Environmental Protection Division

BROOKHAVEN NATIONAL LABORATORY

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Managed by Brookhaven Science Associates
for the U.S. Department of Energy

December 14, 2020

Mr. Brian Jankauskas
New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway, 12th Floor
Albany, New York 12233-7015

Ms. Sharon Hartzell
Federal Facilities Section
Emergency and Remedial Response Division
U. S. EPA – Region II
290 Broadway – 18th Floor
New York, New York 10007-1866

Dear Mr. Jankauskas and Ms. Hartzell:

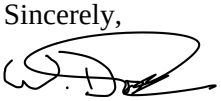
SUBJECT: BROOKHAVEN NATIONAL LABORATORY (BNL): INTERAGENCY AGREEMENT GROUNDWATER REMEDIATION SYSTEMS QUARTERLY OPERATIONS REPORT, July 1, 2020 – September 30, 2020

Enclosed please find the Groundwater Remediation Systems Quarterly Operations Report for July 1, 2020 through September 30, 2020. This report addresses the groundwater remediation systems and includes the groundwater monitoring for the g-2 Tritium Plume and the Brookhaven Linac Isotope Producer Source Area for the third quarter CY 2020. The Section 1 overview table provides a status of each groundwater treatment system through September 2020. The following items contained in the report are of note:

- As a follow-up to the second quarter 2020 installation of three temporary wells (Geoprobes) immediately downgradient of the former Hazardous Waste Management Facility Sr-90 source area, in September 2020 two new monitoring wells were installed and the two original wells that were screened too shallow, were abandoned.
- In August, a soil boring and vertical profile well were installed to address data gaps in the groundwater model geologic framework for the OU VI ethylene dibromide (EDB) plume upgradient of the extraction wells. Two permanent monitoring wells were installed at this location in October 2020.
- The North Street East EDB Groundwater Treatment System began operation in mid-July. A revised Operations and Maintenance Manual for the North Street East Treatment System was submitted to the regulators August 3rd.
- In September, a temporary well was installed downgradient of BGRR sentinel well 085-403 to re-establish the location of the leading edge of the Sr-90 plume.

If you have any questions concerning this report, please contact me at (631) 344-5186.

Sincerely,



W. Dorsch, Manager
Groundwater Protection Group

Enclosure:

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File: GWER 58.2.20

Groundwater Remediation Systems

Quarterly Operations Report

July 1, 2020 through September 30, 2020

Brookhaven National Laboratory
Upton, Long Island, New York

Prepared by:

Brookhaven National Laboratory
Environmental Protection Division

Upton, N.Y. 11973

Prepared for:

U.S. Department of Energy
Brookhaven Site Office

December 2020

Groundwater Remediation Systems

Quarterly Operations Report

July 1, 2020 through September 30, 2020

Brookhaven National Laboratory
Upton, Long Island, New York

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Environmental Protection Division

Upton, N.Y. 11973

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Brookhaven Site Office

December 2020

3rd Quarter Groundwater Remediation System Operations Report
July 1, 2020 through September 30, 2020
Brookhaven National Laboratory
Upton, Long Island, New York

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Section 1

System Operations Overview 3rd Quarter 2020

Table 1 – Summary of Operations

Operable Unit System	*Type*	*Target Contaminant*	*Number of Wells*	*Years of Operation*	*Run Time For Quarter (%)*	*Pounds VOCS Removed (Quarter/Cum)*
Operable Unit I						
South Boundary	Pump and Treat (AS)	VOC	2	Operate- 16 Standby- 6	Closure Approved 9/19	0 369
Operable Unit III						
South Boundary	Pump and Treat (AS)	VOC	8	23	95%PP	2 3,060
HFBR Pump and Recharge	Pump and Recirculate	Tritium	4	Operate- 9 Standby- 13	Closure Approved 3/19	NA 180
Industrial Park	Recirculation/ In-Well (AS/Carbon)/ Pump and Treat (Carbon)	VOC VOC	7 2	Operate- 16 Standby- 5 Operate- 4 Standby-1	Standby Standby	0 1066 0 10
Building 96	Recirculation Well (AS/Carbon)	VOC	4	Operate- 16 Standby- 3	66%	0.1 144
Middle Road	Pump and Treat (AS)	VOC	7	19	95%	3 1303
Western South Boundary	Pump and Treat (AS)	VOC	6	18	95%	3 162
North Street	Pump and Treat (Carbon)	VOC	2	Operate – 11 Standby - 5	Standby	0 342
North Street East	Pump and Treat (Carbon)	VOC/EDB	4	Operate – 10 Standby - 6	100%	0.2 44
LIPA/Airport	Pump and Treat (Carbon)	VOC	10	16	100%	4 482
*Industrial Park East	Pump and Treat (Carbon)	VOC	2	Operate- 5 Standby- 4	Dismantled	NA 38
Chemical Holes	Pump and Treat (IE)	Sr-90	3	Operate - 15 Standby- 2	Standby	NA
BGRR/WCF	Pump and Treat (IE)	Sr-90	9	15	35% PP	NA
Freon	Pump and Treat (AS)	Freon-11	1	Operate – 4 Standby – 4	Closure Approved 9/19	0 106
Operable Unit VI						
EDB	Pump and Treat (Carbon)	EDB	2	16	50%	NA**

AS = air stripping
IE = ion exchange
EDB = ethylene dibromide
NA = not applicable
PP = system is pulse pumping

* Dismantlement of the Industrial Park East system was completed in 2013.

** EDB has only been detected in the influent at trace levels, just above standard, therefore no removal is reported.

Section 2

Q3-2020 Operations Summary
OU I/RA V South Boundary Pump & Treat System
(System Closed)

Process: Groundwater extraction and air stripping treatment, with discharge to the RA V recharge basin

Goal: Reach Maximum Contaminant Levels (MCLs) in core monitoring wells within 30 years for the Upper Glacial aquifer (by 2030). The Petition for Closure of the OU I South Boundary Groundwater Treatment System was approved by the regulators in September 2019.
Note: Current Landfill monitoring well data is included in the attached data tables since this is one of the sources of the OU I/RA V plume.

Start Date: January 1997

Table 2-1
OU I South Boundary Pump & Treat System
Pumping Rates (gpm)

Extraction Well	EW-1*	EW-2*
Site ID #	115-27	115-43
Screen Interval (ft bls)	150-190	104-124/134-154
Desired Rate (GPM)	0	0
July	Off	Off
August	Off	Off
September	Off	Off
Actual (Avg. over Qtr.)	Off	Off

* The system was shut down and approved for closure in September 2019.

Figure 2-1
OU I South Boundary Pump & Treat System
Cumulative Mass Removal VOCs vs. Time

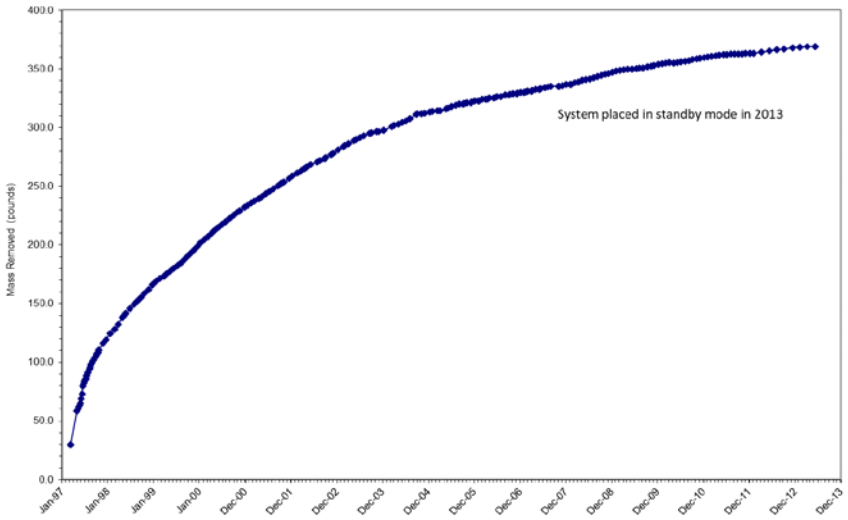


Figure 2-2
OU I South Boundary Pump & Treat System
Influent TVOC Concentrations vs. Time

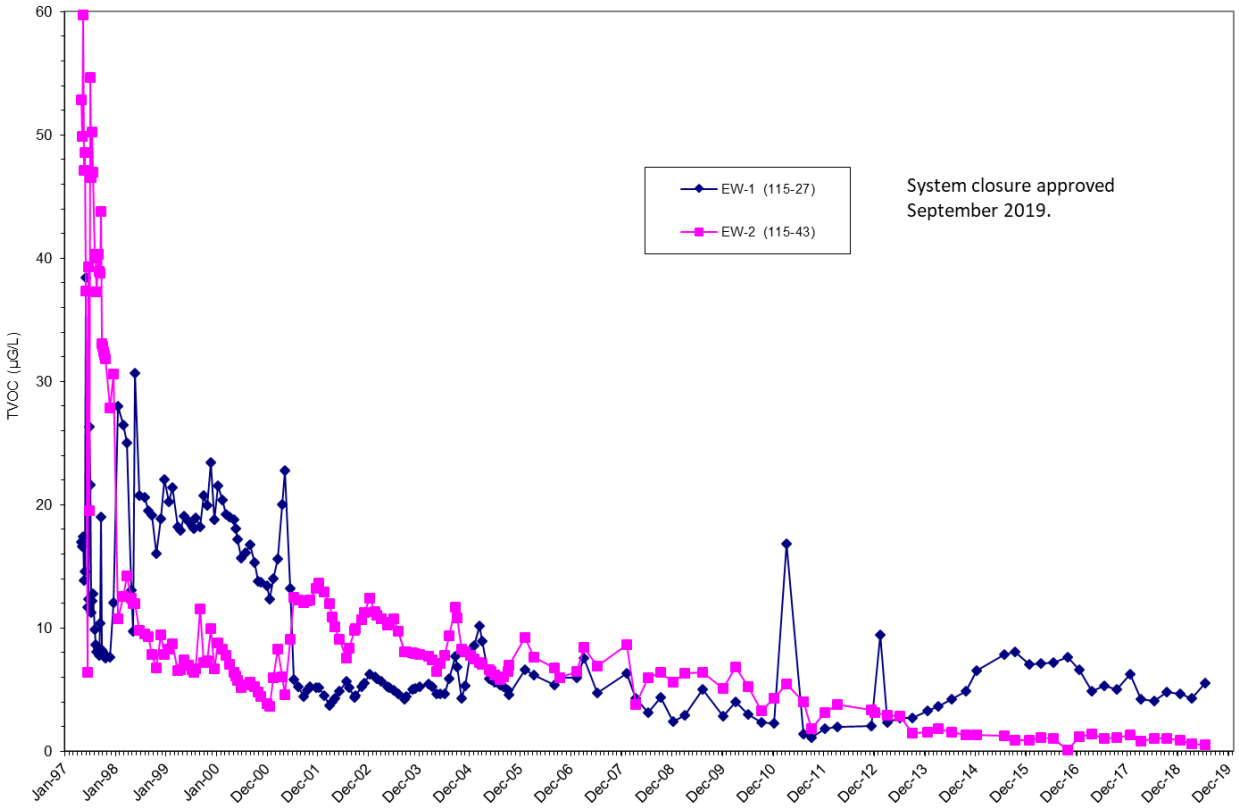


Table 2-2
Effluent Water Quality
SPDES Equivalency Permit Concentrations July 1 through September 30, 2020

Parameter	Permit Limit	Max. Measured Value	Units	Frequency
Flow	Monitor	NA [1]	GPD	Continuous
pH (range)	6.0- 9.0	NA	SU	Weekly
Benzene	0.8	NA	ug/L	Month
Chloroform	7.0	NA	ug/L	Month
Chloroethane	5.0	NA	ug/L	Month
1,2-Dichloroethane	5.0	NA	ug/L	Month
1,1-Dichloroethene	5.0	NA	ug/L	Month
1,1,1-Trichloroethane	5.0	NA	ug/L	Month
Carbon Tetrachloride	5.0	NA	ug/L	Quarterly
1,2-Dichloropropane	5.0	NA	ug/L	Quarterly
Methylene Chloride	5.0	NA	ug/L	Quarterly
Trichloroethylene	5.0	NA	ug/L	Quarterly
Vinyl Chloride	2.0	NA	ug/L	Quarterly
1,2-Xylene	5.0	NA	ug/L	Quarterly
Sum of 1,3 and 1,4-Xylenes	10.0	NA	ug/L	Quarterly

[1] The system is closed.

System Operations

July through September 2020:

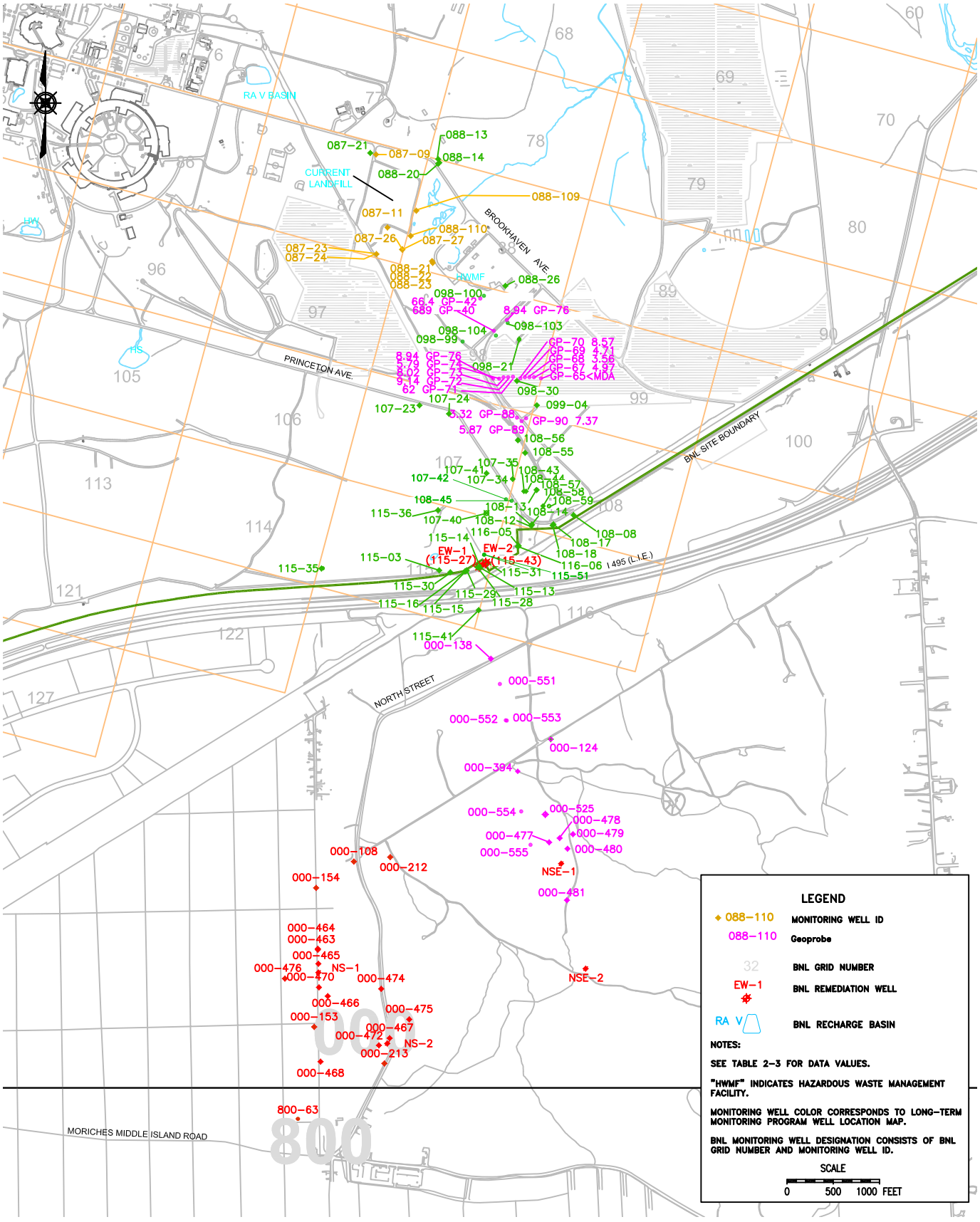
The system remained closed.

As a follow-up to the second quarter 2020 installation of three temporary wells (Geoprobes) immediately downgradient of the FHWMF Sr-90 source area, in September 2020 two new monitoring wells were installed and the two original wells that were screened too shallow, were abandoned.

Due to schedule delays with third quarter monitoring well sampling, some of the samples were collected in mid-October and the analytical results were not available at the time of this report. All analytical data will be included in the 2020 Groundwater Status Report.

Planned Operational Changes

- Maintain the VOC post-closure groundwater monitoring program of an annual sample collection from post-closure wells: 098-99, 107-40, 107-41, 115-13, 115-16, and 115-51. Maintain quarterly sampling of Current Landfill sentinel well 098-99.



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BROOKHAVEN NATIONAL LABORATORY

ENVIRONMENTAL PROTECTION DIVISION

TITLE:

OU I SOUTH BOUNDARY/NORTH STREET/NORTH STREET EAST MONITORING WELL NETWORK

SITEWIDE REMEDIATION SYSTEMS
THIRD QUARTER 2020 OPERATIONS REPORT

DWN:	VT: HZ.:	DATE:	PROJECT NO.:
JEB	–	08/08/11	NA
CHKD:	APPD:	REV.:	NOTES:
LDS	--	10/20/20	–

FIGURE NO.: 2-3

Format 2 Report

Site ID : 088-109

Chemical Name	Sample Date	Value	Detlim	Error	Units	Depth	Qual	Matrix
1,1-Dichloroethane	10/07/2020	10.7	0.5	0	UG/L	13.50		W
524.2 TVOC	10/07/2020	28.04	0	0	UG/L	13.50		W
Benzene	10/07/2020	0.44	0.5	0	UG/L	13.50	J	W
Chloroethane	10/07/2020	16.9	0.5	0	UG/L	13.50		W

Site ID : 098-30

Chemical Name	Sample Date	Value	Detlim	Error	Units	Depth	Qual	Matrix
Strontium-90	07/30/2020	26.7	0.292	2.38	PCI/L	37.80		W

Site ID : 098-99

Chemical Name	Sample Date	Value	Detlim	Error	Units	Depth	Qual	Matrix
1,1-Dichloroethane	10/07/2020	4.86	0.5	0	UG/L	44.50		W
524.2 TVOC	10/07/2020	5.2	0	0	UG/L	44.50		W
cis-1,2-Dichloroethylene	10/07/2020	0.34	0.5	0	UG/L	44.50	J	W

Site ID : 107-35

Chemical Name	Sample Date	Value	Detlim	Error	Units	Depth	Qual	Matrix
Strontium-90	07/30/2020	4.33	0.248	0.515	PCI/L	65.00		W

Site ID : 115-13

Chemical Name	Sample Date	Value	Detlim	Error	Units	Depth	Qual	Matrix
1,1-Dichloroethane	10/08/2020	0.16	0.5	0	UG/L	145.00	J	W
524.2 TVOC	10/08/2020	2.06	0	0	UG/L	145.00		W
Chloroform	10/08/2020	1.7	0.5	0	UG/L	145.00		W
Trichloroethylene	10/08/2020	0.2	0.5	0	UG/L	145.00	J	W

Site ID : 115-16

Chemical Name	Sample Date	Value	Detlim	Error	Units	Depth	Qual	Matrix
1,1-Dichloroethane	10/08/2020	3	0.5	0	UG/L	130.00		W
524.2 TVOC	10/08/2020	7.14	0	0	UG/L	130.00		W
Benzene	10/08/2020	0.14	0.5	0	UG/L	130.00	J	W
Chloroethane	10/08/2020	4	0.5	0	UG/L	130.00		W
Sodium-22	10/08/2020	4.8	4.41	3.34	PCI/L	130.00		W

Format 2 Report

Site ID : 115-16

Chemical Name	Sample Date	Value	Detlim	Error	Units	Depth	Qual	Matrix

Site ID : 115-28

Chemical Name	Sample Date	Value	Detlim	Error	Units	Depth	Qual	Matrix
Co-60	10/08/2020	6.31	5.34	5.38	PCI/L	207.00	N2	W

Site ID : 115-31

Chemical Name	Sample Date	Value	Detlim	Error	Units	Depth	Qual	Matrix
Beryllium-7	10/09/2020	42.8	40.5	34.9	PCI/L	172.00		W

Section 3

Q3-2020 Operations Summary
OU III South Boundary Pump and Treat System

Process: Groundwater extraction and air stripping treatment, with discharge to both the OU III and RA V recharge basins.

Goal: Reach MCLs in core monitoring wells in OU III within 30 years for the Upper Glacial aquifer (by 2030).

Start Date: June 1997

Table 3-1
OU III South Boundary
Pumping Rates (gpm)

Extraction Well	EW-3	EW-4	EW-5	EW-6	EW-7	EW-8	EW-12	EW-17
Site ID	121-17	121-16	121-15	122-14	122-13	122-12	122-30	121-46
Screen Interval (ft bls)	150-190	160-180 &190-200	160-200	160-200	170-210	190-210 & 230-250	180-220	207-237
Desired Flow Rate (gpm)	0*	140	0*	0*	0*	0*	0*	150
July	0	136	0	0	0	0	0	129
August	0	0	0	0	0	0	0	150
September	0	138	0	0	0	0	0	124
Actual (Avg. over Qtr)	**0**	**137**	**0**	**0**	**0**	**0**	**0**	**134**

* Extraction wells placed in standby mode: EW-12 (2003), EW-8 (2006), EW-6 (2007), EW-7 (2007), EW-3 and EW-5 (2015). EW-4 is pulsed pumping (one month on and one month off).

Figure 3-1
OU III South Boundary
Cumulative Mass Removal of VOC's vs. Time

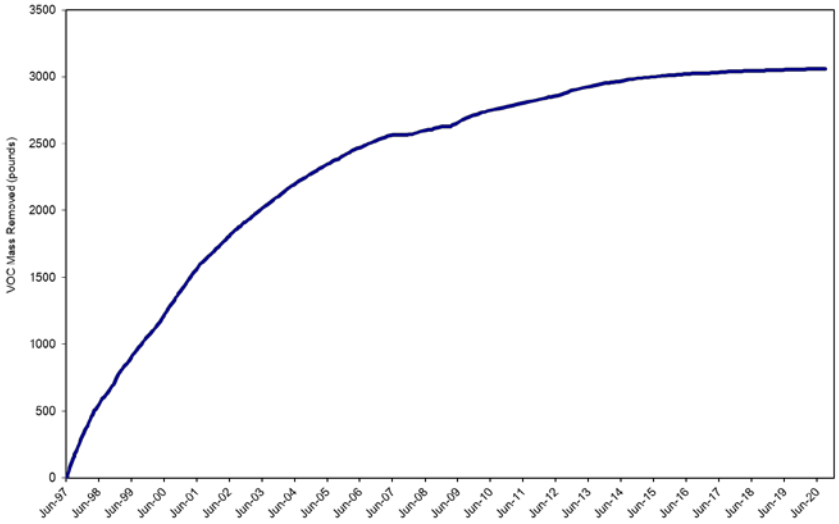


Figure 3-2
OU III South Boundary
Influent TVOC Concentration vs. Time

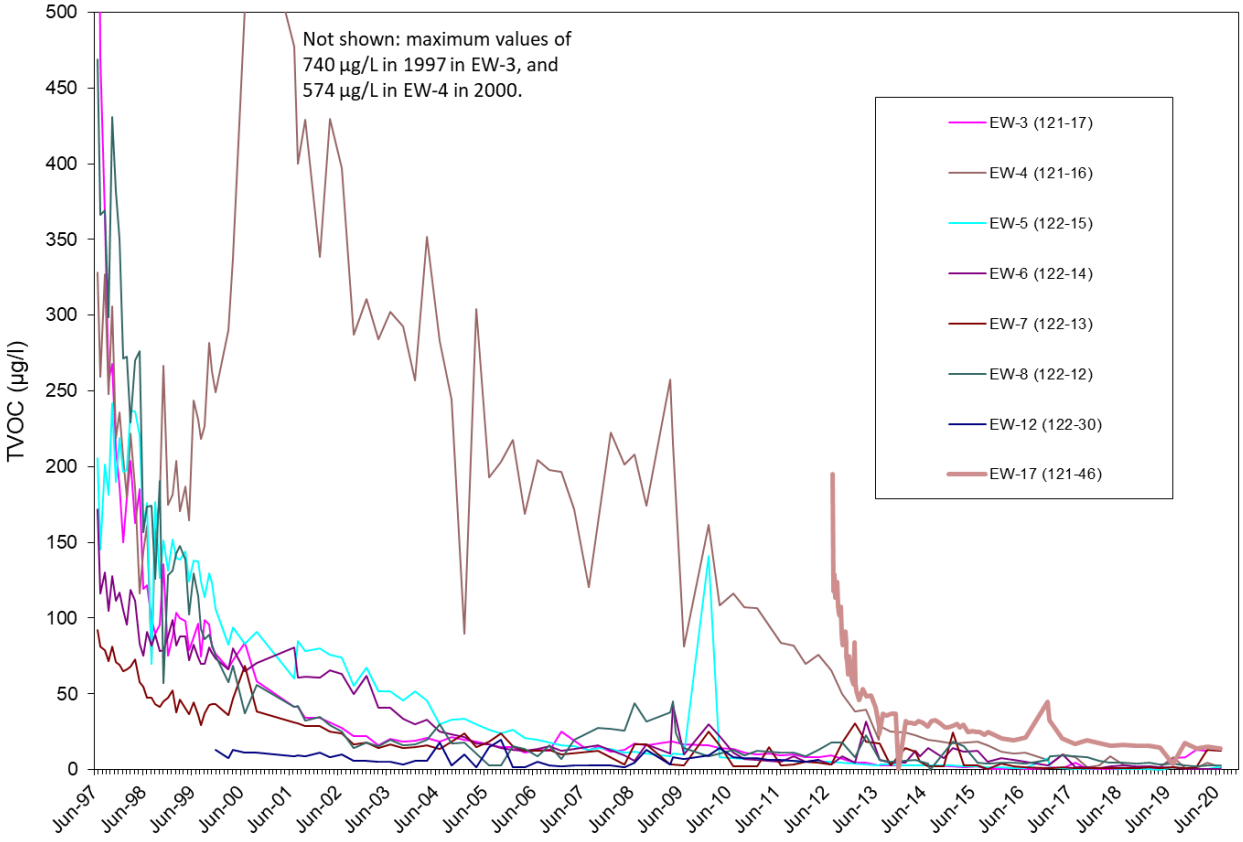


Table 3-2
OU III South Boundary Effluent Water Quality
SPDES Equivalency Permit Concentrations July 1 – September 30, 2020

Parameter	Permit Limit	Max. Measured Value	Units	Frequency
Flow	**Monitor**	**891,753**	**GPD**	**Continuous**
pH (range)	**6.5 - 8.5**	**7.1– 7.5[2]**	**SU**	**Monthly[3]**
Carbon Tetrachloride	**5**	**<0.50**	**ug/L**	**Monthly[3]**
Chloroform	**7**	**<0.50**	**ug/L**	**Monthly[3]**
Dichlorodifluoromethane	**5**	**<0.50**	**ug/L**	**Monthly[3]**
1,1-Dichloroethane	**5**	**<0.50**	**ug/L**	**Monthly[3]**
1,1-Dichloroethylene	**5**	**<0.50**	**ug/L**	**Monthly[3]**
Methyl Chloride	**5**	**<0.50**	**ug/L**	**Monthly[3]**
Tetrachloroethylene	**5**	**<0.50**	**ug/L**	**Monthly[3]**
Toluene	**5**	**<0.50**	**ug/L**	**Monthly[3]**
1,1,1-Trichloroethane	**5**	**<0.50**	**ug/L**	**Monthly[3]**
1,1,2 Trichloroethane	**5**	**<0.50**	**ug/L**	**Monthly[3]**
Trichloroethylene	**10**	**<0.50**	**ug/L**	**Monthly[3]**

[1] = The maximum monthly average flow rate for both the OUIII South Boundary and Middle Road Systems, during the operational period.
[2] = The minimum and maximum pH values during the operational period.
[3] = Beginning in April 2003, a SPDES modification was approved revising the pH and volatile organic sampling to once a month.

System Operations

July 2020:

The system operated normally for the month. Extraction well EW-4 and EW-17 were in full time operation. Wells EW-3, EW-5, EW-6, EW-7, EW-8 and EW-12 remained in standby mode. The system treated approximately 11.5 million gallons of water.

August 2020:

Extraction well EW-4 was off for pulsed pumping and EW-17 was in full time operation. Wells EW-3, EW-5, EW-6, EW-7, EW-8 and EW-12 remained in standby mode. The system treated approximately 6.5 million gallons of water.

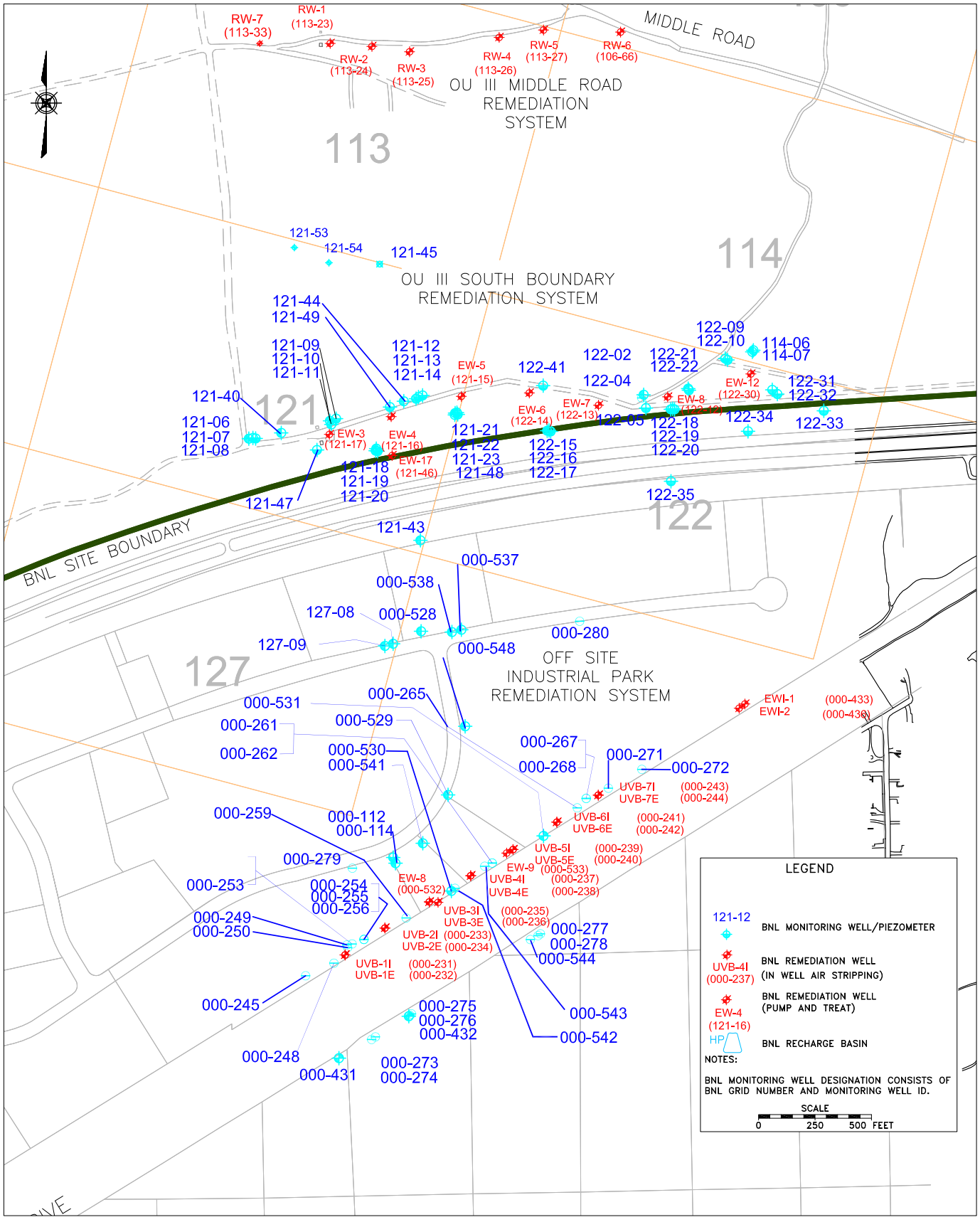
September 2020:

The system operated normally for the month. EW-4 and EW-17 were in full time operation. Wells EW-3, EW-5, EW-6, EW-7, EW-8 and EW-12 remained in standby mode. The system treated approximately 11 million gallons of water.

The system treated approximately 29 million gallons of water during the third quarter of 2020.

Planned Operational Changes

- Maintain wells EW-3, EW-5, EW-6, EW-7, EW-8, and EW-12 in standby mode. The system's extraction wells will continue to be sampled on a quarterly basis. The wells will be restarted if extraction or monitoring well data indicate TVOC concentrations exceed the 50 µg/L capture goal. During the third quarter, TVOC concentrations in extraction wells EW-5, EW-6, EW-7, and EW-8 and adjacent monitoring wells were less than 50 µg/L. Extraction well EW-3 was not sampled in the third quarter due to repairs being performed on the pump.
- Continue to operate well EW-17 on a full-time basis. Continue pulsed pumping of well EW-4 one month on and one month off. During the third quarter, TVOC concentrations in extraction wells EW-4 and EW-17 were less than 50 µg/L. TVOC concentrations in monitoring well 121-49, located upgradient of and at the same depth as EW-17, remain above 50 µg/L in the third quarter, at a concentration of 279 µg/L.



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ENVIRONMENTAL PROTECTION DIVISION

TITLE:
OU III SOUTH BOUNDARY/INDUSTRIAL PARK/INDUSTRIAL PARK EAST MONITORING WELL NETWORKS

SITEWIDE REMEDIATION SYSTEMS
THIRD QUARTER 2020 OPERATIONS REPORT

DWN:	VT:HZ.:	DATE:	PROJECT NO.:
JEB	–	09/12/14	–
CHKD:	APPD:	REV.:	NOTES:
LDS	–	10/20/20	–

FIGURE NO.: 3–3

Table 3-3
OU III South Boundary Monitoring Well Data
'Hits Only' July through September 2020

Site ID : 114-07

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Cesium-137	09/17/2020	5.95	5.83	5.33	PCI/L	205.00	

Site ID : 121-06

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	09/09/2020	0.96	--	--	UG/L	45.00	
Chloroform	09/09/2020	0.96	0.5	--	UG/L	45.00	
Co-60	09/09/2020	5.13	4.71	4.56	PCI/L	45.00	
Sodium-22	09/09/2020	7.86	2.41	3.34	PCI/L	45.00	

Site ID : 121-12

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	09/15/2020	1.6	--	--	UG/L	50.00	
Chloroform	09/15/2020	1.6	0.5	--	UG/L	50.00	

Site ID : 121-18

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	09/14/2020	1.7	--	--	UG/L	70.00	
Chloroform	09/14/2020	1.7	0.5	--	UG/L	70.00	

Site ID : 121-19

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Tritium	09/14/2020	1080	388	331	PCI/L	100.00	

Site ID : 121-21

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	09/15/2020	0.35	--	--	UG/L	70.00	
Chloroform	09/15/2020	0.35	0.5	--	UG/L	70.00	J

Site ID : 121-40

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/06/2020	0	--	--	UG/L	291.00	

Site ID : 121-44

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/06/2020	0	--	--	UG/L	270.00	

Site ID : 121-45

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	09/08/2020	5.87	--	--	UG/L	199.00	
Chloroform	09/08/2020	0.35	0.5	--	UG/L	199.00	J
Tetrachloroethylene	09/08/2020	5.1	0.5	--	UG/L	199.00	

Table 3-3
OU III South Boundary Monitoring Well Data
'Hits Only' July through September 2020

Site ID : 121-45

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Trichloroethylene	09/08/2020	0.42	0.5	--	UG/L	199.00	J

Site ID : 121-49

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	09/17/2020	279.09	--	--	UG/L	215.00	
Carbon tetrachloride	09/17/2020	42	2.5	--	UG/L	215.00	D
Tetrachloroethylene	09/17/2020	230	2.5	--	UG/L	215.00	E D

Site ID : 121-53

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	09/09/2020	1.4	0.5	--	UG/L	229.00	
1,1-Dichloroethane	09/09/2020	0.96	0.5	--	UG/L	229.00	
1,1-Dichloroethylene	09/09/2020	1.8	0.5	--	UG/L	229.00	
524.2 TVOC	09/09/2020	55.96	--	--	UG/L	229.00	
Carbon tetrachloride	09/09/2020	6.6	0.5	--	UG/L	229.00	
Chloroform	09/09/2020	2.7	0.5	--	UG/L	229.00	
Tetrachloroethylene	09/09/2020	41	2.5	--	UG/L	229.00	D
Trichloroethylene	09/09/2020	1.5	0.5	--	UG/L	229.00	

Site ID : 121-54

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	09/09/2020	96.86	--	--	UG/L	220.00	
Carbon tetrachloride	09/09/2020	33	2.5	--	UG/L	220.00	D

Site ID : 122-02

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	09/18/2020	0.316	0.283	0.188	PCI/L	95.00	

Site ID : 122-04

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Cesium-137	09/18/2020	5.85	5.32	4.87	PCI/L	202.50	

Site ID : 122-10

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	09/17/2020	0	--	--	UG/L	154.50	

Site ID : 122-15

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	09/18/2020	0.969	0.298	0.259	PCI/L	60.00	

Site ID : 122-16

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Tritium	09/18/2020	946	386	295	PCI/L	150.00	

Table 3-3
OU III South Boundary Monitoring Well Data
'Hits Only' July through September 2020

Site ID : 122-17

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	09/18/2020	0.385	0.294	0.201	PCI/L	210.00	

Site ID : 122-20

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Europium-154	09/17/2020	66.7	48.5	47.9	PCI/L	260.00	

Site ID : 122-41

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,4-Dioxane	07/06/2020	0.753	0.2	--	UG/L	325.00	
524.2 TVOC	07/06/2020	0	--	--	UG/L	325.00	

Table 3-4
OU III South Boundary Extraction Well Data
'Hits Only' July through September 2020

Site ID : 121-15 (EW-5)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/10/2020	2.34	--	--	UG/L	0.00	
Methyl bromide	07/10/2020	1.8	0.57	--	UG/L	0.00	
Tetrachloroethylene	07/10/2020	0.54	0.5	--	UG/L	0.00	

Site ID : 121-16 (EW-4)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/10/2020	1.37	--	--	UG/L	0.00	
Chloroform	07/10/2020	0.27	0.5	--	UG/L	0.00	J
Tetrachloroethylene	07/10/2020	1.1	0.5	--	UG/L	0.00	

Site ID : 121-46 (EW-17)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	07/10/2020	0.44	0.5	--	UG/L	0.00	J
1,1-Dichloroethylene	07/10/2020	0.37	0.5	--	UG/L	0.00	J
524.2 TVOC	07/10/2020	14.08	--	--	UG/L	0.00	
Carbon tetrachloride	07/10/2020	2.3	0.5	--	UG/L	0.00	
Chloroform	07/10/2020	0.52	0.5	--	UG/L	0.00	
Tetrachloroethylene	07/10/2020	10	0.5	--	UG/L	0.00	
Trichloroethylene	07/10/2020	0.45	0.5	--	UG/L	0.00	J

Site ID : 122-12 (EW-8)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/10/2020	2.7	--	--	UG/L	0.00	
Tetrachloroethylene	07/10/2020	2.7	0.5	--	UG/L	0.00	

Site ID : 122-13 (EW-7)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	07/10/2020	2	0.5	--	UG/L	0.00	
1,1-Dichloroethylene	07/10/2020	2.5	0.5	--	UG/L	0.00	
524.2 TVOC	07/10/2020	12.12	--	--	UG/L	0.00	
Carbon tetrachloride	07/10/2020	1.3	0.5	--	UG/L	0.00	
Chloroform	07/10/2020	0.57	0.5	--	UG/L	0.00	
Tetrachloroethylene	07/10/2020	5.2	0.5	--	UG/L	0.00	
Trichloroethylene	07/10/2020	0.55	0.5	--	UG/L	0.00	

Site ID : 122-14 (EW-6)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/10/2020	0.37	--	--	UG/L	0.00	

Table 3-4
OU III South Boundary Extraction Well Data
'Hits Only' July through September 2020

Site ID : 122-14 (EW-6)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Tetrachloroethylene	07/10/2020	0.37	0.5	--	UG/L	0.00	J

Table 3-5
OU III South Boundary Influent Data
'Hits Only' July through September 2020

Site ID : 121-41 (System Influent)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/10/2020	6.48	--	--	UG/L	0.00	
Carbon tetrachloride	07/10/2020	1	0.5	--	UG/L	0.00	
Chloroform	07/10/2020	0.38	0.5	--	UG/L	0.00	J
Tetrachloroethylene	07/10/2020	5.1	0.5	--	UG/L	0.00	
1,1,1-Trichloroethane	08/06/2020	0.45	0.5	--	UG/L	0.00	J
1,1-Dichloroethylene	08/06/2020	0.45	0.5	--	UG/L	0.00	J
524.2 TVOC	08/06/2020	12.85	--	--	UG/L	0.00	
Carbon tetrachloride	08/06/2020	1.9	0.5	--	UG/L	0.00	
Chloroform	08/06/2020	0.62	0.5	--	UG/L	0.00	
Tetrachloroethylene	08/06/2020	9	0.5	--	UG/L	0.00	
Trichloroethylene	08/06/2020	0.43	0.5	--	UG/L	0.00	J
1,1,1-Trichloroethane	09/02/2020	0.27	0.5	--	UG/L	0.00	J
524.2 TVOC	09/02/2020	7.3	--	--	UG/L	0.00	
Carbon tetrachloride	09/02/2020	1.1	0.5	--	UG/L	0.00	
Chloroform	09/02/2020	0.43	0.5	--	UG/L	0.00	J
Tetrachloroethylene	09/02/2020	5.5	0.5	--	UG/L	0.00	

Table 3-6
OU III South Boundary Effluent Data
'Hits Only' July through September 2020

Site ID : 095-126 (System Effluent)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	08/06/2020	0	--	--	UG/L	0.00	
1,4-Dioxane	09/02/2020	1.66	0.2	--	UG/L	0.00	
524.2 TVOC	09/02/2020	0	--	--	UG/L	0.00	

Qualifiers :

J = Estimated value.

D = Compound was identified in an analysis at a secondary dilution factor.

Organic Compounds :

B = Compound was found in both the sample And associated laboratory blank.

Inorganic Compounds :

B = Result Is between instrument detection limit And contract required reporting limit.

Section 4

Q3-2020 Operations Summary
OU III Middle Road Pump and Treat System

Process: Groundwater extraction and air stripping treatment, with discharge to both the OU III and RAV recharge basins.

Goal: Reach Maximum Contaminant Levels (MCLs) in core monitoring wells in OU III within 30 years for the Upper Glacial aquifer (by 2030).

Start Date: October 23, 2001

Table 4-1
OU III Middle Road
Pumping Rates (gpm)

Extraction Well	RW-1	RW-2	RW-3	RW-4	RW-5	RW-6	RW-7
Site Id #	113-23	113-24	113-25	113-26	113-27	106-66	113-33
Screen Interval (ft bls)	90-130	170-200	228-268	150-180	150-180	188-218	202-222
Desired Flow Rate (gpm)	0*	150	100	0*	0*	0*	100
July (Avg monthly gpm)	0	116	107	0	0	0	131
August " " "	0	136	118	0	0	0	132
September " " "	0	120	111	0	0	0	87
Actual (Avg. over Qtr.)	**0**	**124**	**112**	**0**	**0**	**0**	**117**

* Extraction wells placed in standby mode: RW-4 and RW-5 (2003), RW-6 (2006), and RW-1 (2015).

