Groundwater Remediation Systems

Quarterly Operations Report

July 1, 2021 through September 30, 2021

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

November 2021

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3rd Quarter Groundwater Remediation System Operations Report
July 1, 2021 through September 30, 2021
Brookhaven National Laboratory
Upton, Long Island, New York

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Section 1

System Operations Overview 3rd Quarter 2021

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- 8	Closure Approved 9/19	0 369
Operable Unit III						
South Boundary	Pump and Treat (AS)	VOC	8	24	92%PP	2.5 3,068
HFBR Pump and Recharge	Pump and Recirculate	Tritium	4	Operate- 9 Standby- 15	Closure Approved 3/19	NA 180
Industrial Park	Recirculation/ In-Well (AS/Carbon)/ Pump and Treat (Carbon)	VOC VOC	7 2	Operate- 16 Standby- 6 Operate- 4 Standby-2	Standby Standby	0 1066 0 10
Building 96	Recirculation Well (AS/Carbon)	VOC	4	Operate- 17 Standby- 3	100%	0.2 145
Middle Road	Pump and Treat (AS)	VOC	7	20	41%	4.5 1323
Western South Boundary	Pump and Treat (AS)	VOC	6	19	92%	4.2 175
North Street	Pump and Treat (Carbon)	VOC	2	Operate – 11 Standby - 5	Closure Approved 3/20	NA 342
North Street East	Pump and Treat (Carbon)	VOC/EDB	4	Operate – 11 Standby - 6	99%	0.5 46
LIPA/Airport	Pump and Treat (Carbon)	VOC	10	17	100%	2.2 491
Industrial Park East	Pump and Treat (Carbon)	VOC	2	Operate- 5 Standby- 4	Dismantled 2013	NA 38
Chemical Holes	Pump and Treat (IE)	Sr-90	3	Operate - 15 Standby- 3	Standby	NA
BGRR/WCF	Pump and Treat (IE)	Sr-90	9	16	100% 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	17	82%	NA*

AS = air stripping
IE = ion exchange
EDB = ethylene dibromide
NA = not applicable
PP = system is pulse pumping
* EDB has only been detected in the influent at trace levels, just above standard, therefore no removal is reported.

Section 2

Q3-2021 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

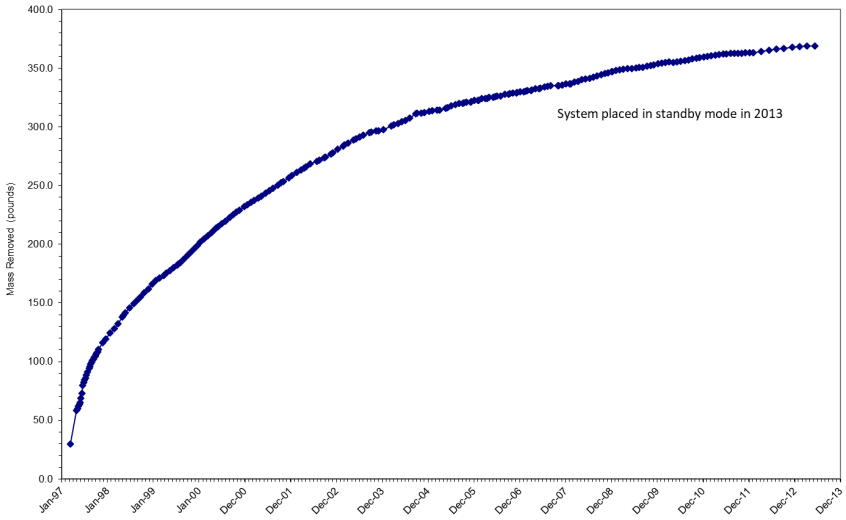


Figure 2-2
OU I South Boundary Pump & Treat System
Influent TVOC Concentrations vs. Time