Figure 4-1
OU III Middle Road
Cumulative Mass Removal of VOC's vs. Time

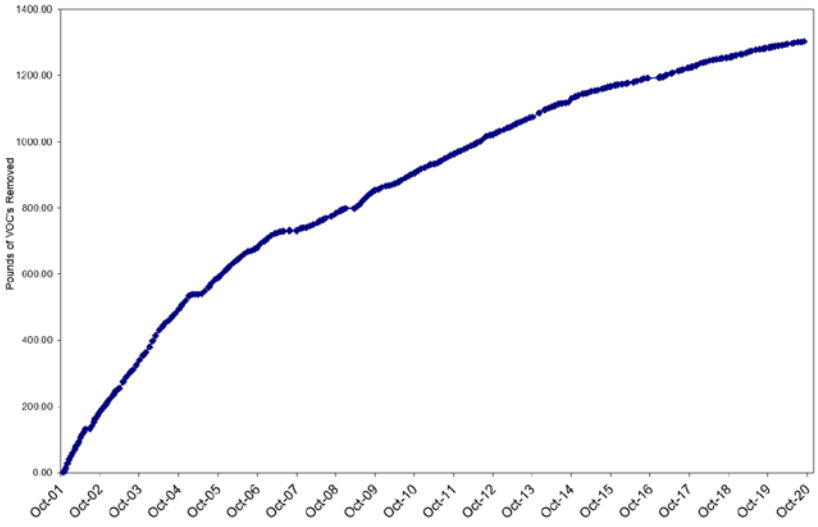


Figure 4-2
OU III Middle Road
Influent TVOC Concentrations vs. Time

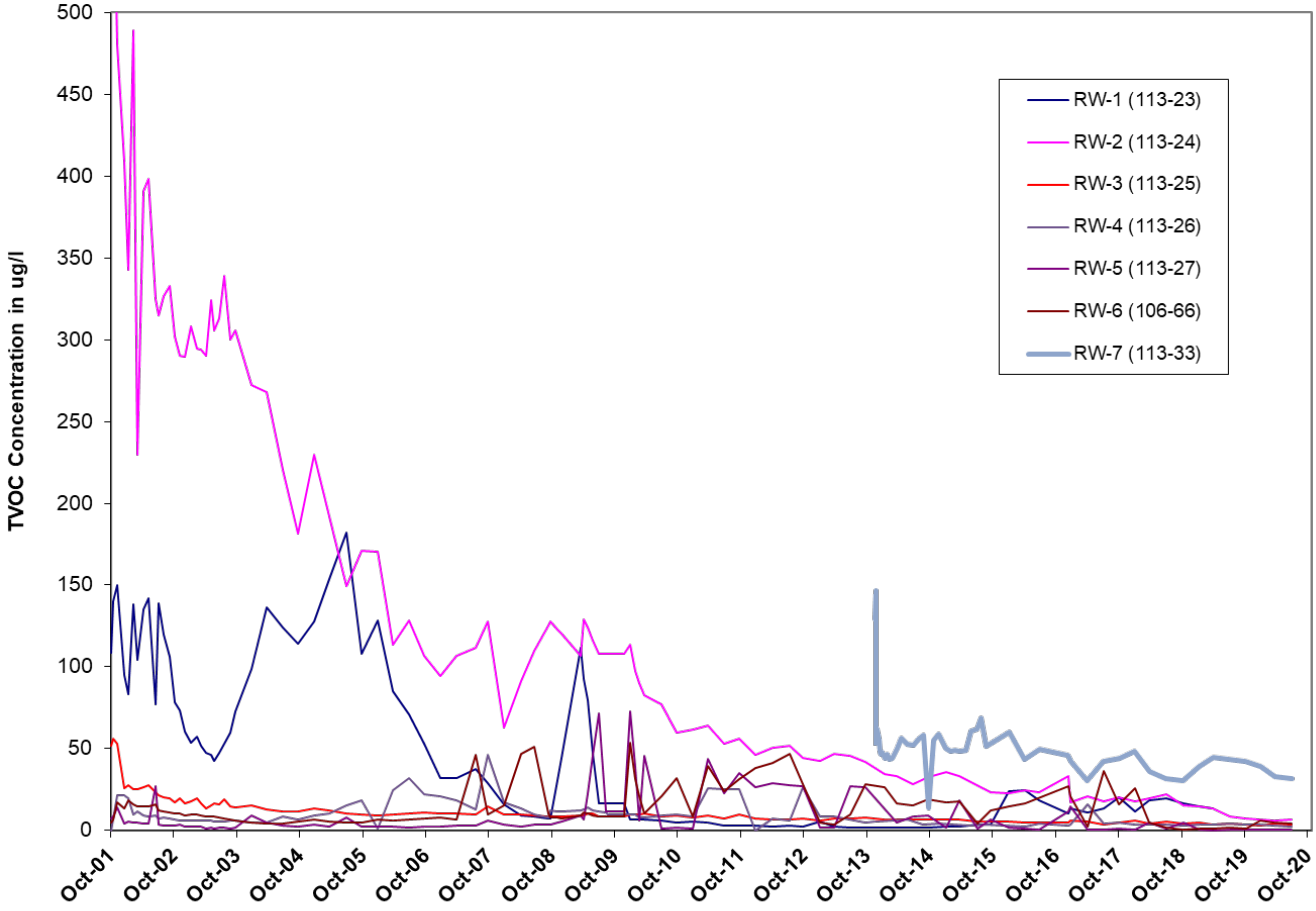


Table 4-2
OU III Middle Road Air-Stripping Tower Effluent Water Quality
SPDES Equivalency Permit Concentrations July 1, 2020 – September 30, 2020

Parameter	Permit Limit	Max. Measured Value	Units	Frequency
Flow	**Monitor**	**891,753** [1]	**GPD**	**Continuous**
pH (range)	**6.5 - 8.5**	**7.1-7.5** [2]	**SU**	**Monthly**[3]
Carbon Tetrachloride	**5**	**<0.05**	**ug/L**	**Monthly**[3]
Chloroform	**7**	**<0.05**	**ug/L**	**Monthly**[3]
Dichlorodifluorometha	**5**	**<0.05**	**ug/L**	**Monthly**[3]
1,1-Dichloroethane	**5**	**<0.05**	**ug/L**	**Monthly**[3]
1,1-Dichloroethylene	**5**	**<0.05**	**ug/L**	**Monthly**[3]
Methyl Chloride	**5**	**<0.05**	**ug/L**	**Monthly**[3]
Tetrachloroethylene	**5**	**<0.05**	**ug/L**	**Monthly**[3]
Toluene	**5**	**<0.05**	**ug/L**	**Monthly**[3]
1,1,1-Trichloroethane	**5**	**<0.05**	**ug/L**	**Monthly**[3]
1,1,2 Trichloroethane	**5**	**<0.05**	**ug/L**	**Monthly**[3]
Trichloroethylene	**10**	**<0.05**	**ug/L**	**Monthly**[3]

[1] The maximum monthly average flow for the Middle Road and South Boundary Systems during the operational period.
[2] The minimum and maximum pH values for the Middle Road Effluent, during the operational period.
[3] Beginning in April 2003, a SPDES modification was approved revising the pH and volatile organic sampling to once a month.

System Operations

July 2020:

Extraction wells RW-2, RW-3, and RW-7 were in full time operation. Wells RW-1, RW-4, RW-5 and RW-6 remained in standby mode. The effluent sample was taken from the Middle Road air stripper tower effluent. The system treated approximately 15 million gallons of water.

August 2020:

Extraction well RW-2, RW-3, and RW-7 were in full time operation. Wells RW-1, RW-4, RW-5 and RW-6 remained in standby mode. The effluent sample was taken from the OU III South Boundary air stripper tower effluent. The system treated approximately 16.5 million gallons of water.

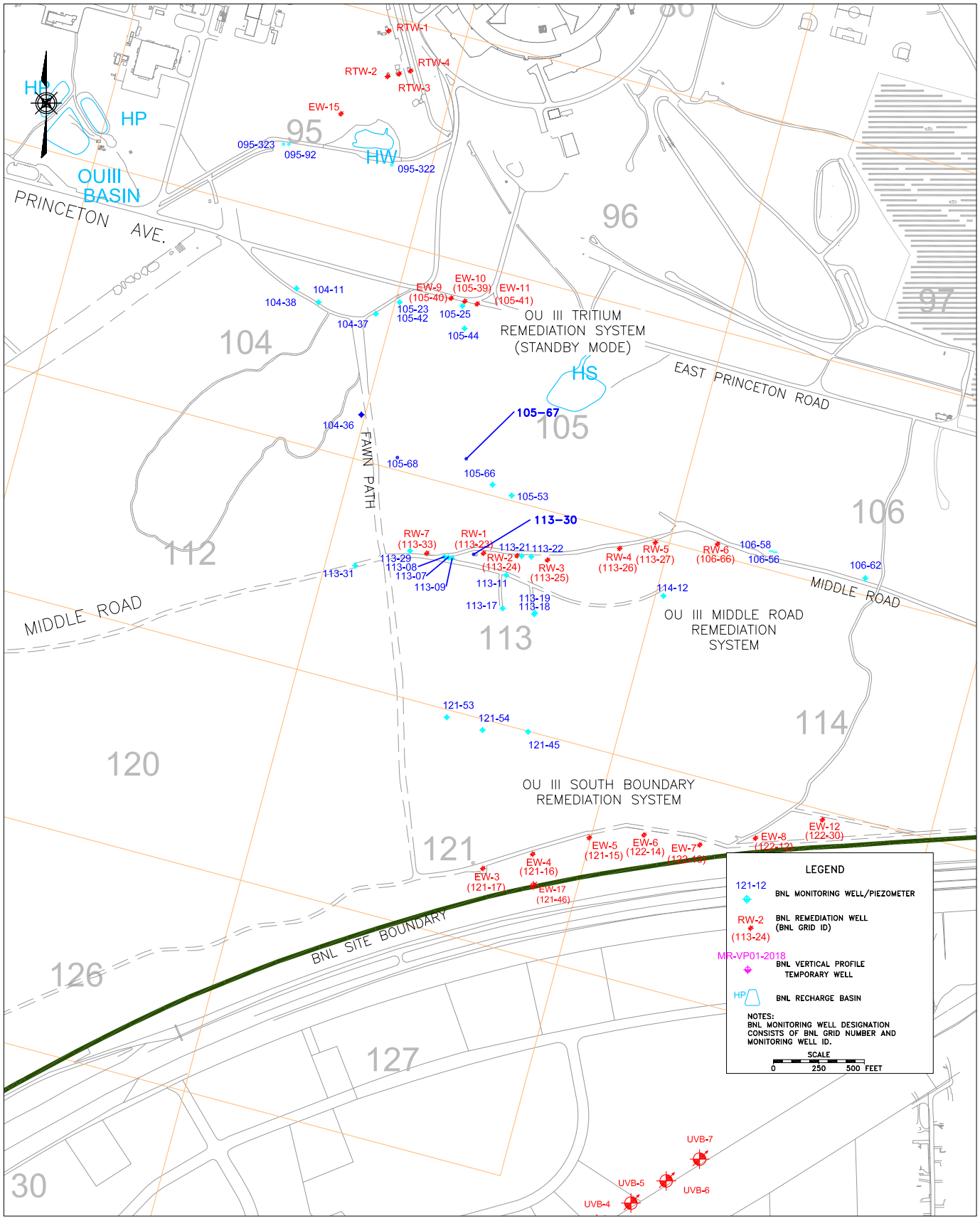
September 2020:

Extraction wells RW-2, RW-3, and RW-7 were in full time operation. RTW-7 was off for a week for maintenance. Wells RW-1, RW- 4, RW-5 and RW-6 remained in standby mode. The effluent sample was taken from OU III South Boundary effluent. The system treated approximately 13.5 million gallons of water.

The system treated approximately 45 million gallons of water during the third quarter of 2020.

Planned Operational Changes

- Continue operation of extraction wells RW-2, RW-3 and RW-7, and maintain RW-1, RW-4, RW-5 and RW-6 in standby mode. Restart the well(s) if extraction or monitoring well data indicate that TVOC concentrations exceed the 50 µg/L capture goal. TVOC concentrations in extraction wells RW-4, RW-5 and RW-6 and adjacent monitoring wells were below 50 µg/L in the third quarter. Well RW-1 was not sampled this quarter due to electrical maintenance.



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ENVIRONMENTAL
PROTECTION DIVISION

TITLE:

OU III MIDDLE ROAD MONITORING WELL NETWORK

SITEWIDE REMEDIATION SYSTEMS
THIRD QUARTER 2020 OPERATIONS REPORT

DWN:	VT:HZ.:	DATE:	PROJECT NO.:
JEB	–	02/08/07	–
CHKD:	APPD:	REV.:	NOTES:
LDS	––	10/20/20	–

FIGURE NO.: 4–3

Table 4-3
OU III Middle Road Monitoring Well Data
'Hits Only' July through September 2020

Site ID : 095-322

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	09/02/2020	3.8	0.5		UG/L	180.00	
1,1-Dichloroethane	09/02/2020	0.64	0.5		UG/L	180.00	
1,1-Dichloroethylene	09/02/2020	5.4	0.5		UG/L	180.00	
524.2 TVOC	09/02/2020	33.88	--		UG/L	180.00	
Chloroform	09/02/2020	0.64	0.5		UG/L	180.00	
Tetrachloroethylene	09/02/2020	16	0.5		UG/L	180.00	
Trichloroethylene	09/02/2020	7.4	0.5		UG/L	180.00	

Site ID : 095-323

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	09/02/2020	2.1	0.5		UG/L	205.00	
1,1,2,2-Tetrachloroethane	09/02/2020	1.4	0.5		UG/L	205.00	
1,1-Dichloroethylene	09/02/2020	1.2	0.5		UG/L	205.00	
524.2 TVOC	09/02/2020	18.09	--		UG/L	205.00	
Chloroform	09/02/2020	0.39	0.5		UG/L	205.00	J
Tetrachloroethylene	09/02/2020	8.9	0.5		UG/L	205.00	
Trichloroethylene	09/02/2020	4.1	0.5		UG/L	205.00	

Site ID : 104-37

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	07/01/2020	1.5	0.5		UG/L	209.00	
1,1,2,2-Tetrachloroethane	07/01/2020	1.3	0.5		UG/L	209.00	
1,1-Dichloroethylene	07/01/2020	1.7	0.5		UG/L	209.00	
524.2 TVOC	07/01/2020	83	--		UG/L	209.00	
Carbon tetrachloride	07/01/2020	3.1	0.5		UG/L	209.00	
Chloroform	07/01/2020	1.2	0.5		UG/L	209.00	
Tetrachloroethylene	07/01/2020	71	2.5		UG/L	209.00	
Trichloroethylene	07/01/2020	3.2	0.5		UG/L	209.00	
1,1,1-Trichloroethane	09/02/2020	2.2	0.5		UG/L	209.00	
1,1,2,2-Tetrachloroethane	09/02/2020	1.3	0.5		UG/L	209.00	
1,1,2-Trichloroethane	09/02/2020	3.1	0.5		UG/L	209.00	
1,1-Dichloroethylene	09/02/2020	2.4	0.5		UG/L	209.00	
524.2 TVOC	09/02/2020	83.5	--		UG/L	209.00	
Carbon tetrachloride	09/02/2020	4.1	0.5		UG/L	209.00	
Chloroform	09/02/2020	1	0.5		UG/L	209.00	

Table 4-3
OU III Middle Road Monitoring Well Data
'Hits Only' July through September 2020

Site ID : 104-37

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Tetrachloroethylene	09/02/2020	66	2.5		UG/L	209.00	D
Trichloroethylene	09/02/2020	3.4	0.5		UG/L	209.00	

Site ID : 105-23

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	09/08/2020	15.94	--		UG/L	180.00	
Carbon tetrachloride	09/08/2020	0.36	0.5		UG/L	180.00	J
Chloroform	09/08/2020	0.58	0.5		UG/L	180.00	
Tetrachloroethylene	09/08/2020	15	0.5		UG/L	180.00	

Site ID : 105-66

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	09/08/2020	1.4	0.5		UG/L	184.00	
1,1,2,2-Tetrachloroethane	09/08/2020	0.5	0.5		UG/L	184.00	
1,1-Dichloroethylene	09/08/2020	0.77	0.5		UG/L	184.00	
524.2 TVOC	09/08/2020	184.96	--		UG/L	184.00	
Carbon tetrachloride	09/08/2020	5.6	0.5		UG/L	184.00	
Chloroform	09/08/2020	0.77	0.5		UG/L	184.00	
Methyl tert-butyl ether	09/08/2020	0.92	0.5		UG/L	184.00	
Tetrachloroethylene	09/08/2020	170	5		UG/L	184.00	D
Trichloroethylene	09/08/2020	5	0.5		UG/L	184.00	

Site ID : 105-67

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	09/01/2020	3.5	0.5		UG/L	185.00	
1,1,2,2-Tetrachloroethane	09/01/2020	0.56	0.5		UG/L	185.00	
1,1,2-Trichloroethane	09/01/2020	2.6	0.5		UG/L	185.00	
1,1-Dichloroethylene	09/01/2020	3.6	0.5		UG/L	185.00	
524.2 TVOC	09/01/2020	69.99	--		UG/L	185.00	
Chloroform	09/01/2020	0.63	0.5		UG/L	185.00	
Tetrachloroethylene	09/01/2020	58	2.5		UG/L	185.00	D
Trichloroethylene	09/01/2020	1.1	0.5		UG/L	185.00	

Site ID : 105-68

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	09/02/2020	1.4	0.5		UG/L	205.00	
1,1,2,2-Tetrachloroethane	09/02/2020	4	0.5		UG/L	205.00	

Table 4-3
OU III Middle Road Monitoring Well Data
'Hits Only' July through September 2020

Site ID : 105-68

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1-Dichloroethylene	09/02/2020	0.9	0.5		UG/L	205.00	
524.2 TVOC	09/02/2020	208.25	--		UG/L	205.00	
Carbon tetrachloride	09/02/2020	18	0.5		UG/L	205.00	
Chloroform	09/02/2020	0.95	0.5		UG/L	205.00	
Tetrachloroethylene	09/02/2020	170	5		UG/L	205.00	D
Trichloroethylene	09/02/2020	13	0.5		UG/L	205.00	

Site ID : 113-11

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	09/01/2020	2.43	--		UG/L	201.00	
Chloroform	09/01/2020	0.43	0.5		UG/L	201.00	J
Tetrachloroethylene	09/01/2020	2	0.5		UG/L	201.00	

Site ID : 113-17

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	09/01/2020	13.75	--		UG/L	177.00	
Chloroform	09/01/2020	0.33	0.5		UG/L	177.00	J
Tetrachloroethylene	09/01/2020	13	0.5		UG/L	177.00	
Trichloroethylene	09/01/2020	0.42	0.5		UG/L	177.00	J

Site ID : 113-19

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	09/08/2020	10	0.5		UG/L	230.00	
1,1-Dichloroethane	09/08/2020	0.86	0.5		UG/L	230.00	
1,1-Dichloroethylene	09/08/2020	5	0.5		UG/L	230.00	
524.2 TVOC	09/08/2020	27.99	--		UG/L	230.00	
Carbon tetrachloride	09/08/2020	6.2	0.5		UG/L	230.00	
Chloroform	09/08/2020	0.9	0.5		UG/L	230.00	
cis-1,2-Dichloroethylene	09/08/2020	0.43	0.5		UG/L	230.00	J
Trichloroethylene	09/08/2020	4.6	0.5		UG/L	230.00	

Site ID : 113-30

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	09/01/2020	14.1	--		UG/L	190.00	
Carbon tetrachloride	09/01/2020	4.3	0.5		UG/L	190.00	
Chloroform	09/01/2020	2.3	0.5		UG/L	190.00	
Tetrachloroethylene	09/01/2020	7.5	0.5		UG/L	190.00	

Table 4-3
OU III Middle Road Monitoring Well Data
'Hits Only' July through September 2020

Site ID : 113-31

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	09/01/2020	1.5	0.5		UG/L	190.00	
1,1-Dichloroethylene	09/01/2020	0.47	0.5		UG/L	190.00	J
524.2 TVOC	09/01/2020	2.54	--		UG/L	190.00	
Trichloroethylene	09/01/2020	0.57	0.5		UG/L	190.00	

Site ID : 114-12

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	09/08/2020	0.25	--		UG/L	155.00	
Chloroform	09/08/2020	0.25	0.5		UG/L	155.00	J

Site ID : 121-45

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	09/08/2020	5.87	--		UG/L	199.00	
Chloroform	09/08/2020	0.35	0.5		UG/L	199.00	J
Tetrachloroethylene	09/08/2020	5.1	0.5		UG/L	199.00	
Trichloroethylene	09/08/2020	0.42	0.5		UG/L	199.00	J

Site ID : 121-53

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	09/09/2020	1.4	0.5		UG/L	229.00	
1,1-Dichloroethane	09/09/2020	0.96	0.5		UG/L	229.00	
1,1-Dichloroethylene	09/09/2020	1.8	0.5		UG/L	229.00	
524.2 TVOC	09/09/2020	55.96	--		UG/L	229.00	
Carbon tetrachloride	09/09/2020	6.6	0.5		UG/L	229.00	
Chloroform	09/09/2020	2.7	0.5		UG/L	229.00	
Tetrachloroethylene	09/09/2020	41	2.5		UG/L	229.00	D
Trichloroethylene	09/09/2020	1.5	0.5		UG/L	229.00	

Table 4-4
OU III Middle Road Extraction Well Data
'Hits Only' July through September 2020

Site ID : 106-66 (RW-6)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	07/10/2020	0.89	0.5	--	UG/L	0.00	
524.2 TVOC	07/10/2020	4.22	--	--	UG/L	0.00	
Chloroform	07/10/2020	0.24	0.5	--	UG/L	0.00	J
Tetrachloroethylene	07/10/2020	2.5	0.5	--	UG/L	0.00	
Trichloroethylene	07/10/2020	0.59	0.5	--	UG/L	0.00	

Site ID : 113-24 (RW-2)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/10/2020	6.71	--	--	UG/L	0.00	
Carbon tetrachloride	07/10/2020	0.63	0.5	--	UG/L	0.00	
Chloroform	07/10/2020	0.35	0.5	--	UG/L	0.00	J
Tetrachloroethylene	07/10/2020	5.4	0.5	--	UG/L	0.00	
Trichloroethylene	07/10/2020	0.33	0.5	--	UG/L	0.00	J

Site ID : 113-25 (RW-3)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	07/10/2020	1.7	0.5	--	UG/L	0.00	
1,1-Dichloroethane	07/10/2020	0.29	0.5	--	UG/L	0.00	J
1,1-Dichloroethylene	07/10/2020	0.58	0.5	--	UG/L	0.00	
524.2 TVOC	07/10/2020	3.4	--	--	UG/L	0.00	
Trichloroethylene	07/10/2020	0.83	0.5	--	UG/L	0.00	

Site ID : 113-26 (RW-4)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/10/2020	0.55	--	--	UG/L	0.00	
Trichloroethylene	07/10/2020	0.55	0.5	--	UG/L	0.00	

Site ID : 113-27 (RW-5)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/10/2020	0.34	--	--	UG/L	0.00	
Chloroform	07/10/2020	0.34	0.5	--	UG/L	0.00	J

Site ID : 113-33 (RW-7)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	07/10/2020	0.88	0.5	--	UG/L	0.00	
1,1,2-Trichloroethane	07/10/2020	1.1	0.5	--	UG/L	0.00	
1,1-Dichloroethylene	07/10/2020	0.44	0.5	--	UG/L	0.00	J
524.2 TVOC	07/10/2020	31.47	--	--	UG/L	0.00	

Table 4-4
OU III Middle Road Extraction Well Data
'Hits Only' July through September 2020

Site ID : 113-33 (RW-7)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Carbon tetrachloride	07/10/2020	2.8	0.5	--	UG/L	0.00	
Chloroform	07/10/2020	0.5	0.5	--	UG/L	0.00	
Tetrachloroethylene	07/10/2020	25	0.5	--	UG/L	0.00	
Trichloroethylene	07/10/2020	0.75	0.5	--	UG/L	0.00	

Table 4-5
OU III Middle Road Influent Data
'Hits Only' July through September 2020

Site ID : 113-34 (Combo Influent)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	07/10/2020	0.9	0.5	--	UG/L	0.00	
1,1-Dichloroethylene	07/10/2020	0.38	0.5	--	UG/L	0.00	J
524.2 TVOC	07/10/2020	15.66	--	--	UG/L	0.00	
Carbon tetrachloride	07/10/2020	1.4	0.5	--	UG/L	0.00	
Chloroform	07/10/2020	0.33	0.5	--	UG/L	0.00	J
Tetrachloroethylene	07/10/2020	12	0.5	--	UG/L	0.00	
Trichloroethylene	07/10/2020	0.65	0.5	--	UG/L	0.00	
524.2 TVOC	08/06/2020	0	--	--	UG/L	0.00	
1,1,1-Trichloroethane	09/02/2020	0.88	0.5	--	UG/L	0.00	
1,1-Dichloroethylene	09/02/2020	0.4	0.5	--	UG/L	0.00	J
524.2 TVOC	09/02/2020	13.59	--	--	UG/L	0.00	
Carbon tetrachloride	09/02/2020	1.3	0.5	--	UG/L	0.00	
Chloroform	09/02/2020	0.36	0.5	--	UG/L	0.00	J
Tetrachloroethylene	09/02/2020	10	0.5	--	UG/L	0.00	
Trichloroethylene	09/02/2020	0.65	0.5	--	UG/L	0.00	

Table 4-6
OU III Middle Road Effluent Data
'Hits Only' July through September 2020

Site ID : 095-270 (System Effluent)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/10/2020	0	--	--	UG/L	0.00	

Qualifiers :

J = Estimated value.

D = Compound was identified in an analysis at a secondary dilution factor.

Organic Compounds :

B = Compound was found in both the sample And associated laboratory blank.

Inorganic Compounds :

B = Result Is between instrument detection limit And contract required reporting limit.

Section 5

Q3-2020 Operations Summary
OU III Industrial Park In-Well Air Stripping System

Process: Groundwater extraction and in-well air stripping treatment, with discharge in same well (recirculating well technology) for wells UVB-1 through UVB-7, and groundwater extraction and liquid phase granular activated carbon treatment, with discharge to injection wells for wells EW-8 and EW-9.

Goal: Reach Maximum Contaminant Levels (MCLs) in core monitoring wells within 30 years for the Upper Glacial aquifer (by 2030), and 65 years for the Magothy aquifer (by 2065).

Start Date: September 1999

Table 5-1
OU III Industrial Park
Pumping Rates (gpm)

Recirculation Treatment Well	**UVB-1**	**UVB-2**	**UVB-3**	**UVB-4**	**UVB-5**	**UVB-6**	**UVB-7**	**EW-8**	**EW-9**
Site Id #	000-231	000-233	000-235	000-237	000-239	000-241	000-243	000-532	000-533
Screened Interval (feet below grade)	220-240	195-215	194-214	170-190	180-200	190-210	205-225	230-250	220-240
Desired Flow Rate (GPM)	*0	*0	*0	*0	*0	*0	*0	**0	**0
July	*0	*0	*0	*0	*0	*0	*0	**0	**0
August	*0	*0	*0	*0	*0	*0	*0	**0	**0
September	*0	*0	*0	*0	*0	*0	*0	**0	**0
Actual (Avg.over Qtr.)	*0	*0	*0	*0	*0	*0	*0	**0	**0

Note:
*Wells UVB-1 to UVB-7 were placed in stand-by mode February 2017.
Wells EW-8 and EW-9 started full-time operation January 2015.
**Wells EW-8 and EW-9 started one month on and one month off pulsed pumping February 2018 and were placed in stand-by mode July 2019.

Figure 5-1
OU III Industrial Park
Cumulative Mass Removal of VOCs vs. Time

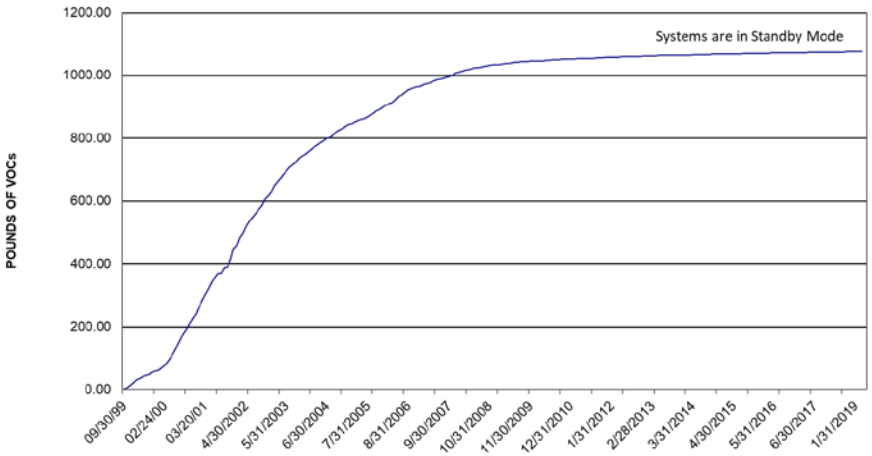
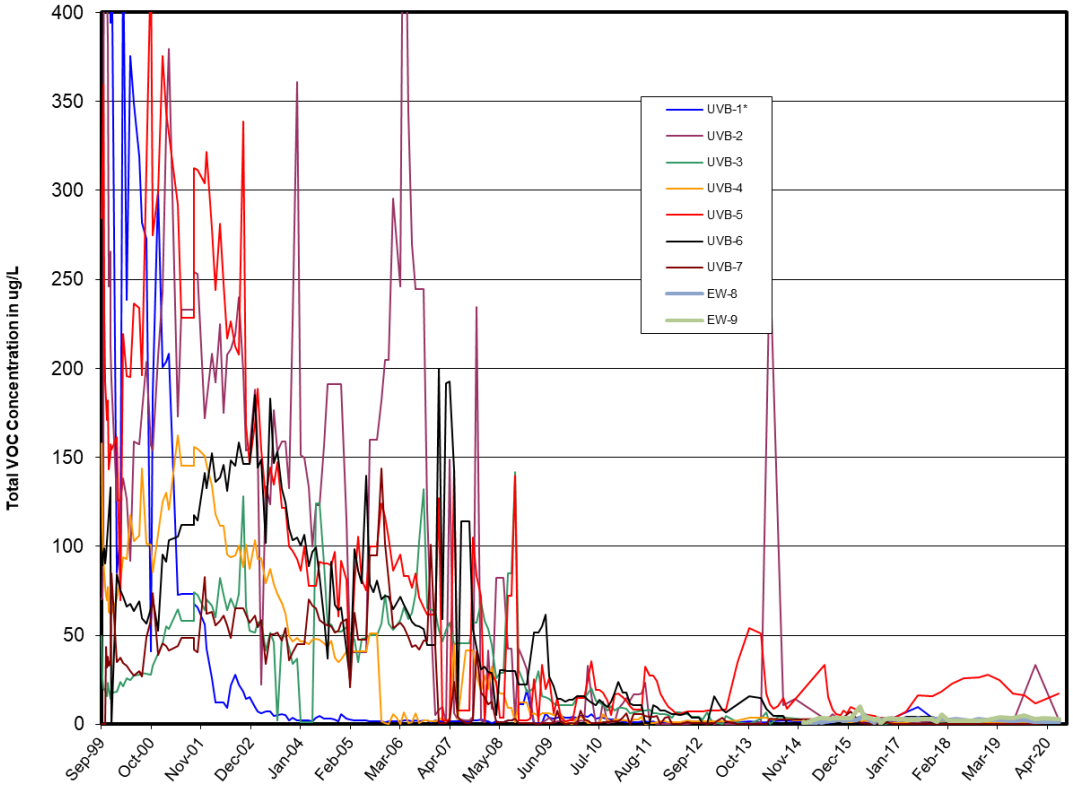


Figure 5-2
OU III Industrial Park
Influent TVOC Concentrations vs. Time



*Startup concentrations for UVB-1 are not illustrated on this graph.
TVOC concentration of 1,900 µg/L in September 1999, and 1,485 µg/L in October 1999.

Table 5-2
OU III Industrial Park Effluent Water Quality for EW-8 and EW-9
SPDES Equivalency Permit Concentrations July 1 – September 30, 2020

Parameter	Permit Limit	Max. Measured Value	Units	Frequency
Flow	**Monitor**	**N/A**	**GPM**	**Continuous**
pH (range)	**5.0 - 8.5**	**N/A**	**SU**	**Weekly**
Carbon Tetrachloride	**5**	**N/A**	**ug/L**	**Monthly[1]**
Chloroform	**7**	**N/A**	**ug/L**	**Monthly[1]**
1,2-Dichloroethane	**0.6**	**N/A**	**ug/L**	**Monthly[1]**
1,1-Dichloroethylene	**5**	**N/A**	**ug/L**	**Monthly[1]**
Tetrachloroethylene	**5**	**N/A**	**ug/L**	**Monthly[1]**
Trichloroethene	**5**	**N/A**	**ug/L**	**Monthly[1]**
1,1,1-Trichloroethane	**5**	**N/A**	**ug/L**	**Monthly[1]**

[1] The minimum measurement frequency shall be monthly following a period of 24 consecutive weekly sampling events showing no exceedances of the stated discharge limitations. Monthly sampling was initiated in August 2015.
NA = Not applicable since the system was placed in standby mode in July 2019.

System Operation

July 2020:

Extraction wells UVB-1 through UVB-7, EW-8 and EW-9 remained in stand-by mode.

August 2020:

Extraction wells UVB-1 through UVB-7, EW-8 and EW-9 remained in stand-by mode.

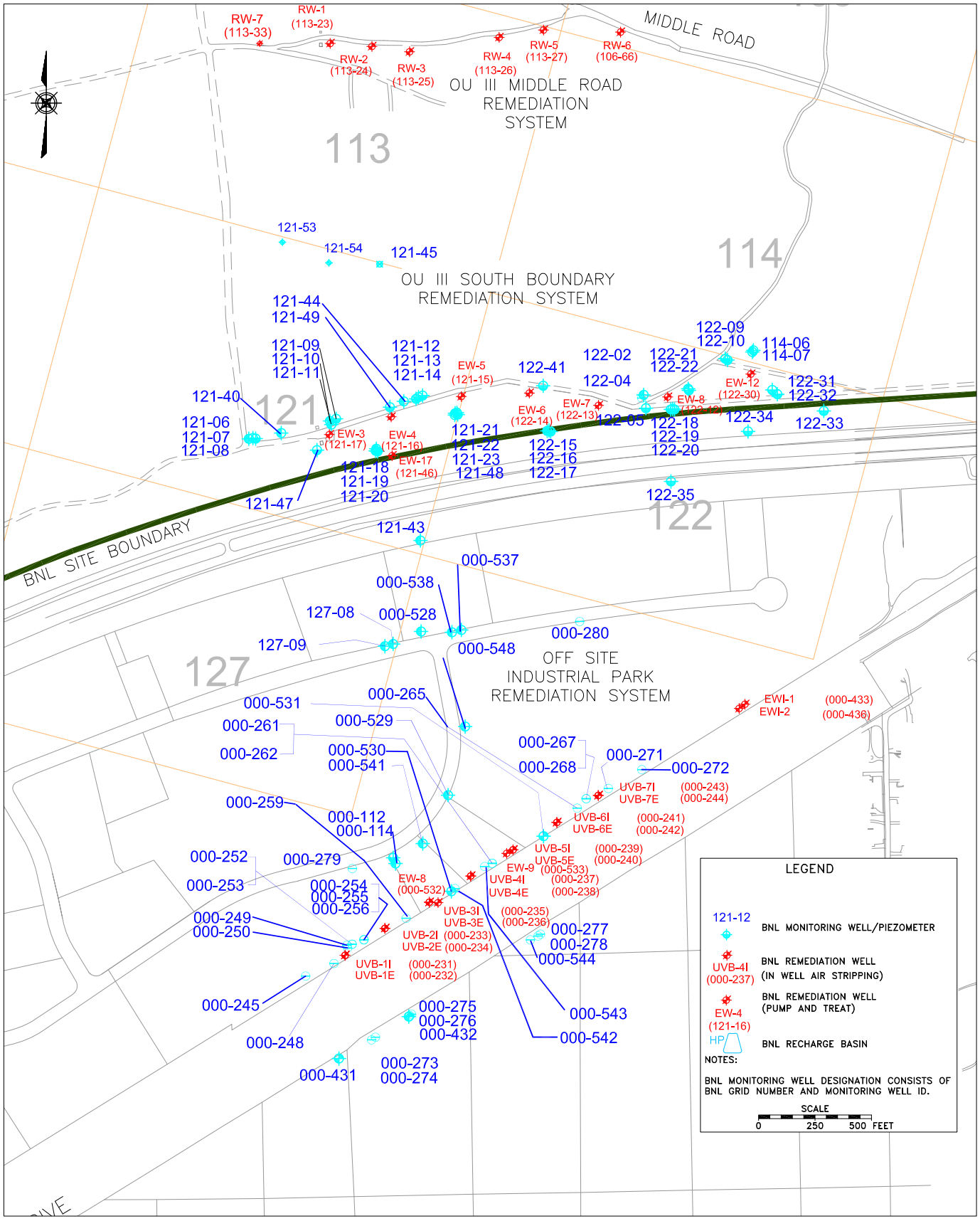
September 2020:

Extraction wells UVB-1 through UVB-7, EW-8 and EW-9 remained in stand-by mode.

Due to schedule delays with third quarter monitoring well sampling, some of the samples were collected in early-October and the analytical results were not available at the time of this report. All analytical data will be included in the 2020 Groundwater Status Report.

Planned Operational Changes

- Maintain the seven UVB wells, and EW-8 and EW-9 in standby. If TVOC concentrations exceed the 50 µg/L capture goal adjacent to any of the wells they may be restarted. During the third quarter, TVOC concentrations in EW-8 and EW-9, and adjacent core monitoring wells were below 50 µg/L.