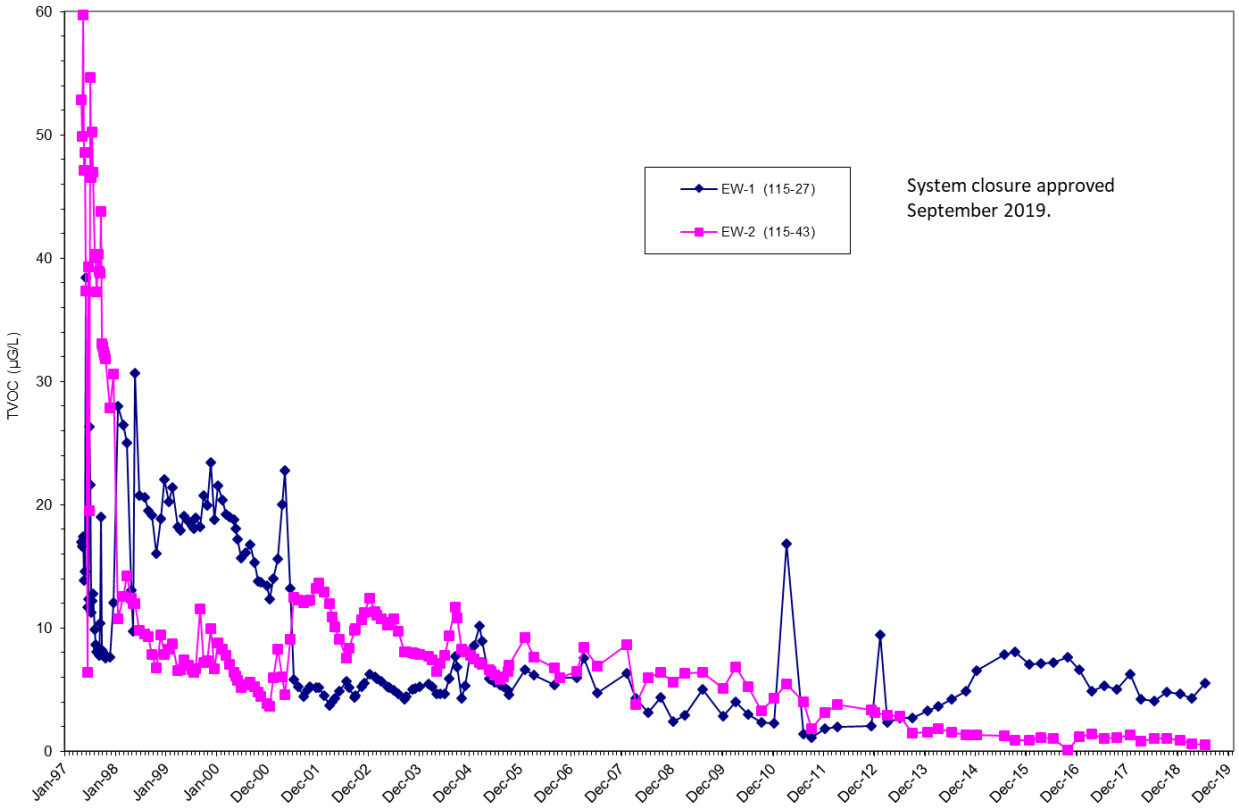


Table 2-2
Effluent Water Quality
SPDES Equivalency Permit Concentrations July 1 through September 30, 2021

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

[1] The system is closed.

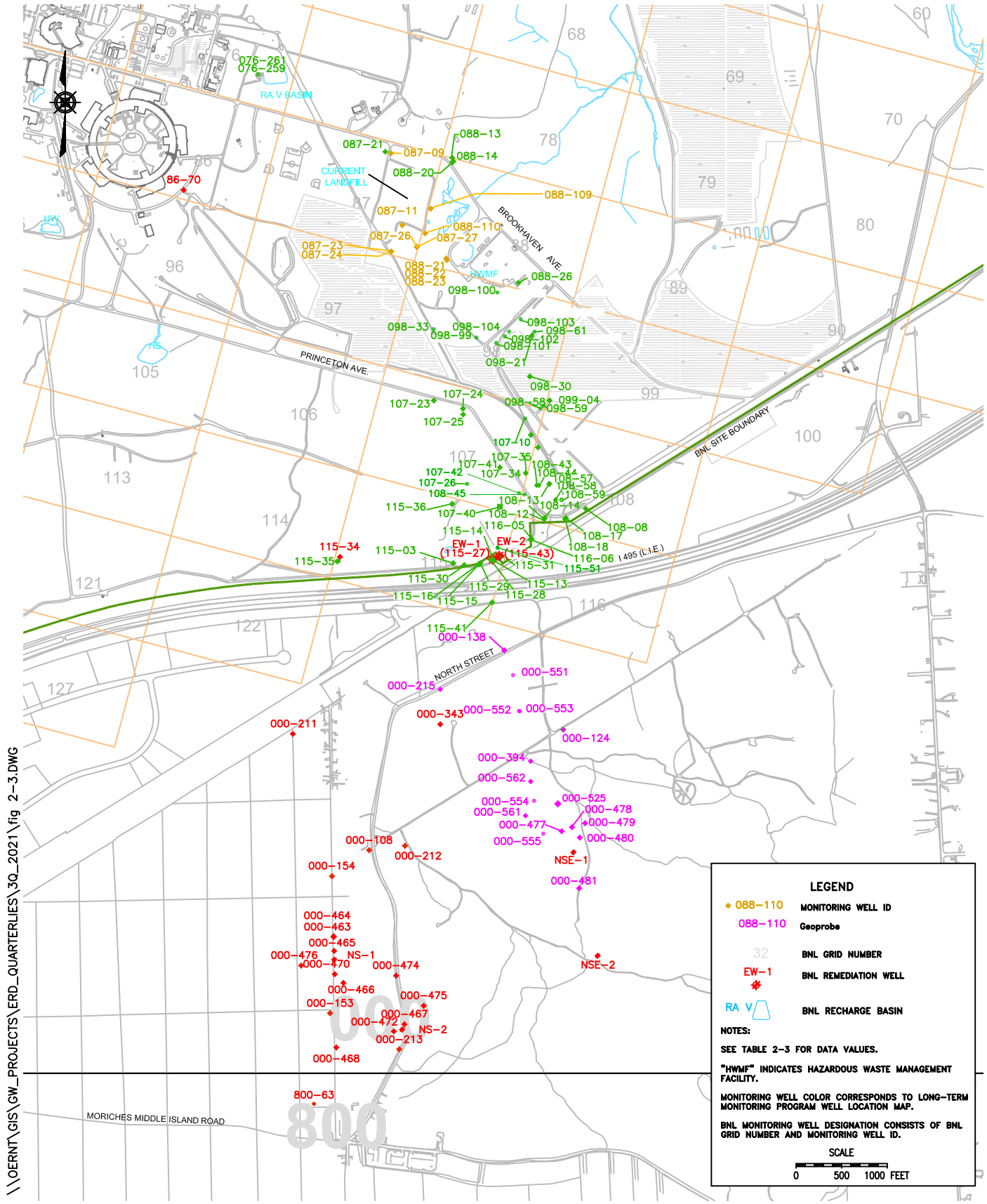
System Operations

July through September 2021:

The system remained closed.