\\OERNT\GIS\GW_PROJECTS\ERD_QUARTERLIES\3Q_2020\FIG 5-3.DWG

ENVIRONMENTAL PROTECTION DIVISION

TITLE:
OU III SOUTH BOUNDARY/INDUSTRIAL PARK/INDUSTRIAL PARK EAST MONITORING WELL NETWORKS
SITEWIDE REMEDIATION SYSTEMS
THIRD QUARTER 2020 OPERATIONS REPORT

DWN:	VT:HZ.:	DATE:	PROJECT NO.:
JEB	–	09/12/14	–
CHKD:	APPD:	REV.:	NOTES:
LDS	–	10/20/20	–

FIGURE NO.: 5–3

Table 5-3
OU III Industrial Park Monitoring Well Data
'Hits Only' July through September 2020

Site ID : 000-112

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/29/2020	1.2	--	--	UG/L	180.00	
Chloroform	07/29/2020	1.2	0.5	--	UG/L	180.00	

Site ID : 000-249

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/23/2020	2.36	--	--	UG/L	264.00	
Carbon tetrachloride	07/23/2020	1	0.5	--	UG/L	264.00	
Chloroform	07/23/2020	0.38	0.5	--	UG/L	264.00	J
Tetrachloroethylene	07/23/2020	0.67	0.5	--	UG/L	264.00	
Trichloroethylene	07/23/2020	0.31	0.5	--	UG/L	264.00	J

Site ID : 000-253

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/23/2020	2.17	--	--	UG/L	225.50	
Chloroform	07/23/2020	1.8	0.5	--	UG/L	225.50	
Tetrachloroethylene	07/23/2020	0.37	0.5	--	UG/L	225.50	J

Site ID : 000-256

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/23/2020	1.86	--	--	UG/L	222.50	
Chloroform	07/23/2020	1.4	0.5	--	UG/L	222.50	
Tetrachloroethylene	07/23/2020	0.46	0.5	--	UG/L	222.50	J

Site ID : 000-259

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	07/23/2020	0.29	0.5	--	UG/L	202.50	J
524.2 TVOC	07/23/2020	6.93	--	--	UG/L	202.50	
Carbon tetrachloride	07/23/2020	0.69	0.5	--	UG/L	202.50	
Chloroform	07/23/2020	0.8	0.5	--	UG/L	202.50	
Methyl tert-butyl ether	07/23/2020	1.1	0.5	--	UG/L	202.50	
Tetrachloroethylene	07/23/2020	3.6	0.5	--	UG/L	202.50	
Trichloroethylene	07/23/2020	0.45	0.5	--	UG/L	202.50	J

Site ID : 000-262

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	07/24/2020	3	0.5	--	UG/L	182.50	
1,1-Dichloroethylene	07/24/2020	1.3	0.5	--	UG/L	182.50	
524.2 TVOC	07/24/2020	15.88	--	--	UG/L	182.50	

Table 5-3
OU III Industrial Park Monitoring Well Data
'Hits Only' July through September 2020

Site ID : 000-262

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Carbon tetrachloride	07/24/2020	4.8	0.5	--	UG/L	182.50	
Chloroform	07/24/2020	0.68	0.5	--	UG/L	182.50	
cis-1,2-Dichloroethylene	07/24/2020	1	0.5	--	UG/L	182.50	
Tetrachloroethylene	07/24/2020	2.6	0.5	--	UG/L	182.50	
Trichloroethylene	07/24/2020	2.5	0.5	--	UG/L	182.50	

Site ID : 000-265

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/21/2020	0.73	--	--	UG/L	212.50	
Tetrachloroethylene	07/21/2020	0.73	0.5	--	UG/L	212.50	

Site ID : 000-268

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/21/2020	0	--	--	UG/L	214.50	

Site ID : 000-271

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/28/2020	0.53	--	--	UG/L	215.50	
Chloroform	07/28/2020	0.53	0.5	--	UG/L	215.50	

Site ID : 000-273

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/28/2020	0.94	--	--	UG/L	185.00	
Chloroform	07/28/2020	0.94	0.5	--	UG/L	185.00	

Site ID : 000-274

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/28/2020	1.6	--	--	UG/L	242.00	
Chloroform	07/28/2020	1.6	0.5	--	UG/L	242.00	

Site ID : 000-275

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/27/2020	0.34	--	--	UG/L	134.00	
Chloroform	07/27/2020	0.34	0.5	--	UG/L	134.00	J

Site ID : 000-276

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/27/2020	0.81	--	--	UG/L	164.00	
Chloroform	07/27/2020	0.81	0.5	--	UG/L	164.00	

Site ID : 000-277

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/27/2020	0.82	--	--	UG/L	147.00	

Table 5-3
OU III Industrial Park Monitoring Well Data
'Hits Only' July through September 2020

Site ID : 000-277

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Chloroform	07/27/2020	0.82	0.5	--	UG/L	147.00	

Site ID : 000-278

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	07/27/2020	2.3	0.5	--	UG/L	194.00	
1,1-Dichloroethylene	07/27/2020	0.83	0.5	--	UG/L	194.00	
524.2 TVOC	07/27/2020	5.43	--	--	UG/L	194.00	
Chloroform	07/27/2020	0.76	0.5	--	UG/L	194.00	
Tetrachloroethylene	07/27/2020	0.67	0.5	--	UG/L	194.00	
Trichloroethylene	07/27/2020	0.87	0.5	--	UG/L	194.00	

Site ID : 000-279

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/24/2020	3.4	--	--	UG/L	193.00	
Chloroform	07/24/2020	1.3	0.5	--	UG/L	193.00	
Tetrachloroethylene	07/24/2020	2.1	0.5	--	UG/L	193.00	
524.2 TVOC	09/25/2020	1.96	--	--	UG/L	193.00	
Chloroform	09/25/2020	1.2	0.5	--	UG/L	193.00	
Tetrachloroethylene	09/25/2020	0.76	0.5	--	UG/L	193.00	

Site ID : 000-431

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/29/2020	1.2	--	--	UG/L	260.00	
Chloroform	07/29/2020	1.2	0.5	--	UG/L	260.00	

Site ID : 000-432

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/27/2020	1.6	--	--	UG/L	230.00	
Chloroform	07/27/2020	1.6	0.5	--	UG/L	230.00	

Site ID : 000-528

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	07/22/2020	0.43	0.5	--	UG/L	220.00	J
524.2 TVOC	07/22/2020	5.95	--	--	UG/L	220.00	
Chloroform	07/22/2020	0.61	0.5	--	UG/L	220.00	
cis-1,2-Dichloroethylene	07/22/2020	0.62	0.5	--	UG/L	220.00	
Tetrachloroethylene	07/22/2020	3.8	0.5	--	UG/L	220.00	
Trichloroethylene	07/22/2020	0.49	0.5	--	UG/L	220.00	J

Table 5-3
OU III Industrial Park Monitoring Well Data
'Hits Only' July through September 2020

Site ID : 000-528

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	09/25/2020	0.51	0.5	--	UG/L	220.00	
524.2 TVOC	09/25/2020	5.85	--	--	UG/L	220.00	
Chloroform	09/25/2020	0.69	0.5	--	UG/L	220.00	
cis-1,2-Dichloroethylene	09/25/2020	0.57	0.5	--	UG/L	220.00	
Tetrachloroethylene	09/25/2020	3.6	0.5	--	UG/L	220.00	
Trichloroethylene	09/25/2020	0.48	0.5	--	UG/L	220.00	J

Site ID : 000-529

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	07/21/2020	4.8	0.5	--	UG/L	219.00	
1,1-Dichloroethylene	07/21/2020	2.9	0.5	--	UG/L	219.00	
524.2 TVOC	07/21/2020	19.23	--	--	UG/L	219.00	
Carbon tetrachloride	07/21/2020	1.2	0.5	--	UG/L	219.00	
Chloroform	07/21/2020	0.5	0.5	--	UG/L	219.00	
Methyl tert-butyl ether	07/21/2020	0.33	0.5	--	UG/L	219.00	J
Tetrachloroethylene	07/21/2020	7.1	0.5	--	UG/L	219.00	
Trichloroethylene	07/21/2020	2.4	0.5	--	UG/L	219.00	

Site ID : 000-530

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	07/23/2020	18	0.5	--	UG/L	210.00	
1,1-Dichloroethylene	07/23/2020	8.7	0.5	--	UG/L	210.00	
524.2 TVOC	07/23/2020	27.5	--	--	UG/L	210.00	
Chloroform	07/23/2020	0.31	0.5	--	UG/L	210.00	J
Methyl tert-butyl ether	07/23/2020	0.49	0.5	--	UG/L	210.00	J

Site ID : 000-531

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	07/21/2020	3.1	0.5	--	UG/L	215.00	
1,1-Dichloroethylene	07/21/2020	2.9	0.5	--	UG/L	215.00	
524.2 TVOC	07/21/2020	33.8	--	--	UG/L	215.00	
Carbon tetrachloride	07/21/2020	17	0.5	--	UG/L	215.00	
Chloroform	07/21/2020	2.2	0.5	--	UG/L	215.00	
Tetrachloroethylene	07/21/2020	1	0.5	--	UG/L	215.00	
Trichloroethylene	07/21/2020	7.6	0.5	--	UG/L	215.00	

Site ID : 000-537

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	07/30/2020	8.3	0.5	--	UG/L	245.00	

Table 5-3
OU III Industrial Park Monitoring Well Data
'Hits Only' July through September 2020

Site ID : 000-537

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1-Dichloroethylene	07/30/2020	3.5	0.5	--	UG/L	245.00	
1,4-Dioxane	07/30/2020	1.87	0.2	--	UG/L	245.00	
524.2 TVOC	07/30/2020	45.8	--	--	UG/L	245.00	
Carbon tetrachloride	07/30/2020	1	0.5	--	UG/L	245.00	
Chloroform	07/30/2020	0.69	0.5	--	UG/L	245.00	
cis-1,2-Dichloroethylene	07/30/2020	0.58	0.5	--	UG/L	245.00	
m/p xylene	07/30/2020	0.43	1	--	UG/L	245.00	J
Perfluorobutanesulfonate (PFBS)	07/30/2020	2.16	1.58	--	NG/L	245.00	
Perfluorobutyric acid (PFBA)	07/30/2020	21.8	1.78	--	NG/L	245.00	
Perfluoroheptanoic acid (PFHpA)	07/30/2020	1.43	1.78	--	NG/L	245.00	J
Perfluorohexanesulfonate (PFHxS)	07/30/2020	12.9	1.62	--	NG/L	245.00	
Perfluorohexanoic acid (PFHxA)	07/30/2020	3	1.78	--	NG/L	245.00	
Perfluorooctanesulfonate (PFOS)	07/30/2020	11	1.78	--	NG/L	245.00	
Perfluorooctanoic acid (PFOA)	07/30/2020	4.43	1.78	--	NG/L	245.00	
Perfluoropentanesulfonate (PFPeS)	07/30/2020	1.58	1.67	--	NG/L	245.00	J
Perfluoropentanoic acid (PFPeA)	07/30/2020	1.69	1.78	--	NG/L	245.00	J
Tetrachloroethylene	07/30/2020	24	0.5	--	UG/L	245.00	
Trichloroethylene	07/30/2020	7.3	0.5	--	UG/L	245.00	

Site ID : 000-538

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	07/30/2020	3.4	0.5	--	UG/L	215.00	
1,1-Dichloroethylene	07/30/2020	1.7	0.5	--	UG/L	215.00	
1,4-Dioxane	07/30/2020	1.88	0.2	--	UG/L	215.00	
524.2 TVOC	07/30/2020	20.73	--	--	UG/L	215.00	
Carbon tetrachloride	07/30/2020	0.57	0.5	--	UG/L	215.00	
Chloroform	07/30/2020	0.76	0.5	--	UG/L	215.00	
cis-1,2-Dichloroethylene	07/30/2020	1.1	0.5	--	UG/L	215.00	
Perfluorobutanesulfonate (PFBS)	07/30/2020	1.7	1.51	--	NG/L	215.00	
Perfluorobutyric acid (PFBA)	07/30/2020	17.5	1.69	--	NG/L	215.00	
Perfluoroheptanoic acid (PFHpA)	07/30/2020	1.18	1.69	--	NG/L	215.00	J
Perfluorohexanesulfonate (PFHxS)	07/30/2020	11.2	1.54	--	NG/L	215.00	
Perfluorohexanoic acid (PFHxA)	07/30/2020	4.65	1.69	--	NG/L	215.00	
Perfluorononanoic acid (PFNA)	07/30/2020	0.575	1.69	--	NG/L	215.00	J

Table 5-3
OU III Industrial Park Monitoring Well Data
'Hits Only' July through September 2020

Site ID : 000-538

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Perfluorooctanesulfonate (PFOS)	07/30/2020	9.95	1.69	--	NG/L	215.00	
Perfluorooctanoic acid (PFOA)	07/30/2020	5.22	1.69	--	NG/L	215.00	
Perfluoropentanesulfonate (PFPeS)	07/30/2020	1.75	1.59	--	NG/L	215.00	
Perfluoropentanoic acid (PFPeA)	07/30/2020	1.6	1.69	--	NG/L	215.00	J
Tetrachloroethylene	07/30/2020	9.3	0.5	--	UG/L	215.00	
Trichloroethylene	07/30/2020	3.9	0.5	--	UG/L	215.00	

Site ID : 000-541

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	07/28/2020	2.8	0.5	--	UG/L	235.00	
1,1-Dichloroethylene	07/28/2020	1.8	0.5	--	UG/L	235.00	
524.2 TVOC	07/28/2020	44.4	--	--	UG/L	235.00	
Carbon tetrachloride	07/28/2020	17	0.5	--	UG/L	235.00	
Chloroform	07/28/2020	6.3	0.5	--	UG/L	235.00	
Tetrachloroethylene	07/28/2020	6.5	0.5	--	UG/L	235.00	
Trichloroethylene	07/28/2020	10	0.5	--	UG/L	235.00	

Site ID : 000-542

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/23/2020	0	--	--	UG/L	235.00	

Site ID : 000-543

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/28/2020	0	--	--	UG/L	230.00	

Site ID : 000-544

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	07/27/2020	20	0.5	--	UG/L	230.00	
1,1-Dichloroethylene	07/27/2020	10	0.5	--	UG/L	230.00	
524.2 TVOC	07/27/2020	40.14	--	--	UG/L	230.00	
Carbon tetrachloride	07/27/2020	8.8	0.5	--	UG/L	230.00	
Chloroform	07/27/2020	0.88	0.5	--	UG/L	230.00	
cis-1,2-Dichloroethylene	07/27/2020	0.46	0.5	--	UG/L	230.00	J

Site ID : 000-548

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	07/28/2020	11	0.5	--	UG/L	235.00	
1,1-Dichloroethylene	07/28/2020	4.8	0.5	--	UG/L	235.00	

Table 5-3
OU III Industrial Park Monitoring Well Data
'Hits Only' July through September 2020

Site ID : 000-548

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/28/2020	27.5	--	--	UG/L	235.00	
Carbon tetrachloride	07/28/2020	2.6	0.5	--	UG/L	235.00	
Chloroform	07/28/2020	0.65	0.5	--	UG/L	235.00	
Tetrachloroethylene	07/28/2020	0.45	0.5	--	UG/L	235.00	J
Trichloroethylene	07/28/2020	8	0.5	--	UG/L	235.00	
1,1,1-Trichloroethane	09/25/2020	9.8	0.5	--	UG/L	235.00	
1,1-Dichloroethylene	09/25/2020	4.2	0.5	--	UG/L	235.00	
524.2 TVOC	09/25/2020	25.27	--	--	UG/L	235.00	
Carbon tetrachloride	09/25/2020	2.6	0.5	--	UG/L	235.00	
Chloroform	09/25/2020	0.55	0.5	--	UG/L	235.00	
Tetrachloroethylene	09/25/2020	0.42	0.5	--	UG/L	235.00	J
Trichloroethylene	09/25/2020	7.7	0.5	--	UG/L	235.00	

Site ID : 127-08

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	07/22/2020	0.85	0.5	--	UG/L	240.00	
1,1-Dichloroethylene	07/22/2020	0.5	0.5	--	UG/L	240.00	
524.2 TVOC	07/22/2020	31.55	--	--	UG/L	240.00	
Carbon tetrachloride	07/22/2020	6.9	0.5	--	UG/L	240.00	
Chloroform	07/22/2020	1.1	0.5	--	UG/L	240.00	
Tetrachloroethylene	07/22/2020	20	0.5	--	UG/L	240.00	
Trichloroethylene	07/22/2020	2.2	0.5	--	UG/L	240.00	
1,1,1-Trichloroethane	09/25/2020	0.82	0.5	--	UG/L	240.00	
1,1-Dichloroethylene	09/25/2020	0.44	0.5	--	UG/L	240.00	J
524.2 TVOC	09/25/2020	27.86	--	--	UG/L	240.00	
Carbon tetrachloride	09/25/2020	5.6	0.5	--	UG/L	240.00	
Chloroform	09/25/2020	1.2	0.5	--	UG/L	240.00	
Tetrachloroethylene	09/25/2020	18	0.5	--	UG/L	240.00	
Trichloroethylene	09/25/2020	1.8	0.5	--	UG/L	240.00	

Site ID : 127-09

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/22/2020	2.9	--	--	UG/L	225.00	
Chloroform	07/22/2020	1	0.5	--	UG/L	225.00	
Tetrachloroethylene	07/22/2020	1.9	0.5	--	UG/L	225.00	

Table 5-3
OU III Industrial Park Monitoring Well Data
'Hits Only' July through September 2020

Site ID : 127-09

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	09/25/2020	3	--	--	UG/L	225.00	
Chloroform	09/25/2020	1.2	0.5	--	UG/L	225.00	
Tetrachloroethylene	09/25/2020	1.8	0.5	--	UG/L	225.00	

Table 5-4
OU III Industrial Park Extraction Well Data
'Hits Only' July through September 2020

Site ID : 000-532 (EW-8)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	07/09/2020	0.76	0.5	--	UG/L	253.00	
524.2 TVOC	07/09/2020	1.42	--	--	UG/L	253.00	
Tetrachloroethylene	07/09/2020	0.66	0.5	--	UG/L	253.00	

Site ID : 000-533 (EW-9)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	07/09/2020	0.93	0.5	--	UG/L	243.00	
1,1-Dichloroethane	07/09/2020	0.75	0.5	--	UG/L	243.00	
1,1-Dichloroethylene	07/09/2020	1.1	0.5	--	UG/L	243.00	
524.2 TVOC	07/09/2020	2.78	--	--	UG/L	243.00	

Table 5-5
OU III Industrial Park Influent Data
'Hits Only' July through September 2020

Site ID : 000-231 (UVB-1 Influent)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/30/2020	0.88	--	--	UG/L	230.00	
Chloroform	07/30/2020	0.35	0.5	--	UG/L	230.00	J
m/p xylene	07/30/2020	0.53	1	--	UG/L	230.00	J

Site ID : 000-233 (UVB-2 Influent)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/30/2020	2.68	--	--	UG/L	205.00	
Chloroform	07/30/2020	0.31	0.5	--	UG/L	205.00	J
Tetrachloroethylene	07/30/2020	0.87	0.5	--	UG/L	205.00	
Toluene	07/30/2020	1.5	0.5	--	UG/L	205.00	

Site ID : 000-237 (UVB-4 Influent)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/30/2020	2.31	--	--	UG/L	180.00	
Chloroform	07/30/2020	0.24	0.5	--	UG/L	180.00	J
Styrene	07/30/2020	0.59	0.5	--	UG/L	180.00	
Tetrachloroethylene	07/30/2020	0.78	0.5	--	UG/L	180.00	
Toluene	07/30/2020	0.7	0.5	--	UG/L	180.00	

Site ID : 000-239 (UVB-5 Influent)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	07/30/2020	1	0.5	--	UG/L	190.00	
1,1-Dichloroethylene	07/30/2020	0.52	0.5	--	UG/L	190.00	
524.2 TVOC	07/30/2020	17.27	--	--	UG/L	190.00	
Carbon tetrachloride	07/30/2020	5	0.5	--	UG/L	190.00	
Chloroform	07/30/2020	0.65	0.5	--	UG/L	190.00	
cis-1,2-Dichloroethylene	07/30/2020	0.41	0.5	--	UG/L	190.00	J
Ethylbenzene	07/30/2020	0.36	0.5	--	UG/L	190.00	J
m/p xylene	07/30/2020	0.69	1	--	UG/L	190.00	J
o-Xylene	07/30/2020	0.55	0.5	--	UG/L	190.00	
Tetrachloroethylene	07/30/2020	2	0.5	--	UG/L	190.00	
Toluene	07/30/2020	0.69	0.5	--	UG/L	190.00	
Trichloroethylene	07/30/2020	4.2	0.5	--	UG/L	190.00	
Xylene (total)	07/30/2020	1.2	3	--	UG/L	190.00	J

Site ID : 000-241 (UVB-6 Influent)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	07/30/2020	0.3	0.5	--	UG/L	200.00	J

Table 5-5
OU III Industrial Park Influent Data
'Hits Only' July through September 2020

Site ID : 000-241 (UVB-6 Influent)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/30/2020	0.3	--	--	UG/L	200.00	

Site ID : 000-243 (UVB-7 Influent)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/30/2020	1.1	--	--	UG/L	215.00	
Toluene	07/30/2020	1.1	0.5	--	UG/L	215.00	

Qualifiers :

J = Estimated value.
D = Compound was identified in an analysis at a secondary dilution factor.

Organic Compounds :

B = Compound was found in both the sample And associated laboratory blank.

Inorganic Compounds :

B = Result Is between instrument detection limit And contract required reporting limit.

Section 6

OU III Former Carbon Tetrachloride Pump & Treat System (System Closed)

The Draft Petition for Closure for the OU III Carbon Tetrachloride Groundwater Removal Action was submitted to the regulators for review in August 2009. Following the incorporation of EPA comments, in October 2009 the Final Petition for Closure for the OU III Carbon Tetrachloride Groundwater Removal Action was issued to the regulators. EPA and NYSDEC provided approval in October 2009. Since that time, activities have been concluded with decommissioning and dismantling of the Carbon Tetrachloride treatment system. A decommissioning report was submitted to the regulators in March 2011.

Section 7
Q3-2020 Operations Summary
OU III Building 96 Pump and Treat System

Process: Three (3) re-circulation wells each connected to an individual shallow tray air-stripping unit and one (1) well with a shallow tray air-stripping unit, with discharge to a drainage culvert and Recharge Basin HS.

Goal: Remediation of the volatile organic compounds (VOCs) in the source area and reach Maximum Contaminant Levels (MCLs) in core monitoring wells within 30 years for the Upper Glacial aquifer (by 2030).

Start Date: January 2001

Table 7-1
OU III Building 96
Pumping Rates (gpm)

Recirculation Treatment Well	RTW-1	RTW-2	RTW-3	RTW-4
Site Id #	095-151	095-153	095-155	095-157
Screen Interval (feet bls)	48-58	48-58	48-58	48-58
Desired Flow Rate (gpm)	60	30	0	0
July	4	0	0	0
August	41	0	0	0
September	50	0	0	0
Actual (Avg. over Qtr.)	**32**	**0**	**0**	**0**

Note: RTW-1 was restarted in 2008 with discharge to Basin HS. RTW-2 and RTW-3 were placed in standby mode in January 2016. RTW-4 was placed in standby mode in 2012. RTW-2 was restarted November 2018 and placed back in standby June 2020. In June 2019, RTW-1 pumping rate was increased from 30 gpm to 60 gpm.

Figure 7-1
OU III Building 96
Cumulative Mass Removal of VOC's vs. Time

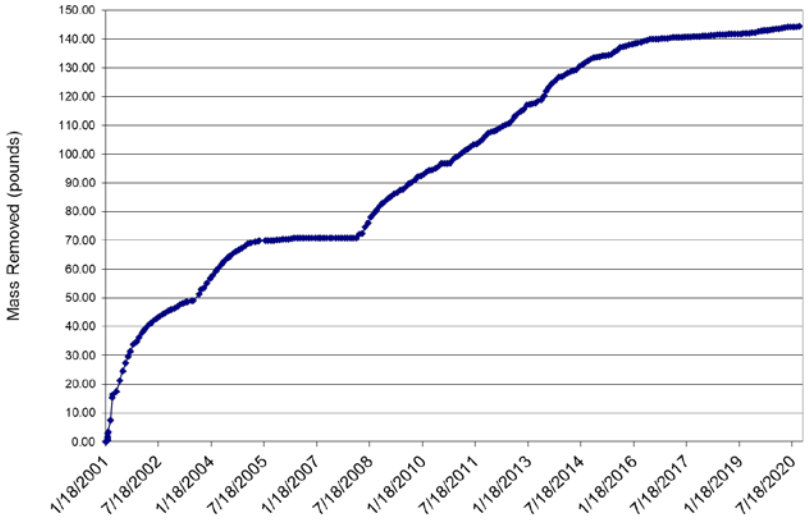


Figure 7-2
OU III Building 96
Influent TVOC Concentrations vs. Time

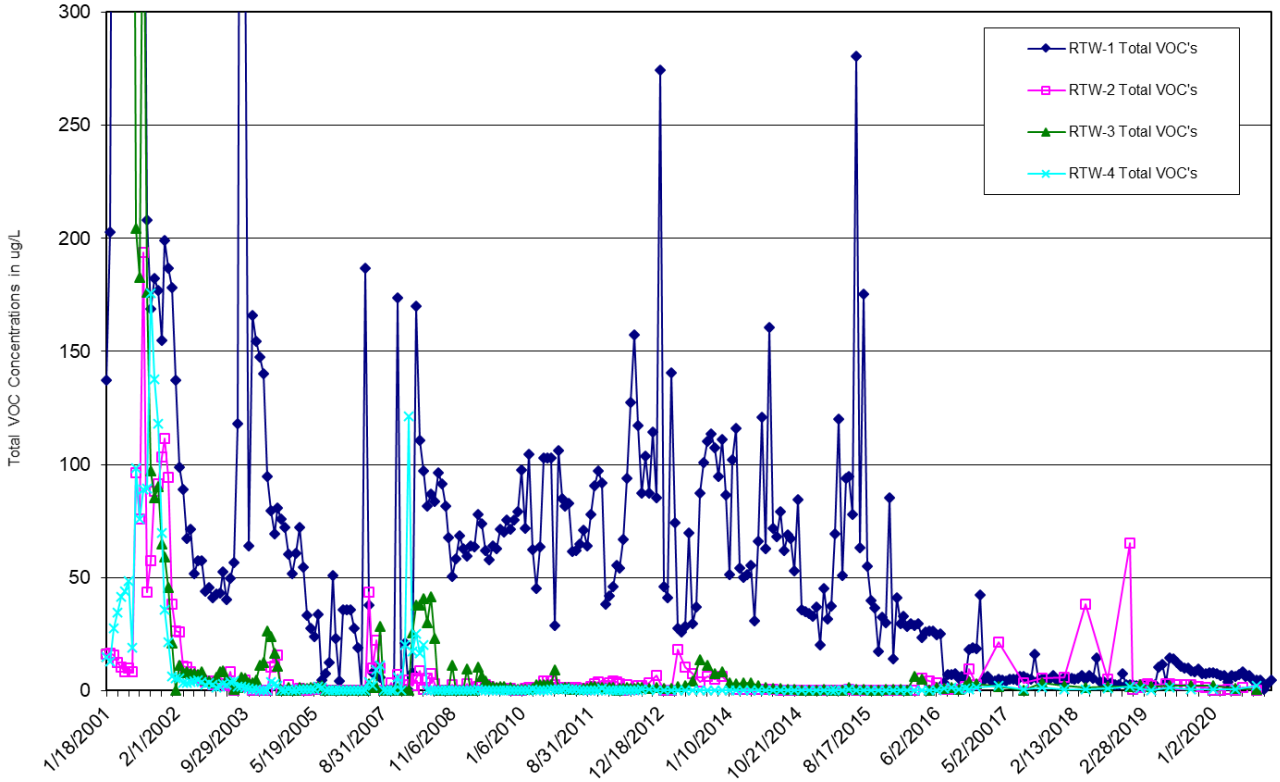


Table 7-2
Effluent Water Quality for RTW-1
SPDES Equivalency Permit Concentrations July 1, 2020– September 30, 2020

Parameter	Permit Limit	Max. Measured Value	Units	Frequency*
Flow	**40**	**50**	**GPM**	**Continuous**
pH (range)	**5.0 - 8.5**	**6.5 – 7.9**	**SU**	**Weekly**
Tetrachloroethylene	**5.0**	**<0.5**	**ug/L**	**Monthly**
1,1,1-Trichloroethane	**5.0**	**<0.5**	**ug/L**	**Monthly**
Thallium	**Monitor**	**<2.0**	**ug/L**	**Monthly**
Trichlorofluoromethane	**5.0**	**<0.5**	**ug/L**	**Monthly**
Methyl Bromide	**5.0**	**<0.5**	**ug/L**	**Monthly**
Methyl Chloride	**5.0**	**<0.5**	**ug/L**	**Monthly**
Methylene Chloride	**5.0**	**<0.5**	**ug/L**	**Monthly**

ND = Not detected.
* The required effluent sampling frequency is monthly following a period of 24 consecutive weekly with no exceedances. Weekly for pH.
Note: Starting in June 2019, the flow from Bldg. 96 RTW-1 was increased to 60 gallons per minute and the water is being treated at the Building 452 Freon-11 treatment system due to the larger capacity of that system. Beginning with the July 2019 Discharge Monitoring Report (DMR), the RTW-1 discharge is formally reported under the Freon-11 Equivalency Permit. The data are also provided here for informational purposes.

System Operations

July 2020:

The system was off July 9th through August 7th due to damage to the programmable logic controller from a lightning storm. The system treated approximately 0.2 million gallons of water.

August 2020:

The system was restarted August 7th and operated normally for the remainder of the month. The

system treated approximately 1.8 million gallons of water.

September 2020:

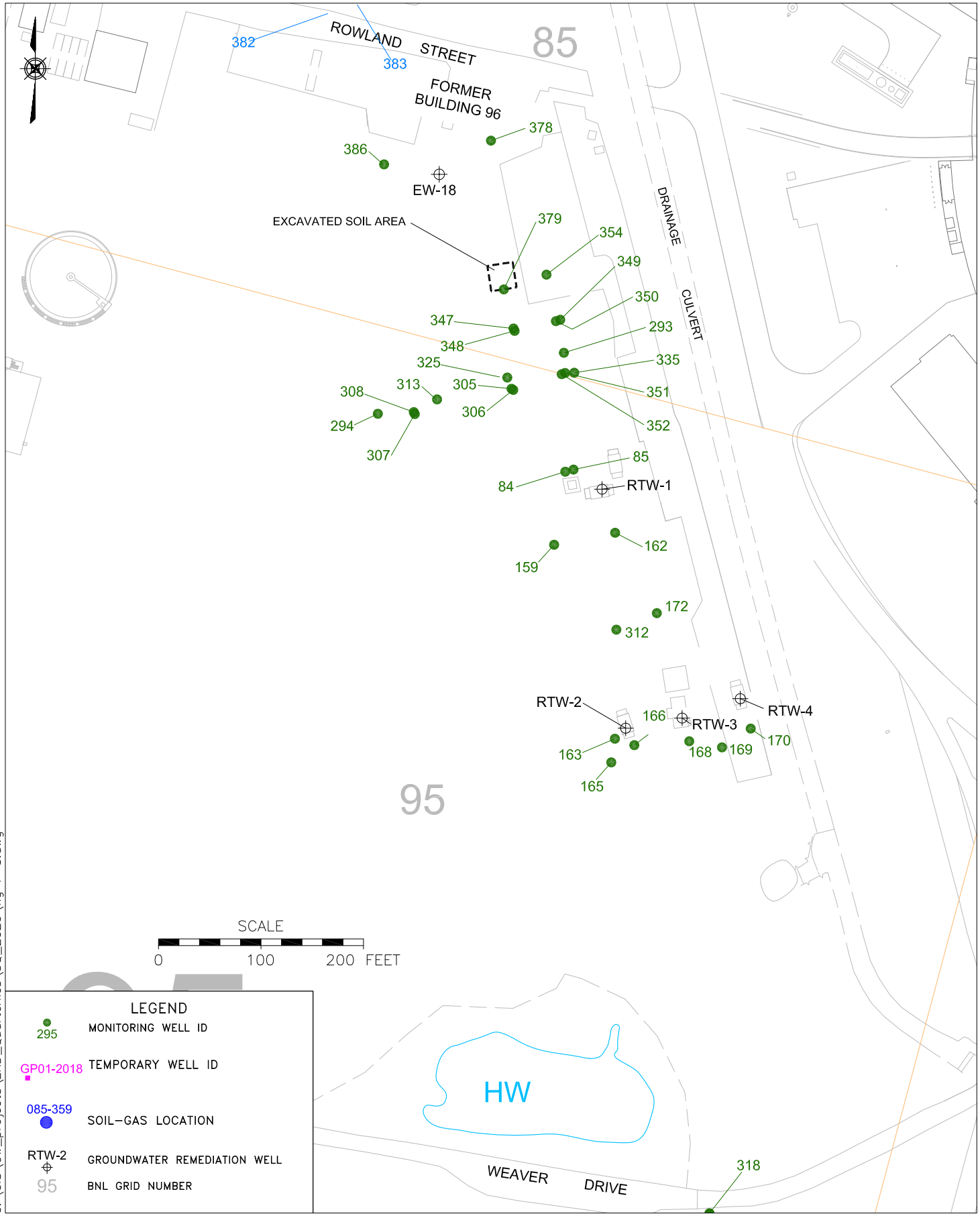
The system was off from September 8th to the 10th for electrical repairs. The system treated approximately 2.2 million gallons of water.

The system treated approximately 4.2 million gallons of water during the third quarter of 2020.

During the third quarter of 2020, the highest PCE concentration in the Building 96 monitoring wells was 87 µg/L in well 085-379. The maximum PCE detection in extraction well RTW-1 in the third quarter was 4 µg/L. Trichlorofluoromethane (Freon-11) was detected at 0.5 µg/L in RTW-1.

Planned Operational Changes

- Maintain full time operation of treatment well RTW-1. Monitor VOC concentrations in wells 085-379 and 095-159 to determine when RTW-1 can be shut down. Maintain a monthly sampling frequency of the influent and effluent.
- Maintain a monthly monitoring frequency for well 095-159 to verify the westward expansion of the RTW-1 capture zone.
- Maintain treatment wells RTW-2, RTW-3 and RTW-4 in standby mode, and restart the wells if extraction or monitoring well data indicate that TVOC concentrations exceed 50 µg/L. During the third quarter of 2020, the maximum TVOC concentration was 2.1 µg/L in monitoring well 095-312. This well is located between extraction well RTW-1 and RTW-2. Extraction wells RTW-2, RTW-3 or RTW-4 did not exceed a TVOC concentration of 50 µg/L.



BROOKHAVEN NATIONAL LABORATORY

ENVIRONMENTAL PROTECTION DIVISION

TITLE:

OU III BUILDING 96 MONITORING WELL NETWORK

SITEWIDE REMEDIATION SYSTEMS
THIRD QUARTER 2020 OPERATIONS REPORT

DWN:	VT: HZ.:	DATE:	PROJECT NO.:
AJZ	–	06/15/18	–
CHKD:	APPD:	REV.:	NOTES:
LDS	––	10/20/20	–

FIGURE NO.: 7-3

Table 7-3
OU III Building 96 Monitoring Well Data
'Hits Only' July through September 2020

Site ID : 085-293

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	08/07/2020	3	--	--	UG/L	50.00	
Chloroform	08/07/2020	3	0.5	--	UG/L	50.00	

Site ID : 085-335

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	08/07/2020	9.5	--	--	UG/L	35.00	
Tetrachloroethylene	08/07/2020	9.5	0.5	--	UG/L	35.00	

Site ID : 085-348

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,2-Trichloroethane	08/11/2020	1.9	0.5		UG/L	34.50	
524.2 TVOC	08/11/2020	38.4	--		UG/L	34.50	
cis-1,2-Dichloroethylene	08/11/2020	0.5	0.5		UG/L	34.50	
Tetrachloroethylene	08/11/2020	36	2.5		UG/L	34.50	D

Site ID : 085-349

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	08/06/2020	5.8	--	--	UG/L	22.50	
Tetrachloroethylene	08/06/2020	5.8	0.5	--	UG/L	22.50	

Site ID : 085-350

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	08/06/2020	7.6	--	--	UG/L	34.50	
Chloroform	08/06/2020	0.4	0.5	--	UG/L	34.50	J
Tetrachloroethylene	08/06/2020	7.2	0.5	--	UG/L	34.50	

Site ID : 085-351

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	08/06/2020	7.1	--	--	UG/L	22.50	
Tetrachloroethylene	08/06/2020	7.1	0.5	--	UG/L	22.50	

Site ID : 085-352

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	08/06/2020	10.12	--	--	UG/L	34.50	
Chloroform	08/06/2020	0.32	0.5	--	UG/L	34.50	J
Tetrachloroethylene	08/06/2020	9.8	0.5	--	UG/L	34.50	

Site ID : 085-354

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	08/06/2020	5.9	--	--	UG/L	22.50	

Table 7-3
OU III Building 96 Monitoring Well Data
'Hits Only' July through September 2020

Site ID : 085-354

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Tetrachloroethylene	08/06/2020	5.9	0.5	--	UG/L	22.50	

Site ID : 085-378

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	08/11/2020	0.9	--		UG/L	25.00	
Styrene	08/11/2020	0.59	0.5		UG/L	25.00	B
Tetrachloroethylene	08/11/2020	0.31	0.5		UG/L	25.00	J

Site ID : 085-379

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	08/11/2020	0.31	0.5		UG/L	21.35	J
524.2 TVOC	08/11/2020	87.9	--		UG/L	21.35	
Styrene	08/11/2020	0.59	0.5		UG/L	21.35	B
Tetrachloroethylene	08/11/2020	87	2.5		UG/L	21.35	D

Site ID : 095-159

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	07/09/2020	1.3	0.5	--	UG/L	50.00	
524.2 TVOC	07/09/2020	40.3	--	--	UG/L	50.00	
Tetrachloroethylene	07/09/2020	39	0.5	--	UG/L	50.00	
1,1,1-Trichloroethane	08/12/2020	1.5	0.5		UG/L	50.00	
1,1-Dichloroethylene	08/12/2020	0.44	0.5		UG/L	50.00	J
524.2 TVOC	08/12/2020	63.56	--		UG/L	50.00	
Methyl bromide	08/12/2020	0.62	0.57		UG/L	50.00	B
Tetrachloroethylene	08/12/2020	61	2.5		UG/L	50.00	D
1,1,1-Trichloroethane	09/11/2020	1.2	0.5	--	UG/L	50.00	
524.2 TVOC	09/11/2020	34.2	--	--	UG/L	50.00	
Tetrachloroethylene	09/11/2020	33	0.5	--	UG/L	50.00	

Site ID : 095-162

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	08/12/2020	1.69	--		UG/L	50.00	
Chloroform	08/12/2020	0.51	0.5		UG/L	50.00	
Methyl bromide	08/12/2020	0.64	0.57		UG/L	50.00	B
Tetrachloroethylene	08/12/2020	0.54	0.5		UG/L	50.00	

Site ID : 095-163

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	08/07/2020	0	--	--	UG/L	50.00	

Table 7-3
OU III Building 96 Monitoring Well Data
'Hits Only' July through September 2020

Site ID : 095-165

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	08/07/2020	0	--	--	UG/L	50.00	

Site ID : 095-166

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	08/07/2020	0	--	--	UG/L	50.00	

Site ID : 095-168

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	08/07/2020	1.61	--	--	UG/L	50.00	
Methyl bromide	08/07/2020	0.71	0.57	--	UG/L	50.00	
Naphthalene	08/07/2020	0.9	0.67	--	UG/L	50.00	B

Site ID : 095-169

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	08/07/2020	1.3	--	--	UG/L	50.00	
Chloroform	08/07/2020	1.3	0.5	--	UG/L	50.00	

Site ID : 095-170

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	08/07/2020	2	--	--	UG/L	50.00	
Chloroform	08/07/2020	2	0.5	--	UG/L	50.00	

Site ID : 095-172

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	08/12/2020	1.93	--		UG/L	50.00	
Chloroform	08/12/2020	1.2	0.5		UG/L	50.00	
Methyl bromide	08/12/2020	0.73	0.57		UG/L	50.00	B

Site ID : 095-305

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	08/11/2020	2.69	--		UG/L	21.61	
Styrene	08/11/2020	0.59	0.5		UG/L	21.61	B
Tetrachloroethylene	08/11/2020	2.1	0.5		UG/L	21.61	

Site ID : 095-306

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	08/11/2020	24.61	--		UG/L	34.00	
Styrene	08/11/2020	0.61	0.5		UG/L	34.00	B
Tetrachloroethylene	08/11/2020	24	0.5		UG/L	34.00	

Site ID : 095-312

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	08/12/2020	2.14	--		UG/L	50.00	

Table 7-3
OU III Building 96 Monitoring Well Data
'Hits Only' July through September 2020

Site ID : 095-312

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Methyl bromide	08/12/2020	1.5	0.57		UG/L	50.00	B
Tetrachloroethylene	08/12/2020	0.36	0.5		UG/L	50.00	J
Trichlorofluoromethane	08/12/2020	0.28	0.5		UG/L	50.00	J

Site ID : 095-318

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	08/12/2020	5.6	--		UG/L	65.00	
Tetrachloroethylene	08/12/2020	5.6	0.5		UG/L	65.00	

Site ID : 095-325

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	08/11/2020	42.68	--		UG/L	45.00	
cis-1,2-Dichloroethylene	08/11/2020	3.1	0.5		UG/L	45.00	
Styrene	08/11/2020	0.58	0.5		UG/L	45.00	B
Tetrachloroethylene	08/11/2020	39	0.5		UG/L	45.00	

Site ID : 095-84

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	08/07/2020	27	--	--	UG/L	25.00	
Tetrachloroethylene	08/07/2020	27	0.5	--	UG/L	25.00	

Site ID : 095-85

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	08/07/2020	0.82	--	--	UG/L	95.00	
Trichlorofluoromethane	08/07/2020	0.82	0.5	--	UG/L	95.00	

Table 7-5
OU III Building 96 Influent Data
'Hits Only' July through September 2020

Site ID : 095-151 (RTW-1 Influent)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/10/2020	4.82	--	--	UG/L	0.00	
Chloroform	07/10/2020	0.76	0.5	--	UG/L	0.00	
Tetrachloroethylene	07/10/2020	3.6	0.5	--	UG/L	0.00	
Trichlorofluoromethane	07/10/2020	0.46	0.5	--	UG/L	0.00	J
524.2 TVOC	08/06/2020	3.06	--	--	UG/L	0.00	
Chloroform	08/06/2020	0.98	0.5	--	UG/L	0.00	
Tetrachloroethylene	08/06/2020	1.6	0.5	--	UG/L	0.00	
Trichlorofluoromethane	08/06/2020	0.48	0.5	--	UG/L	0.00	J
524.2 TVOC	08/18/2020	0.61	--	--	UG/L	0.00	
Styrene	08/18/2020	0.61	0.5	--	UG/L	0.00	B
524.2 TVOC	09/01/2020	4.66	--	--	UG/L	0.00	
Chloroform	09/01/2020	0.66	0.5	--	UG/L	0.00	
Tetrachloroethylene	09/01/2020	4	0.5	--	UG/L	0.00	

Site ID : 095-153 (RTW-2 Influent)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/10/2020	0	--	--	UG/L	0.00	

Site ID : 095-155 (RTW-3 Influent)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/10/2020	0.53	--	--	UG/L	0.00	
Chloroform	07/10/2020	0.53	0.5	--	UG/L	0.00	

Site ID : 095-157 (RTW-4 Influent)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/10/2020	2.11	--	--	UG/L	0.00	
Bromodichloromethane	07/10/2020	0.47	0.5	--	UG/L	0.00	J
Chloroform	07/10/2020	1.2	0.5	--	UG/L	0.00	
Dibromochloromethane	07/10/2020	0.44	0.5	--	UG/L	0.00	J

Table 7-6
OU III Building 96 Effluent Data
'Hits Only' July through September 2020

Site ID : 095-152 (RTW-1 Effluent)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/10/2020	0	--	--	UG/L	0.00	
524.2 TVOC	08/06/2020	0	--	--	UG/L	0.00	
524.2 TVOC	08/18/2020	0.61	--	--	UG/L	0.00	
Styrene	08/18/2020	0.61	0.5	--	UG/L	0.00	B
524.2 TVOC	09/01/2020	0	--	--	UG/L	0.00	

Qualifiers :

J = Estimated value.
D = Compound was identified in an analysis at a secondary dilution factor.

Organic Compounds :

B = Compound was found in both the sample And associated laboratory blank.

Inorganic Compounds :

B = Result Is between instrument detection limit And contract required reporting limit.

Section 8

OU IV Former Air Sparge/Soil Vapor Extraction System (System Closed)

A petition was submitted in June 2002 for closure of this project. The EPA and DEC provided their approval for system closure in July 2003. The system was decommissioned in the fall of 2003. Per the *2010 Groundwater Status Report*, groundwater monitoring related to the OU I Air Sparge/Soil Vapor Extraction System is concluded.

Section 9

Q3-2020 Operations Summary
OU VI Ethylene Dibromide Pump & Treat System

Process: Groundwater extraction and liquid phase granular activated carbon treatment, with discharge to injection wells.

Goal: Reach the ethylene dibromide Maximum Contaminant Level (MCL) in core monitoring wells within 30 years for the Upper Glacial aquifer (by 2030).

Start Date: October 2004

Table 9-1
OU VI Ethylene Dibromide Pump and Treat System
Pumping Rates (gpm)

Extraction Well	EW-1E	EW-2E
Site Id #	000-503	000-504
Screened Interval (feet below grade)	115-135	115-135
Desired Flow Rate (GPM)	160	190
July	169	191
August	64	77
September	0	0
Actual (Avg. over Qtr.)	**78**	**89**

Figure 9-1
OU VI Cumulative Mass Removal of EDB vs. Time

Note: Due to the low concentrations of ethylene dibromide in the extraction wells, presentation of a mass removal graph is not appropriate.

Figure 9-2
OU VI Ethylene Dibromide
Influent EDB Concentration vs. Time

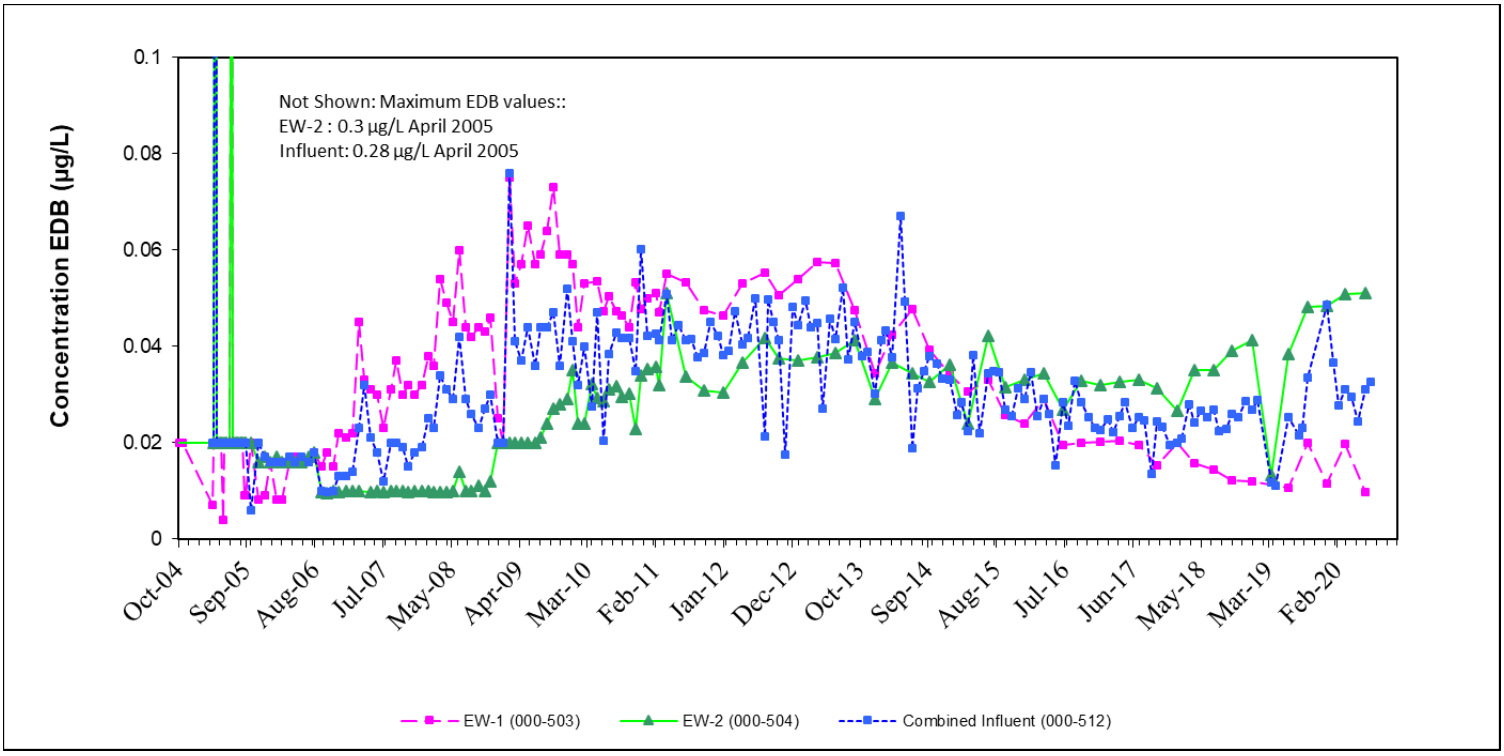


Table 9-2
OU VI Ethylene Dibromide Effluent Water Quality
SPDES Equivalency Permit Concentrations July 1, 2020 – September 30, 2020

Parameter	Permit Limit	Max. Measured Value	Units	Frequency
Flow	**450**	**360**	**GPM**	**Continuous**
pH	**5.0 - 8.5**	**5.6-6.1**	**SU**	**Weekly**
Ethylene Dibromide	**.03**	**<0.02**	**ug/L**	**Monthly****
Chloroform	**7.0**	**<0.5**	**ug/L**	**Monthly****
1,1-Dichloroethene	**5.0**	**<0.5**	**ug/L**	**Monthly****
1,1,1-Trichloroethane	**5.0**	**<0.5**	**ug/L**	**Monthly****
Methyl Chloride	**5.0**	**<0.5**	**ug/L**	**Monthly****
Methylene Chloride	**5.0**	**<0.5**	**ug/L**	**Monthly****

***Minimum to maximum value for pH during this operational period.**
** **The minimum measurement frequency shall be monthly following a period of 24 consecutive weekly sampling events showing no exceedances of the stated discharge limitations.**

System Operations Summary

July 2020:

The system operated normally for the month. The system treated approximately 15 million gallons of water.