Planned Operational Changes

- Maintain the VOC post-closure groundwater monitoring program of an annual sample collection from post-closure wells: 107-40, 107-41, 115-13, 115-16, and 115-51. Maintain quarterly sampling of Current Landfill well 088-109 and sentinel well 098-99.
- Install temporary wells as needed to fill monitoring data gaps and characterize the extent of the Sr-90 plume.



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ENVIRONMENTAL PROTECTION DIVISION

TITLE:

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

SITEWIDE REMEDIATION SYSTEMS
THIRD QUARTER 2021 OPERATIONS REPORT

DWN:	VT: HZ.:	DATE:	PROJECT NO.:
JEB	–	08/08/11	NA
CHKD:	APPD:	REV.:	NOTES:
LDS	––	10/19/21	–

FIGURE NO.: 2-3

Table 2-3
OU I RA V South Boundary - Current Landfill Monitoring Well Data - Current Landfill
'Hits Only' July through September 2021

Site ID : 087-23

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	7/28/2021	0.68	--	--	UG/L	32.5	
Benzene	7/28/2021	0.47	0.5	--	UG/L	32.5	J
o-Chlorotoluene	7/28/2021	0.21	0.5	--	UG/L	32.5	J

Site ID : 088-109

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	7/28/2021	0.79	--	--	UG/L	13.5	
Chloroethane	7/28/2021	0.79	0.5	--	UG/L	13.5	J

Site ID : 088-110

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	7/28/2021	4.44	--	--	UG/L	17.5	
1,1-Dichloroethane	7/28/2021	1.37	0.5	--	UG/L	17.5	
Benzene	7/28/2021	0.51	0.5	--	UG/L	17.5	J
Chloroethane	7/28/2021	2.56	0.5	--	UG/L	17.5	

Table 2-3
OU I RA V South Boundary Monitoring Well Data
'Hits Only' July through September 2021

Site ID : 087-21

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Sodium-22	8/11/2021	5.88	3.33	3.33	PCI/L	130	N2

Site ID : 088-109

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	7/28/2021	0.79	--	--	UG/L	13.5	
Chloroethane	7/28/2021	0.79	0.5	--	UG/L	13.5	J

Site ID : 088-14

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Cobalt-57	8/11/2021	6.34	4.32	3.88	PCI/L	80	N2

Site ID : 088-26

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	9/13/2021	3.09	0.2	0.385	PCI/L	18	

Site ID : 098-100

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	9/13/2021	38.7	0.205	3.31	PCI/L	12.5	

Site ID : 098-103

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	8/10/2021	45.1	0.232	3.85	PCI/L	20	

Site ID : 098-104

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	8/10/2021	28.9	0.604	2.73	PCI/L	20	

Site ID : 098-21

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	8/10/2021	1.89	0.417	0.401	PCI/L	28.8	

Site ID : 098-30

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	9/14/2021	32.7	0.204	2.82	PCI/L	37.8	

Site ID : 107-34

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	8/5/2021	1.58	0.218	0.278	PCI/L	55	

Site ID : 107-35

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	8/5/2021	4.75	0.41	0.676	PCI/L	65	

Site ID : 107-40

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	8/4/2021	2.19	--	--	UG/L	145	

Table 2-3
OU I RA V South Boundary Monitoring Well Data
'Hits Only' July through September 2021

Site ID : 107-40

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1-Dichloroethane	8/4/2021	1.5	0.5	--	UG/L	145	
Chloroethane	8/4/2021	0.69	0.5	--	UG/L	145	

Site ID : 108-12

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Cesium-137	8/9/2021	5.73	4.48	4.27	PCI/L	68	N2

Site ID : 108-13

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Cesium-137	8/9/2021	7.84	6.67	6.2	PCI/L	55	N2
Strontium-90	8/9/2021	0.314	0.253	0.17	PCI/L	55	N2

Site ID : 108-17

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Co-60	8/10/2021	9.11	5.63	6.06	PCI/L	75	N2
Strontium-90	8/10/2021	0.308	0.248	0.168	PCI/L	75	N2

Site ID : 108-43

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	8/6/2021	4.08	0.252	0.498	PCI/L	65	

Site ID : 108-44

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	8/6/2021	0.205	0.198	0.132	PCI/L	55	N2

Site ID : 108-45

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	8/6/2021	1.13	0.216	0.232	PCI/L	69.5	

Site ID : 108-57

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	8/6/2021	7.06	0.259	0.758	PCI/L	70	

Site ID : 108-58

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	8/5/2021	5.75	0.22	0.629	PCI/L	70	

Site ID : 115-13

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	8/12/2021	1.8	--	--	UG/L	145	
Chloroform	8/12/2021	1.4	0.5	--	UG/L	145	
Tetrachloroethylene	8/12/2021	0.17	0.5	--	UG/L	145	J

Table 2-3
OU I RA V South Boundary Monitoring Well Data
'Hits Only' July through September 2021

Site ID : 115-13

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Trichloroethylene	8/12/2021	0.23	0.5	--	UG/L	145	J

Site ID : 115-16

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	8/12/2021	2.9	--	--	UG/L	130	
1,1-Dichloroethane	8/12/2021	1.5	0.5	--	UG/L	130	
Chloroethane	8/12/2021	1.4	0.5	--	UG/L	130	

Site ID : 115-30

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Cesium-137	8/13/2021	6.78	6.67	6.1	PCI/L	163	N2

Site ID : 116-06

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Sodium-22	8/11/2021	6.48	6.24	4.64	PCI/L	135	N2

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.

N2 = Data are not usable based on results that are not distinguishable from background. The reported value is less than or equal to the sum of the MDA and the uncertainty.

Section 3

Q3-2021 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 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: 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 (Avg monthly gpm)	0	87**	0	0	0	0	0	79**
August " "	0	0	0	0	0	0	0	150
September " "	0	113	0	0	0	0	0	133
Actual (Avg. over Qtr)	**0**	**100**	**0**	**0**	**0**	**0**	**0**	**121**

* 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).
** System down during first week of July 2021.

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

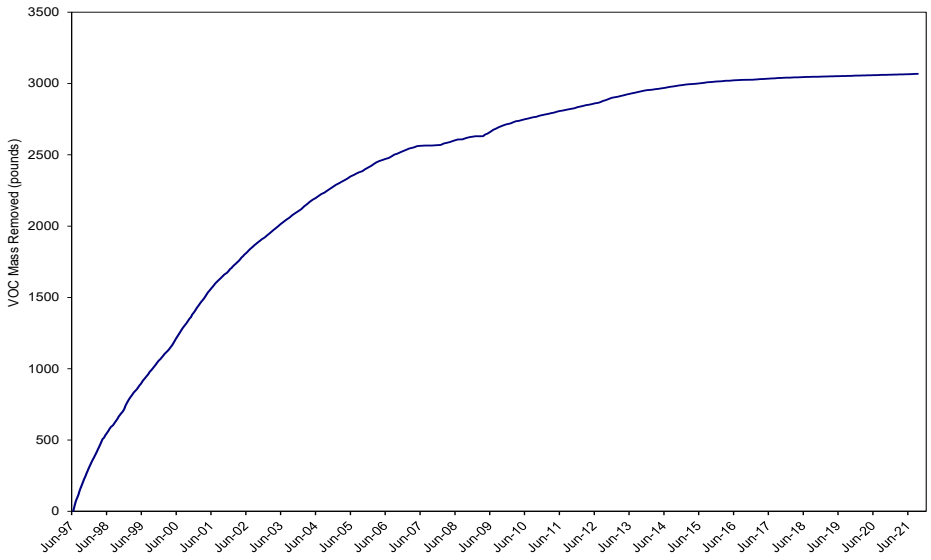


Figure 3-2
OU III South Boundary
Influent TVOC Concentration vs. Time

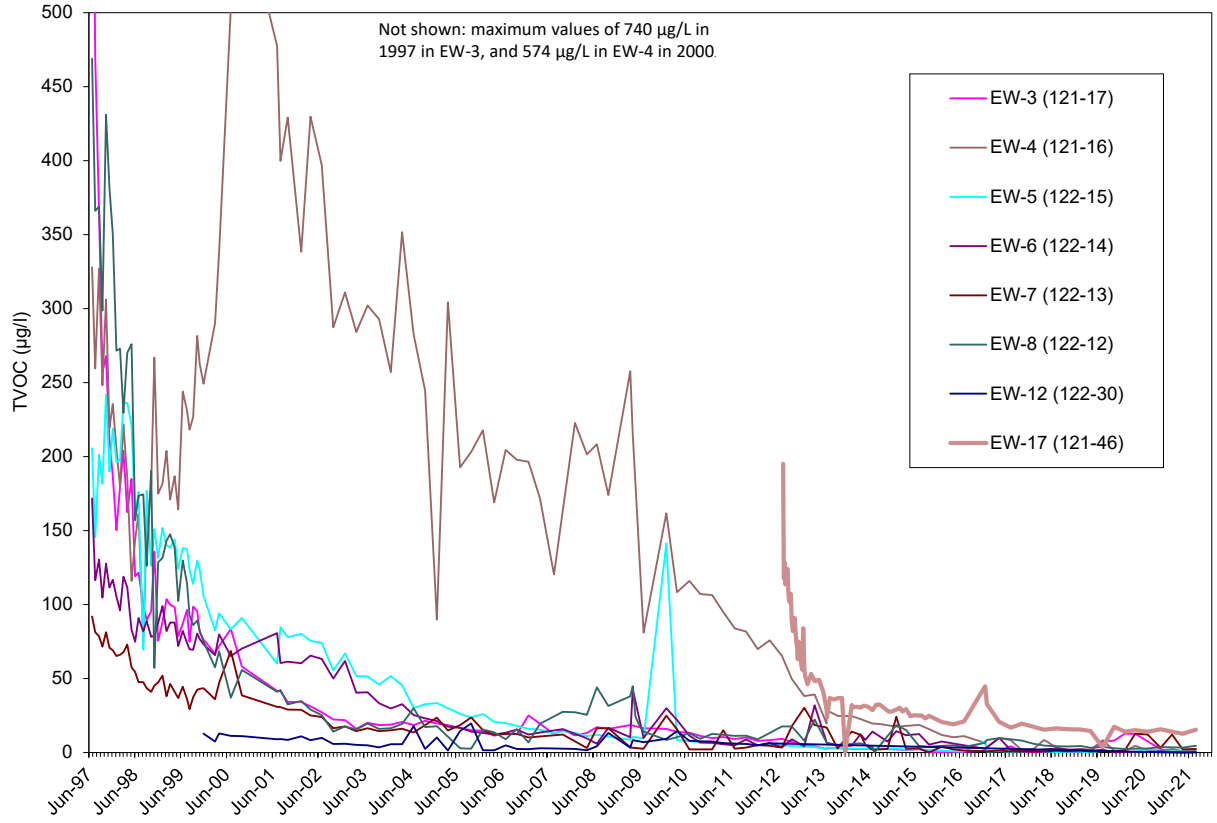


Table 3-2
OU III South Boundary Effluent Water Quality
SPDES Equivalency Permit Concentrations July 1 through September 30, 2021

Parameter	Permit Limit	Max. Measured Value	Units	Frequency
Flow	Monitor	1,234,743[1]	GPD	Continuous
pH (range)	6.5 - 8.5	7.4– 7.6[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, Middle Road, and Western South Boundary 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 2021:

The system was off at the end of the month for one week due to electrical repairs resulting from a lightning strike. Extraction well EW-4 was on 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 7 million gallons of water.