August 2020:

The system was down from August 15th to October 8th for failure and replacement of the programmable logic controller panel. The system treated approximately 6 million gallons of water.

September 2020:

The system was down for the entire month (See August).

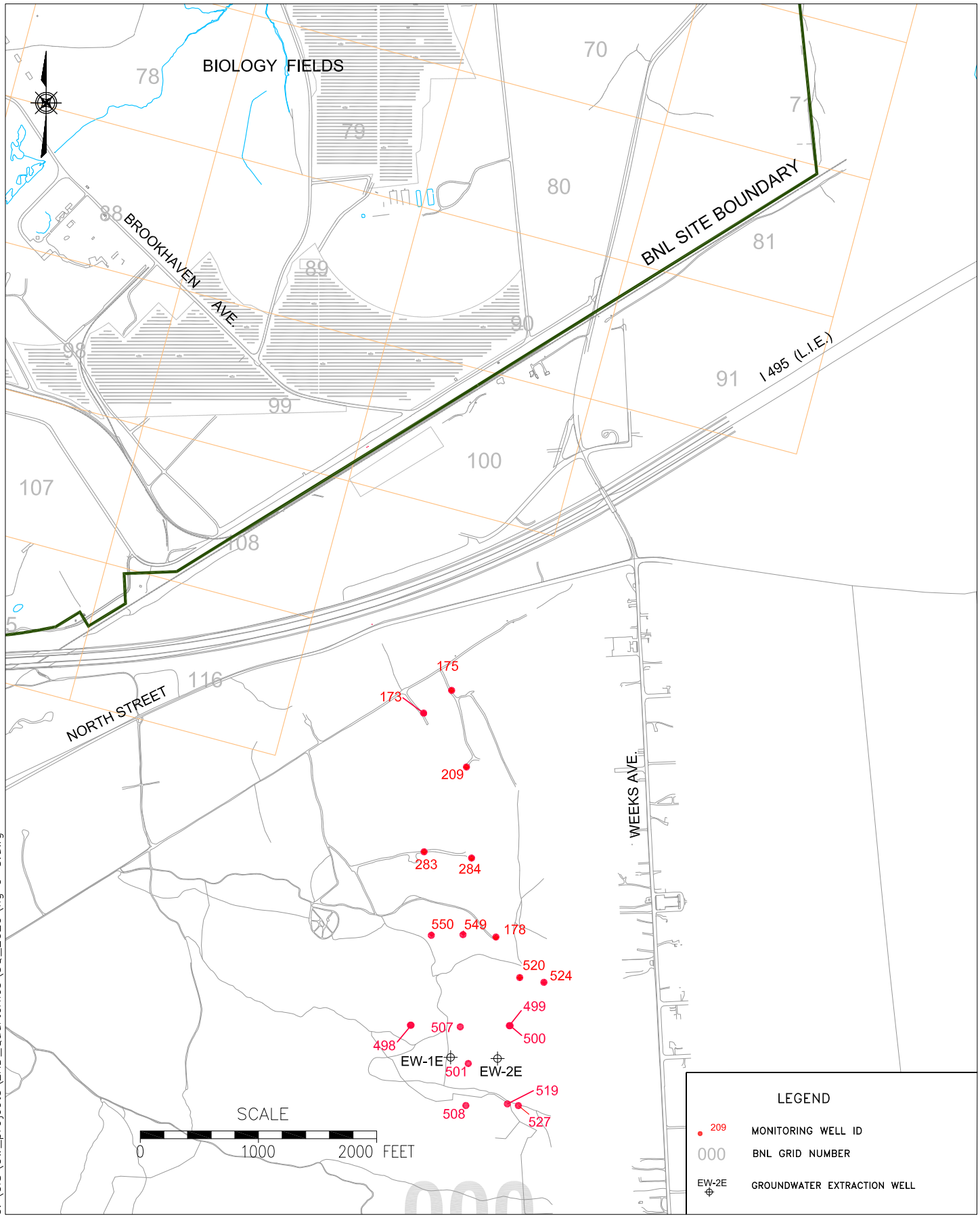
The system treated approximately 21 million gallons of water during the third quarter of 2020.

In August, a soil boring and vertical profile well were installed to address data gaps in the groundwater model geologic framework for the plume core upgradient of the extraction wells. The maximum EDB concentration detected in these temporary wells was 0.9 µg/L at 158 feet below grade. Two permanent monitoring wells were installed at this location in October 2020.

Due to schedule delays with third quarter monitoring well sampling, some of the samples were collected in mid-October and the analytical results were not available at the time of this report. All analytical data will be included in the 2020 Groundwater Status Report.

Planned Operational Changes

- Maintain full time operation of the treatment system and continue quarterly sampling of the extraction wells.
- The observed migration rate for EDB is significantly slower than originally predicted during treatment system design. Perform groundwater modeling using data from the recent vertical profile to evaluate if the existing extraction wells will capture the deeper EDB identified. If the existing extraction wells are not adequate, the model will be used to evaluate modifications which may include additional extraction wells.



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BROOKHAVEN NATIONAL LABORATORY

ENVIRONMENTAL PROTECTION DIVISION

TITLE:

OU VI EDB

SITEWIDE REMEDIATION SYSTEMS
THIRD QUARTER 2020 OPERATIONS REPORT

DWN:	VT: HZ.:	DATE:	PROJECT NO.:
JEB	–	09/26/05	–
CHKD:	APPD:	REV.:	NOTES:
LDS	--	10/10/20	–
FIGURE NO.:			
9-3			

Table 9-3
OU VI Ethylene Dibromide Monitoring Well Data
'Hits Only' July through September 2020

Site ID : 000-173

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,4-Dioxane	07/31/2020	1.93	0.2	--	UG/L	111.00	
Perfluorobutyric acid (PFBA)	07/31/2020	2.04	1.73	--	NG/L	111.00	
Perfluoropentanoic acid (PFPeA)	07/31/2020	1.41	1.73	--	NG/L	111.00	J

Site ID : 000-175

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,4-Dioxane	07/31/2020	1.67	0.2	--	UG/L	105.00	
Perfluorobutyric acid (PFBA)	07/31/2020	2.3	1.83	--	NG/L	105.00	
Perfluoropentanoic acid (PFPeA)	07/31/2020	2.39	1.83	--	NG/L	105.00	

Site ID : 000-178

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,4-Dioxane	08/03/2020	0.364	0.2	--	UG/L	133.00	
EDB	08/03/2020	0.241	0.0196	--	UG/L	133.00	

Site ID : 000-209

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,4-Dioxane	07/31/2020	1.59	0.2	--	UG/L	99.00	

Site ID : 000-283

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
EDB	08/03/2020	0.0293	0.0193	--	UG/L	107.00	

Site ID : 000-284

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,4-Dioxane	08/03/2020	0.616	0.2	--	UG/L	107.00	
EDB	08/03/2020	0.0755	0.0196	--	UG/L	107.00	
Perfluorobutyric acid (PFBA)	08/03/2020	2.61	1.77	--	NG/L	107.00	
Perfluoropentanoic acid (PFPeA)	08/03/2020	2.54	1.77	--	NG/L	107.00	

Site ID : 000-500

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
EDB	07/30/2020	0.0884	0.02	--	UG/L	135.00	

Site ID : 000-507

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,4-Dioxane	08/04/2020	0.354	0.2	--	UG/L	125.00	
EDB	08/04/2020	0.119	0.0196	--	UG/L	125.00	

Site ID : 000-519

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,4-Dioxane	08/04/2020	0.126	0.2	--	UG/L	130.00	J

Table 9-3
OU VI Ethylene Dibromide Monitoring Well Data
'Hits Only' July through September 2020

Site ID : 000-519

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Perfluorononanoic acid (PFNA)	08/04/2020	0.823	1.73	--	NG/L	130.00	J
Perfluoroundecanoic acid (PFUdA)	08/04/2020	1.11	1.73	--	NG/L	130.00	J

Site ID : 000-520

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
EDB	07/29/2020	0.321	0.02	--	UG/L	140.00	

Site ID : 000-527

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Perfluorobutyric acid (PFBA)	08/04/2020	1.33	1.79	--	NG/L	145.00	J

Site ID : 000-549

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,4-Dioxane	08/03/2020	0.157	0.2	--	UG/L	145.00	J
EDB	08/03/2020	0.362	0.0194	--	UG/L	145.00	

Site ID : 000-550

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
EDB	08/03/2020	0.0782	0.0195	--	UG/L	130.00	

Table 9-4
OU VI Ethylene Dibromide Extraction Well Data
'Hits Only' July through September 2020

Site ID : 000-503 (EW-1)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/09/2020	1.41	--	--	UG/L	0.00	
Chloroform	07/09/2020	1.41	0.5	--	UG/L	0.00	
EDB	07/09/2020	0.00968	0.0199	--	UG/L	0.00	J

Site ID : 000-504 (EW-2)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/09/2020	1.4	--	--	UG/L	0.00	
Chloroform	07/09/2020	1.4	0.5	--	UG/L	0.00	
EDB	07/09/2020	0.0505	0.0199	--	UG/L	0.00	

Table 9-5
OU VI Ethylene Dibromide Influent Data
'Hits Only' July through September 2020

Site ID : 000-512 (Combined Influent)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/09/2020	1.38	--	--	UG/L	0.00	
Chloroform	07/09/2020	1.38	0.5	--	UG/L	0.00	
EDB	07/09/2020	0.031	0.0201	--	UG/L	0.00	
524.2 TVOC	08/04/2020	1.06	--	--	UG/L	0.00	
Chloroform	08/04/2020	1.06	0.5	--	UG/L	0.00	
EDB	08/04/2020	0.0326	0.0196	--	UG/L	0.00	

Table 9-6
OU VI Ethylene Dibromide Effluent Data
'Hits Only' July through September 2020

Site ID : 000-510 (System Effluent)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/09/2020	0	--	--	UG/L	0.00	
524.2 TVOC	08/04/2020	0.34	--	--	UG/L	0.00	
Chloroform	08/04/2020	0.34	0.5	--	UG/L	0.00	J

Qualifiers :

J = Estimated value.
D = Compound was identified in an analysis at a secondary dilution factor.

Organic Compounds :

B = Compound was found in both the sample And associated laboratory blank.

Inorganic Compounds :

B = Result Is between instrument detection limit And contract required reporting limit.

Section 10

Q-3 2020 Quarterly Operations Summary
OU III HFBR Tritium Pump and Recharge System
(System Closed)

Process: Pump and recharge (to the RAV basin) with monitored natural attenuation for tritium. Carbon filtration is also included in the pump and recharge system to remove VOCs that are also present in the groundwater.

Goal: Reach Maximum Contaminant Levels (MCLs) in core monitoring wells within 30 years for the Upper Glacial aquifer (by 2030). NYSDEC and EPA approved of the Petition for Closure in August 2018 and March 2019, respectively.

Start Date: May 1997

Table 10-1
OU III HFBR Pump and Recharge System
Pumping Rates (gpm)

Extraction Well	**EW-9**	**EW-10**	**EW-11**	**EW-16**
Site Id #	105-40	105-39	105-41	096-119
Screen Interval (ft bls)	130-150	130-150	130-150	80-120
Desired Flow Rate (gpm)	0 *	0 *	0 *	0 *
July (Avg monthly gpm)	0	0	0	0
August "	0	0	0	0
September "	0	0	0	0
Actual (Avg. over Qtr.)	**0**	**0**	**0**	**0**

* The system was approved for closure in March 2019.

Figure 10-1
OU III HFBR Pump & Treat System
Extraction Wells Tritium Concentrations vs. Time

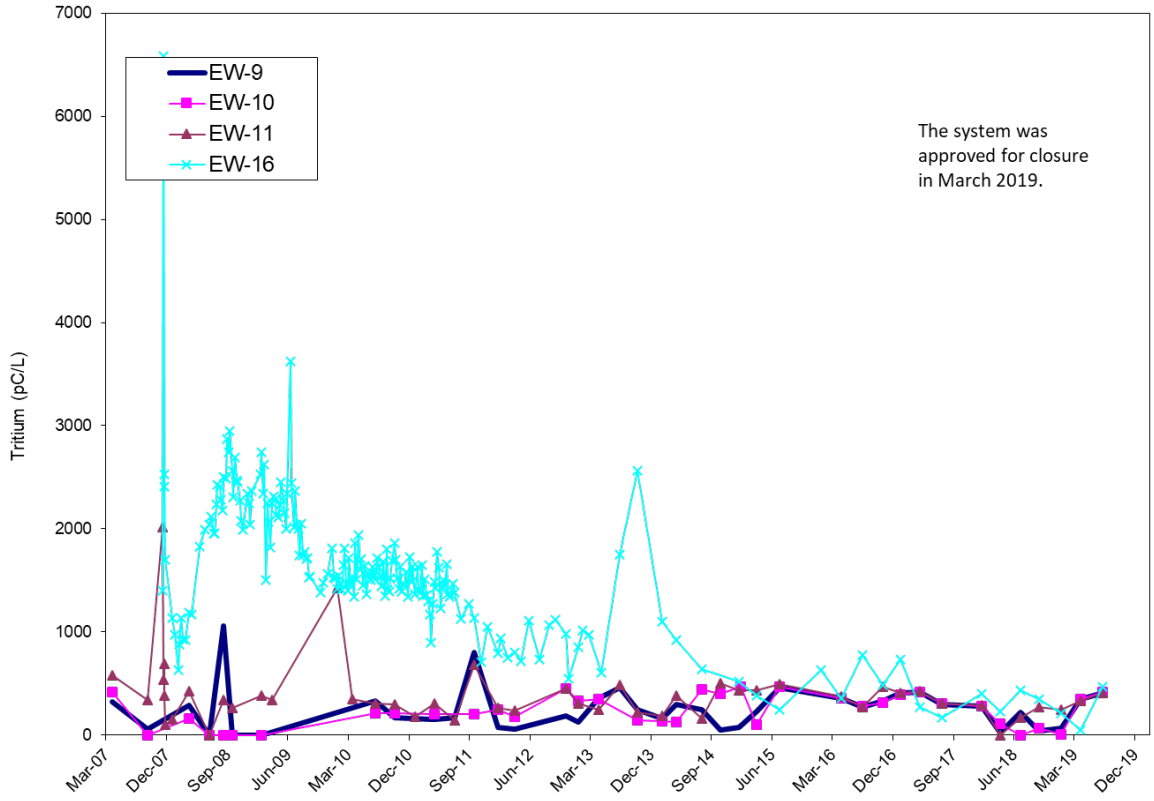


Table 10-2
Effluent Water Quality
SPDES Equivalency Permit Concentrations July 1, 2020 – September 30, 2020

Parameter	Permit Limit	Max. Measured Value	Units	Frequency
Flow	**Monitor**	**NA**	**GPD**	**Continuous**
pH (range)	**5.6 - 8.5**	**NA**	**SU**	**Weekly**
Carbon Tetrachloride	**5.0**	**NA**	**ug/L**	**2/Month**
Chloroform	**7.0**	**NA**	**ug/L**	**2/Month**
1,1-Dichloroethane	**5.0**	**NA**	**ug/L**	**2/Month**

Parameter	Permit Limit	Max. Measured Value	Units	Frequency
1,2-Dichloroethane	**0.6**	**NA**	**ug/L**	**2/Month**
1,1-Dichloroethene	**5.0**	**NA**	**ug/L**	**2/Month**
Cis-1,2-Dichloroethylene	**5.0**	**NA**	**ug/L**	**2/Month**
trans-1,2-Dichloroethylene	**5.0**	**NA**	**ug/L**	**2/Month**
Tetrachloroethylene	**5.0**	**NA**	**ug/L**	**2/Month**
1,1,1-Trichloroethane	**5.0**	**NA**	**ug/L**	**2/Month**
Trichloroethylene	**5.0**	**NA**	**ug/L**	**2/Month**

NA = Not applicable. The system is closed.

Monitoring Activities

The current monitoring well network is depicted on Figure 10-1. The third quarter monitoring well analytical results are shown on Table 10-3. The highest tritium concentration immediately downgradient of the HFBR in the second quarter of 2020 was 3,110 pCi/L in well 075-804. This well is located on the lawn of the HFBR immediately north of Cornell Avenue. Sampling of the extraction wells for this system was discontinued in July 2019.

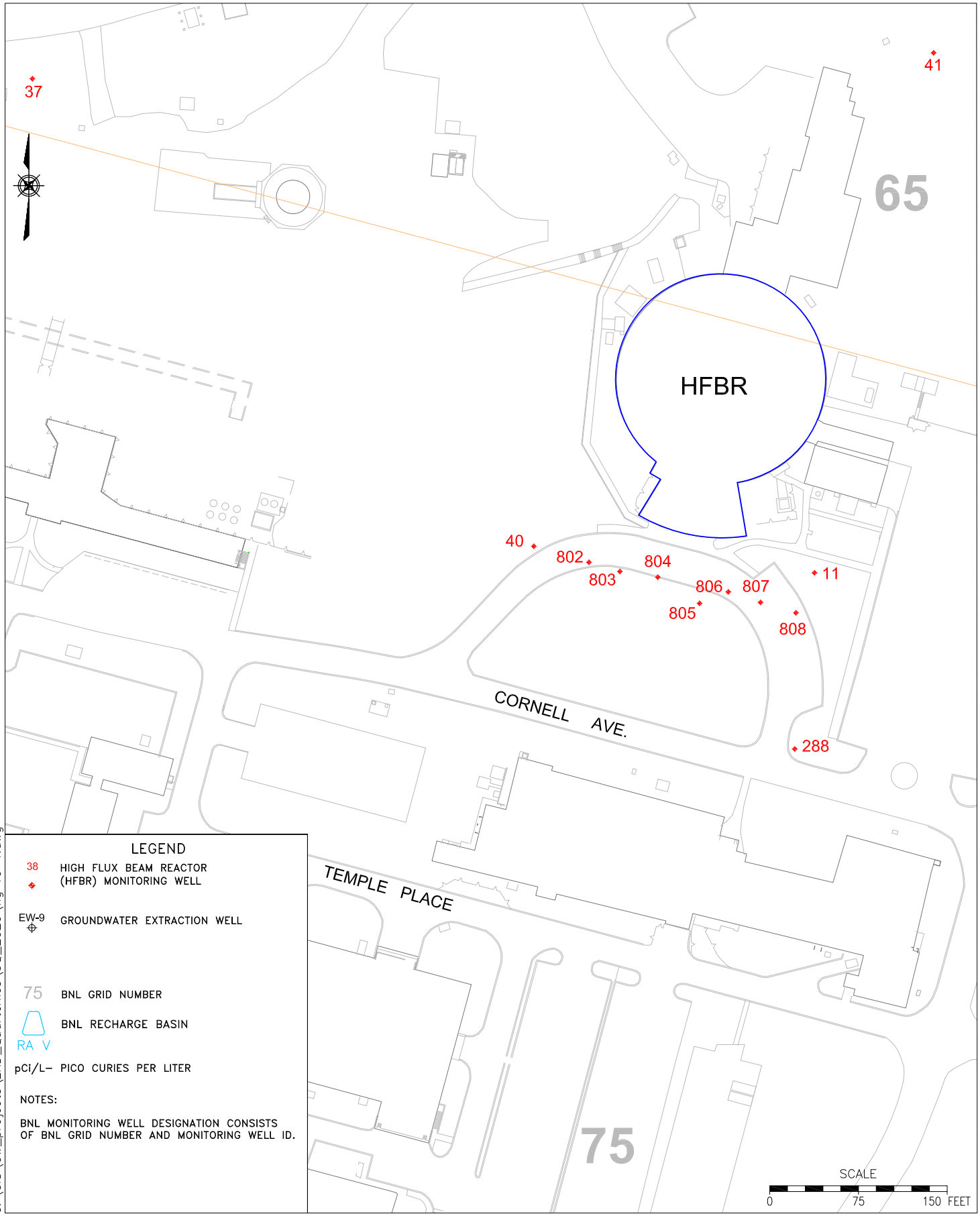
System Operations

July through September 2020:

The system remained closed.

Planned Operational Changes

- Maintain the monitoring wells, extraction wells and carbon vessels until a determination is made on their utilization related to emerging contaminants.



LEGEND

38 HIGH FLUX BEAM REACTOR (HFBR) MONITORING WELL

EW-9 GROUNDWATER EXTRACTION WELL

75 BNL GRID NUMBER

RA V BNL RECHARGE BASIN

pCi/L– PICO CURIES PER LITER

NOTES:

BNL MONITORING WELL DESIGNATION CONSISTS OF BNL GRID NUMBER AND MONITORING WELL ID.

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BROOKHAVEN NATIONAL LABORATORY
ENVIRONMENTAL PROTECTION DIVISION

TITLE:

OU III HFBR AOC 29

THIRD QUARTER 2020 OPERATIONS REPORT

DWN:	VT: HZ.:	DATE:	PROJECT NO.:
AJZ	–	06/14/16	–
CHKD:	APPD:	REV.:	NOTES:
LDS	–	10/20/20	–

FIGURE NO.: 10–1

Table 10-3
OU III HFBR Tritium Plume Monitoring Well Data
'Hits Only' July through September 2020

Site ID : 075-804

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Tritium	08/05/2020	3110	327	479	PCI/L	53.40	

Site ID : 075-805

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Tritium	08/05/2020	507	318	229	PCI/L	53.10	

Site ID : 075-806

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Tritium	08/05/2020	1180	316	294	PCI/L	52.70	

Qualifiers :

J = Estimated value.
D = Compound was identified in an analysis at a secondary dilution factor.

Organic Compounds :

B = Compound was found in both the sample And associated laboratory blank.

Inorganic Compounds :

B = Result Is between instrument detection limit And contract required reporting limit.

Section 11

Q3-2020 Operations Summary
OU III Western South Boundary Pump & Treat System

Process: Groundwater extraction and air stripping treatment. As of March 2019, the water is treated at the OU III South Boundary/Middle Road air stripper towers and discharged to both the OU III and RA V recharge basins.

Goal: Reach Maximum Contaminant Levels (MCLs) in core monitoring wells in OU III within 30 years for the Upper Glacial aquifer (by 2030).

Start Date: September 2002

Table 11-1
OU III Western South Boundary Pump & Treat System
Pumping Rates (gpm)

Extraction Well	WSB-1	WSB-2	WSB-3	WSB-4	WSB-5	WSB-6
Site ID #	126-12	127-05	111-17	119-13	130-12	130-13
Screen Interval (ft bls)	140-160	150-170	168-188	170-190	160-190	196-216
Desired Flow Rate (GPM)	100	0	75	75	75	75
July	73	0	63	71	68	69
August	98	0	100	69	77	79
September	80	0	92	69	71	74
Actual (Avg. over Qtr.)	**84**	**0**	**85**	**70**	**72**	**74**

Extraction well WSB-2 is in standby mode. Extraction wells WSB-3 through WSB-6 became operational in March 2019.

Figure 11-1
OU III Western South Boundary Pump & Treat System
Cumulative Mass Removal of VOCs vs. Time

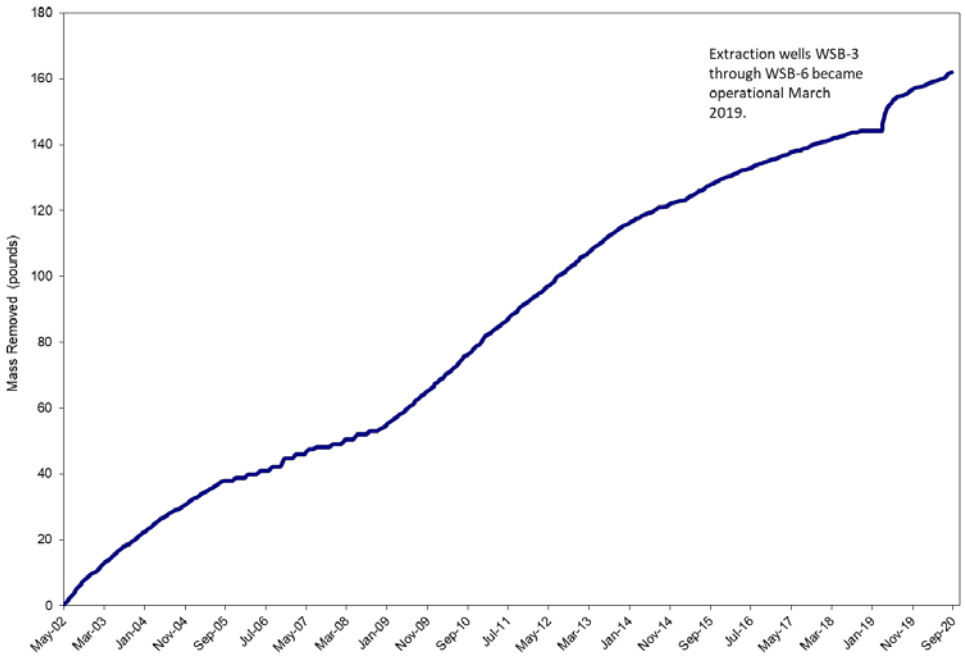


Figure 11-2
OU III Western South Boundary Pump & Treat System
Influent TVOC Concentrations vs. Time

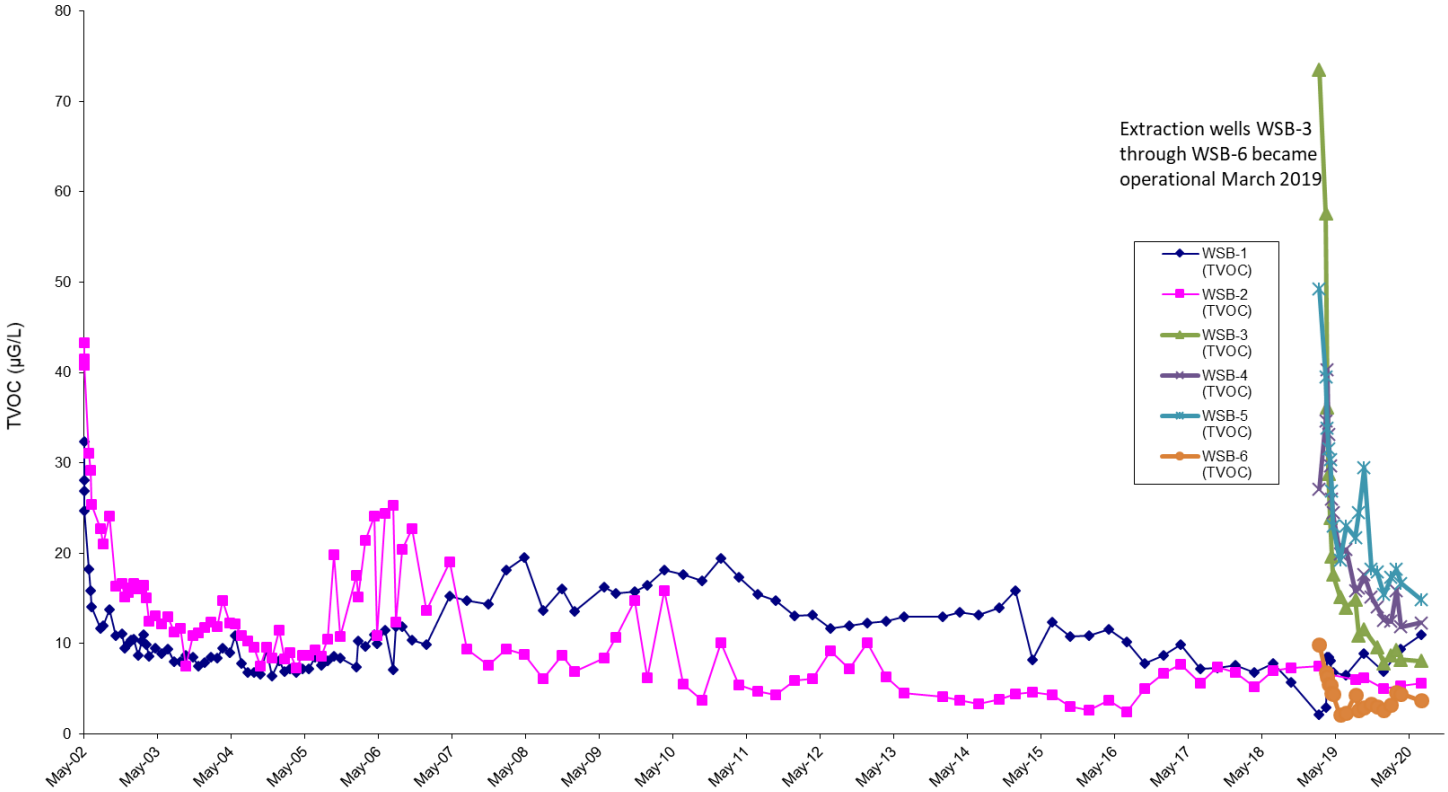


Table 11-2
Effluent Water Quality
SPDES Equivalency Permit Concentrations July 1, 2020 – September 30, 2020

Parameter	Permit Limit	Max. Measured Value	Units	Frequency
Flow	**Monitor**	**591,903 [1]**	**GPD**	**Continuous**
pH (range)	**6.5 - 8.5**	**7.1– 7.5**	**SU**	**Monthly**
Carbon Tetrachloride	**5**	**<0.50**	**ug/L**	**2/Month**
Chloroform	**7**	**<0.50**	**ug/L**	**2/Month**
Dichlorodifluoromethane	**5**	**<0.50**	**ug/L**	**2/Month**
1,1-Dichloroethane	**5**	**<0.50**	**ug/L**	**2/Month**
1,1-Dichloroethylene	**5**	**<0.50**	**ug/L**	**2/Month**
Methyl Chloride	**5**	**<0.50**	**ug/L**	**2/Month**
Tetrachloroethylene	**5**	**<0.50**	**ug/L**	**2/Month**
Toluene	**5**	**<0.50**	**ug/L**	**2/Month**
1,1,1-Trichloroethane	**5**	**<0.50**	**ug/L**	**2/Month**
1,1,2-Tricholorethane	**5**	**<0.50**	**ug/L**	**2/Month**
Trichloroethylene	**10**	**<0.50**	**ug/L**	**2/Month**

[1] The average flow for the operational period at the influent flow meter.
Note: As of March 2019, the water from the Western South Boundary is treated at the OU III South Boundary/Middle Road air stripper towers and discharged under that equivalency permit. This change in discharge location was reflected starting with the April 2019 DMR.

System Operations

July 2020:

Extraction well WSB-1, WSB-3, WSB-4, WSB-5, WSB-6 were running normally. The system was off for five days for maintenance. Extraction well WSB-2 was in standby mode. The system treated approximately 15 million gallons of water.

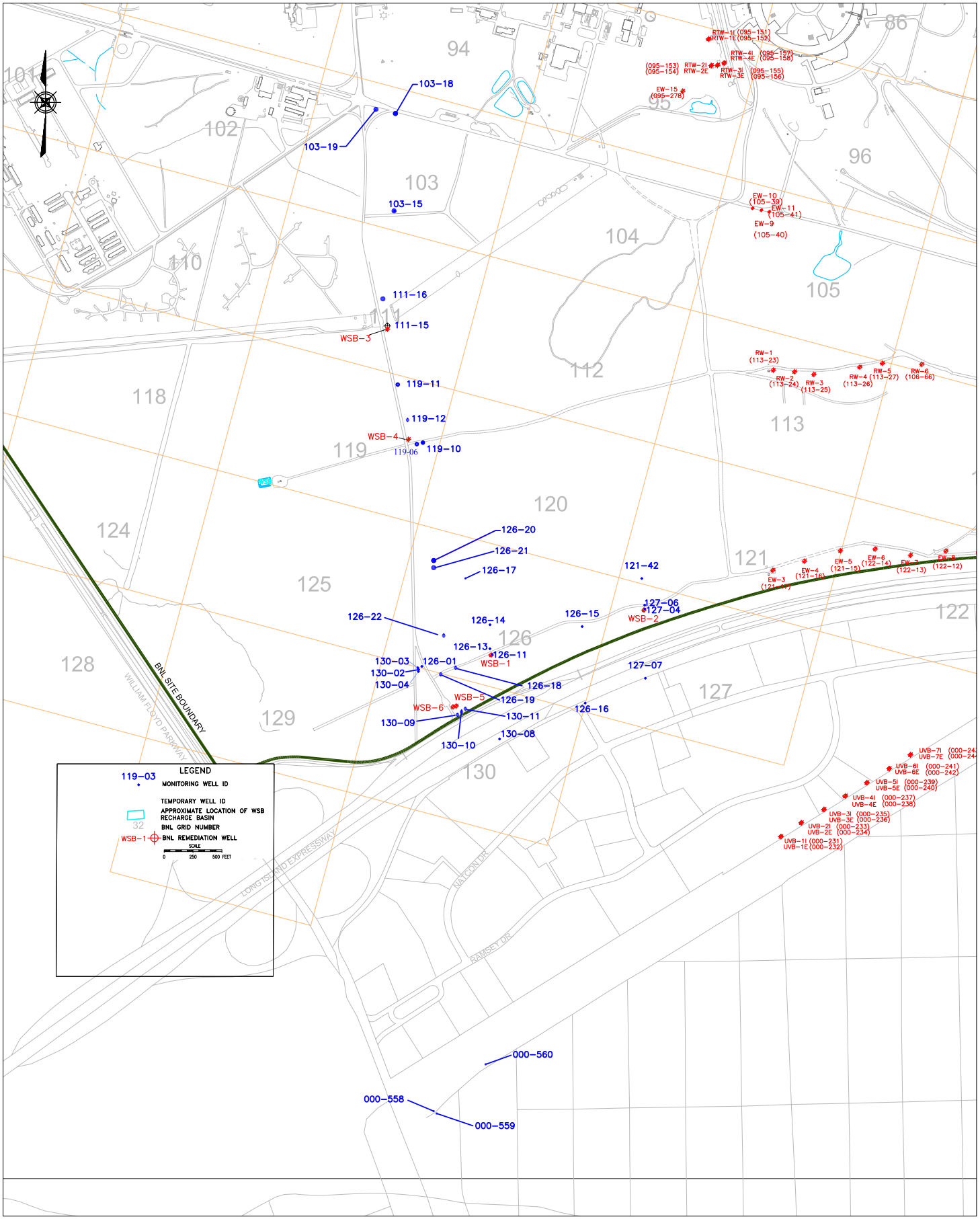
August 2020:
Extraction well WSB-1, WSB-3, WSB-4, WSB-5, WSB-6 were running normally. Extraction well WSB-2 was in standby mode. The system treated approximately 18 million gallons of water.

September 2020:
Extraction well WSB-1, WSB-3, WSB-4, WSB-5, WSB-6 were running normally. The system was off for four days for maintenance. Extraction well WSB-2 was in standby mode. The system treated approximately 16 million gallons of water.

The system treated approximately 49 million gallons of water during the third quarter of 2020.

Planned Operational Changes

- Continue full-time operation of extraction well WSB-1 based on elevated concentrations persisting at well 126-14.
- Continue full time operation of extraction wells WSB-3 through WSB-6.
- Based on the low TVOC concentrations below the capture goal of 20 µg/L, maintain extraction well WSB-2 in standby mode. If TVOC concentrations greater than 20 µg/L are observed in WSB-2 or the adjacent core monitoring wells, extraction well WSB-2 may be put into full time operation. During the third quarter, WSB-2 and adjacent monitoring wells were below the TVOC capture goal of 20 µg/L.