August 2021:

The system operated normally for the month. Extraction wells 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 million gallons of water.

September 2021:

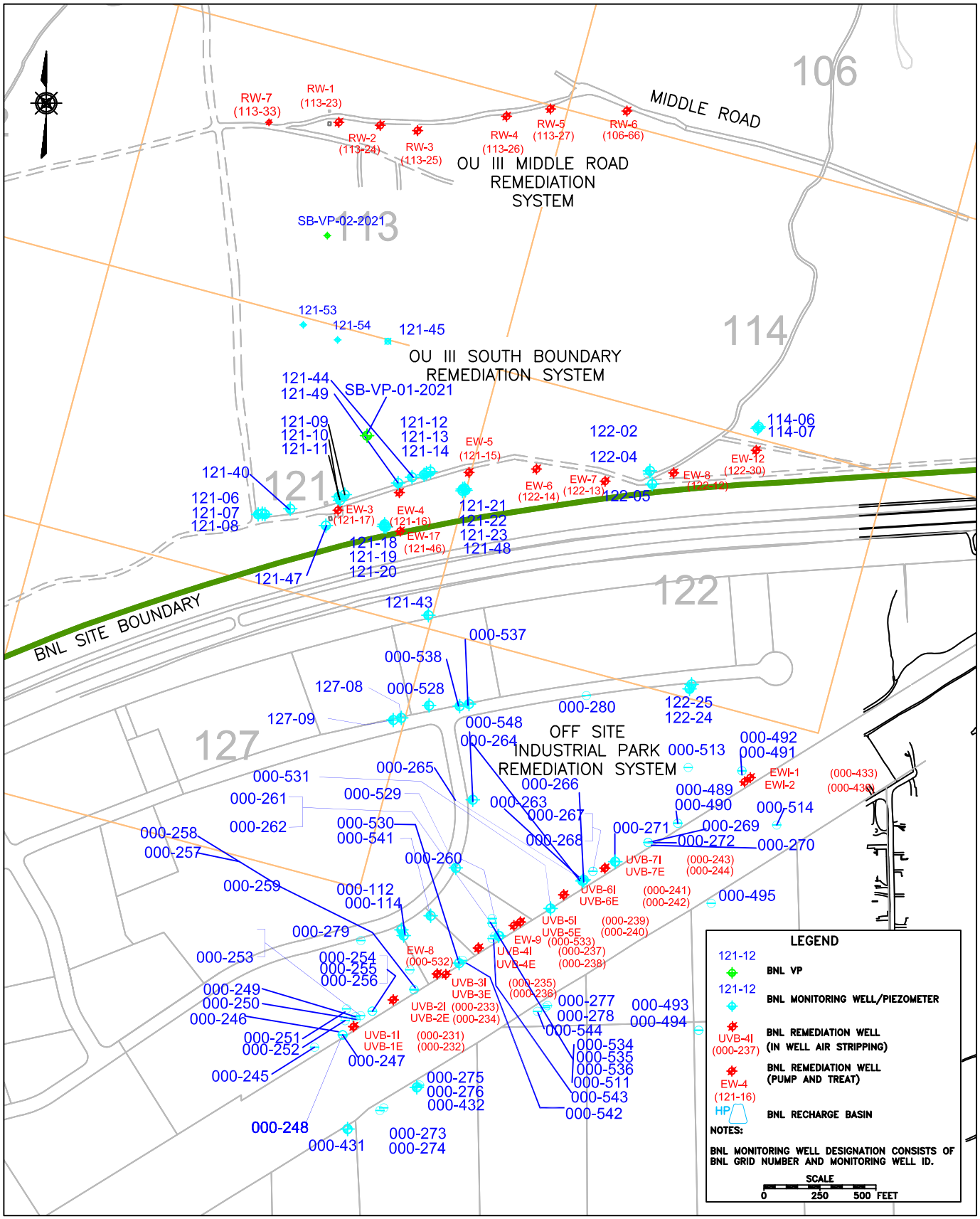
The system operated normally for the month. Extraction well EW-4 was on for pulsed pumping and EW-17 was in full time operation. Wells EW-3, EW-5, EW-6, EW-7, EW-8 and EW-12 remained in standby mode. The system treated approximately 11 million gallons of water.

The system treated approximately 24 million gallons of water during the third quarter of 2021.

As recommended in the 2020 Groundwater Status Report, in July and August 2021 two additional vertical profile wells (SB-VP-01-2021 and SB-VP-02-2021) were installed to provide updated groundwater quality data for modeling simulations for potential placement of an additional extraction well. The location of the profile wells is shown on Figure 3-3 and the analytical data detections are included in Table 3-7, 3-8 and 3-9. The maximum TVOC concentration was observed in SB-VP-01-2021 in the 215-220 feet bgs sample at 344 µg/L. The maximum 1,4 dioxane concentration was observed in SB-VP-01-2021 in the 215-220 feet bgs sample at 19 µg/L. The maximum PFOA concentration observed in SB-VP-01-2021 was in the 105-110 feet bgs sample at 13 ng/L. All PFOS samples collected were below 10 ng/L.

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-3, EW-5, EW-6, EW-7, and EW-8 and adjacent monitoring wells were less than 50 µg/L.
- Continue to operate well EW-17 on a full-time basis. Place well EW-4 into standby mode in the fourth quarter 2021. 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 292 µg/L.
- Perform groundwater modeling simulations to help evaluate the need for additional extraction wells to optimize the system and achieve cleanup goals.
- Install an additional extraction well downgradient of well 121-54 based on results of characterization and groundwater modeling.



\\OERNT\GIS\GW_PROJECTS\ERD_QUARTERLIES\3Q_2021\FIG 3-3.DWG

ENVIRONMENTAL PROTECTION DIVISION

TITLE: OU III SOUTH BOUNDARY/INDUSTRIAL PARK/INDUSTRIAL PARK EAST MONITORING WELL NETWORKS
SITEWIDE REMEDIATION SYSTEMS
THIRD QUARTER 2021 OPERATIONS REPORT

DWN:	VT:HZ.:	DATE:	PROJECT NO.:
JEB	–	09/12/14	–
CHKD:	APPD:	REV.:	NOTES:
LDS	–	10/19/21	–

FIGURE NO.: 3–3

Table 3-3
OU III South Boundary Monitoring Well Data
'Hits Only' July through September 2021

Site ID : 121-06

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/29/2021	1.1	--	--	UG/L	45.00	
Chloroform	07/29/2021	1.1	0.5	--	UG/L	45.00	

Site ID : 121-12

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/29/2021	1.9	--	--	UG/L	50.00	
Chloroform	07/29/2021	1.9	0.5	--	UG/L	50.00	

Site ID : 121-18

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/29/2021	1.5	--	--	UG/L	70.00	
Chloroform	07/29/2021	1.5	0.5	--	UG/L	70.00	

Site ID : 121-21

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/29/2021	0.44	--	--	UG/L	70.00	
Chloroform	07/29/2021	0.44	0.5	--	UG/L	70.00	J

Site ID : 121-45

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/27/2021	8.25	--	--	UG/L	199.50	
Carbon tetrachloride	07/27/2021	0.21	0.5	--	UG/L	199.50	J
Chloroform	07/27/2021	0.41	0.5	--	UG/L	199.50	J
Tetrachloroethylene	07/27/2021	7.1	0.5	--	UG/L	199.50	
Trichloroethylene	07/27/2021	0.53	0.5	--	UG/L	199.50	

Site ID : 121-49

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/29/2021	291.5	--	--	UG/L	215.00	
1,1,1-Trichloroethane	07/29/2021	1.1	0.5	--	UG/L	215.00	
1,1-Dichloroethylene	07/29/2021	1.1	0.5	--	UG/L	215.00	
Carbon tetrachloride	07/29/2021	44	0.5	--	UG/L	215.00	
Chloroform	07/29/2021	1.2	0.5	--	UG/L	215.00	
Tetrachloroethylene	07/29/2021	240	5	--	UG/L	215.00	D
Trichloroethylene	07/29/2021	4.1	0.5	--	UG/L	215.00	

Site ID : 121-53

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/28/2021	86.47	--	--	UG/L	229.00	

Table 3-3
OU III South Boundary Monitoring Well Data
'Hits Only' July through September 2021

Site ID : 121-53

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	07/28/2021	1.8	0.5	--	UG/L	229.00	
1,1-Dichloroethane	07/28/2021	0.78	0.5	--	UG/L	229.00	
1,1-Dichloroethylene	07/28/2021	2.2	0.5	--	UG/L	229.00	
Carbon tetrachloride	07/28/2021	9.4	0.5	--	UG/L	229.00	
Chloroform	07/28/2021	2.1	0.5	--	UG/L	229.00	
Dichlorodifluoromethane	07/28/2021	0.49	0.5	--	UG/L	229.00	J
Tetrachloroethylene	07/28/2021	68	2	--	UG/L	229.00	D
Trichloroethylene	07/28/2021	1.7	0.5	--	UG/L	229.00	

Site ID : 121-54

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/28/2021	116.98	--	--	UG/L	220.00	
1,1,1-Trichloroethane	07/28/2021	0.61	0.5	--	UG/L	220.00	
1,1-Dichloroethylene	07/28/2021	0.46	0.5	--	UG/L	220.00	J
Carbon tetrachloride	07/28/2021	26	0.5	--	UG/L	220.00	
Chloroform	07/28/2021	0.81	0.5	--	UG/L	220.00	
Tetrachloroethylene	07/28/2021	88	2	--	UG/L	220.00	D
Trichloroethylene	07/28/2021	1.1	0.5	--	UG/L	220.00	

Site ID : 122-10

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/29/2021	0.46	--	--	UG/L	154.50	
Chloroform	07/29/2021	0.23	0.5	--	UG/L	154.50	J
Tetrachloroethylene	07/29/2021	0.23	0.5	--	UG/L	154.50	J

Table 3-4
OU III South Boundary Extraction Well Data
'Hits Only' July through September 2021

Site ID : 121-15 (EW-5)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/08/2021	0.59	--	--	UG/L	0.00	
1,1-Dichloroethane	07/08/2021	0.24	0.5	--	UG/L	0.00	J
Chloroform	07/08/2021	0.35	0.5	--	UG/L	0.00	J