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BROOKHAVEN NATIONAL LABORATORY

ENVIRONMENTAL PROTECTION DIVISION

OU III WESTERN SOUTH BOUNDARY PUMP AND TREAT SYSTEM MONITORING WELL LOCATIONS

SITEWIDE REMEDIATION SYSTEMS
THIRD QUARTER 2020 OPERATIONS REPORT

DWN:	VT: HZ.:	DATE:	PROJECT NO.:
JEB	–	09/26/05	–
CHKD:	APPD:	REV.:	NOTES:
LDS	––	10/20/20	–

FIGURE NO.: 11-3

Table 11-3
OU III Western South Boundary Monitoring Well Data
'Hits Only' July through September 2020

Site ID : 000-558

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	08/27/2020	2.5	0.5	--	UG/L	165.00	
1,1-Dichloroethane	08/27/2020	0.83	0.5	--	UG/L	165.00	
1,1-Dichloroethylene	08/27/2020	2.8	0.5	--	UG/L	165.00	
524.2 TVOC	08/27/2020	14.45	--	--	UG/L	165.00	
Chloroform	08/27/2020	4	0.5	--	UG/L	165.00	
Dichlorodifluoromethane	08/27/2020	0.82	0.66	--	UG/L	165.00	
Trichloroethylene	08/27/2020	3.5	0.5	--	UG/L	165.00	

Site ID : 000-559

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	08/27/2020	0.28	0.5	--	UG/L	215.00	J
524.2 TVOC	08/27/2020	1.76	--	--	UG/L	215.00	
Chloroform	08/27/2020	0.38	0.5	--	UG/L	215.00	J
Dichlorodifluoromethane	08/27/2020	1.1	0.66	--	UG/L	215.00	

Site ID : 000-560

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	08/27/2020	1.7	0.5	--	UG/L	159.50	
1,1-Dichloroethane	08/27/2020	0.66	0.5	--	UG/L	159.50	
1,1-Dichloroethylene	08/27/2020	2.5	0.5	--	UG/L	159.50	
524.2 TVOC	08/27/2020	11.76	--	--	UG/L	159.50	
Chloroform	08/27/2020	2	0.5	--	UG/L	159.50	
Dichlorodifluoromethane	08/27/2020	2.9	0.66	--	UG/L	159.50	
Trichloroethylene	08/27/2020	2	0.5	--	UG/L	159.50	

Site ID : 103-15

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1-Dichloroethane	08/21/2020	4.6	0.5	--	UG/L	200.00	
1,1-Dichloroethylene	08/21/2020	4.9	0.5	--	UG/L	200.00	
524.2 TVOC	08/21/2020	20.3	--	--	UG/L	200.00	
Dichlorodifluoromethane	08/21/2020	6	0.66	--	UG/L	200.00	
Trichloroethylene	08/21/2020	4.8	0.5	--	UG/L	200.00	

Site ID : 103-18

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,4-Dioxane	08/26/2020	4.2	0.2	--	UG/L	170.00	
524.2 TVOC	08/26/2020	2.1	--	--	UG/L	170.00	

Table 11-3
OU III Western South Boundary Monitoring Well Data
'Hits Only' July through September 2020

Site ID : 103-18

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Trichloroethylene	08/26/2020	2.1	2.5	--	UG/L	170.00	J D

Site ID : 103-19

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1-Dichloroethane	08/24/2020	1	0.5	--	UG/L	170.00	
1,1-Dichloroethylene	08/24/2020	1.4	0.5	--	UG/L	170.00	
524.2 TVOC	08/24/2020	7	--	--	UG/L	170.00	
Dichlorodifluoromethane	08/24/2020	1.7	0.66	--	UG/L	170.00	
Trichloroethylene	08/24/2020	2.9	0.5	--	UG/L	170.00	

Site ID : 111-15

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,4-Dioxane	08/21/2020	1.38	0.2	--	UG/L	175.00	
524.2 TVOC	08/21/2020	0	--	--	UG/L	175.00	

Site ID : 111-16

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	08/28/2020	0.44	0.5	--	UG/L	173.00	J
1,1-Dichloroethane	08/28/2020	0.78	0.5	--	UG/L	173.00	
1,1-Dichloroethylene	08/28/2020	1.9	0.5	--	UG/L	173.00	
524.2 TVOC	08/28/2020	3.66	--	--	UG/L	173.00	
Trichloroethylene	08/28/2020	0.54	0.5	--	UG/L	173.00	

Site ID : 119-06

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	08/24/2020	0	--	--	UG/L	130.00	

Site ID : 119-10

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1-Dichloroethane	08/24/2020	2.2	0.5	--	UG/L	200.00	
1,1-Dichloroethylene	08/24/2020	2	0.5	--	UG/L	200.00	
524.2 TVOC	08/24/2020	8.5	--	--	UG/L	200.00	
Dichlorodifluoromethane	08/24/2020	2.6	0.66	--	UG/L	200.00	
Trichloroethylene	08/24/2020	1.7	0.5	--	UG/L	200.00	

Site ID : 119-11

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	08/21/2020	9.3	0.5	--	UG/L	180.00	
1,1-Dichloroethane	08/21/2020	6.2	0.5	--	UG/L	180.00	

Table 11-3
OU III Western South Boundary Monitoring Well Data
'Hits Only' July through September 2020

Site ID : 119-11

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1-Dichloroethylene	08/21/2020	34	2.5	--	UG/L	180.00	D
1,2-Dichloroethane	08/21/2020	0.46	0.5	--	UG/L	180.00	J
1,4-Dioxane	08/21/2020	19.1	0.6	--	UG/L	180.00	
524.2 TVOC	08/21/2020	53.75	--	--	UG/L	180.00	
Dichlorodifluoromethane	08/21/2020	0.89	0.66	--	UG/L	180.00	
Trichloroethylene	08/21/2020	2.9	0.5	--	UG/L	180.00	

Site ID : 119-12

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	08/21/2020	5.4	0.5	--	UG/L	179.00	
1,1-Dichloroethane	08/21/2020	1.5	0.5	--	UG/L	179.00	
1,1-Dichloroethylene	08/21/2020	6.4	0.5	--	UG/L	179.00	
524.2 TVOC	08/21/2020	16.97	--	--	UG/L	179.00	
Chloroform	08/21/2020	0.37	0.5	--	UG/L	179.00	J
Trichloroethylene	08/21/2020	3.3	0.5	--	UG/L	179.00	

Site ID : 126-13

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	08/24/2020	0.416	0.355	0.237	PCI/L	155.00	

Site ID : 126-14

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	08/28/2020	19	0.5	--	UG/L	155.00	
1,1-Dichloroethylene	08/28/2020	20	0.5	--	UG/L	155.00	
1,2-Dichloroethane	08/28/2020	0.42	0.5	--	UG/L	155.00	J
1,4-Dioxane	08/28/2020	6.61	0.2	--	UG/L	155.00	
524.2 TVOC	08/28/2020	41.82	--	--	UG/L	155.00	
Trichloroethylene	08/28/2020	2.4	0.5	--	UG/L	155.00	

Site ID : 126-15

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	08/24/2020	0.513	0.362	0.248	PCI/L	155.00	

Site ID : 126-16

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	08/25/2020	2.1	0.5	--	UG/L	135.00	
1,1-Dichloroethane	08/25/2020	0.9	0.5	--	UG/L	135.00	
1,1-Dichloroethylene	08/25/2020	3.1	0.5	--	UG/L	135.00	

Table 11-3
OU III Western South Boundary Monitoring Well Data
'Hits Only' July through September 2020

Site ID : 126-16

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	08/25/2020	15.1	--	--	UG/L	135.00	
Cesium-137	08/25/2020	6.13	4.78	4.42	PCI/L	135.00	
Chloroform	08/25/2020	3.1	0.5	--	UG/L	135.00	
Dichlorodifluoromethane	08/25/2020	2.8	0.66	--	UG/L	135.00	
Trichloroethylene	08/25/2020	3.1	0.5	--	UG/L	135.00	

Site ID : 126-17

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	08/28/2020	0	--	--	UG/L	140.00	

Site ID : 126-18

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	08/26/2020	4.2	0.5	--	UG/L	165.00	
1,1-Dichloroethylene	08/26/2020	4.8	0.5	--	UG/L	165.00	
1,2-Dichloroethane	08/26/2020	0.31	0.5	--	UG/L	165.00	J
1,4-Dioxane	08/26/2020	5.27	0.2	--	UG/L	165.00	
524.2 TVOC	08/26/2020	9.62	--	--	UG/L	165.00	
Trichloroethylene	08/26/2020	0.31	0.5	--	UG/L	165.00	J

Site ID : 126-19

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	08/24/2020	1.8	0.5	--	UG/L	195.00	
1,1-Dichloroethane	08/24/2020	2	0.5	--	UG/L	195.00	
1,1-Dichloroethylene	08/24/2020	3.8	0.5	--	UG/L	195.00	
524.2 TVOC	08/24/2020	17.79	--	--	UG/L	195.00	
Chloroform	08/24/2020	0.69	0.5	--	UG/L	195.00	
Dichlorodifluoromethane	08/24/2020	9.5	0.66	--	UG/L	195.00	

Site ID : 126-20

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	08/28/2020	11	0.5	--	UG/L	140.00	
1,1-Dichloroethylene	08/28/2020	14	0.5	--	UG/L	140.00	
1,2-Dichloroethane	08/28/2020	0.37	0.5	--	UG/L	140.00	J
524.2 TVOC	08/28/2020	26.82	--	--	UG/L	140.00	
Chloroform	08/28/2020	0.35	0.5	--	UG/L	140.00	J
Tetrachloroethylene	08/28/2020	0.37	0.5	--	UG/L	140.00	J
Trichloroethylene	08/28/2020	0.73	0.5	--	UG/L	140.00	

Table 11-3
OU III Western South Boundary Monitoring Well Data
'Hits Only' July through September 2020

Site ID : 126-21

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	08/28/2020	0.27	0.5	--	UG/L	204.00	J
1,1-Dichloroethylene	08/28/2020	0.45	0.5	--	UG/L	204.00	J
1,4-Dioxane	08/28/2020	1.92	0.2	--	UG/L	204.00	
524.2 TVOC	08/28/2020	1.07	--	--	UG/L	204.00	
Chloroform	08/28/2020	0.35	0.5	--	UG/L	204.00	J

Site ID : 127-07

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	08/25/2020	0	--	--	UG/L	151.00	

Site ID : 130-03

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	08/21/2020	0.23	0.229	0.15	PCI/L	162.50	

Site ID : 130-04

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Co-60	08/27/2020	9.68	5.16	5.52	PCI/L	287.50	

Site ID : 130-08

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	08/25/2020	0.8	--	--	UG/L	150.00	
Chloroform	08/25/2020	0.8	0.5	--	UG/L	150.00	

Site ID : 130-09

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	08/25/2020	0.46	--	--	UG/L	140.00	
Chloroform	08/25/2020	0.46	0.5	--	UG/L	140.00	J

Site ID : 130-10

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	08/25/2020	0	--	--	UG/L	155.00	

Site ID : 130-11

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	08/25/2020	1	0.5	--	UG/L	200.00	
1,1-Dichloroethylene	08/25/2020	0.95	0.5	--	UG/L	200.00	
524.2 TVOC	08/25/2020	2.34	--	--	UG/L	200.00	
Chloroform	08/25/2020	0.39	0.5	--	UG/L	200.00	J

Table 11-4
OU III Western South Boundary Extraction Well Data
'Hits Only' July through September 2020

Site ID : 111-17 (WSB-3)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	07/10/2020	1.4	0.5	--	UG/L	0.00	
1,1-Dichloroethane	07/10/2020	0.81	0.5	--	UG/L	0.00	
1,1-Dichloroethylene	07/10/2020	4.7	0.5	--	UG/L	0.00	
524.2 TVOC	07/10/2020	8.1	--	--	UG/L	0.00	
Chloroform	07/10/2020	0.56	0.5	--	UG/L	0.00	
Trichloroethylene	07/10/2020	0.63	0.5	--	UG/L	0.00	
1,4-Dioxane	09/02/2020	2.85	0.2	--	UG/L	0.00	

Site ID : 119-13 (WSB-4)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	07/10/2020	4.2	0.5	--	UG/L	0.00	
1,1-Dichloroethane	07/10/2020	0.52	0.5	--	UG/L	0.00	
1,1-Dichloroethylene	07/10/2020	6.5	0.5	--	UG/L	0.00	
524.2 TVOC	07/10/2020	12.3	--	--	UG/L	0.00	
Chloroform	07/10/2020	0.29	0.5	--	UG/L	0.00	J
Trichloroethylene	07/10/2020	0.79	0.5	--	UG/L	0.00	

Site ID : 126-12 (WSB-1)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	07/10/2020	4	0.5	--	UG/L	0.00	
1,1-Dichloroethylene	07/10/2020	5.6	0.5	--	UG/L	0.00	
524.2 TVOC	07/10/2020	10.99	--	--	UG/L	0.00	
Chloroform	07/10/2020	0.69	0.5	--	UG/L	0.00	
Trichloroethylene	07/10/2020	0.7	0.5	--	UG/L	0.00	

Site ID : 127-05 (WSB-2)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	07/10/2020	1	0.5	--	UG/L	0.00	
1,1-Dichloroethane	07/10/2020	0.38	0.5	--	UG/L	0.00	J
1,1-Dichloroethylene	07/10/2020	1.1	0.5	--	UG/L	0.00	
524.2 TVOC	07/10/2020	5.58	--	--	UG/L	0.00	
Chloroform	07/10/2020	1.1	0.5	--	UG/L	0.00	
Trichloroethylene	07/10/2020	2	0.5	--	UG/L	0.00	

Site ID : 130-12 (WSB-5)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	07/10/2020	4.8	0.5	--	UG/L	0.00	

Table 11-4
OU III Western South Boundary Extraction Well Data
'Hits Only' July through September 2020

Site ID : 130-12 (WSB-5)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1-Dichloroethylene	07/10/2020	5.4	0.5	--	UG/L	0.00	
524.2 TVOC	07/10/2020	14.9	--	--	UG/L	0.00	
Chloroform	07/10/2020	1.7	0.5	--	UG/L	0.00	
Dichlorodifluoromethane	07/10/2020	1.8	0.66	--	UG/L	0.00	
Trichloroethylene	07/10/2020	1.2	0.5	--	UG/L	0.00	

Site ID : 130-13 (WSB-6)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1-Dichloroethane	07/10/2020	0.32	0.5	--	UG/L	0.00	J
1,1-Dichloroethylene	07/10/2020	0.38	0.5	--	UG/L	0.00	J
524.2 TVOC	07/10/2020	3.7	--	--	UG/L	0.00	
Dichlorodifluoromethane	07/10/2020	3	0.66	--	UG/L	0.00	

Table 11-5
OU III Western South Boundary Influent Data
'Hits Only' July through September 2020

Site ID : 121-55 (System Influent)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	07/10/2020	3	0.5	--	UG/L	0.00	
1,1-Dichloroethane	07/10/2020	0.38	0.5	--	UG/L	0.00	J
1,1-Dichloroethylene	07/10/2020	4.7	0.5	--	UG/L	0.00	
524.2 TVOC	07/10/2020	10.4	--	--	UG/L	0.00	
Chloroform	07/10/2020	0.66	0.5	--	UG/L	0.00	
Dichlorodifluoromethane	07/10/2020	0.96	0.66	--	UG/L	0.00	
Trichloroethylene	07/10/2020	0.7	0.5	--	UG/L	0.00	
1,1,1-Trichloroethane	08/06/2020	5.3	0.5	--	UG/L	0.00	
1,1-Dichloroethylene	08/06/2020	2.8	0.5	--	UG/L	0.00	
524.2 TVOC	08/06/2020	20.53	--	--	UG/L	0.00	
Carbon tetrachloride	08/06/2020	1.5	0.5	--	UG/L	0.00	
Chloroform	08/06/2020	0.72	0.5	--	UG/L	0.00	
Methyl tert-butyl ether	08/06/2020	0.31	0.5	--	UG/L	0.00	J
Tetrachloroethylene	08/06/2020	7.4	0.5	--	UG/L	0.00	
Trichloroethylene	08/06/2020	2.5	0.5	--	UG/L	0.00	
1,1,1-Trichloroethane	09/02/2020	2.6	0.5	--	UG/L	0.00	
1,1-Dichloroethylene	09/02/2020	4.2	0.5	--	UG/L	0.00	
524.2 TVOC	09/02/2020	9.14	--	--	UG/L	0.00	
Chloroform	09/02/2020	0.71	0.5	--	UG/L	0.00	
Dichlorodifluoromethane	09/02/2020	1	0.66	--	UG/L	0.00	
Trichloroethylene	09/02/2020	0.63	0.5	--	UG/L	0.00	

Table 11-6
OU III Western South Boundary Effluent Data
'Hits Only' July through September 2020

Site ID : 095-126 (System Effluent)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	08/06/2020	0	--	--	UG/L	0.00	
1,4-Dioxane	09/02/2020	1.66	0.2	--	UG/L	0.00	
524.2 TVOC	09/02/2020	0	--	--	UG/L	0.00	

Site ID : 095-270 (System Effluent)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/10/2020	0	--	--	UG/L	0.00	

Qualifiers :

J = Estimated value.
D = Compound was identified in an analysis at a secondary dilution factor.

Organic Compounds :

B = Compound was found in both the sample And associated laboratory blank.

Inorganic Compounds :

B = Result Is between instrument detection limit And contract required reporting limit.

Section 12
Q3-2020 Operations Summary
OU III Strontium-90 Chemical Holes Treatment System

Process: Groundwater extraction and treatment via zeolite resin (Clinoptilolite) for the removal of Sr-90, with discharge to dry wells.

Goal: Reach Maximum Contaminant Levels (MCLs) in core monitoring wells within 40 years for the Upper Glacial aquifer (by 2040).

Start Date: February 2003

Table 12-1
OU III Sr-90 Chemical Holes
Pumping Rates (gpm)

Extraction Well	EW-1 *	EW-2*	EW-3*
Site Id #	106-92	106-123	106-124
Screen Interval (ft bls)	23.5-38.5	35-45	35-45
Desired Flow Rate (gpm)	0.0	0.0	0.0
July (Avg monthly gpm)	0.0	0.0	0.0
August	0.0	0.0	0.0
September	0.0	0.0	0.0
Actual (Avg. over Qtr. when on)	0.0	0.0	0.0

***** All three extraction wells began pulse pumping (one month on and two months off) in October 2014. In October 2015, EW-1 resumed full time operation. In April 2016, EW-1 was placed into pulsed pumping mode (one month on and one month off). In October 2016, EW-2 and EW-3 were placed in stand-by mode while EW-1 continued in pulsed pumping mode. EW-1 was placed in stand-by mode in July 2018.

Figure 12-1
Chemical Holes Strontium-90 Cumulative Millicuries Removed

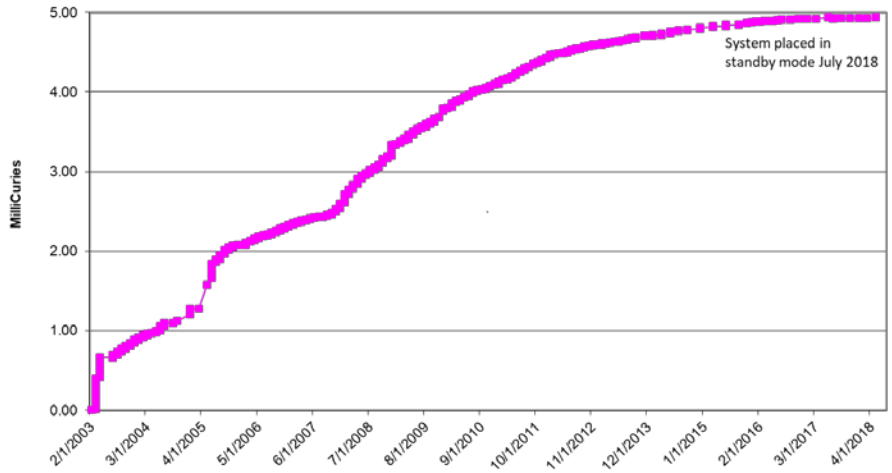


Figure 12-2
Chemical Holes Influent Strontium-90 Concentrations

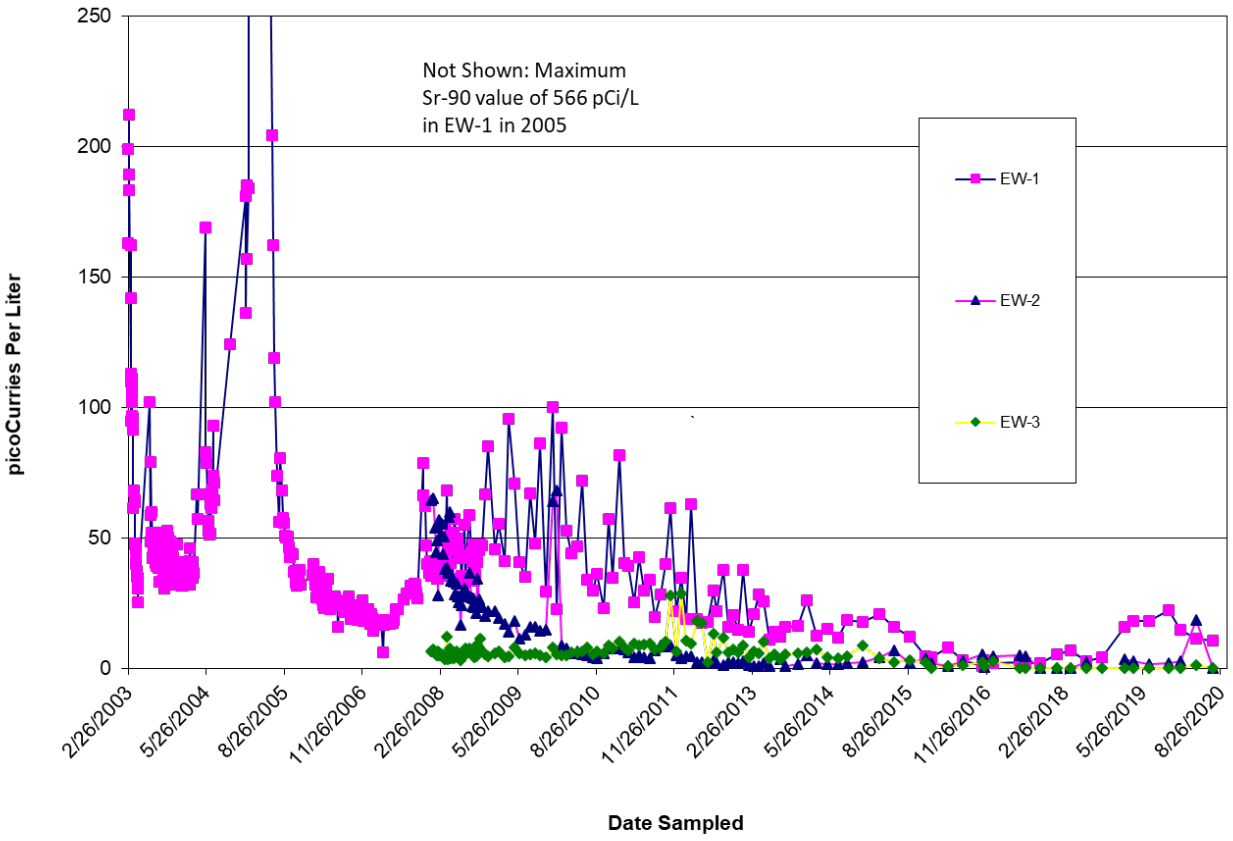


Table 12-2
OU III Sr-90 Chemical Holes Treatment System Effluent Water Quality
SPDES Equivalency Permit Concentrations July 1 – September 30, 2020

Parameter	Permit Limit	Max. Measured Value	Units	Frequency
Flow	**Monitor**	**NA**	**GPM**	**Continuous**
pH (range)	**5.0 - 8.5**	**NA**	**SU**	**Monthly**
Sr-90	**8**	**NA**	**pCi/L**	**Monthly**

NA = Not Applicable. The system was shut down in July 2018.
ND = Not Detected.

Systems Operations

July 2020:

The system was in stand-by mode.

August 2020:

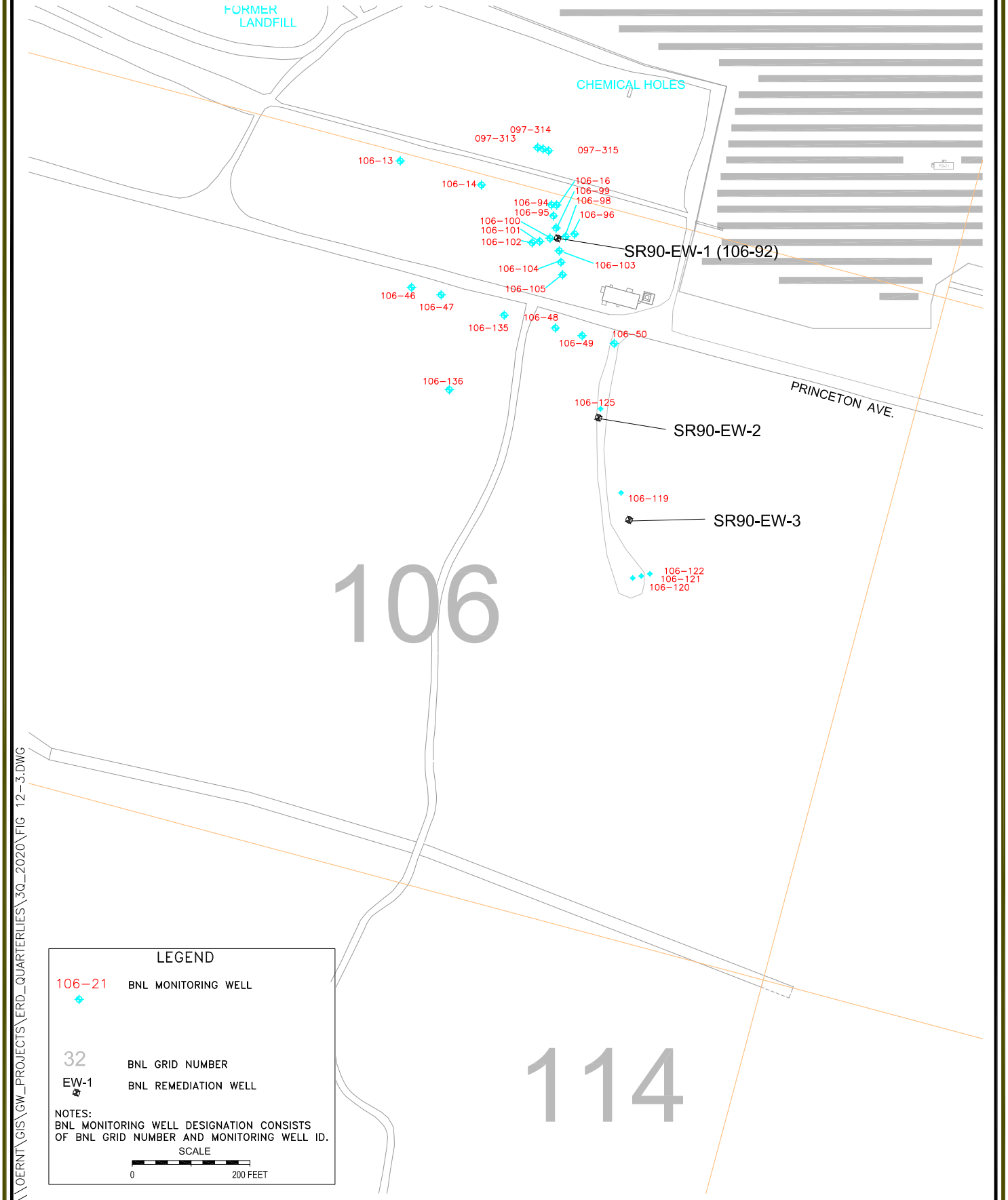
The system was in stand-by mode.

September 2020:

The system was in stand-by mode.

Planned Operational Changes

- Maintain the system in stand-by mode. If significant rebound is identified, the extraction wells may be restarted. During the third quarter, Sr-90 concentrations in extraction well EW-2 and EW-3 were non-detect. Extraction well EW-1 had Sr-90 concentration of 10.6 pCi/L and the maximum concentration in the monitoring wells was 39 pCi/L.



\\OERNT\GIS\GW_PROJECTS\ERD_QUARTERLIES\3Q_2020\FIG 12-3.DWG

BROOKHAVEN NATIONAL LABORATORY
ENVIRONMENTAL PROTECTION DIVISION

TITLE:

CHEMICAL HOLES
Sr-90 MONITORING WELL NETWORK

SITEWIDE REMEDIATION SYSTEMS
THIRD QUARTER 2020 OPERATIONS REPORT

DWN:	VT: HZ.:	DATE:	PROJECT NO.:
JEB	–	07/15/08	–
CHKD:	APPD:	REV.:	NOTES:
LDS	--	10/20/20	–

FIGURE NO.: 12-3

Table 12-3
OU III Strontium-90 Chemical Holes Monitoring Well Data
'Hits Only' July through September 2020

Site ID : 097-313

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	08/14/2020	3.12	0.787	0.743	PCI/L	34.17	

Site ID : 097-314

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	08/14/2020	38.7	0.79	1.99	PCI/L	30.00	

Site ID : 097-315

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	08/14/2020	2.25	0.798	0.599	PCI/L	33.89	

Site ID : 106-100

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	08/14/2020	4.77	0.765	0.774	PCI/L	30.91	

Site ID : 106-101

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	08/14/2020	3.01	0.777	0.633	PCI/L	33.16	

Site ID : 106-103

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	08/14/2020	8.3	0.789	0.923	PCI/L	30.27	

Site ID : 106-104

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	08/14/2020	4.93	0.786	0.906	PCI/L	30.02	

Site ID : 106-105

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	08/14/2020	1.11	0.759	0.516	PCI/L	29.70	

Site ID : 106-125

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	08/18/2020	1.92	0.756	0.582	PCI/L	40.00	

Site ID : 106-13

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	08/14/2020	0.904	0.667	0.475	PCI/L	35.41	

Site ID : 106-136

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	08/13/2020	5.93	0.775	0.788	PCI/L	31.12	

Site ID : 106-16

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	08/21/2020	13.7	0.772	0.957	PCI/L	37.80	

Table 12-3
OU III Strontium-90 Chemical Holes Monitoring Well Data
'Hits Only' July through September 2020

Site ID : 106-94

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	08/19/2020	20.2	0.764	1.16	PCI/L	37.44	

Site ID : 106-95

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	08/19/2020	14.2	0.774	1.04	PCI/L	37.45	

Site ID : 106-98

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	08/14/2020	2.01	0.795	0.6	PCI/L	31.05	

Site ID : 106-99

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	08/14/2020	17.3	0.777	1.32	PCI/L	32.19	

Table 12-4
OU III Strontium-90 Chemical Holes Extraction Well Data
'Hits Only' July through September 2020

Site ID : 106-92 (EW-1)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	07/09/2020	10.6	0.548	0.953	PCI/L	0.00	

Qualifiers :

J = Estimated value.

D = Compound was identified in an analysis at a secondary dilution factor.

Organic Compounds :

B = Compound was found in both the sample And associated laboratory blank.

Inorganic Compounds :

B = Result Is between instrument detection limit And contract required reporting limit.

Section 13

Q3-2020 Operations Summary
OU III Former Industrial Park East Pump & Treat System
(System Closed)

The Petition for Closure for the OU III Industrial Park East Groundwater Treatment System was submitted to the regulators for review in May 2013. Approval was received from the regulators in June and July 2013 that the system met its treatment goals and can now be dismantled. Any remaining contaminants in the downgradient portion of the plume beyond the capture zone of the extraction wells will attenuate to below MCLs in the Upper Glacial and Magothy aquifers before the required 2030 and 2065 cleanup timeframes, respectively.

Dismantlement activities have been initiated including the abandonment of four groundwater monitoring wells (000-489, 000-493, 000-513, 000-514) and the two groundwater extraction wells (EWI-1 and EWI-2) in September 2013. Final decommissioning of the treatment system will be performed following the completion of remediation of the deep VOC contamination in the Industrial Park.

The building, carbon units, and the two recharge wells are being used with the two new extraction wells for remediation of the deep VOC contamination in the Industrial Park.

The post closure monitoring network consists of four wells. In accordance with the recommendation in the *2015 Groundwater Status Report*, VOC monitoring for seven wells was discontinued in the fourth quarter of 2016 since the wells have been below the AWQS for a minimum of four consecutive sampling events. The data from the four wells are also evaluated as part of the North Street and Magothy monitoring programs. Monitoring will continue until MCLs are achieved for a minimum of four consecutive sampling events. The monitoring schedule is described in the BNL Environmental Monitoring Plan (EMP).

Section 14

Q3-2020 Operations Summary
OU III North Street Pump & Treat System
(System Closed)

Process: Groundwater extraction and liquid phase granular activated carbon treatment, with discharge to injection wells

Goal: Reach Maximum Contaminant Levels (MCLs) or asymptotic conditions in core monitoring wells within 30 years for the Upper Glacial aquifer and within 65 years for the Magothy aquifer (by 2030 and 2065, respectively).

Start Date: June 2004

Table 14-1
OU III North Street Pump & Treat System
Pumping Rates (gpm)

Extraction Well	NS-1	NS-2
Site ID #	000-471	000-473
Screen Interval (ft bls)	165-205	190-220
Design Flow Rate (GPM)	0	0
July	off	off
August	off	off
September	off	off
Actual (Avg. over Qtr.)	off	off

Note: The system is shut down and approved for closure in March 2020.

Figure 14-1
OU III North Street Pump & Treat System
Cumulative Mass Removal of VOCs vs. Time

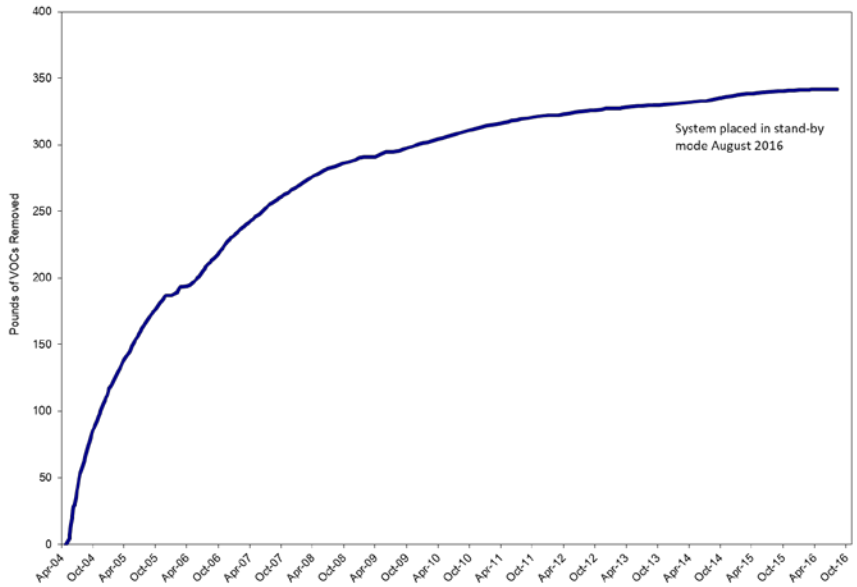


Figure 14-2
OU III North Street Pump & Treat System
Influent TVOC Concentrations vs. Time

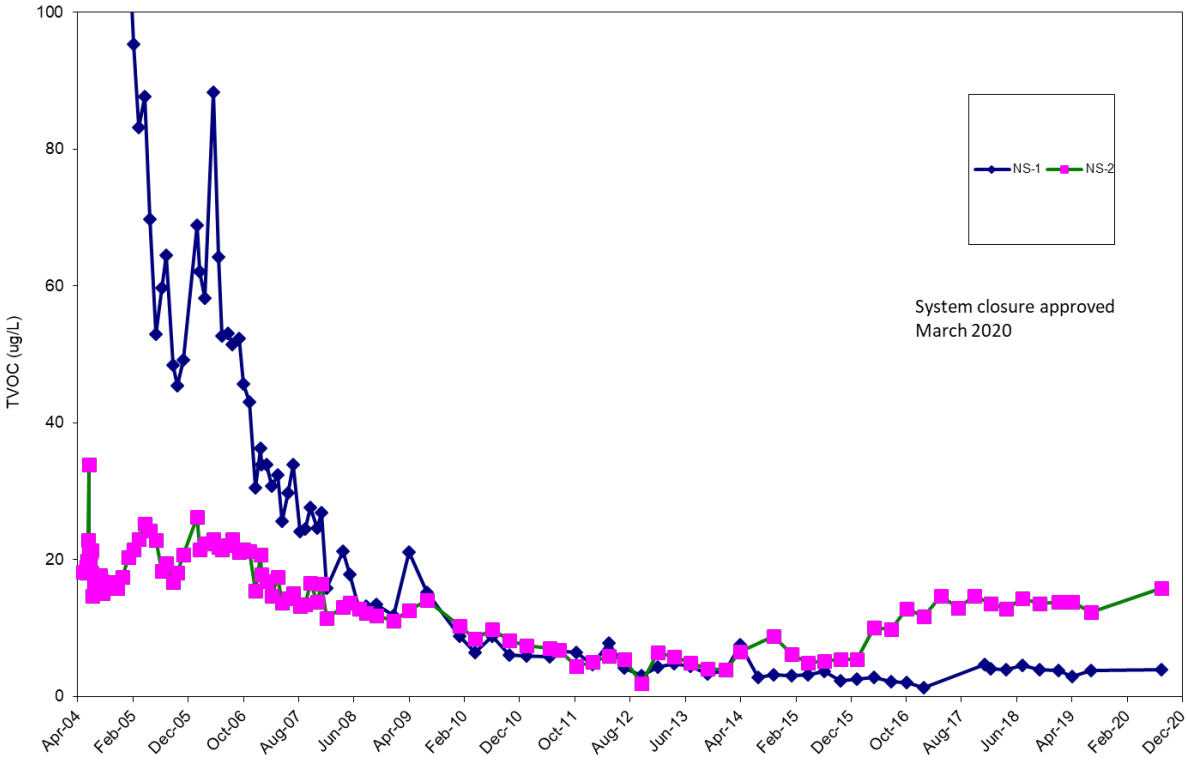


Table 14-2
Effluent Water Quality
SPDES Equivalency Permit Concentrations July 1 – September 30, 2020

Parameter	Permit Limit	Max. Measured Value	Units	Frequency
Flow	**Monitor**	NA [1]	**GPD**	**Continuous**
pH (range)	**5.5 - 8.5**	NA	**SU**	**Monthly**
Carbon Tetrachloride	**5**	NA	**ug/L**	**Monthly**
Chloroform	**5**	NA	**ug/L**	**Monthly**
1,1-Dichloroethane	**5**	NA	**ug/L**	**Monthly**
1,2-Dichloroethane	**5**	NA	**ug/L**	**Monthly**
1,1-Dichloroethylene	**5**	NA	**ug/L**	**Monthly**
Tetrachloroethylene	**5**	NA	**ug/L**	**Monthly**
Toluene	**5**	NA	**ug/L**	**Monthly**
1,1,1-Trichloroethane	**5**	NA	**ug/L**	**Monthly**
Trichloroethylene	**10**	NA	**ug/L**	**Monthly**

[1] The system is closed. [NA=] Not Applicable.

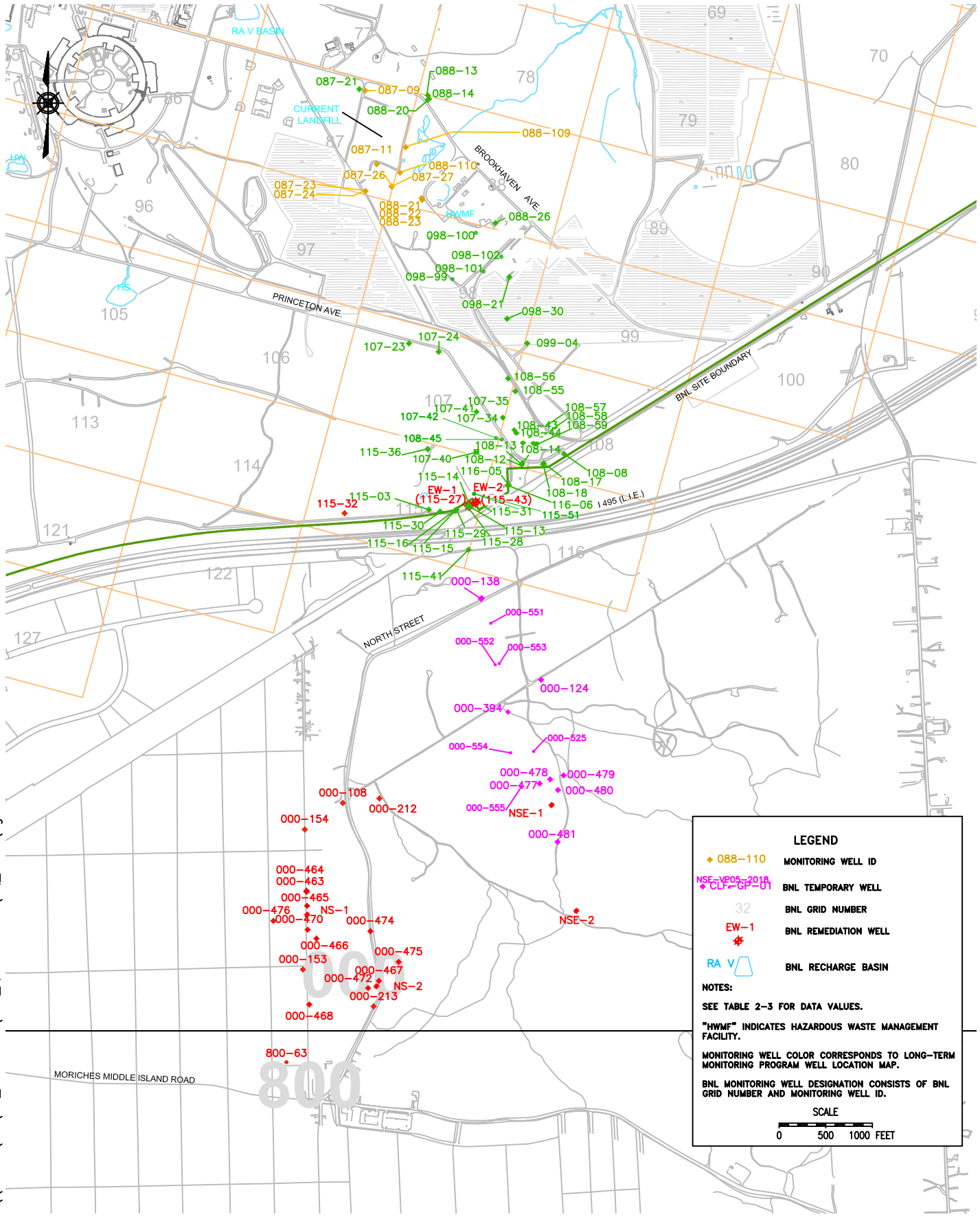
System Operations

July through September 2020:
The system remained closed.

Since construction of the nearby North Street East extraction wells and system modification was completed, sampling of the North Street extraction wells was performed in August 2020. The maximum VOC concentration detected was 7.7 µg/L in extraction well NS-2. This is the last quarterly samples collected for this system.

Planned Operational Changes

- As noted in the Petition for Closure, seven of the 12 core monitoring wells will continue annual monitoring until the results for individual VOCs are consistently below MCLs. Sampling of the remaining 11 monitoring wells will be discontinued but the wells will be retained until the completion of the PFAS and 1,4-dioxane characterization.



LEGEND

- ◆ 088-110 — MONITORING WELL ID
- NSE-VP05-2018 / ◆ CLF-GP-01 — BNL TEMPORARY WELL
- 32 — BNL GRID NUMBER
- EW-1 — BNL REMEDIATION WELL
- RA V — BNL RECHARGE BASIN

NOTES:

SEE TABLE 2-3 FOR DATA VALUES.

"HWMF" INDICATES HAZARDOUS WASTE MANAGEMENT FACILITY.

MONITORING WELL COLOR CORRESPONDS TO LONG-TERM MONITORING PROGRAM WELL LOCATION MAP.

BNL MONITORING WELL DESIGNATION CONSISTS OF BNL GRID NUMBER AND MONITORING WELL ID.

SCALE

0 500 1000 FEET

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BROOKHAVEN NATIONAL LABORATORY

ENVIRONMENTAL PROTECTION DIVISION

TITLE:

OU I SOUTH BOUNDARY/NORTH STREET/NORTH STREET EAST MONITORING WELL NETWORK

SITEWIDE REMEDIATION SYSTEMS THIRD QUARTER 2020 OPERATIONS REPORT

DWN:	VT: HZ.:	DATE:	PROJECT NO.:
JEB	–	08/08/11	–
CHKD:	APPD:	REV.:	NOTES:
LDS	––	10/20/20	–

FIGURE NO.: 14-3

Table 14-3
OU III North Street Monitoring Well Data
'Hits Only' July through September 2020

Site ID : 000-212

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,4-Dioxane	07/31/2020	0.417	0.2	--	UG/L	205.00	

Site ID : 000-343

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,4-Dioxane	07/13/2020	7.16	0.2	--	UG/L	330.00	
1,1,1-Trichloroethane	07/14/2020	1.1	0.5	--	UG/L	330.00	
1,1-Dichloroethane	07/14/2020	3.6	0.5	--	UG/L	330.00	
1,1-Dichloroethylene	07/14/2020	0.47	0.5	--	UG/L	330.00	J
524.2 TVOC	07/14/2020	8.64	--	--	UG/L	330.00	
Chloroethane	07/14/2020	0.46	0.5	--	UG/L	330.00	J
Chloroform	07/14/2020	0.27	0.5	--	UG/L	330.00	J
cis-1,2-Dichloroethylene	07/14/2020	0.66	0.5	--	UG/L	330.00	
Methyl bromide	07/14/2020	1.8	0.57	--	UG/L	330.00	
Vinyl chloride	07/14/2020	0.28	0.5	--	UG/L	330.00	J

Site ID : 800-63

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,4-Dioxane	07/21/2020	0.145	0.2	--	UG/L	206.00	J

Table 14-4
OU III North Street Extraction Well Data
'Hits Only' July through September 2020

Site ID : 000-471 (NS-1)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	08/05/2020	0.3	0.5	--	UG/L	0.00	J
1,4-Dioxane	08/05/2020	1.48	0.2	--	UG/L	0.00	
524.2 TVOC	08/05/2020	3.94	--	--	UG/L	0.00	
Carbon tetrachloride	08/05/2020	0.98	0.5	--	UG/L	0.00	
Chloroform	08/05/2020	0.92	0.5	--	UG/L	0.00	
Methyl bromide	08/05/2020	0.81	0.57	--	UG/L	0.00	
Trichloroethylene	08/05/2020	0.93	0.5	--	UG/L	0.00	

Site ID : 000-473 (NS-2)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	08/05/2020	3.1	0.5	--	UG/L	0.00	
1,1-Dichloroethylene	08/05/2020	1.4	0.5	--	UG/L	0.00	
1,4-Dioxane	08/05/2020	1.22	0.2	--	UG/L	0.00	
524.2 TVOC	08/05/2020	15.78	--	--	UG/L	0.00	
Carbon tetrachloride	08/05/2020	0.5	0.5	--	UG/L	0.00	
Chloroform	08/05/2020	2.2	0.5	--	UG/L	0.00	
Methyl bromide	08/05/2020	0.88	0.57	--	UG/L	0.00	
Tetrachloroethylene	08/05/2020	7.7	0.5	--	UG/L	0.00	

Table 14-5
OU III North Street Influent Data
'Hits Only' July through September 2020

Site ID : 000-437 (System Influent)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,4-Dioxane	08/05/2020	1.32	0.2	--	UG/L	0.00	

Table 14-6
OU III North Street Effluent Data
'Hits Only' July through September 2020

Site ID : 000-440 (System Effluent)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,4-Dioxane	08/05/2020	0.271	0.2	--	UG/L	0.00	
Perfluoropentanoic acid (PFPeA)	08/05/2020	0.705	1.84	--	NG/L	0.00	J

Qualifiers :

J = Estimated value.
D = Compound was identified in an analysis at a secondary dilution factor.

Organic Compounds :

B = Compound was found in both the sample And associated laboratory blank.

Inorganic Compounds :

B = Result Is between instrument detection limit And contract required reporting limit.

Section 15

Q3-2020 Operations Summary
OU III North Street East Pump & Treat System

Process: Groundwater extraction and liquid phase granular activated carbon treatment, with discharge to injection wells.

Goal: Reach Maximum Contaminant Levels (MCLs) in core monitoring wells within 30 years for the Upper Glacial aquifer (by 2030).

Start Date: June 2004

Table 15-1
OU III North Street East Pump & Treat System
Pumping Rates (gpm)

Extraction Well	NSE-1	NSE-2	NSE-EDB-3	NSE-EDB-4
Site ID #	000-487	000-488	000-561	000-562
Screen Interval (ft bls)	161-191	152-182	195-215	182-202
Desired Flow Rate (GPM)	200	100	100	100
July	0	0	57	60
August	0	0	78	80
September	0	0	8	8
Actual (Avg. over Qtr.)	0	0	48	50

Notes: As documented in the 2019 Groundwater Status Report, the original VOC system (NSE-1 and NSE-2) is administratively closed for its originally designed purpose. NSE-EDB-3 and NSE-EDB-4 began operation in July 2020.