Site ID : 121-16 (EW-4)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/08/2021	1.58	--	--	UG/L	0.00	
Chloroform	07/08/2021	0.38	0.5	--	UG/L	0.00	J
Tetrachloroethylene	07/08/2021	1.2	0.5	--	UG/L	0.00	

Site ID : 121-17 (EW-3)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/08/2021	0.46	--	--	UG/L	0.00	
Chloroform	07/08/2021	0.24	0.5	--	UG/L	0.00	J
Tetrachloroethylene	07/08/2021	0.22	0.5	--	UG/L	0.00	J

Site ID : 121-46 (EW-17)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/08/2021	15.51	--	--	UG/L	0.00	
1,1,1-Trichloroethane	07/08/2021	0.46	0.5	--	UG/L	0.00	J
1,1-Dichloroethylene	07/08/2021	0.43	0.5	--	UG/L	0.00	J
Carbon tetrachloride	07/08/2021	2.4	0.5	--	UG/L	0.00	
Chloroform	07/08/2021	0.7	0.5	--	UG/L	0.00	
Tetrachloroethylene	07/08/2021	11	0.5	--	UG/L	0.00	
Trichloroethylene	07/08/2021	0.52	0.5	--	UG/L	0.00	

Site ID : 122-12 (EW-8)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/08/2021	4.62	--	--	UG/L	0.00	
Chloroform	07/08/2021	0.19	0.5	--	UG/L	0.00	J
Methylene chloride	07/08/2021	0.73	0.5	--	UG/L	0.00	
Tetrachloroethylene	07/08/2021	3.3	0.5	--	UG/L	0.00	
Toluene	07/08/2021	0.2	0.5	--	UG/L	0.00	J
Trichloroethylene	07/08/2021	0.2	0.5	--	UG/L	0.00	J

Site ID : 122-13 (EW-7)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/08/2021	2.47	--	--	UG/L	0.00	

Table 3-4
OU III South Boundary Extraction Well Data
'Hits Only' July through September 2021

Site ID : 122-13 (EW-7)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	07/08/2021	0.27	0.5	--	UG/L	0.00	J
Chloroform	07/08/2021	0.3	0.5	--	UG/L	0.00	J
cis-1,2-Dichloroethylene	07/08/2021	0.81	0.5	--	UG/L	0.00	
Dichlorodifluoromethane	07/08/2021	0.22	0.5	--	UG/L	0.00	J
Tetrachloroethylene	07/08/2021	0.87	0.5	--	UG/L	0.00	

Site ID : 122-14 (EW-6)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/08/2021	0.38	--	--	UG/L	0.00	
Tetrachloroethylene	07/08/2021	0.38	0.5	--	UG/L	0.00	J

Table 3-5
OU III South Boundary Influent Data
'Hits Only' July through September 2021

Site ID : 121-41 (System Influent)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/08/2021	8.7	--	--	UG/L	0.00	
1,1,1-Trichloroethane	07/08/2021	0.27	0.5	--	UG/L	0.00	J
Carbon tetrachloride	07/08/2021	1.3	0.5	--	UG/L	0.00	
Chloroform	07/08/2021	0.51	0.5	--	UG/L	0.00	
Tetrachloroethylene	07/08/2021	6.3	0.5	--	UG/L	0.00	
Trichloroethylene	07/08/2021	0.32	0.5	--	UG/L	0.00	J
8260 TVOC	08/03/2021	15.33	--	--	UG/L	0.00	
1,1,1-Trichloroethane	08/03/2021	0.4	5	--	UG/L	0.00	J
1,1-Dichloroethylene	08/03/2021	0.38	5	--	UG/L	0.00	J
1,2-Dichloroethane	08/03/2021	0.13	5	--	UG/L	0.00	J
Carbon tetrachloride	08/03/2021	1.8	5	--	UG/L	0.00	J
Chloroform	08/03/2021	0.62	5	--	UG/L	0.00	J
Tetrachloroethylene	08/03/2021	12	5	--	UG/L	0.00	
8260 TVOC	09/13/2021	9.61	--	--	UG/L	0.00	
1,1,1-Trichloroethane	09/13/2021	0.19	0.5	--	UG/L	0.00	J
1,1-Dichloroethylene	09/13/2021	0.28	0.5	--	UG/L	0.00	J
Carbon tetrachloride	09/13/2021	1.2	0.5	--	UG/L	0.00	
Chloroform	09/13/2021	0.52	0.5	--	UG/L	0.00	
Tetrachloroethylene	09/13/2021	7.1	0.5	--	UG/L	0.00	
Trichloroethylene	09/13/2021	0.32	0.5	--	UG/L	0.00	J

Table 3-6
OU III South Boundary Effluent Data
'Hits Only' July through September 2021

Site ID : 095-126 (System Effluent)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/08/2021	0	--	--	UG/L	0.00	
8260 TVOC	08/03/2021	0	--	--	UG/L	0.00	
8260 TVOC	09/13/2021	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.