Figure 15-1
OU III North Street East Pump & Treat System
Cumulative Mass Removal of VOCs vs. Time

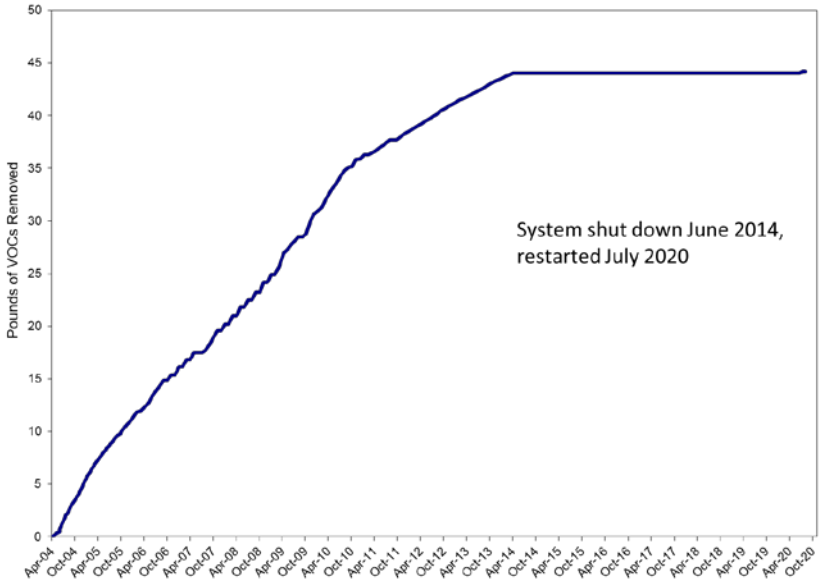


Figure 15-2
OU III North Street East Pump & Treat System
Influent TVOC Concentrations vs. Time

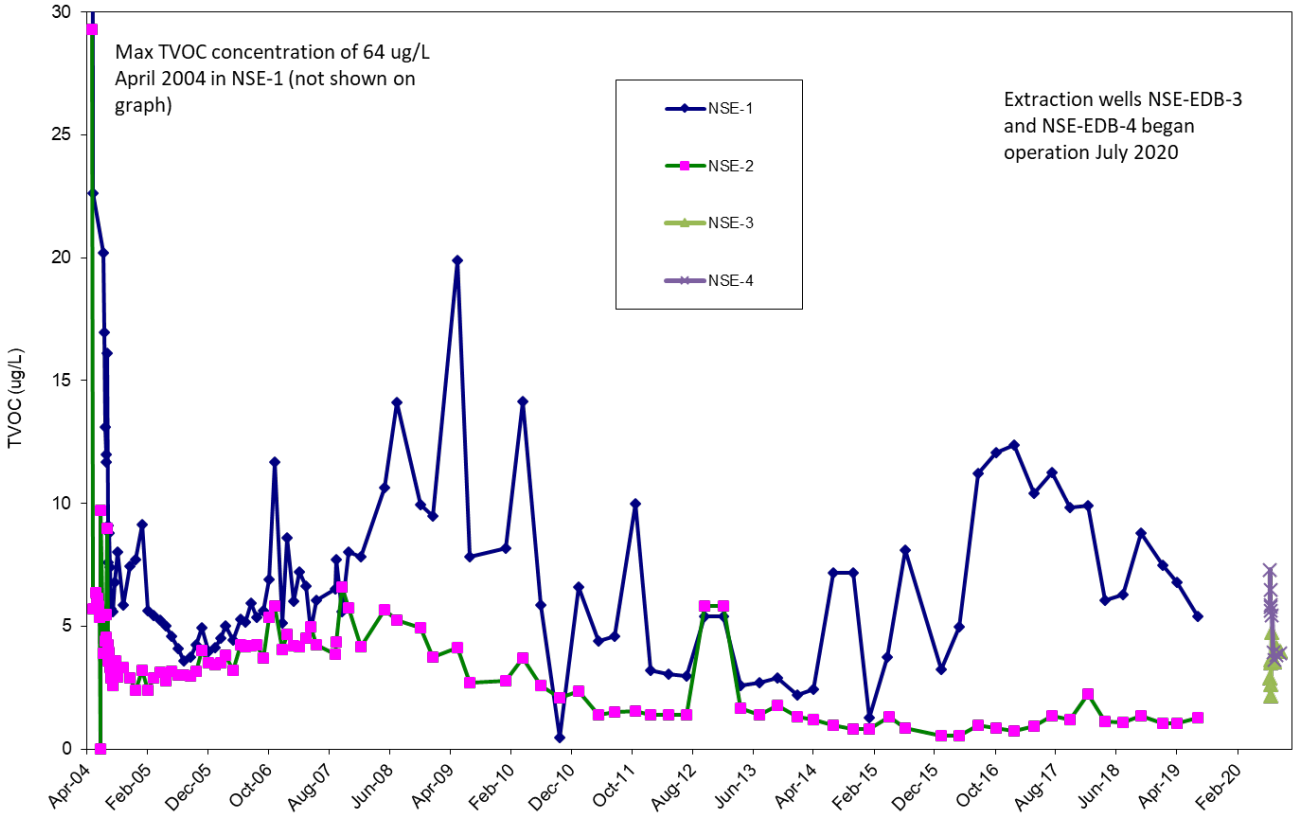


Table 15-2
Effluent Water Quality
SPDES Equivalency Permit Concentrations July 1 – September 30, 2020

Parameter	Permit Limit	Max. Measured Value	Units	Frequency
Flow	Monitor	220,387	GPD	Continuous
pH (range)	5.5 - 8.5	5.7 – 7.0	SU	Monthly
Carbon Tetrachloride	5	<0.5	ug/L	Monthly
Chloroform	5	<0.5	ug/L	Monthly
1,1-Dichloroethane	5	<0.5	ug/L	Monthly
1,2-Dichloroethane	0.6	<0.5	ug/L	Monthly
1,1-Dichloroethylene	5	<0.5	ug/L	Monthly
Tetrachloroethylene	5	<0.5	ug/L	Monthly
Toluene	5	<0.5	ug/L	Monthly
1,1,1-Trichloroethane	5	<0.5	ug/L	Monthly
Trichloroethylene	10	<0.5	ug/L	Monthly
Ethylene Dibromide (EDB)	0.03	<0.02	ug/L	Monthly

System Operations

July 2020:

Extraction wells NSE-EDB-3 and NSE-EDB-4 started operating at the beginning of the month to address the EDB plume. The system treated approximately 5 million gallons of water.

August 2020:

Extraction wells NSE-EDB-3 and NSE-EDB-4 were operational. The system was off for two days for a carbon change-out. The system treated approximately 7 million gallons of water.

September 2020:

The system was off for the month with high differential pressure caused by a blocked cone strainer in the lag carbon vessel. The system treated approximately 0.5 million gallons of water.

The system treated approximately 12.5 million gallons of water during the third quarter of 2020.

As documented in the 2019 Groundwater Status Report, the original VOC system (NSE-1 and NSE-2) is administratively closed for its originally designed purpose. However, the treatment system infrastructure is being used for remediation of the EDB plume.

A revised Operations and Maintenance Manual for the North Street East Treatment System was submitted to the regulators August 3rd.

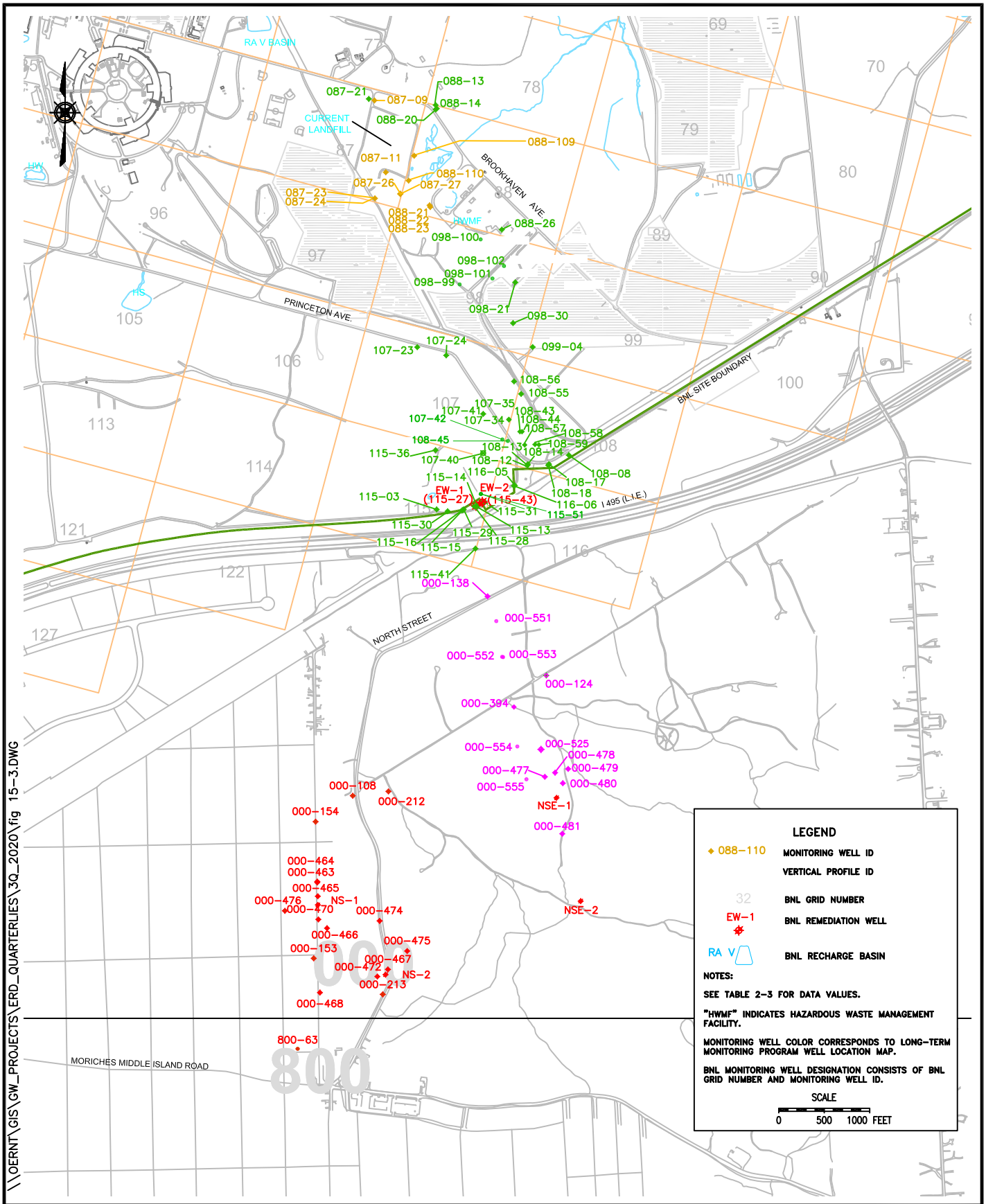
Planned Operational Changes

Original VOC Plume:

- Extraction wells NSE-1 and NSE-2 were sampled in August 2020. EDB was detected in NSE-1 up to 0.06 µg/L. Based on the configuration of the sampling port following the addition of the two new EDB extraction wells, this detection was due to cross contamination from NSE-EDB-3 untreated water. Two follow-up samples of NSE-1 were collected in October 2020 with the valves to new EDB extraction well NSE-EDB-3 closed. The samples did not detect EDB. Further sampling of NSE-1 and NSE-2 will be discontinued.

EDB Plume:

- Continue operation of EDB extraction wells and treatment system.
- Maintain the quarterly sampling frequency for the 12 EDB monitoring wells using Method 504, except for upgradient perimeter well 115-42 which is sampled semi-annually.



\\OERNT\GIS\GW_PROJECTS\ERD_QUARTERLIES\3Q_2020\fig 15-3.DWG

BROOKHAVEN NATIONAL LABORATORY

ENVIRONMENTAL PROTECTION DIVISION

TITLE:

OU I SOUTH BOUNDARY/NORTH STREET/NORTH STREET EAST MONITORING WELL NETWORK

SITEWIDE REMEDIATION SYSTEMS
THIRD QUARTER 2020 OPERATIONS REPORT

DWN:	VT: HZ.:	DATE:	PROJECT NO.:
JEB	–	08/08/11	NA
CHKD:	APPD:	REV.:	NOTES:
LDS	--	10/20/20	–

FIGURE NO.: 15-3

Table 15-3
OU III North Street East Monitoring Well Data
'Hits Only' July through September 2020

Site ID : 000-394

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
EDB	07/14/2020	0.0649	0.02	--	UG/L	178.00	
EDB	09/22/2020	0.0806	0.0197	--	UG/L	178.00	

Site ID : 000-551

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
EDB	09/24/2020	0.0153	0.02	--	UG/L	175.00	J

Site ID : 000-552

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
EDB	07/14/2020	0.0447	0.0201	--	UG/L	155.00	
EDB	09/24/2020	0.0574	0.0202	--	UG/L	155.00	

Table 15-4
OU III North Street East Extraction Well Data
'Hits Only' July through September 2020

Site ID : 000-487 (NSE-1)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	08/05/2020	0.9	0.5	--	UG/L	0.00	
1,1-Dichloroethylene	08/05/2020	0.64	0.5	--	UG/L	0.00	
1,4-Dioxane	08/05/2020	4.12	0.2	--	UG/L	0.00	
524.2 TVOC	08/05/2020	4.86	--	--	UG/L	0.00	
Carbon tetrachloride	08/05/2020	0.18	0.5	--	UG/L	0.00	J
Chloroform	08/05/2020	0.84	0.5	--	UG/L	0.00	
EDB	08/05/2020	0.0646	0.0197	--	UG/L	0.00	
Methyl tert-butyl ether	08/05/2020	0.57	0.5	--	UG/L	0.00	
Perfluorobutyric acid (PFBA)	08/05/2020	227	8.89	--	NG/L	0.00	
Tetrachloroethylene	08/05/2020	0.79	0.5	--	UG/L	0.00	
Trichloroethylene	08/05/2020	0.94	0.5	--	UG/L	0.00	
1,1,1-Trichloroethane	08/20/2020	1.46	0.5	--	UG/L	0.00	
1,1-Dichloroethylene	08/20/2020	1.49	0.5	--	UG/L	0.00	
524.2 TVOC	08/20/2020	7.71	--	--	UG/L	0.00	
Carbon tetrachloride	08/20/2020	0.21	0.5	--	UG/L	0.00	J
Chloroform	08/20/2020	2.25	0.5	--	UG/L	0.00	
EDB	08/20/2020	0.0223	0.0196	--	UG/L	0.00	
Methyl tert-butyl ether	08/20/2020	0.3	0.5	--	UG/L	0.00	J
Tetrachloroethylene	08/20/2020	0.6	0.5	--	UG/L	0.00	
Trichloroethylene	08/20/2020	1.4	0.5	--	UG/L	0.00	

Site ID : 000-488 (NSE-2)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	08/05/2020	1.4	--	--	UG/L	0.00	
Chloroform	08/05/2020	1.4	0.5	--	UG/L	0.00	
Perfluorobutyric acid (PFBA)	08/05/2020	1.13	1.81	--	NG/L	0.00	J

Site ID : 000-561 (NSE-EDB-3)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	07/13/2020	0.46	0.5	--	UG/L	0.00	J
524.2 TVOC	07/13/2020	2.88	--	--	UG/L	0.00	
Carbon tetrachloride	07/13/2020	0.23	0.5	--	UG/L	0.00	J
Chloroform	07/13/2020	0.88	0.5	--	UG/L	0.00	
EDB	07/13/2020	0.0408	0.0198	--	UG/L	0.00	
Tetrachloroethylene	07/13/2020	0.18	0.5	--	UG/L	0.00	J

Table 15-4
OU III North Street East Extraction Well Data
'Hits Only' July through September 2020

Site ID : 000-561 (NSE-EDB-3)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Toluene	07/13/2020	0.2	0.5	--	UG/L	0.00	J
Trichloroethylene	07/13/2020	0.93	0.5	--	UG/L	0.00	
1,1,1-Trichloroethane	07/14/2020	0.72	0.5	--	UG/L	0.00	
524.2 TVOC	07/14/2020	2.61	--	--	UG/L	0.00	
Carbon tetrachloride	07/14/2020	0.2	0.5	--	UG/L	0.00	J
Chloroform	07/14/2020	0.87	0.5	--	UG/L	0.00	
EDB	07/14/2020	0.0493	0.0197	--	UG/L	0.00	
Trichloroethylene	07/14/2020	0.82	0.5	--	UG/L	0.00	
1,1,1-Trichloroethane	07/15/2020	0.61	0.5	--	UG/L	0.00	
524.2 TVOC	07/15/2020	2.16	--	--	UG/L	0.00	
Chloroform	07/15/2020	0.77	0.5	--	UG/L	0.00	
EDB	07/15/2020	0.0516	0.0198	--	UG/L	0.00	
Trichloroethylene	07/15/2020	0.78	0.5	--	UG/L	0.00	
1,1,1-Trichloroethane	07/16/2020	1.27	0.5	--	UG/L	0.00	
524.2 TVOC	07/16/2020	3.52	--	--	UG/L	0.00	
Carbon tetrachloride	07/16/2020	0.48	0.5	--	UG/L	0.00	J
Chloroform	07/16/2020	0.95	0.5	--	UG/L	0.00	
EDB	07/16/2020	0.0437	0.0197	--	UG/L	0.00	
Trichloroethylene	07/16/2020	0.82	0.5	--	UG/L	0.00	
1,1,1-Trichloroethane	07/17/2020	1.1	0.5	--	UG/L	0.00	
1,1-Dichloroethane	07/17/2020	0.27	0.5	--	UG/L	0.00	J
1,4-Dioxane	07/17/2020	3.88	0.2	--	UG/L	0.00	
524.2 TVOC	07/17/2020	3.62	--	--	UG/L	0.00	
Carbon tetrachloride	07/17/2020	0.41	0.5	--	UG/L	0.00	J
Chloroform	07/17/2020	0.99	0.5	--	UG/L	0.00	
EDB	07/17/2020	0.0478	0.0196	--	UG/L	0.00	
Perfluorobutyric acid (PFBA)	07/17/2020	188	9.18	--	NG/L	0.00	
Trichloroethylene	07/17/2020	0.85	0.5	--	UG/L	0.00	
1,1,1-Trichloroethane	07/21/2020	1.9	0.5	--	UG/L	0.00	
524.2 TVOC	07/21/2020	4.73	--	--	UG/L	0.00	
Carbon tetrachloride	07/21/2020	0.62	0.5	--	UG/L	0.00	
Chloroform	07/21/2020	1.32	0.5	--	UG/L	0.00	
EDB	07/21/2020	0.0409	0.0194	--	UG/L	0.00	

Table 15-4
OU III North Street East Extraction Well Data
'Hits Only' July through September 2020

Site ID : 000-561 (NSE-EDB-3)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Trichloroethylene	07/21/2020	0.89	0.5	--	UG/L	0.00	
1,1,1-Trichloroethane	07/28/2020	1.31	0.5	--	UG/L	0.00	
524.2 TVOC	07/28/2020	3.64	--	--	UG/L	0.00	
Carbon tetrachloride	07/28/2020	0.37	0.5	--	UG/L	0.00	J
Chloroform	07/28/2020	0.91	0.5	--	UG/L	0.00	
EDB	07/28/2020	0.0367	0.02	--	UG/L	0.00	
Tetrachloroethylene	07/28/2020	0.17	0.5	--	UG/L	0.00	J
Trichloroethylene	07/28/2020	0.88	0.5	--	UG/L	0.00	
1,1,1-Trichloroethane	08/04/2020	1.17	0.5	--	UG/L	0.00	
524.2 TVOC	08/04/2020	3.55	--	--	UG/L	0.00	
Carbon tetrachloride	08/04/2020	0.32	0.5	--	UG/L	0.00	J
Chloroform	08/04/2020	0.84	0.5	--	UG/L	0.00	
EDB	08/04/2020	0.0369	0.0198	--	UG/L	0.00	
Methyl tert-butyl ether	08/04/2020	0.2	0.5	--	UG/L	0.00	J
Tetrachloroethylene	08/04/2020	0.2	0.5	--	UG/L	0.00	J
Trichloroethylene	08/04/2020	0.82	0.5	--	UG/L	0.00	
1,1,1-Trichloroethane	08/11/2020	1.12	0.5	--	UG/L	0.00	
1,1-Dichloroethylene	08/11/2020	0.62	0.5	--	UG/L	0.00	
524.2 TVOC	08/11/2020	4.14	--	--	UG/L	0.00	
Carbon tetrachloride	08/11/2020	0.29	0.5	--	UG/L	0.00	J
Chloroform	08/11/2020	0.83	0.5	--	UG/L	0.00	
Methyl tert-butyl ether	08/11/2020	0.18	0.5	--	UG/L	0.00	J
Tetrachloroethylene	08/11/2020	0.22	0.5	--	UG/L	0.00	J
Trichloroethylene	08/11/2020	0.88	0.5	--	UG/L	0.00	
1,1,1-Trichloroethane	09/02/2020	0.91	0.5	--	UG/L	0.00	
1,1-Dichloroethylene	09/02/2020	0.57	0.5	--	UG/L	0.00	
524.2 TVOC	09/02/2020	3.99	--	--	UG/L	0.00	
Carbon tetrachloride	09/02/2020	0.34	0.5	--	UG/L	0.00	J
Chloroform	09/02/2020	0.74	0.5	--	UG/L	0.00	
EDB	09/02/2020	0.0361	0.0194	--	UG/L	0.00	
Methyl tert-butyl ether	09/02/2020	0.42	0.5	--	UG/L	0.00	J
Tetrachloroethylene	09/02/2020	0.29	0.5	--	UG/L	0.00	J
Trichloroethylene	09/02/2020	0.72	0.5	--	UG/L	0.00	

Table 15-4
OU III North Street East Extraction Well Data
'Hits Only' July through September 2020

Site ID : 000-562 (NSE-EDB-4)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	07/13/2020	0.39	0.5	--	UG/L	0.00	J
524.2 TVOC	07/13/2020	7.3	--	--	UG/L	0.00	
Chloroform	07/13/2020	0.58	0.5	--	UG/L	0.00	
EDB	07/13/2020	0.0903	0.0199	--	UG/L	0.00	
Methyl tert-butyl ether	07/13/2020	3.61	0.5	--	UG/L	0.00	
Tetrachloroethylene	07/13/2020	2.22	0.5	--	UG/L	0.00	
Trichloroethylene	07/13/2020	0.5	0.5	--	UG/L	0.00	
1,1,1-Trichloroethane	07/14/2020	0.43	0.5	--	UG/L	0.00	J
524.2 TVOC	07/14/2020	6.48	--	--	UG/L	0.00	
Chloroform	07/14/2020	0.59	0.5	--	UG/L	0.00	
EDB	07/14/2020	0.131	0.0198	--	UG/L	0.00	
Methyl tert-butyl ether	07/14/2020	2.75	0.5	--	UG/L	0.00	
Tetrachloroethylene	07/14/2020	2.2	0.5	--	UG/L	0.00	
Trichloroethylene	07/14/2020	0.51	0.5	--	UG/L	0.00	
1,1,1-Trichloroethane	07/15/2020	0.51	0.5	--	UG/L	0.00	
524.2 TVOC	07/15/2020	5.79	--	--	UG/L	0.00	
Chloroform	07/15/2020	0.57	0.5	--	UG/L	0.00	
EDB	07/15/2020	0.148	0.0198	--	UG/L	0.00	
Methyl tert-butyl ether	07/15/2020	2.18	0.5	--	UG/L	0.00	
Tetrachloroethylene	07/15/2020	2.04	0.5	--	UG/L	0.00	
Trichloroethylene	07/15/2020	0.49	0.5	--	UG/L	0.00	J
1,1,1-Trichloroethane	07/16/2020	0.38	0.5	--	UG/L	0.00	J
524.2 TVOC	07/16/2020	5.87	--	--	UG/L	0.00	
Carbon tetrachloride	07/16/2020	0.29	0.5	--	UG/L	0.00	J
Chloroform	07/16/2020	0.57	0.5	--	UG/L	0.00	
EDB	07/16/2020	0.137	0.0198	--	UG/L	0.00	
Methyl tert-butyl ether	07/16/2020	2.17	0.5	--	UG/L	0.00	
Tetrachloroethylene	07/16/2020	1.79	0.5	--	UG/L	0.00	
Trichloroethylene	07/16/2020	0.67	0.5	--	UG/L	0.00	
1,1,1-Trichloroethane	07/17/2020	0.61	0.5	--	UG/L	0.00	
1,4-Dioxane	07/17/2020	0.862	0.2	--	UG/L	0.00	
524.2 TVOC	07/17/2020	5.65	--	--	UG/L	0.00	
Carbon tetrachloride	07/17/2020	0.23	0.5	--	UG/L	0.00	J

Table 15-4
OU III North Street East Extraction Well Data
'Hits Only' July through September 2020

Site ID : 000-562 (NSE-EDB-4)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Chloroform	07/17/2020	0.63	0.5	--	UG/L	0.00	
EDB	07/17/2020	0.118	0.0194	--	UG/L	0.00	
Methyl tert-butyl ether	07/17/2020	2.07	0.5	--	UG/L	0.00	
Perfluorobutyric acid (PFBA)	07/17/2020	82.3	8.92	--	NG/L	0.00	
Tetrachloroethylene	07/17/2020	1.5	0.5	--	UG/L	0.00	
Trichloroethylene	07/17/2020	0.61	0.5	--	UG/L	0.00	
1,1,1-Trichloroethane	07/21/2020	0.6	0.5	--	UG/L	0.00	
524.2 TVOC	07/21/2020	5.43	--	--	UG/L	0.00	
Chloroform	07/21/2020	0.61	0.5	--	UG/L	0.00	
EDB	07/21/2020	0.14	0.0197	--	UG/L	0.00	
Methyl tert-butyl ether	07/21/2020	2.02	0.5	--	UG/L	0.00	
Tetrachloroethylene	07/21/2020	1.57	0.5	--	UG/L	0.00	
Trichloroethylene	07/21/2020	0.63	0.5	--	UG/L	0.00	
1,1,1-Trichloroethane	07/28/2020	0.33	0.5	--	UG/L	0.00	J
524.2 TVOC	07/28/2020	3.94	--	--	UG/L	0.00	
Chloroform	07/28/2020	0.44	0.5	--	UG/L	0.00	J
EDB	07/28/2020	0.135	0.02	--	UG/L	0.00	
Methyl tert-butyl ether	07/28/2020	1.13	0.5	--	UG/L	0.00	
Tetrachloroethylene	07/28/2020	1.26	0.5	--	UG/L	0.00	
Trichloroethylene	07/28/2020	0.78	0.5	--	UG/L	0.00	
1,1,1-Trichloroethane	08/04/2020	0.38	0.5	--	UG/L	0.00	J
524.2 TVOC	08/04/2020	3.64	--	--	UG/L	0.00	
Chloroform	08/04/2020	0.51	0.5	--	UG/L	0.00	
EDB	08/04/2020	0.123	0.0193	--	UG/L	0.00	
Methyl tert-butyl ether	08/04/2020	0.91	0.5	--	UG/L	0.00	
Tetrachloroethylene	08/04/2020	1.08	0.5	--	UG/L	0.00	
Trichloroethylene	08/04/2020	0.76	0.5	--	UG/L	0.00	
1,1,1-Trichloroethane	08/11/2020	0.29	0.5	--	UG/L	0.00	J
524.2 TVOC	08/11/2020	3.81	--	--	UG/L	0.00	
Chloroform	08/11/2020	0.52	0.5	--	UG/L	0.00	
EDB	08/11/2020	0.106	0.0196	--	UG/L	0.00	
Methyl tert-butyl ether	08/11/2020	0.88	0.5	--	UG/L	0.00	
Tetrachloroethylene	08/11/2020	1.21	0.5	--	UG/L	0.00	

Table 15-4
OU III North Street East Extraction Well Data
'Hits Only' July through September 2020

Site ID : 000-562 (NSE-EDB-4)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Trichloroethylene	08/11/2020	0.91	0.5	--	UG/L	0.00	
1,1,1-Trichloroethane	09/02/2020	0.27	0.5	--	UG/L	0.00	J
524.2 TVOC	09/02/2020	3.89	--	--	UG/L	0.00	
Chloroform	09/02/2020	0.56	0.5	--	UG/L	0.00	
EDB	09/02/2020	0.101	0.0194	--	UG/L	0.00	
Methyl tert-butyl ether	09/02/2020	1.49	0.5	--	UG/L	0.00	
Tetrachloroethylene	09/02/2020	0.95	0.5	--	UG/L	0.00	
Trichloroethylene	09/02/2020	0.62	0.5	--	UG/L	0.00	

Table 15-5
OU III North Street East Influent Data
'Hits Only' July through September 2020

Site ID : 000-441 (Combined Influent)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	07/14/2020	0.62	0.5	--	UG/L	0.00	
524.2 TVOC	07/14/2020	5.1	--	--	UG/L	0.00	
Chloroform	07/14/2020	0.77	0.5	--	UG/L	0.00	
EDB	07/14/2020	0.0923	0.02	--	UG/L	0.00	
Methyl tert-butyl ether	07/14/2020	1.63	0.5	--	UG/L	0.00	
Tetrachloroethylene	07/14/2020	1.21	0.5	--	UG/L	0.00	
Trichloroethylene	07/14/2020	0.87	0.5	--	UG/L	0.00	
1,1,1-Trichloroethane	07/15/2020	0.92	0.5	--	UG/L	0.00	
524.2 TVOC	07/15/2020	4.79	--	--	UG/L	0.00	
Carbon tetrachloride	07/15/2020	0.22	0.5	--	UG/L	0.00	J
Chloroform	07/15/2020	0.7	0.5	--	UG/L	0.00	
EDB	07/15/2020	0.096	0.0197	--	UG/L	0.00	
Methyl tert-butyl ether	07/15/2020	1.16	0.5	--	UG/L	0.00	
Tetrachloroethylene	07/15/2020	1.09	0.5	--	UG/L	0.00	
Trichloroethylene	07/15/2020	0.7	0.5	--	UG/L	0.00	
1,1,1-Trichloroethane	07/16/2020	0.76	0.5	--	UG/L	0.00	
524.2 TVOC	07/16/2020	4.52	--	--	UG/L	0.00	
Carbon tetrachloride	07/16/2020	0.28	0.5	--	UG/L	0.00	J
Chloroform	07/16/2020	0.71	0.5	--	UG/L	0.00	
EDB	07/16/2020	0.0902	0.0196	--	UG/L	0.00	
Methyl tert-butyl ether	07/16/2020	1.2	0.5	--	UG/L	0.00	
Tetrachloroethylene	07/16/2020	0.86	0.5	--	UG/L	0.00	
Trichloroethylene	07/16/2020	0.71	0.5	--	UG/L	0.00	
1,1,1-Trichloroethane	07/17/2020	0.67	0.5	--	UG/L	0.00	
1,4-Dioxane	07/17/2020	2.52	0.2	--	UG/L	0.00	
524.2 TVOC	07/17/2020	4.5	--	--	UG/L	0.00	
Carbon tetrachloride	07/17/2020	0.33	0.5	--	UG/L	0.00	J
Chloroform	07/17/2020	0.83	0.5	--	UG/L	0.00	
EDB	07/17/2020	0.0821	0.0195	--	UG/L	0.00	
Methyl tert-butyl ether	07/17/2020	0.98	0.5	--	UG/L	0.00	
Tetrachloroethylene	07/17/2020	1.14	0.5	--	UG/L	0.00	
Trichloroethylene	07/17/2020	0.55	0.5	--	UG/L	0.00	
1,1,1-Trichloroethane	07/21/2020	0.99	0.5	--	UG/L	0.00	

Table 15-5
OU III North Street East Influent Data
'Hits Only' July through September 2020

Site ID : 000-441 (Combined Influent)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/21/2020	4.58	--	--	UG/L	0.00	
Chloroform	07/21/2020	0.91	0.5	--	UG/L	0.00	
EDB	07/21/2020	0.1	0.0197	--	UG/L	0.00	
Methyl tert-butyl ether	07/21/2020	1.06	0.5	--	UG/L	0.00	
Tetrachloroethylene	07/21/2020	0.91	0.5	--	UG/L	0.00	
Trichloroethylene	07/21/2020	0.71	0.5	--	UG/L	0.00	
1,1,1-Trichloroethane	07/28/2020	0.8	0.5	--	UG/L	0.00	
524.2 TVOC	07/28/2020	3.75	--	--	UG/L	0.00	
Carbon tetrachloride	07/28/2020	0.23	0.5	--	UG/L	0.00	J
Chloroform	07/28/2020	0.62	0.5	--	UG/L	0.00	
EDB	07/28/2020	0.0815	0.02	--	UG/L	0.00	
Methyl tert-butyl ether	07/28/2020	0.58	0.5	--	UG/L	0.00	
Tetrachloroethylene	07/28/2020	0.82	0.5	--	UG/L	0.00	
Trichloroethylene	07/28/2020	0.7	0.5	--	UG/L	0.00	
1,1,1-Trichloroethane	08/04/2020	0.76	0.5	--	UG/L	0.00	
524.2 TVOC	08/04/2020	3.71	--	--	UG/L	0.00	
Carbon tetrachloride	08/04/2020	0.25	0.5	--	UG/L	0.00	J
Chloroform	08/04/2020	0.63	0.5	--	UG/L	0.00	
EDB	08/04/2020	0.0815	0.0196	--	UG/L	0.00	
Methyl tert-butyl ether	08/04/2020	0.58	0.5	--	UG/L	0.00	
Tetrachloroethylene	08/04/2020	0.7	0.5	--	UG/L	0.00	
Trichloroethylene	08/04/2020	0.79	0.5	--	UG/L	0.00	
1,1,1-Trichloroethane	08/11/2020	0.69	0.5	--	UG/L	0.00	
524.2 TVOC	08/11/2020	3.52	--	--	UG/L	0.00	
Carbon tetrachloride	08/11/2020	0.21	0.5	--	UG/L	0.00	J
Chloroform	08/11/2020	0.73	0.5	--	UG/L	0.00	
EDB	08/11/2020	0.0674	0.0194	--	UG/L	0.00	
Methyl tert-butyl ether	08/11/2020	0.56	0.5	--	UG/L	0.00	
Tetrachloroethylene	08/11/2020	0.51	0.5	--	UG/L	0.00	
Trichloroethylene	08/11/2020	0.82	0.5	--	UG/L	0.00	
1,4-Dioxane	08/18/2020	3.33	0.2	--	UG/L	0.00	
1,1,1-Trichloroethane	09/02/2020	0.69	0.5	--	UG/L	0.00	
524.2 TVOC	09/02/2020	3.75	--	--	UG/L	0.00	

Table 15-5
OU III North Street East Influent Data
'Hits Only' July through September 2020

Site ID : 000-441 (Combined Influent)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Carbon tetrachloride	09/02/2020	0.17	0.5	--	UG/L	0.00	J
Chloroform	09/02/2020	0.65	0.5	--	UG/L	0.00	
EDB	09/02/2020	0.0652	0.0194	--	UG/L	0.00	
Methyl tert-butyl ether	09/02/2020	0.87	0.5	--	UG/L	0.00	
Tetrachloroethylene	09/02/2020	0.7	0.5	--	UG/L	0.00	
Trichloroethylene	09/02/2020	0.67	0.5	--	UG/L	0.00	

Table 15-6
OU III North Street East Effluent Data
'Hits Only' July through September 2020

Site ID : 000-444 (System Effluent)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/14/2020	0	--	--	UG/L	0.00	
524.2 TVOC	07/15/2020	0	--	--	UG/L	0.00	
524.2 TVOC	07/16/2020	0	--	--	UG/L	0.00	
524.2 TVOC	07/17/2020	0	--	--	UG/L	0.00	
524.2 TVOC	07/21/2020	0	--	--	UG/L	0.00	
524.2 TVOC	07/28/2020	0	--	--	UG/L	0.00	
524.2 TVOC	08/04/2020	0	--	--	UG/L	0.00	
524.2 TVOC	08/11/2020	0	--	--	UG/L	0.00	
1,4-Dioxane	08/18/2020	3.31	0.2	--	UG/L	0.00	
524.2 TVOC	09/02/2020	0	--	--	UG/L	0.00	

Qualifiers :

J = Estimated value.

D = Compound was identified in an analysis at a secondary dilution factor.

Organic Compounds :

B = Compound was found in both the sample And associated laboratory blank.

Inorganic Compounds :

B = Result Is between instrument detection limit And contract required reporting limit.

Section 16

Q3-2020 Operations Summary
OU III LIPA/Airport Treatment System

Process: Groundwater extraction and liquid phase granular activated carbon treatment, with discharge to injection wells

Goal: Reach Maximum Contaminant Levels (MCLs) in core monitoring wells within 30 years for the Upper Glacial aquifer (by 2030), and within 65 years for the Magothy aquifer (by 2065).

Start Date: August 2004

Table 16-1
OU III LIPA/Airport Treatment System
Pumping Rates (gpm)

Extraction Well	EW-1L	EW-2L	EW-3L	EW-4L*	RTW-1A	RTW-2A	RTW-3A	RTW-4A*	RTW-5A	RTW-6A
Site ID	000-453	000-455	000-457	000-461	800-109	800-110	800-111	800-112	800-113	800-132
Screen Interval (ft bls)	217-237	224-244	216-236	304-324	188-208	188-208	210-230	268-288	220-240	165-185
Desired Flow Rate (GPM)	0**	0**	0**	0**	100	100	100	100	0***	150
July	0	0	0	0	110	0	0	140	0	175
August	0	0	0	0	110	0	0	134	0	171
September	0	0	0	0	100	0	0	62	0	149
Actual (Avg. over QTR.)	**0**	**0**	**0**	**0**	**107**	**0**	**0**	**112**	**0**	**165**

***** EW-4L and RTW-4A are Magothy aquifer extraction wells.

****** EW-1L, EW-2L, and EW-3L are in standby mode. EW-4L was put in standby January 2017. RTW-2A and RTW-3A were pulsed pumped, consisting of one week on and three weeks off, through February 2020. Both wells were placed in standby mode in March 2020. RTW-4A resumed full time operation in 2011.

***RTW-5A was placed on standby September 2016.

Figure 16-1
OU III LIPA/ Airport Treatment System
Cumulative Mass Removal of VOCs vs. Time

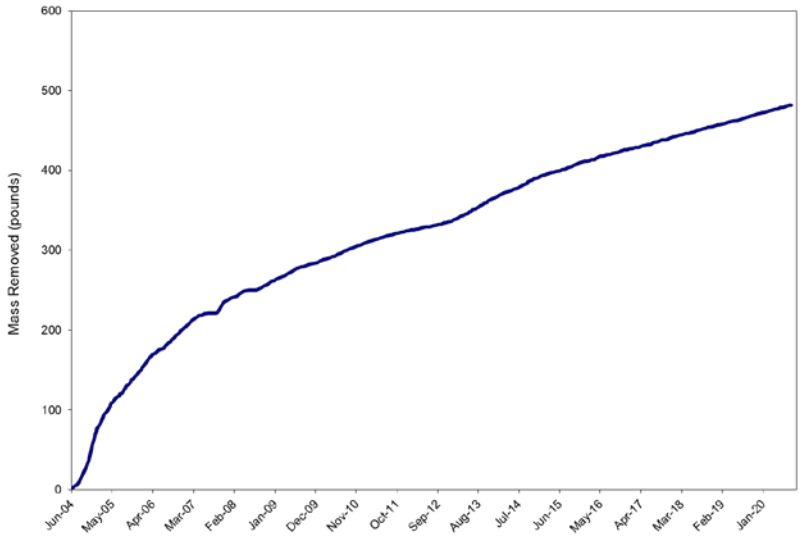


Figure 16-2
OU III LIPA/ Airport Treatment System
Influent TVOC Concentrations vs. Time

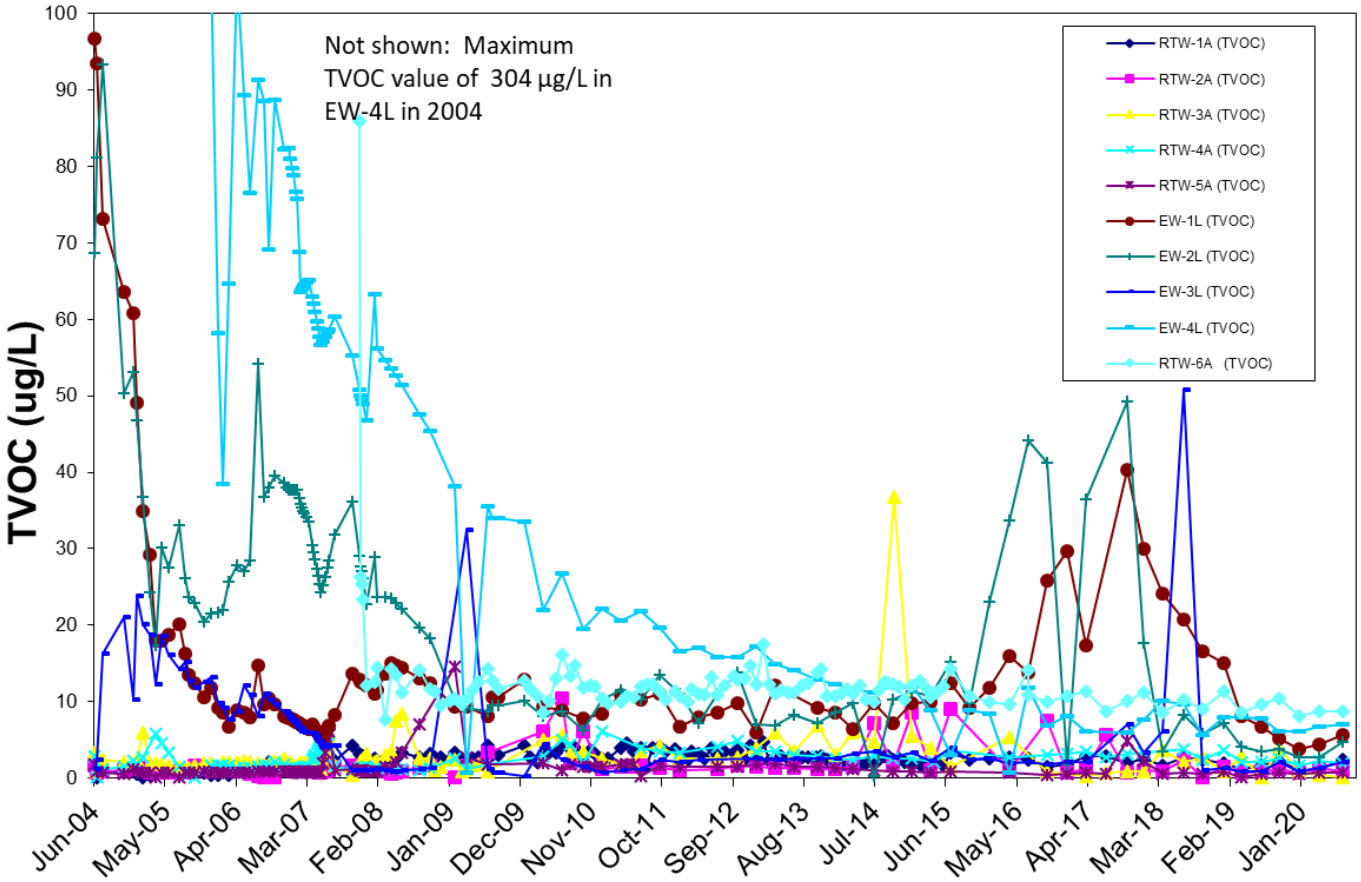


Table 16-2
Effluent Water Quality
SPDES Equivalency Permit Concentrations July 1 – September 30, 2020

Parameter	Permit Limit	Max. Measured Value	Units	Frequency
Flow	Monitor	592,759 [1]	GPD	Continuous
pH (range)	5.5 – 7.5	5.8-6.1	SU	Monthly
Carbon Tetrachloride	5	<0.50	ug/L	Monthly
Chloroform	7	<0.50	ug/L	Monthly
1,1-Dichloroethane	5	<0.50	ug/L	Monthly
1,1-Dichloroethylene	5	<0.50	ug/L	Monthly
Methylene Chloride	5	<0.50	ug/L	Monthly
1,1,1-Trichloroethane	5	<0.50	ug/L	Monthly
Trichloroethylene	10	<0.50	ug/L	Monthly

[1] The average flow for the operational period at the influent flow meter.

System Operations

July 2020:

Extraction wells RTW-1A, RTW-4A, and RTW-6A ran normally for the month. The four LIPA extraction wells and Airport extraction wells RTW-2A, RTW-3A, and RTW-5A remained in standby mode. The system treated approximately 18 million gallons of water.

August 2020:

Extraction wells RTW-1A, RTW-4A and RTW-6A ran normally for the month. The four LIPA extraction wells and Airport extraction wells RTW-2A, RTW-3A, and RTW-5A remained in standby mode. The system treated approximately 18 million gallons of water.

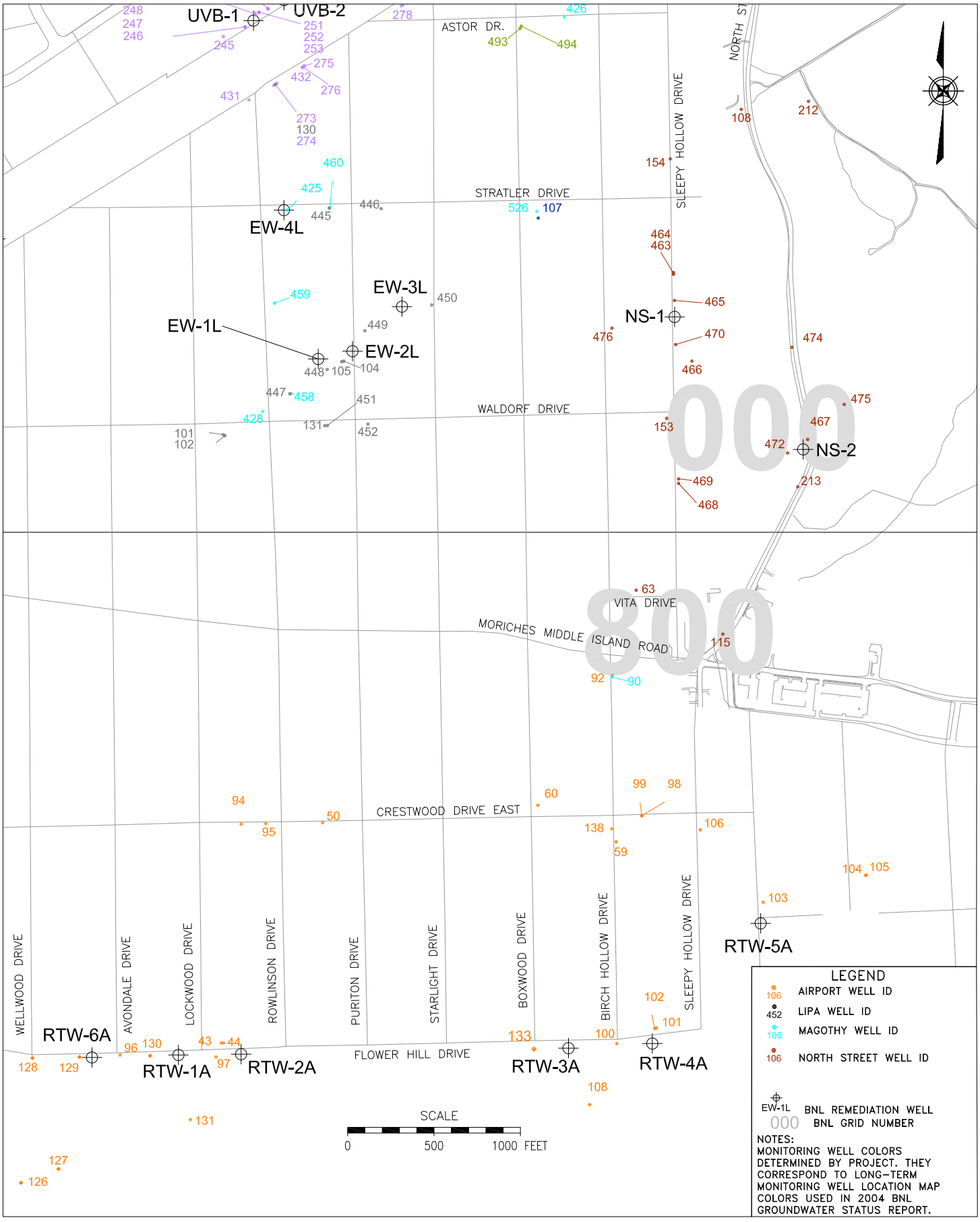
September 2020:

Extraction wells RTW-1A, RTW-4A and RTW-6A were in operation for the month. RTW-4A was off for two weeks for repair. The system was down for three days for a carbon change-out. The four LIPA extraction wells and Airport extraction wells RTW-2A, RTW-3A, and RTW-5A remained in standby mode. The system treated approximately 13 million gallons of water.

The system treated approximately 49 million gallons of water during the third quarter of 2020.

Planned Operational Changes

- Continue full time operation of Airport extraction wells RTW-1A, RTW-4A and RTW-6A. Maintain wells RTW-2A, RTW-3A and RTW-5A in standby mode. If TVOC concentrations above the capture goal of 10 µg/L are observed in any of the extraction wells or the monitoring wells adjacent to wells that are not operating, the well(s) will be put back into full-time operation. During the third quarter of 2020, extraction wells RTW-2A, RTW-3A, RTW-5A, and adjacent monitoring wells did not exceed TVOC concentrations of 10 µg/L.
- Maintain LIPA wells EW-1, EW-2, EW-3L and EW-4L in standby mode. These extraction wells may be restarted if TVOC concentrations rebound above the 50 µg/L capture goal in either the plume core monitoring wells or the extraction wells. During the third quarter of 2020, none of the LIPA monitoring wells detected TVOCs above the capture goal of 50 µg/L.



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BROOKHAVEN NATIONAL LABORATORY
ENVIRONMENTAL PROTECTION DIVISION

TITLE:

OU III AIRPORT/LIPA

SITEWIDE REMEDIATION SYSTEMS
THIRD QUARTER 2020 OPERATIONS REPORT

DWN:	VT: HZ.:	DATE:	PROJECT NO.:
JEB	–	09/26/05	–
CHKD:	APPD:	REV.:	NOTES:
LDS	––	10/20/20	–

FIGURE NO.: 16-3

Table 16-3
OU III LIPA/Airport Monitoring Well Data
'Hits Only' July through September 2020

Site ID : 000-104

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	07/08/2020	0.43	0.5	--	UG/L	205.00	J
1,1-Dichloroethylene	07/08/2020	0.37	0.5	--	UG/L	205.00	J
1,4-Dioxane	07/08/2020	0.161	0.2	--	UG/L	205.00	J
524.2 TVOC	07/08/2020	3	--	--	UG/L	205.00	
Chloroform	07/08/2020	1.7	0.5	--	UG/L	205.00	
Trichloroethylene	07/08/2020	0.5	0.5	--	UG/L	205.00	

Site ID : 000-130

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/08/2020	2.51	--	--	UG/L	280.00	
Carbon tetrachloride	07/08/2020	0.18	0.5	--	UG/L	280.00	J
Chloroform	07/08/2020	1.5	0.5	--	UG/L	280.00	
Tetrachloroethylene	07/08/2020	0.83	0.5	--	UG/L	280.00	
1,4-Dioxane	07/15/2020	1.19	0.2	--	UG/L	185.00	
Fluorotelomer sulfonate 6:2 (6:2 FTS)	07/15/2020	2.4	3.36	--	NG/L	185.00	J

Site ID : 000-425

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	07/07/2020	0.55	0.5	--	UG/L	315.00	
1,1-Dichloroethylene	07/07/2020	0.33	0.5	--	UG/L	315.00	J
524.2 TVOC	07/07/2020	4.29	--	--	UG/L	315.00	
Carbon tetrachloride	07/07/2020	0.29	0.5	--	UG/L	315.00	J
Chloroform	07/07/2020	0.6	0.5	--	UG/L	315.00	
Tetrachloroethylene	07/07/2020	1.8	0.5	--	UG/L	315.00	
Trichloroethylene	07/07/2020	0.72	0.5	--	UG/L	315.00	

Site ID : 000-428

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/07/2020	0	--	--	UG/L	298.00	

Site ID : 000-447

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	07/07/2020	1.4	0.5	--	UG/L	219.00	
1,1-Dichloroethylene	07/07/2020	1.4	0.5	--	UG/L	219.00	
1,2-Dichloroethane	07/07/2020	0.21	0.5	--	UG/L	219.00	J
524.2 TVOC	07/07/2020	3.79	--	--	UG/L	219.00	
Chloroform	07/07/2020	0.54	0.5	--	UG/L	219.00	

Table 16-3
OU III LIPA/Airport Monitoring Well Data
'Hits Only' July through September 2020

Site ID : 000-447

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Trichloroethylene	07/07/2020	0.24	0.5	--	UG/L	219.00	J

Site ID : 000-448

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	07/07/2020	6.9	0.5	--	UG/L	212.00	
1,1-Dichloroethylene	07/07/2020	7.8	0.5	--	UG/L	212.00	
1,2-Dichloroethane	07/07/2020	0.23	0.5	--	UG/L	212.00	J
524.2 TVOC	07/07/2020	18.81	--	--	UG/L	212.00	
Carbon tetrachloride	07/07/2020	0.4	0.5	--	UG/L	212.00	J
Chloroform	07/07/2020	1.9	0.5	--	UG/L	212.00	
cis-1,2-Dichloroethylene	07/07/2020	0.28	0.5	--	UG/L	212.00	J
Trichloroethylene	07/07/2020	1.3	0.5	--	UG/L	212.00	

Site ID : 000-449

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	07/08/2020	0.76	0.5	--	UG/L	193.00	
1,1-Dichloroethylene	07/08/2020	0.8	0.5	--	UG/L	193.00	
1,2-Dichloroethane	07/08/2020	0.34	0.5	--	UG/L	193.00	J
524.2 TVOC	07/08/2020	2.68	--	--	UG/L	193.00	
Chloroform	07/08/2020	0.27	0.5	--	UG/L	193.00	J
Trichloroethylene	07/08/2020	0.51	0.5	--	UG/L	193.00	

Site ID : 000-458

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,4-Dioxane	07/07/2020	0.968	0.2	--	UG/L	301.00	

Site ID : 800-100

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/16/2020	0	--	--	UG/L	214.00	

Site ID : 800-101

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	07/16/2020	0.93	0.5	--	UG/L	280.00	
1,1,2,2-Tetrachloroethane	07/16/2020	6.9	0.5	--	UG/L	280.00	
1,1-Dichloroethylene	07/16/2020	1.1	0.5	--	UG/L	280.00	
1,2-Dichloroethane	07/16/2020	0.7	0.5	--	UG/L	280.00	
1,4-Dioxane	07/16/2020	3.98	0.2	--	UG/L	280.00	
524.2 TVOC	07/16/2020	38.03	--	--	UG/L	280.00	

Table 16-3
OU III LIPA/Airport Monitoring Well Data
'Hits Only' July through September 2020

Site ID : 800-101

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Carbon tetrachloride	07/16/2020	3.6	0.5	--	UG/L	280.00	
Chloroform	07/16/2020	5.4	0.5	--	UG/L	280.00	
Perfluorobutyric acid (PFBA)	07/16/2020	156	1.81	--	NG/L	280.00	
Perfluorodecanoic acid (PFDA)	07/16/2020	1.97	1.81	--	NG/L	280.00	
Perfluorohexanoic acid (PFHxA)	07/16/2020	1.15	1.81	--	NG/L	280.00	J
Perfluorononanoic acid (PFNA)	07/16/2020	1.12	1.81	--	NG/L	280.00	J
Perfluoropentanoic acid (PFPeA)	07/16/2020	1.2	1.81	--	NG/L	280.00	J
Perfluoroundecanoic acid (PFUdA)	07/16/2020	3.67	1.81	--	NG/L	280.00	
Trichloroethylene	07/16/2020	19	0.5	--	UG/L	280.00	
Trichlorofluoromethane	07/16/2020	0.4	0.5	--	UG/L	280.00	J

Site ID : 800-102

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/16/2020	0.65	--	--	UG/L	304.00	
Chloroform	07/16/2020	0.65	0.5	--	UG/L	304.00	

Site ID : 800-103

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,4-Dioxane	07/16/2020	2.17	0.2	--	UG/L	225.00	
524.2 TVOC	07/16/2020	2	--	--	UG/L	225.00	
Chloroform	07/16/2020	2	0.5	--	UG/L	225.00	
Perfluorobutyric acid (PFBA)	07/16/2020	1.67	1.78	--	NG/L	225.00	J
Perfluorooctanesulfonate (PFOS)	07/16/2020	0.773	1.78	--	NG/L	225.00	J
Perfluoropentanoic acid (PFPeA)	07/16/2020	1.67	1.78	--	NG/L	225.00	J

Site ID : 800-104

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,4-Dioxane	07/20/2020	1.08	0.2	--	UG/L	170.00	
524.2 TVOC	07/20/2020	0.31	--	--	UG/L	170.00	
Chloroform	07/20/2020	0.31	0.5	--	UG/L	170.00	J

Site ID : 800-105

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/20/2020	1	--	--	UG/L	233.00	
Chloroform	07/20/2020	1	0.5	--	UG/L	233.00	

Site ID : 800-106

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,4-Dioxane	07/14/2020	1.66	0.2	--	UG/L	217.00	

Table 16-3
OU III LIPA/Airport Monitoring Well Data
'Hits Only' July through September 2020

Site ID : 800-106

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/14/2020	13	--	--	UG/L	217.00	
Perfluorobutyric acid (PFBA)	07/14/2020	64.6	1.85	--	NG/L	217.00	
Trichloroethylene	07/14/2020	13	0.5	--	UG/L	217.00	

Site ID : 800-108

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,4-Dioxane	07/16/2020	1.12	0.2	--	UG/L	216.00	
524.2 TVOC	07/16/2020	0.37	--	--	UG/L	216.00	
Chloroform	07/16/2020	0.37	0.5	--	UG/L	216.00	J
Perfluorobutyric acid (PFBA)	07/16/2020	3.02	1.79	--	NG/L	216.00	

Site ID : 800-126

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/20/2020	0	--	--	UG/L	175.00	

Site ID : 800-127

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/20/2020	0	--	--	UG/L	175.00	

Site ID : 800-128

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,4-Dioxane	07/15/2020	0.124	0.2	--	UG/L	180.00	J
524.2 TVOC	07/15/2020	0	--	--	UG/L	180.00	
Perfluorobutanesulfonate (PFBS)	07/15/2020	1.67	1.68	--	NG/L	180.00	J
Perfluorobutyric acid (PFBA)	07/15/2020	1.53	1.89	--	NG/L	180.00	J
Perfluoroheptanoic acid (PFHpA)	07/15/2020	0.978	1.89	--	NG/L	180.00	J
Perfluorohexanesulfonate (PFHxS)	07/15/2020	11.2	1.72	--	NG/L	180.00	
Perfluorohexanoic acid (PFHxA)	07/15/2020	3.72	1.89	--	NG/L	180.00	
Perfluorooctanesulfonate (PFOS)	07/15/2020	25.5	1.89	--	NG/L	180.00	
Perfluorooctanoic acid (PFOA)	07/15/2020	1.65	1.89	--	NG/L	180.00	J
Perfluoropentanesulfonate (PFPeS)	07/15/2020	1.36	1.78	--	NG/L	180.00	J
Perfluoropentanoic acid (PFPeA)	07/15/2020	2.05	1.89	--	NG/L	180.00	

Site ID : 800-129

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,4-Dioxane	07/15/2020	0.232	0.2	--	UG/L	180.00	
524.2 TVOC	07/15/2020	0	--	--	UG/L	180.00	
Fluorotelomer sulfonate 6:2 (6:2 FTS)	07/15/2020	2.36	3.33	--	NG/L	180.00	J

Table 16-3
OU III LIPA/Airport Monitoring Well Data
'Hits Only' July through September 2020

Site ID : 800-130

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	07/15/2020	2.9	0.5	--	UG/L	185.00	
1,1-Dichloroethylene	07/15/2020	3.5	0.5	--	UG/L	185.00	
1,2-Dichloroethane	07/15/2020	0.38	0.5	--	UG/L	185.00	J
524.2 TVOC	07/15/2020	31.03	--	--	UG/L	185.00	
Carbon tetrachloride	07/15/2020	4.4	0.5	--	UG/L	185.00	
cis-1,2-Dichloroethylene	07/15/2020	0.85	0.5	--	UG/L	185.00	
Trichloroethylene	07/15/2020	19	0.5	--	UG/L	185.00	

Site ID : 800-131

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/20/2020	0	--	--	UG/L	194.00	

Site ID : 800-133

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,4-Dioxane	07/16/2020	0.285	0.2	--	UG/L	225.00	
524.2 TVOC	07/16/2020	1	--	--	UG/L	225.00	
Chloroform	07/16/2020	1	0.5	--	UG/L	225.00	
Perfluorobutyric acid (PFBA)	07/16/2020	1.48	1.77	--	NG/L	225.00	J
Perfluorohexanesulfonate (PFHxS)	07/16/2020	2.32	1.61	--	NG/L	225.00	
Perfluorohexanoic acid (PFHxA)	07/16/2020	2.35	1.77	--	NG/L	225.00	
Perfluorooctanoic acid (PFOA)	07/16/2020	1.69	1.77	--	NG/L	225.00	J
Perfluoropentanoic acid (PFPeA)	07/16/2020	2.02	1.77	--	NG/L	225.00	

Site ID : 800-138

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,4-Dioxane	07/13/2020	2.08	0.2	--	UG/L	250.00	
524.2 TVOC	07/13/2020	0	--	--	UG/L	250.00	

Site ID : 800-43

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/17/2020	1	--	--	UG/L	157.00	
Chloroform	07/17/2020	1	0.5	--	UG/L	157.00	

Site ID : 800-44

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,4-Dioxane	07/17/2020	1.5	0.2	--	UG/L	212.00	
524.2 TVOC	07/17/2020	0.51	--	--	UG/L	212.00	
Chloroform	07/17/2020	0.51	0.5	--	UG/L	212.00	

Table 16-3
OU III LIPA/Airport Monitoring Well Data
'Hits Only' July through September 2020

Site ID : 800-50

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/13/2020	0	--	--	UG/L	205.00	

Site ID : 800-59

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/13/2020	0	--	--	UG/L	208.00	
Perfluorobutyric acid (PFBA)	07/13/2020	5.24	1.74	--	NG/L	208.00	
Perfluorohexanesulfonate (PFHxS)	07/13/2020	1.92	1.58	--	NG/L	208.00	
Perfluorohexanoic acid (PFHxA)	07/13/2020	0.614	1.74	--	NG/L	208.00	J
Perfluoropentanoic acid (PFPeA)	07/13/2020	7.58	1.74	--	NG/L	208.00	

Site ID : 800-60

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,4-Dioxane	07/21/2020	0.204	0.2	--	UG/L	210.00	
524.2 TVOC	07/21/2020	0.73	--	--	UG/L	210.00	
Chloroform	07/21/2020	0.73	0.5	--	UG/L	210.00	

Site ID : 800-63

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,4-Dioxane	07/21/2020	0.145	0.2	--	UG/L	206.00	J

Site ID : 800-90

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/13/2020	5	--	--	UG/L	255.00	
Carbon tetrachloride	07/13/2020	1.2	0.5	--	UG/L	255.00	
Chloroform	07/13/2020	1.7	0.5	--	UG/L	255.00	
Trichloroethylene	07/13/2020	2.1	0.5	--	UG/L	255.00	

Site ID : 800-92

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,4-Dioxane	07/13/2020	0.158	0.2	--	UG/L	200.00	J
524.2 TVOC	07/13/2020	0.56	--	--	UG/L	200.00	
Carbon tetrachloride	07/13/2020	0.56	0.5	--	UG/L	200.00	
Perfluorobutyric acid (PFBA)	07/13/2020	1.41	1.72	--	NG/L	200.00	J
Perfluoroheptanoic acid (PFHpA)	07/13/2020	1.22	1.72	--	NG/L	200.00	J
Perfluorohexanesulfonate (PFHxS)	07/13/2020	1.36	1.57	--	NG/L	200.00	J
Perfluorohexanoic acid (PFHxA)	07/13/2020	4.17	1.72	--	NG/L	200.00	
Perfluorooctanesulfonate (PFOS)	07/13/2020	1.2	1.72	--	NG/L	200.00	J
Perfluorooctanoic acid (PFOA)	07/13/2020	4.04	1.72	--	NG/L	200.00	

Table 16-3
OU III LIPA/Airport Monitoring Well Data
'Hits Only' July through September 2020

Site ID : 800-92

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Perfluoropentanoic acid (PFPeA)	07/13/2020	3	1.72	--	NG/L	200.00	

Site ID : 800-94

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1-Dichloroethylene	07/20/2020	1.3	0.5	--	UG/L	185.00	
1,4-Dioxane	07/20/2020	3.13	0.2	--	UG/L	185.00	
524.2 TVOC	07/20/2020	54.54	--	--	UG/L	185.00	
Carbon tetrachloride	07/20/2020	36	0.5	--	UG/L	185.00	
Chloroform	07/20/2020	0.24	0.5	--	UG/L	185.00	J
Perfluorobutyric acid (PFBA)	07/20/2020	0.962	1.78	--	NG/L	185.00	J
Perfluorohexanesulfonate (PFHxS)	07/20/2020	0.899	1.62	--	NG/L	185.00	J
Perfluorooctanesulfonate (PFOS)	07/20/2020	0.823	1.78	--	NG/L	185.00	J
Perfluorooctanoic acid (PFOA)	07/20/2020	0.694	1.78	--	NG/L	185.00	J
Trichloroethylene	07/20/2020	17	0.5	--	UG/L	185.00	

Site ID : 800-95

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,4-Dioxane	07/21/2020	1.21	0.2	--	UG/L	187.00	
524.2 TVOC	07/21/2020	16.11	--	--	UG/L	187.00	
Carbon tetrachloride	07/21/2020	9.7	0.5	--	UG/L	187.00	
Chloroform	07/21/2020	0.91	0.5	--	UG/L	187.00	
Perfluorobutyric acid (PFBA)	07/21/2020	1.71	1.82	--	NG/L	187.00	J
Perfluorohexanesulfonate (PFHxS)	07/21/2020	1.36	1.66	--	NG/L	187.00	J
Perfluorohexanoic acid (PFHxA)	07/21/2020	1.56	1.82	--	NG/L	187.00	J
Perfluorooctanesulfonate (PFOS)	07/21/2020	0.751	1.82	--	NG/L	187.00	J
Perfluorooctanoic acid (PFOA)	07/21/2020	0.908	1.82	--	NG/L	187.00	J
Perfluoropentanoic acid (PFPeA)	07/21/2020	1.59	1.82	--	NG/L	187.00	J
Trichloroethylene	07/21/2020	5.5	0.5	--	UG/L	187.00	

Site ID : 800-96

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,4-Dioxane	07/15/2020	3.37	0.2	--	UG/L	189.00	
524.2 TVOC	07/15/2020	0.36	--	--	UG/L	189.00	
Carbon tetrachloride	07/15/2020	0.36	0.5	--	UG/L	189.00	J
Perfluorobutyric acid (PFBA)	07/15/2020	1.04	1.72	--	NG/L	189.00	J

Site ID : 800-97

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/15/2020	1.7	--	--	UG/L	199.00	

Table 16-3
OU III LIPA/Airport Monitoring Well Data
'Hits Only' July through September 2020

Site ID : 800-97

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Methyl bromide	07/15/2020	1.7	0.57	--	UG/L	199.00	

Site ID : 800-98

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,4-Dioxane	07/17/2020	0.404	0.2	--	UG/L	184.00	
524.2 TVOC	07/17/2020	0.26	--	--	UG/L	184.00	
Chloroform	07/17/2020	0.26	0.5	--	UG/L	184.00	J
Perfluorohexanesulfonate (PFHxS)	07/17/2020	1.25	1.62	--	NG/L	184.00	J

Site ID : 800-99

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,4-Dioxane	07/17/2020	1.92	0.2	--	UG/L	248.00	
524.2 TVOC	07/17/2020	1.2	--	--	UG/L	248.00	
Fluorotelomer sulfonate 6:2 (6:2 FTS)	07/17/2020	1.21	3.36	--	NG/L	248.00	J
Perfluorobutyric acid (PFBA)	07/17/2020	2.74	1.77	--	NG/L	248.00	
Trichloroethylene	07/17/2020	1.2	0.5	--	UG/L	248.00	

Table 16-4
OU III LIPA/Airport Extraction Well Data
'Hits Only' July through September 2020

Site ID : 000-453 (EW-1L)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	07/28/2020	1.9	0.5	--	UG/L	227.00	
1,1-Dichloroethylene	07/28/2020	1.6	0.5	--	UG/L	227.00	
524.2 TVOC	07/28/2020	5.62	--	--	UG/L	227.00	
Chloroform	07/28/2020	0.92	0.5	--	UG/L	227.00	
Trichloroethylene	07/28/2020	1.2	0.5	--	UG/L	227.00	

Site ID : 000-455 (EW-2L)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	07/28/2020	1.7	0.5	--	UG/L	234.00	
1,1-Dichloroethylene	07/28/2020	1.4	0.5	--	UG/L	234.00	
1,2-Dichloroethane	07/28/2020	0.35	0.5	--	UG/L	234.00	J
524.2 TVOC	07/28/2020	4.62	--	--	UG/L	234.00	
Chloroform	07/28/2020	0.41	0.5	--	UG/L	234.00	J
Trichloroethylene	07/28/2020	0.76	0.5	--	UG/L	234.00	

Site ID : 000-457 (EW-3L)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/28/2020	2.03	--	--	UG/L	226.00	
Chloroform	07/28/2020	1.1	0.5	--	UG/L	226.00	
Methyl chloride	07/28/2020	0.6	0.5	--	UG/L	226.00	
Trichloroethylene	07/28/2020	0.33	0.5	--	UG/L	226.00	J

Site ID : 000-461 (EW-4L)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/28/2020	6.98	--	--	UG/L	314.00	
Carbon tetrachloride	07/28/2020	1	0.5	--	UG/L	314.00	
Chloroform	07/28/2020	0.98	0.5	--	UG/L	314.00	
Tetrachloroethylene	07/28/2020	3.5	0.5	--	UG/L	314.00	
Trichloroethylene	07/28/2020	1.5	0.5	--	UG/L	314.00	

Site ID : 800-109 (RTW-1A)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/28/2020	2.37	--	--	UG/L	198.00	
Carbon tetrachloride	07/28/2020	1.1	0.5	--	UG/L	198.00	
Chloroform	07/28/2020	0.75	0.5	--	UG/L	198.00	
Trichloroethylene	07/28/2020	0.52	0.5	--	UG/L	198.00	

Site ID : 800-110 (RTW-2A)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/28/2020	0.83	--	--	UG/L	198.00	

Table 16-4
OU III LIPA/Airport Extraction Well Data
'Hits Only' July through September 2020

Site ID : 800-110 (RTW-2A)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Chloroform	07/28/2020	0.83	0.5	--	UG/L	198.00	

Site ID : 800-111 (RTW-3A)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/28/2020	0	--	--	UG/L	220.00	

Site ID : 800-112 (RTW-4A)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/28/2020	1.94	--	--	UG/L	278.00	
Chloroform	07/28/2020	0.84	0.5	--	UG/L	278.00	
Trichloroethylene	07/28/2020	1.1	0.5	--	UG/L	278.00	

Site ID : 800-113 (RTW-5A)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/28/2020	0.63	--	--	UG/L	230.00	
Chloroform	07/28/2020	0.63	0.5	--	UG/L	230.00	

Site ID : 800-132 (RTW-6A)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	07/28/2020	0.26	0.5	--	UG/L	175.00	J
524.2 TVOC	07/28/2020	8.65	--	--	UG/L	175.00	
Carbon tetrachloride	07/28/2020	2	0.5	--	UG/L	175.00	
Chloroform	07/28/2020	0.69	0.5	--	UG/L	175.00	
Trichloroethylene	07/28/2020	5.7	0.5	--	UG/L	175.00	

Table 16-5
OU III LIPA/Airport Influent Data
'Hits Only' July through September 2020

Site ID : 800-122 (Combined Influent)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/09/2020	4.15	--	--	UG/L	0.00	
Carbon tetrachloride	07/09/2020	1.2	0.5	--	UG/L	0.00	
Chloroform	07/09/2020	0.65	0.5	--	UG/L	0.00	
Trichloroethylene	07/09/2020	2.3	0.5	--	UG/L	0.00	
524.2 TVOC	07/28/2020	3.12	--	--	UG/L	0.00	
Carbon tetrachloride	07/28/2020	0.8	0.5	--	UG/L	0.00	
Chloroform	07/28/2020	0.52	0.5	--	UG/L	0.00	
Trichloroethylene	07/28/2020	1.8	0.5	--	UG/L	0.00	
524.2 TVOC	08/06/2020	4.93	--	--	UG/L	0.00	
Carbon tetrachloride	08/06/2020	1.2	0.5	--	UG/L	0.00	
Chloroform	08/06/2020	0.65	0.5	--	UG/L	0.00	
Naphthalene	08/06/2020	0.78	0.67	--	UG/L	0.00	B
Trichloroethylene	08/06/2020	2.3	0.5	--	UG/L	0.00	
524.2 TVOC	08/18/2020	3.95	--	--	UG/L	0.00	
Carbon tetrachloride	08/18/2020	1.1	0.5	--	UG/L	0.00	
Chloroform	08/18/2020	0.75	0.5	--	UG/L	0.00	
Trichloroethylene	08/18/2020	2.1	0.5	--	UG/L	0.00	
524.2 TVOC	09/01/2020	5.56	--	--	UG/L	0.00	
Carbon tetrachloride	09/01/2020	1.6	0.5	--	UG/L	0.00	
Chloroform	09/01/2020	0.66	0.5	--	UG/L	0.00	
Trichloroethylene	09/01/2020	3.3	0.5	--	UG/L	0.00	
524.2 TVOC	09/15/2020	5.39	--	--	UG/L	0.00	
Carbon tetrachloride	09/15/2020	1.7	0.5	--	UG/L	0.00	
Chloroform	09/15/2020	0.69	0.5	--	UG/L	0.00	
Trichloroethylene	09/15/2020	3	0.5	--	UG/L	0.00	

Table 16-6
OU III LIPA/Airport Effluent Data
'Hits Only' July through September 2020

Site ID : 800-124 (System Effluent)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
524.2 TVOC	07/09/2020	0	--	--	UG/L	0.00	
524.2 TVOC	07/28/2020	0	--	--	UG/L	0.00	
524.2 TVOC	08/06/2020	0	--	--	UG/L	0.00	
524.2 TVOC	08/18/2020	0	--	--	UG/L	0.00	
524.2 TVOC	09/01/2020	0	--	--	UG/L	0.00	
524.2 TVOC	09/15/2020	0.3	--	--	UG/L	0.00	
Chloroform	09/15/2020	0.3	0.5	--	UG/L	0.00	J

Qualifiers :

J = Estimated value.
D = Compound was identified in an analysis at a secondary dilution factor.

Organic Compounds :

B = Compound was found in both the sample And associated laboratory blank.

Inorganic Compounds :

B = Result Is between instrument detection limit And contract required reporting limit.

Section 17

Q3-2020 Operations Summary
OU III Strontium-90 BGRR/WCF Treatment System

Process: Groundwater extraction with liquid phase granular activated carbon treatment for volatile organic compounds, followed by clinoptilolite zeolite treatment for the removal of Sr-90, with discharge to dry wells.

Goal: Reach Maximum Contaminant Levels (MCLs) in core monitoring wells within 70 years for the Upper Glacial aquifer (by 2070).

Start Date: June 2005

Table 17-1
OU III Strontium-90 BGRR/WCF Treatment System
Pumping Rates (gpm)

Extraction Well	SR-1	SR-2	SR-3*	SR-4*	SR-5*	SR-6*	SR-7*	SR-8*	SR-9
Site Id #	065-368	065-369	075-676	075-677	075-678	065-403	075-702	075-703	075-704
Screen Interval (ft bls)	33-53	33.5-53.5	51-71	35-75	35-75	85-105	82-102	77-97	67-87
Desired Flow Rate (gpm)	**5**	**5**	**5**	**5**	**5**	**10**	**10**	**10**	**10**
July (Avg gpm)	0.3	0.3	0.3	0	0	0	0	0.6	0.6
August "	1	1	1	0	0	0	0	0	2
September "	7.3	5.4	5.4	0	0	0	0	11.1	10
Actual (Avg. over Qtr.)	**2.9**	**2.3**	**2.3**	**0**	**0**	**0**	**0**	**3.9**	**4.2**

*Wells SR-4 and SR-5 were placed in standby mode in September 2016. Well SR-6 was placed in standby mode in October 2017. Wells SR-3 and SR-7 were placed in standby mode October 2018. Well SR-8 was placed in pulsed pumping mode in October 2018. Well SR-3 was put back in operation in February 2019.

Figure 17-1
Strontium-90 BGRR/WCF Treatment System
Cumulative Millicuries Removed

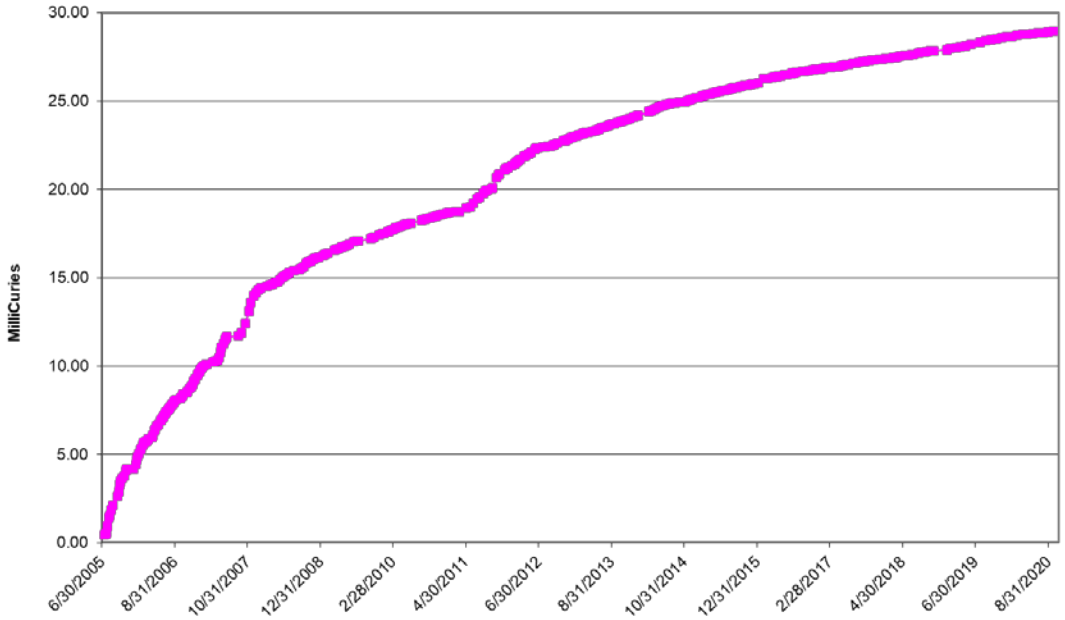

Figure 17-2
Strontium-90 BGRR/WCF Treatment System
Influent Sr-90 Concentrations vs. Time

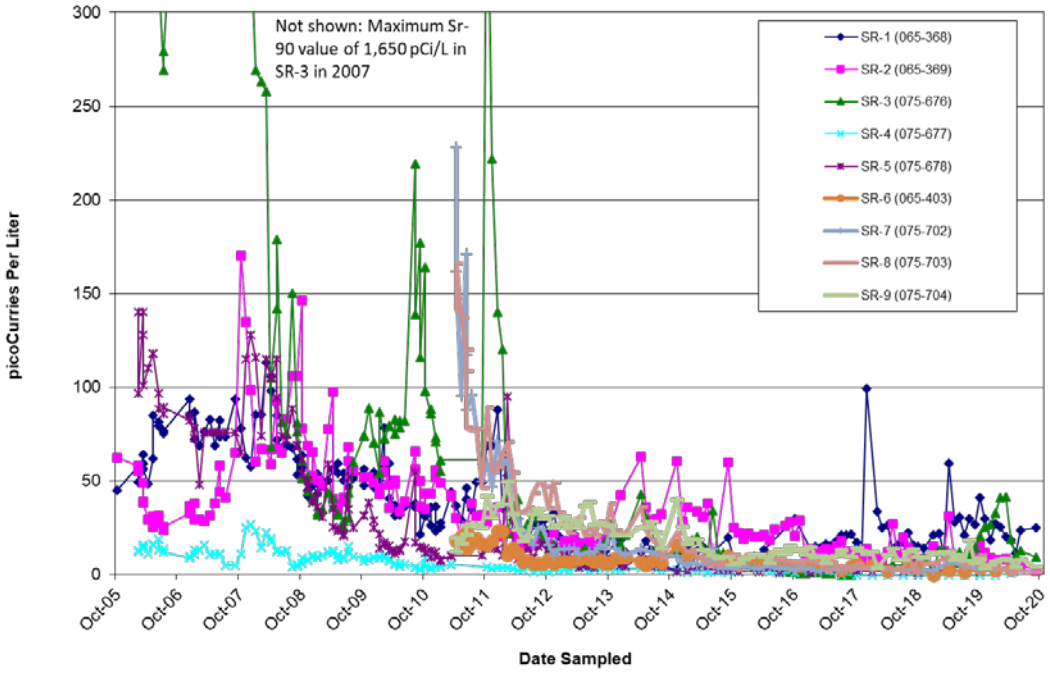

Table 17-2
Strontium-90 BGRR/WCF Treatment System Effluent Water Quality
SPDES Equivalency Permit Concentrations July 1, 2020 – September 30, 2020

Parameter	Permit Limit	Max. Measured Value	Units	Frequency
Flow	75	39	GPM	Continuous
pH (range)	5.5 – 8.5	6.1– 6.5	SU	Weekly
Strontium-90	8.0	2.14	PCi/L	Monthly[1]
Chloroform	7.0	<0.5	ug/L	Monthly[1]
1,1-Dichloroethane	5.0	<0.5	ug/L	Monthly[1]
Ethylbenzene	5.0	<0.5	ug/L	Monthly[1]
Methyl Chloride	5.0	<0.5	ug/L	Monthly[1]
Methylene Chloride	5.0	<0.5	ug/L	Monthly[1]
Toluene	5.0	<0.5	ug/L	Monthly[1]
1,2,3-Trichlorobenzene	5.0	<0.5	ug/L	Monthly[1]
1,1,1-Trichloroethane	5.0	<0.5	ug/L	Monthly[1]
1,2,4-Trimethylbenzene	5.0	<0.5	ug/L	Monthly[1]
Xylene, total	10.0	<0.5	ug/L	Monthly[1]

[1] The minimum measurement frequency shall be monthly following a period of 24 consecutive weekly sampling events showing no exceedances of the stated discharge limitations.
[2] Not detected.

System Operations

July 2020:

The system was off from July 2 to August 26 due to a lightning strike that damaged multiple electrical components of the control center. The system treated approximately 0.1 million gallons of water.

August 2020:

The system was re-started August 26 and ran for the remainder of the month. Wells SR-4 through SR-7 were in stand-by mode. Well SR-8 was off for pulsed-pumping. The system treated approximately 0.2 million gallons of water.

September 2020:

The system ran normally for the month. Wells SR-4 through SR-7 were off in stand-by mode. The system treated approximately 1.7 million gallons of water.

The system treated approximately 2.0 million gallons of water during the third quarter of 2020.

In September, a temporary well was installed downgradient of BGRR sentinel well 085-403 to re-establish the location of the leading edge of the Sr-90 plume. Strontium-90 was not detected in the temporary well. The temporary well was also sampled for PFAS and the detections are presented in Table 17.3. The location is shown on Figure 17.3.

Planned Operational Changes

- Continue operating wells SR-1, SR-2, SR-3 and SR-9 in full time mode, and maintain wells SR-4, SR-5, SR-6 and SR-7 in standby mode. If significant rebound occurs, place these extraction wells back in full time operation. Sr-90 concentrations in SR-4, SR-5, and SR-6 have remained below the drinking water standard since May 2016.
- Maintain SR-8 in pulsed pumping mode (one month on and one month off) based on low but fluctuating Sr-90 concentrations since August 2018.
- Continue to supplement the current monitoring network with temporary well data to get a comprehensive status of the plumes and account for well network gaps and groundwater flow related plume shifts. Areas of focus include:
    - Install several temporary wells along Temple Place to supplement monitoring of the downgradient segment of the WCF plume.
    - In October, install a new sentinel well at the leading edge of the BGRR plume.

LEGEND

160 MONITORING WELL ID

SR-1 EXTRACTION WELL ID

75 BNL GRID NUMBER

HFBR – HIGH FLUX BEAM REACTOR

WCF – WASTE CONCENTRATION FACILITY

BGRR – BROOKHAVEN GRAPHITE RESEARCH REACTOR

FORMER D-WASTE TANK AREA

WASTE CONCENTRATION FACILITY

FORMER PILE FAN SUMP LOCATION

BGRR

BLDG. 708 UNDG. DUCTS LOCATION

HFBR

TO BLDG 855

65

75

SR-1 SR-2 SR-3 SR-4 SR-5 SR-6 SR-7 SR-8 SR-9

Building 701 Building 801 FORMER CANAL HOUSE

LAWRENCE DR. RUTHERFORD DR. CORNELL AVENUE TECHNOLOGY STREET RAILROAD STREET TEMPLE PLACE BROOKHAVEN AVENUE GROVE BELL AVENUE

SCALE 0 150 300 FEET

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BROOKHAVEN NATIONAL LABORATORY

ENVIRONMENTAL PROTECTION DIVISION

TITLE:

OU III BGRR/WCF

SITEWIDE REMEDIATION SYSTEMS THIRD QUARTER 2020 OPERATIONS REPORT

DWN:	VT: HZ.:	DATE:	PROJECT NO.:
JEB	–	03/15/13	
CHKD:	APPD:	REV.:	NOTES:
LDS	--	10/20/20	
FIGURE NO.:		17-3	

Table 17-3
OU III Strontium-90 BGRR/WCF Monitoring Well Data
'Hits Only' July through September 2020

Site ID : 075-663

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	08/19/2020	0.17	0.5	--	UG/L	118.00	J
524.2 TVOC	08/19/2020	0.35	--	--	UG/L	118.00	
Chloroform	08/19/2020	0.18	0.5	--	UG/L	118.00	J
Gross Beta	08/19/2020	2.4	1.62	1.01	PCI/L	118.00	J
Perfluorobutanesulfonate (PFBS)	08/19/2020	1.33	1.52	--	NG/L	118.00	J
Perfluorobutyric acid (PFBA)	08/19/2020	6.68	1.71	--	NG/L	118.00	
Perfluorodecanoic acid (PFDA)	08/19/2020	2.82	1.71	--	NG/L	118.00	
Perfluoroheptanoic acid (PFHpA)	08/19/2020	1.36	1.71	--	NG/L	118.00	J
Perfluorohexanesulfonate (PFHxS)	08/19/2020	2.42	1.55	--	NG/L	118.00	
Perfluorohexanoic acid (PFHxA)	08/19/2020	3.8	1.71	--	NG/L	118.00	
Perfluorononanoic acid (PFNA)	08/19/2020	1.55	1.71	--	NG/L	118.00	J
Perfluorooctanesulfonate (PFOS)	08/19/2020	8.92	1.71	--	NG/L	118.00	
Perfluorooctanoic acid (PFOA)	08/19/2020	4.71	1.71	--	NG/L	118.00	
Perfluoropentanoic acid (PFPeA)	08/19/2020	2.29	1.71	--	NG/L	118.00	
Perfluoroundecanoic acid (PFUdA)	08/19/2020	1.7	1.71	--	NG/L	118.00	J

Site ID : 075-664

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	07/09/2020	76	0.302	6.43	PCI/L	65.00	
Strontium-90	08/13/2020	75.7	0.207	6.36	PCI/L	65.00	
Strontium-90	09/11/2020	122	0.303	10.2	PCI/L	62.99	

Site ID : 075-680

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	08/19/2020	0.23	0.5	--	UG/L	95.00	J
524.2 TVOC	08/19/2020	0.23	--	--	UG/L	95.00	
Gross Beta	08/19/2020	4.24	1.23	0.873	PCI/L	95.00	
Perfluorobutanesulfonate (PFBS)	08/19/2020	1.88	1.54	--	NG/L	95.00	
Perfluorobutyric acid (PFBA)	08/19/2020	10.8	1.73	--	NG/L	95.00	
Perfluorodecanoic acid (PFDA)	08/19/2020	3.03	1.73	--	NG/L	95.00	
Perfluoroheptanoic acid (PFHpA)	08/19/2020	3.39	1.73	--	NG/L	95.00	
Perfluorohexanesulfonate (PFHxS)	08/19/2020	4.35	1.58	--	NG/L	95.00	
Perfluorohexanoic acid (PFHxA)	08/19/2020	5.25	1.73	--	NG/L	95.00	
Perfluorononanoic acid (PFNA)	08/19/2020	4.67	1.73	--	NG/L	95.00	
Perfluorooctanesulfonate (PFOS)	08/19/2020	8.3	1.73	--	NG/L	95.00	

Table 17-3
OU III Strontium-90 BGRR/WCF Monitoring Well Data
'Hits Only' July through September 2020

Site ID : 075-680

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Perfluorooctanoic acid (PFOA)	08/19/2020	4.2	1.73	--	NG/L	95.00	
Perfluoropentanesulfonate (PFPeS)	08/19/2020	0.673	1.63	--	NG/L	95.00	J
Perfluoropentanoic acid (PFPeA)	08/19/2020	8.24	1.73	--	NG/L	95.00	
Perfluoroundecanoic acid (PFUdA)	08/19/2020	1.04	1.73	--	NG/L	95.00	J

Site ID : 075-701

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	08/13/2020	114	0.784	3.36	PCI/L	60.86	
Strontium-90	09/11/2020	161	1.46	3.39	PCI/L	61.97	

Table 17-4
OU III Strontium-90 BGRR/WCF Extraction Well Data
'Hits Only' July through September 2020

Site ID : 065-368 (SR-1)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	09/01/2020	24.9	0.598	1.5	PCI/L	0.00	

Site ID : 065-369 (SR-2)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	09/01/2020	2.2	0.611	0.596	PCI/L	0.00	

Site ID : 075-676 (SR-3)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	09/01/2020	9.17	0.628	0.98	PCI/L	0.00	

Site ID : 075-703 (SR-8)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	09/01/2020	1.41	0.716	0.546	PCI/L	0.00	

Site ID : 075-704 (SR-9)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	09/01/2020	4.14	0.584	0.648	PCI/L	0.00	

Table 17-5
OU III Strontium-90 BGRR/WCF Influent Data
'Hits Only' July through September 2020

Site ID : 066-216 (Combined Influent)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	09/01/2020	0.23	0.5	--	UG/L	0.00	J
524.2 TVOC	09/01/2020	0.59	--	--	UG/L	0.00	
Ethene, 1,2-dichloro-, (E)-	09/01/2020	0.36	0.5	--	UG/L	0.00	J
Strontium-90	09/01/2020	8.62	0.606	0.919	PCI/L	0.00	

Table 17-6
OU III Strontium-90 BGRR/WCF Effluent Data
'Hits Only' July through September 2020

Site ID : 066-219 (System Effluent)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	09/01/2020	0.34	0.5	--	UG/L	0.00	J
524.2 TVOC	09/01/2020	0.97	--	--	UG/L	0.00	
Ethene, 1,2-dichloro-, (E)-	09/01/2020	0.63	0.5	--	UG/L	0.00	
Strontium-90	09/01/2020	2.14	0.779	0.597	PCI/L	0.00	

Qualifiers :

J = Estimated value.
D = Compound was identified in an analysis at a secondary dilution factor.

Organic Compounds :

B = Compound was found in both the sample And associated laboratory blank.

Inorganic Compounds :

B = Result Is between instrument detection limit And contract required reporting limit.

Table 17-3
BGRR Temporary Well Data "Hits Only"
July through September 2020

Site ID : OU3-BGRR-VP01-2020

Chemical Name	Sample Date	Value	Detlim	Units	Depth	Qual
Perfluorobutanesulfonate (PFBS)	9/18/2020	1.26	1.61	NG/L	32.5	J
Perfluoroheptanoic acid (PFHpA)	9/18/2020	2.54	1.81	NG/L	32.5	
Perfluorohexanesulfonate (PFHxS)	9/18/2020	3.16	1.65	NG/L	32.5	
Perfluorohexanoic acid (PFHxA)	9/18/2020	6.72	1.81	NG/L	32.5	
Perfluorooctanesulfonate (PFOS)	9/18/2020	8.52	1.81	NG/L	32.5	
Perfluorooctanoic acid (PFOA)	9/18/2020	4.16	1.81	NG/L	32.5	
Perfluoropentanoic acid (PFPeA)	9/18/2020	5.4	1.81	NG/L	32.5	
Fluorotelomer sulfonate 6:2 (6:2 FTS)	9/18/2020	7.63	17.2	NG/L	37.5	DJ
Perfluorobutanesulfonate (PFBS)	9/18/2020	0.673	1.61	NG/L	37.5	J
Perfluorobutyric acid (PFBA)	9/18/2020	2.66	1.81	NG/L	37.5	
Perfluoroheptanoic acid (PFHpA)	9/18/2020	1.59	1.81	NG/L	37.5	J
Perfluorohexanesulfonate (PFHxS)	9/18/2020	1.73	1.65	NG/L	37.5	
Perfluorohexanoic acid (PFHxA)	9/18/2020	6.51	1.81	NG/L	37.5	
Perfluorooctanesulfonate (PFOS)	9/18/2020	7.28	1.81	NG/L	37.5	
Perfluorooctanoic acid (PFOA)	9/18/2020	4.13	1.81	NG/L	37.5	
Perfluoropentanoic acid (PFPeA)	9/18/2020	5.09	1.81	NG/L	37.5	
Perfluorobutyric acid (PFBA)	9/18/2020	6.02	9.02	NG/L	47.5	DJ
Perfluoroheptanoic acid (PFHpA)	9/18/2020	3.63	1.8	NG/L	47.5	
Perfluorohexanesulfonate (PFHxS)	9/18/2020	4.85	1.64	NG/L	47.5	
Perfluorohexanoic acid (PFHxA)	9/18/2020	6.96	1.8	NG/L	47.5	
Perfluorononanoic acid (PFNA)	9/18/2020	1.03	1.8	NG/L	47.5	J
Perfluorooctanesulfonate (PFOS)	9/18/2020	9.93	1.8	NG/L	47.5	
Perfluorooctanoic acid (PFOA)	9/18/2020	4.79	1.8	NG/L	47.5	
Perfluoropentanoic acid (PFPeA)	9/18/2020	5.25	1.8	NG/L	47.5	
Perfluorobutanesulfonate (PFBS)	9/18/2020	1.18	1.53	NG/L	57.5	J
Perfluorobutyric acid (PFBA)	9/18/2020	5.94	8.61	NG/L	57.5	DJ
Perfluoroheptanoic acid (PFHpA)	9/18/2020	2.23	1.72	NG/L	57.5	
Perfluorohexanesulfonate (PFHxS)	9/18/2020	3.95	1.57	NG/L	57.5	
Perfluorohexanoic acid (PFHxA)	9/18/2020	4.37	1.72	NG/L	57.5	
Perfluorononanoic acid (PFNA)	9/18/2020	1	1.72	NG/L	57.5	J
Perfluorooctanesulfonate (PFOS)	9/18/2020	7.33	1.72	NG/L	57.5	
Perfluorooctanoic acid (PFOA)	9/18/2020	3.45	1.72	NG/L	57.5	
Perfluoropentanoic acid (PFPeA)	9/18/2020	3.9	1.72	NG/L	57.5	
Perfluorobutanesulfonate (PFBS)	9/18/2020	0.848	1.61	NG/L	67.5	J
Perfluorobutyric acid (PFBA)	9/18/2020	5.78	9.02	NG/L	67.5	DJ
Perfluoroheptanoic acid (PFHpA)	9/18/2020	1.66	1.8	NG/L	67.5	J
Perfluorohexanesulfonate (PFHxS)	9/18/2020	1.91	1.64	NG/L	67.5	
Perfluorohexanoic acid (PFHxA)	9/18/2020	2.57	1.8	NG/L	67.5	
Perfluorooctanesulfonate (PFOS)	9/18/2020	4.04	1.8	NG/L	67.5	

Table 17-3
BGRR Temporary Well Data "Hits Only"
July through September 2020

Chemical Name	Sample Date	Value	Detlim	Units	Depth	Qual
Perfluorooctanoic acid (PFOA)	9/18/2020	4.49	1.8	NG/L	67.5	
Perfluoropentanoic acid (PFPeA)	9/18/2020	2.12	1.8	NG/L	67.5	
Perfluorobutanesulfonate (PFBS)	9/18/2020	1.53	1.65	NG/L	77.5	J
Perfluorobutyric acid (PFBA)	9/18/2020	9.28	9.25	NG/L	77.5	D
Perfluoroheptanoic acid (PFHpA)	9/18/2020	8.77	1.85	NG/L	77.5	
Perfluorohexanesulfonate (PFHxS)	9/18/2020	5.9	1.68	NG/L	77.5	
Perfluorohexanoic acid (PFHxA)	9/18/2020	22.4	1.85	NG/L	77.5	
Perfluorononanoic acid (PFNA)	9/18/2020	2.99	1.85	NG/L	77.5	
Perfluorooctanesulfonate (PFOS)	9/18/2020	23.8	1.85	NG/L	77.5	
Perfluorooctanoic acid (PFOA)	9/18/2020	4.27	1.85	NG/L	77.5	
Perfluoropentanesulfonate (PFPeS)	9/18/2020	0.722	1.74	NG/L	77.5	J
Perfluoropentanoic acid (PFPeA)	9/18/2020	15.8	1.85	NG/L	77.5	
Perfluorobutanesulfonate (PFBS)	9/18/2020	1.51	1.6	NG/L	87.5	J
Perfluorobutyric acid (PFBA)	9/18/2020	8.65	8.99	NG/L	87.5	DJ
Perfluoroheptanoic acid (PFHpA)	9/18/2020	6.89	1.8	NG/L	87.5	
Perfluorohexanesulfonate (PFHxS)	9/18/2020	5.62	1.64	NG/L	87.5	
Perfluorohexanoic acid (PFHxA)	9/18/2020	21	1.8	NG/L	87.5	
Perfluorononanoic acid (PFNA)	9/18/2020	2.39	1.8	NG/L	87.5	
Perfluorooctanesulfonate (PFOS)	9/18/2020	28.3	1.8	NG/L	87.5	
Perfluorooctanoic acid (PFOA)	9/18/2020	4.83	1.8	NG/L	87.5	
Perfluoropentanesulfonate (PFPeS)	9/18/2020	0.753	1.69	NG/L	87.5	J
Perfluoropentanoic acid (PFPeA)	9/18/2020	14.6	1.8	NG/L	87.5	
Fluorotelomer sulfonate 6:2 (6:2 FTS)	9/18/2020	6.09	17.4	NG/L	97.5	DJ
Perfluorobutanesulfonate (PFBS)	9/18/2020	2.07	1.63	NG/L	97.5	
Perfluorobutyric acid (PFBA)	9/18/2020	12	9.14	NG/L	97.5	D
Perfluoroheptanoic acid (PFHpA)	9/18/2020	7.58	1.83	NG/L	97.5	
Perfluorohexanesulfonate (PFHxS)	9/18/2020	5.47	1.66	NG/L	97.5	
Perfluorohexanoic acid (PFHxA)	9/18/2020	16.1	1.83	NG/L	97.5	
Perfluorononanoic acid (PFNA)	9/18/2020	1.53	1.83	NG/L	97.5	J
Perfluorooctanesulfonate (PFOS)	9/18/2020	13.6	1.83	NG/L	97.5	
Perfluorooctanoic acid (PFOA)	9/18/2020	12.4	1.83	NG/L	97.5	
Perfluoropentanoic acid (PFPeA)	9/18/2020	11.6	1.83	NG/L	97.5	
Fluorotelomer sulfonate 6:2 (6:2 FTS)	9/18/2020	8.47	3.42	NG/L	107.5	
Perfluorobutanesulfonate (PFBS)	9/18/2020	2	1.6	NG/L	107.5	
Perfluorobutyric acid (PFBA)	9/18/2020	10.9	1.8	NG/L	107.5	
Perfluoroheptanoic acid (PFHpA)	9/18/2020	4.73	1.8	NG/L	107.5	
Perfluorohexanesulfonate (PFHxS)	9/18/2020	8.25	1.64	NG/L	107.5	
Perfluorohexanoic acid (PFHxA)	9/18/2020	9.6	1.8	NG/L	107.5	
Perfluorooctanesulfonate (PFOS)	9/18/2020	8.85	1.8	NG/L	107.5	
Perfluorooctanoic acid (PFOA)	9/18/2020	11.7	1.8	NG/L	107.5	
Perfluoropentanesulfonate (PFPeS)	9/18/2020	0.904	1.69	NG/L	107.5	J

Table 17-3
BGRR Temporary Well Data "Hits Only"
July through September 2020

Chemical Name	Sample Date	Value	Detlim	Units	Depth	Qual
Perfluoropentanoic acid (PFPeA)	9/18/2020	6.47	1.8	NG/L	107.5	
Fluorotelomer sulfonate 6:2 (6:2 FTS)	9/18/2020	13.8	3.32	NG/L	117.5	
Perfluorobutanesulfonate (PFBS)	9/18/2020	2.16	1.56	NG/L	117.5	
Perfluorobutyric acid (PFBA)	9/18/2020	9.74	1.75	NG/L	117.5	
Perfluoroheptanoic acid (PFHpA)	9/18/2020	3.56	1.75	NG/L	117.5	
Perfluorohexanesulfonate (PFHxS)	9/18/2020	8.15	1.59	NG/L	117.5	
Perfluorohexanoic acid (PFHxA)	9/18/2020	6.34	1.75	NG/L	117.5	
Perfluorooctanesulfonate (PFOS)	9/18/2020	8.63	1.75	NG/L	117.5	
Perfluorooctanoic acid (PFOA)	9/18/2020	8.77	1.75	NG/L	117.5	
Perfluoropentanesulfonate (PFPeS)	9/18/2020	1.1	1.64	NG/L	117.5	J
Perfluoropentanoic acid (PFPeA)	9/18/2020	4.66	1.75	NG/L	117.5	
Fluorotelomer sulfonate 6:2 (6:2 FTS)	9/18/2020	13.7	3.39	NG/L	127.5	
Perfluorobutanesulfonate (PFBS)	9/18/2020	2.13	1.59	NG/L	127.5	
Perfluorobutyric acid (PFBA)	9/18/2020	11.2	1.78	NG/L	127.5	
Perfluoroheptanoic acid (PFHpA)	9/18/2020	7.21	1.78	NG/L	127.5	
Perfluorohexanesulfonate (PFHxS)	9/18/2020	7.17	1.62	NG/L	127.5	
Perfluorohexanoic acid (PFHxA)	9/18/2020	15.9	1.78	NG/L	127.5	
Perfluorononanoic acid (PFNA)	9/18/2020	0.883	1.78	NG/L	127.5	J
Perfluorooctanesulfonate (PFOS)	9/18/2020	9.05	1.78	NG/L	127.5	
Perfluorooctanoic acid (PFOA)	9/18/2020	7.93	1.78	NG/L	127.5	
Perfluoropentanesulfonate (PFPeS)	9/18/2020	0.682	1.68	NG/L	127.5	J
Perfluoropentanoic acid (PFPeA)	9/18/2020	11.9	1.78	NG/L	127.5	
Fluorotelomer sulfonate 6:2 (6:2 FTS)	9/18/2020	14.7	3.35	NG/L	137.5	
Perfluorobutanesulfonate (PFBS)	9/18/2020	2.41	1.57	NG/L	137.5	
Perfluorobutyric acid (PFBA)	9/18/2020	10.8	8.81	NG/L	137.5	D
Perfluoroheptanoic acid (PFHpA)	9/18/2020	6.77	1.76	NG/L	137.5	
Perfluorohexanesulfonate (PFHxS)	9/18/2020	6.73	1.6	NG/L	137.5	
Perfluorohexanoic acid (PFHxA)	9/18/2020	15.6	1.76	NG/L	137.5	
Perfluorononanoic acid (PFNA)	9/18/2020	0.606	1.76	NG/L	137.5	J
Perfluorooctanesulfonate (PFOS)	9/18/2020	8.01	1.76	NG/L	137.5	
Perfluorooctanoic acid (PFOA)	9/18/2020	8.08	1.76	NG/L	137.5	
Perfluoropentanesulfonate (PFPeS)	9/18/2020	0.848	1.66	NG/L	137.5	J
Perfluoropentanoic acid (PFPeA)	9/18/2020	11.5	1.76	NG/L	137.5	
Fluorotelomer sulfonate 6:2 (6:2 FTS)	9/17/2020	33.5	3.44	NG/L	147.5	
Perfluorobutanesulfonate (PFBS)	9/17/2020	1.93	1.61	NG/L	147.5	
Perfluorobutyric acid (PFBA)	9/17/2020	11.8	1.81	NG/L	147.5	
Perfluoroheptanoic acid (PFHpA)	9/17/2020	7.16	1.81	NG/L	147.5	
Perfluorohexanesulfonate (PFHxS)	9/17/2020	6.9	1.65	NG/L	147.5	
Perfluorohexanoic acid (PFHxA)	9/17/2020	19.4	1.81	NG/L	147.5	
Perfluorooctanesulfonate (PFOS)	9/17/2020	7.43	1.81	NG/L	147.5	
Perfluorooctanoic acid (PFOA)	9/17/2020	7.56	1.81	NG/L	147.5	

Table 17-3
BGRR Temporary Well Data "Hits Only"
July through September 2020

Chemical Name	Sample Date	Value	Detlim	Units	Depth	Qual
Perfluoropentanesulfonate (PFPeS)	9/17/2020	0.879	1.7	NG/L	147.5	J
Perfluoropentanoic acid (PFPeA)	9/17/2020	13.3	1.81	NG/L	147.5	
Fluorotelomer sulfonate 6:2 (6:2 FTS)	9/17/2020	42.3	3.3	NG/L	157.5	
Perfluorobutanesulfonate (PFBS)	9/17/2020	1.56	1.55	NG/L	157.5	
Perfluorobutyric acid (PFBA)	9/17/2020	8.7	1.74	NG/L	157.5	
Perfluoroheptanoic acid (PFHpA)	9/17/2020	3.09	1.74	NG/L	157.5	
Perfluorohexanesulfonate (PFHxS)	9/17/2020	5.61	1.58	NG/L	157.5	
Perfluorohexanoic acid (PFHxA)	9/17/2020	6.83	1.74	NG/L	157.5	
Perfluorooctanesulfonate (PFOS)	9/17/2020	5.29	1.74	NG/L	157.5	
Perfluorooctanoic acid (PFOA)	9/17/2020	6.61	1.74	NG/L	157.5	
Perfluoropentanesulfonate (PFPeS)	9/17/2020	0.882	1.63	NG/L	157.5	J
Perfluoropentanoic acid (PFPeA)	9/17/2020	4.89	1.74	NG/L	157.5	

J = The associated numerical value was an estimated quantity.
D = Results are reported from a diluted aliquot of the sample.

Section 18

Q-3 2020 Quarterly Monitoring Summary
g-2 Source Area and Tritium Plume

1.0 Background

In November 1999, tritium was detected in the groundwater near the g-2 experiment at concentrations above the 20,000 pCi/L maximum contaminant level (MCL). Sodium-22 was also detected in the groundwater, but at concentrations well below the 400 pCi/L MCL. An investigation into the source of the contamination revealed that the tritium and sodium-22 originated from activated soil shielding located adjacent to the g-2 target building. Rainwater was able to infiltrate the activated soils and carry the tritium and sodium-22 into the groundwater. To prevent additional rainwater infiltration into the activated soil shielding, a concrete cap was constructed over the soil shielding in December 1999.

Following the concurrence of the NYSDEC, a Record of Decision (ROD) was signed by the U.S. DOE and U.S. EPA in early 2007. This ROD requires continued routine inspection and maintenance of the impermeable cap, groundwater monitoring of the source area to verify the continued effectiveness of the storm water controls and monitoring the tritium plume until it attenuates to less than the 20,000 pCi/L MCL.

2.0 Monitoring Activities

Surveillance of groundwater quality is accomplished using five wells located immediately downgradient of the source area, and 10 wells located further downgradient, southeast of AGS facility Building 912. The monitoring frequency for five wells located immediately downgradient of the source area wells is semi-annual, with samples collected during the 2nd and 4th quarters of the year. The 10 wells located downgradient of Building 912 are sampled during the 4th quarter.

Source Area Monitoring Results:

No groundwater samples were collected during the 3rd Quarter 2020. During the 2nd Quarter 2020 sampling period, the maximum tritium concentration in source area monitoring wells was 31,900 pCi/L in well 054-185 (Figure 18-1). The overall reductions in tritium concentrations observed in source area monitoring wells indicate that the cap is effectively preventing rainwater infiltration into the activated soil shielding and the amount of residual tritium that is available to be flushed out of the deep vadose zone is decreasing.

3.0 Recommendations

- Continue to sample the five monitoring wells directly downgradient of the source area (near Building 912A) semiannually (2nd and 4th Quarters), and the 10 wells located near Building 912 annually (4th Quarter).
- Continue scheduled inspections and perform required maintenance of the g-2 cap.

- Monitoring results will be communicated to the regulatory agencies via quarterly and annual reports.

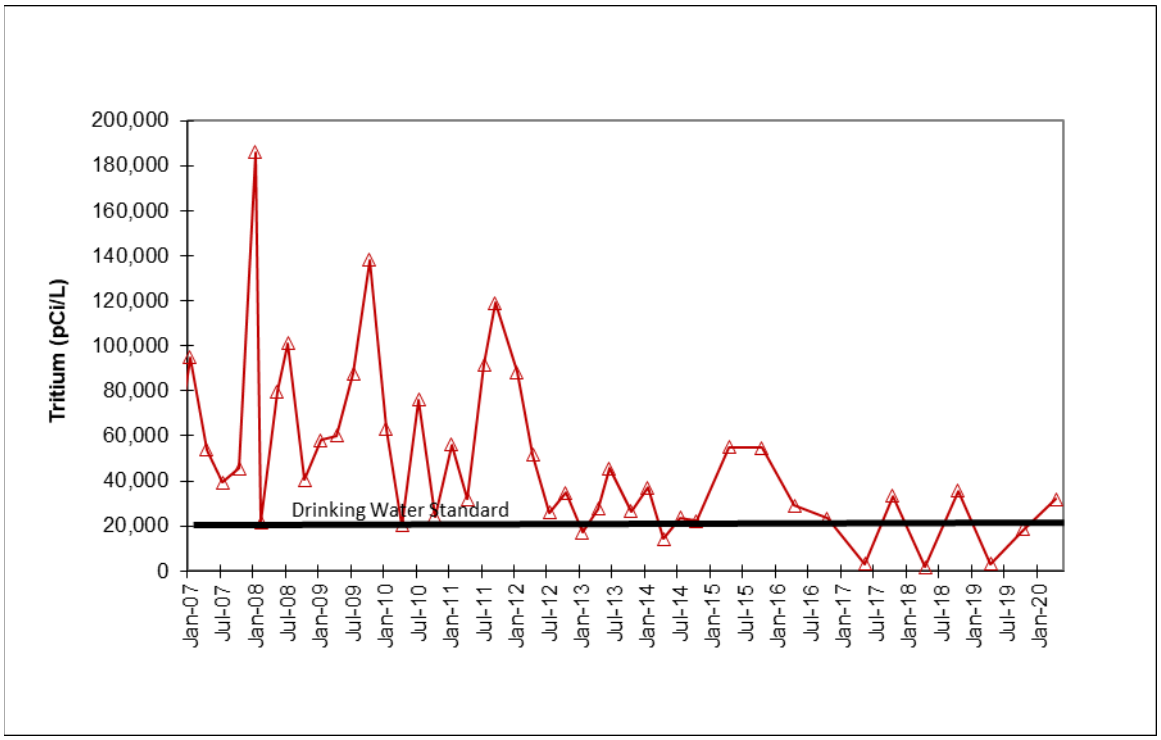


Figure 18-1. Maximum tritium concentrations observed from January 2007 through April 2020 in groundwater downgradient of the g-2 source area.

Section 19

Q-3 2020 Quarterly Monitoring Summary
BLIP Source Area

1.0 Background

The Brookhaven Linac Isotope Producer (BLIP) is an active accelerator facility located in the central portion of the site. The BLIP facility has been in operation since 1972 and is a national resource for producing the radioisotopes that are crucial in nuclear medicine for both research and clinical use. BLIP also supports BNL's research on diagnostic and therapeutic radiopharmaceuticals.

Beam line operations have resulted in the activation of soils that surround the BLIP target vessel. These activated soils are approximately 30 feet below the BLIP building, in a small zone surrounding the target vessel. In 1998, low levels of tritium were detected in the groundwater near the BLIP facility experiment at concentrations of approximately three times the 20,000 pCi/L MCL. Sodium-22 was also detected in the groundwater, but the levels were less than the 400 pCi/L MCL. A number of corrective actions were implemented in 1998 to prevent additional rainwater from entering the activated soil. These included repairing and reconfiguring the building's roof gutters and downspouts, resealing the paved areas south of the building, and installing a concrete cap in the remaining areas around the building. In 2000, a colloidal silica grout was injected into the activated soil to further immobilize the tritium and sodium-22, and in 2004 an additional impermeable cap was constructed over the beam line that runs from the Linac to the BLIP facility.

Following the concurrence of the NYSDEC, a Record of Decision (ROD) was signed by the U.S. DOE and U.S. EPA in early 2007. This ROD requires continued routine inspection and maintenance of the impermeable cap and groundwater monitoring to verify the continued effectiveness of the storm water controls.

2.0 Monitoring Activities

Three groundwater monitoring wells are positioned immediately downgradient of the BLIP facility. The wells are currently monitored on a semi-annual basis (during the 2nd and 4th Quarters).

Monitoring Results:

No groundwater samples were collected during the 3rd Quarter 2020. During the 2nd Quarter 2020 sample period, the maximum tritium concentration was detected in downgradient well 064-67 at a concentration of 2,070 pCi/L. Since early 2006, tritium concentrations in the groundwater downgradient of BLIP have been continually less than the 20,000 pCi/L MCL (Figure 19-1). The overall reductions in tritium concentrations observed in the source area wells since 2006 indicate that the cap is effectively preventing rainwater infiltration into the activated soil shielding and the amount of residual tritium that is available to be flushed out of the deep vadose zone is decreasing.

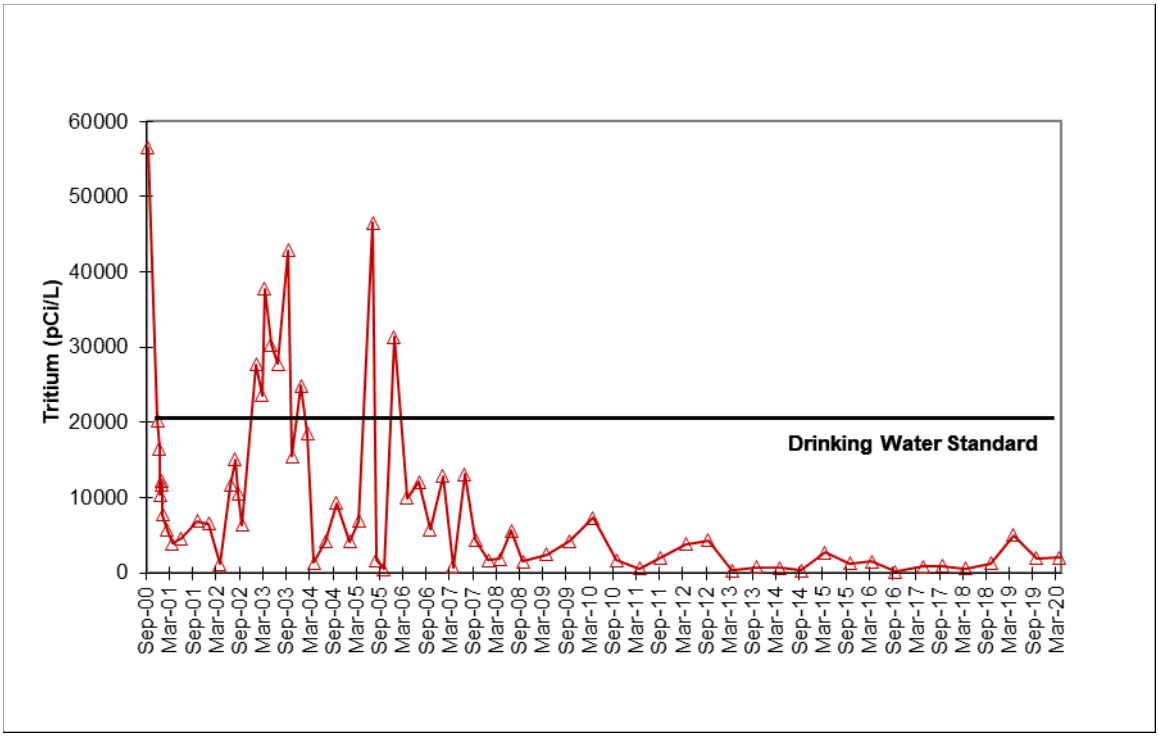


Figure 19-1. Maximum tritium concentrations observed from 2000 through April 2020 in groundwater immediately downgradient of the BLIP Facility.

3.0 Recommendations

The following are recommendations for the BLIP facility:

- Continue monitoring the three wells immediately downgradient of BLIP for tritium on a semiannual basis (2nd and 4th Quarters).
- Continue scheduled inspections and perform required maintenance of the BLIP cap.
- Monitoring results will continue to be communicated to the regulatory agencies via quarterly and annual reports.

Section 20
Q3-2020 Operations Summary
OU III Building 452 Freon-11 Pump & Treat System
(System Closed)

Process: Groundwater extraction and air stripping treatment, with discharge to a drainage culvert leading to Recharge Basin HS.

Goal: Remediation of Freon-11 in the groundwater and reach Maximum Contaminant Levels (MCLs) in core monitoring wells within 30 years for the Upper Glacial aquifer (by 2030). NYSDEC and EPA approved of the Petition for Closure in August and September 2019, respectively.

Start Date: March 2012

Table 20-1
OU III Building 452 Freon-11 Pump & Treat System
Pumping Rate (gpm)

Extraction Well	**EW-18**
Site Id #	095-316
Screened Interval (feet below grade)	55-65
Desired Flow Rate (GPM)	0*
July	0*
August	0*
September	0*
Actual (Avg. over Qtr.)	0*

* The system was approved for closure in September 2019.

Figure 20-1
OU III Building 452 Freon-11 Pump & Treat System
Cumulative Mass Removal of Trichlorofluoromethane vs. Time

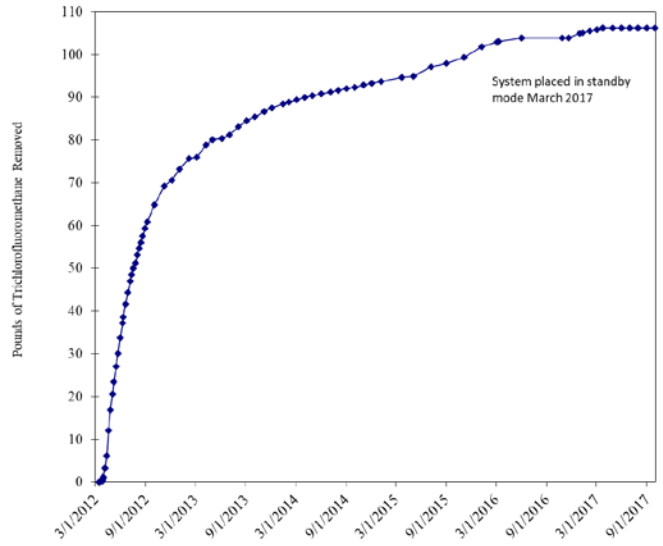


Figure 20-2
OU III Building 452 Freon-11 Pump & Treat System
Influent Trichlorofluoromethane Concentrations vs. Time

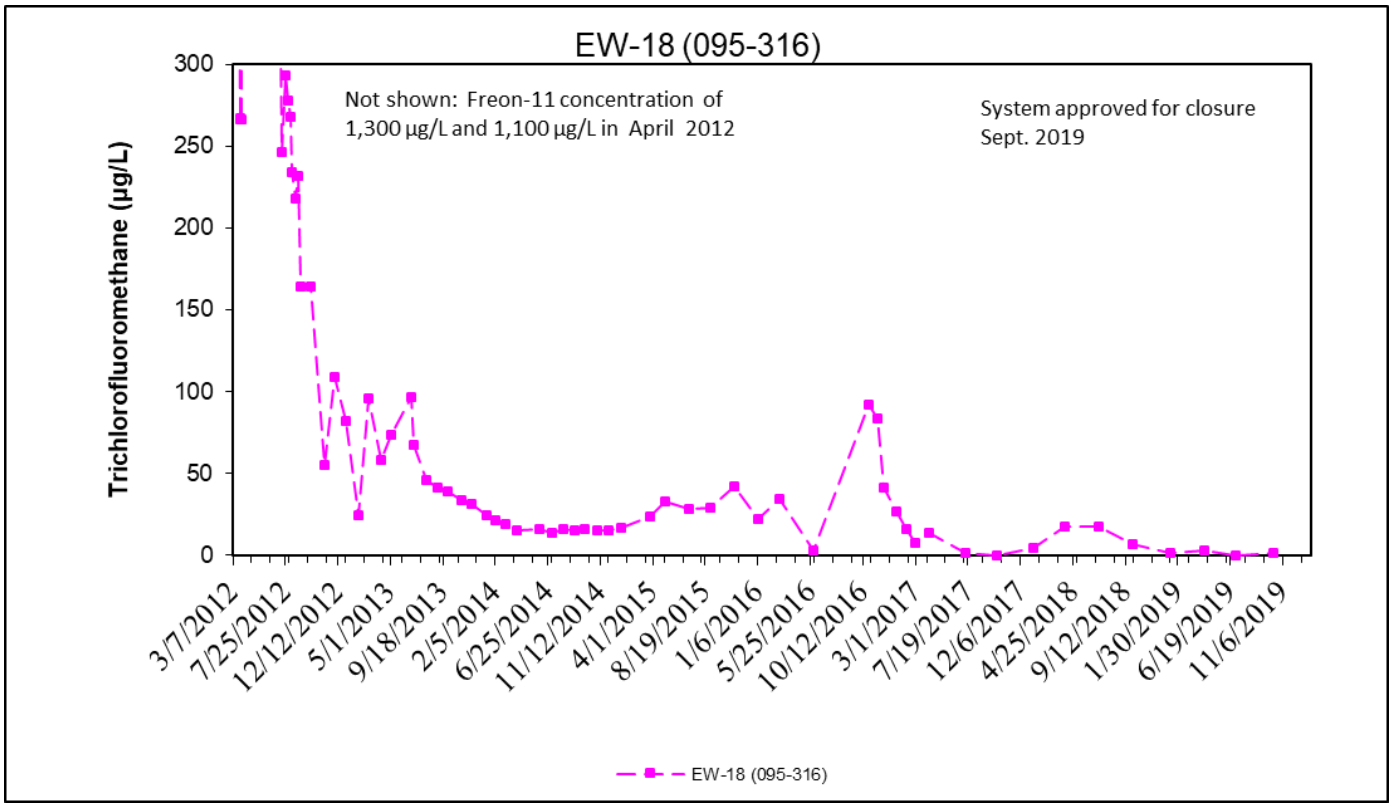


Table 20-2
Effluent Water Quality
SPDES Equivalency Permit Concentrations July 1, 2020 – September 30, 2020

Parameter	Permit Limit	Max. Measured Value	Units	Frequency*
Flow	**120**	**NA**	**GPM**	**Continuous**
pH (range)	**5.0 - 8.5**	**NA**	**SU**	**Weekly**
Benzene	**1.0**	**NA**	**ug/L**	**Monthly**
Bromodichloromethane	**50**	**NA**	**ug/L**	**Monthly**
Carbon Tetrachloride	**5.0**	**NA**	**ug/L**	**Monthly**
Chloroform	**7.0**	**NA**	**ug/L**	**Monthly**
Dichlorodifluoromethane	**5.0**	**NA**	**ug/L**	**Monthly**
1,1-Dichloroethylene	**5.0**	**NA**	**ug/L**	**Monthly**
4-Isopropyltoluene	**5.0**	**NA**	**ug/L**	**Monthly**
Methyl Chloride	**5.0**	**NA**	**ug/L**	**Monthly**
Methylene Chloride	**5.0**	**NA**	**ug/L**	**Monthly**
Tetrachloroethylene	**5.0**	**NA**	**ug/L**	**Monthly**
Toluene	**5.0**	**NA**	**ug/L**	**Monthly**
1,2,3-Trichlorobenzene	**5.0**	**NA**	**ug/L**	**Monthly**
1,1,1-Trichloroethane	**5.0**	**NA**	**ug/L**	**Monthly**
Trichlorofluoromethane	**5.0**	**NA**	**ug/L**	**Monthly**
1,2,4-Trimethylbenzene	**5.0**	**NA**	**ug/L**	**Monthly**
Xylene (meta + para)	**10.0**	**NA**	**ug/L**	**Monthly**

NA = Not analyzed. The system is closed.

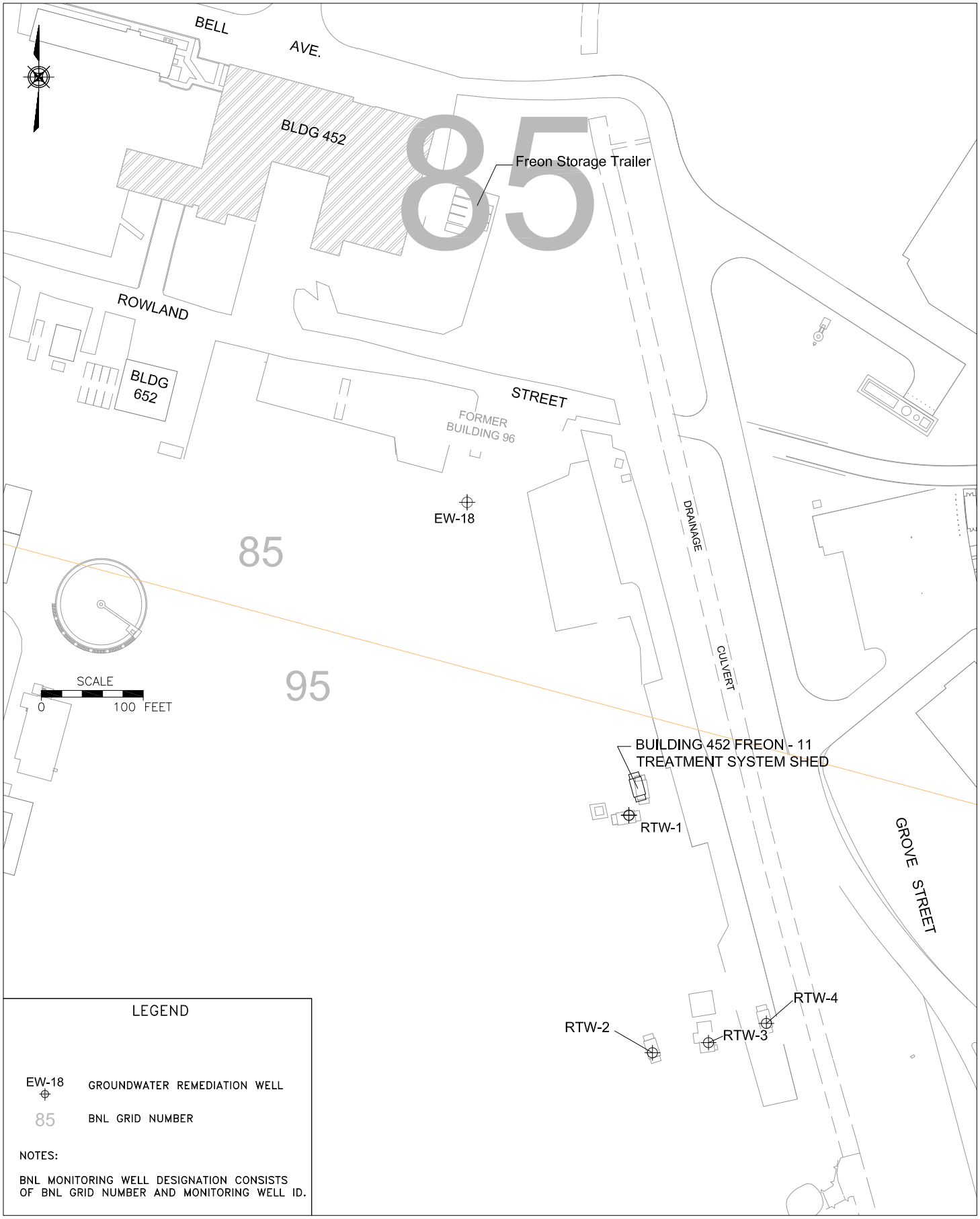
Note: Starting in June 2019, the flow from Bldg. 96 RTW-1 was increased to 60 gallons per minute and the water is being treated at the Building 452 Freon-11 treatment system due to the larger capacity of this system. Beginning with the July 2019 Discharge Monitoring Report (DMR), the RTW-1 discharge is formally reported under the Freon-11 Equivalency Permit.

System Operations

July through September 2020:
Treatment for the former Freon-11 plume is complete. The air stripping treatment system is being used to treat the water from Building 96 extraction well RTW-1.

Planned Operational Changes

- Postpone decisions to abandon extraction well EW-18 and the remaining monitoring wells until the PFAS plume originating from the former firehouse area has been fully characterized and a determination is made on their utilization related to emerging contaminants.
- Maintain full-time operation of the Building 96 treatment well RTW-1. Continue to report the RTW-1 discharge under the Freon-11 equivalency permit discharge monitoring report.



BROOKHAVEN NATIONAL LABORATORY

ENVIRONMENTAL PROTECTION DIVISION

TITLE:

BUILDING 452 AREA FREON-11 MONITORING WELL NETWORK

SITEWIDE REMEDIATION SYSTEMS
THIRD QUARTER 2020 OPERATIONS REPORT

DWN:	VT: HZ.:	DATE:	PROJECT NO.:
AJZ	–	08/24/12	
CHKD:	APPD:	REV.:	NOTES:
LDS	––	10/20/20	––

FIGURE NO.: 20-3