Table 3-7
OU III South Boundary
2021 Temporary Well Data

SB-VP-01-2021													
Sample Depth	**215-220**	**205-210**	**195-200**	**185-190**	**175-180**	**165-170**	**155-160**	**145-150**	**135-140**	**125-130**	**115-120**	**105-110**	**95-100**
Date sampled	**8/12/2021**	**8/12/2021**	**8/12/2021**	**8/12/2021**	**8/12/2021**	**8/12/2021**	**8/13/2021**	**8/13/2021**	**8/13/2021**	**8/13/2021**	**8/13/2021**	**8/13/2021**	**8/13/2021**
	ug/L	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**
Compound													
1,1,2,2-Tetrachloroethane	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	0.680 J	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethylene	5.58	2.42	1.6	-	-	-	-	-	-	-	-	-	-
Dichlorodifloromethane	-	-	-	-	-	-	-	-	-	-	-	-	-
MTBE	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	7.4	2.31	1.8	0.530 J	-	-	-	-	-	-	-	-	-
Carbon tetrachloride	38.8	1.69	0.880 J	-	-	-	-	-	0.430 J	-	-	-	-
Chloroform	1.55	0.610 J	0.720 J	0.570 J	0.450 J	-	-	0.470 J	0.570 J	0.500 J	-	-	-
Tetrachloroethylene	282 E	88.6	51.1	38.7	8.29	1.86	1.63	1.00	1.17	1.12	0.840 J	0.960 J	1.01
Trichloroethylene	7.8	2.02	0.910 J	1.44	-	-	-	-	-	-	-	-	-
TVOC total	343.81	97.65	57.01	41.24	8.74	1.86	1.63	1.47	2.17	1.62	0.84	0.96	1.01

SB-VP-02-2021													
Sample Depth	**215-220**	**205-210**	**195-200**	**185-190**	**175-180**	**165-170**	**155-160**	**145-150**	**135-140**	**125-130**	**115-120**	**105-110**	**95-100**
Date sampled	**8/16/2021**	**8/16/2021**	**8/17/2021**	**8/17/2021**	**8/17/2021**	**8/17/2021**	**8/17/2021**	**8/17/2021**	**8/18/2021**	**8/18/2021**	**8/18/2021**	**8/18/2021**	**8/18/2021**
	ug/L	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**
Compound													
1,1,2,2-Tetrachloroethane	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethylene	-	-	-	0.350 J	-	-	-	-	-	-	-	-	-
Dichlorodifloromethane	-	-	-	-	-	-	-	-	-	-	-	-	-
MTBE	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	-	-	0.350 J	0.350 J	-	-	-	-	1.31	-	-	-	-
1,1,1-Trichloroethane	-	-	-	0.390 J	-	-	-	-	-	-	-	-	-
Carbon tetrachloride	0.720 J	19.4	-	-	1.60	-	-	-	-	-	-	-	-
Chloroform	0.600 J	1.07	0.460 J	0.530 J	0.940 J	0.420 J	-	0.370 J	0.440 J	-	-	-	-
Tetrachloroethylene	0.81 J	32.8	2.35	40.8	8.80	3.08	64.3	34.5	6.52	5.17	4.91	1.58	2.60
Trichloroethylene	-	0.660 J	-	0.570 J	0.410 J	-	29.3	5.39	1.18	-	-	-	-
TVOC total	2.13	53.93	3.16	42.99	11.75	3.5	93.6	40.26	9.45	5.17	4.91	1.58	2.6

J: Estimated concentration.

E: Results are over the calibration range on the raw data.

Table 3-8

OUIII South Boundary
2021 Temporary Well Data
SB-VP-01-2021
Installed: August 12-13, 2021
Brookhaven National Laboratory

Sample Depth (BLS)	1,4-D (µg/L)	PFOS (ng/L)	PFOA (ng/L)	PFBS (ng/L)	PFBA (ng/L)	PFHpS (ng/L)	PFHpA (ng/L)	PFHxS (ng/L)	PFHxA (ng/L)	PFNA (ng/L)	PFOSAm (ng/L)	PFPeS (ng/L)	PFPeA (ng/L)	6:2 FTS (ng/L)
95-100	0.14 J	6.17	**11.3**	0.624J	10.4	1.69U	2.36	3.44	3.45	1.78U	1.78U	1.67U	1.78U	3.38U
105-110	0.14 J	5.26	**13**	0.711J	10.8	1.73U	3.43	3.69	4.71	1.82U	1.82U	1.72U	1.17J	3.47U
115-120	0.20 U	3.18	8.13	1.64U	10.3	1.75U	1.88	3.26	1.61J	1.84U	1.84U	1.73U	0.671J	3.50U
125-130	0.17 J	5.28	7.63	0.817J	18.4	1.73U	1.15J	5.77	0.947J	1.82U	1.82U	1.71U	1.82U	3.46U
135-140	0.20	2.52	3.94	1.60U	27.4	1.70U	1.79U	2.42	1.79U	1.79U	1.79U	1.69U	1.79U	3.41U
145-150	0.27	3.31	4.9	1.62U	26.6	1.73U	0.642J	3.07	1.82U	1.82U	1.82U	1.71U	1.82U	3.45U
155-160	0.27	3.08	3.19	1.60U	23	1.71U	1.80U	3.27	1.80U	1.80U	1.80U	1.69U	1.80U	3.41U
165-170	0.36	3.27	2.8	0.735J	20.9	1.70U	1.79U	3.89	1.79U	1.79U	1.79U	1.68U	1.79U	3.40U
175-180	**2.0**	2.88	3.91	0.935J	6.35	1.71U	1.80U	16.8	1.8	1.80U	1.80U	1.05J	1.80U	3.42
185-190	**2.7**	4.89	3.31	0.895J	6.27	1.71U	0.676J	17.5	1.94	1.80U	1.80U	0.865J	0.940J	3.41U
195-200	**4.7**	1.58J	0.835J	1.74	12.7	1.70U	1.79U	3.14	1.79U	1.79U	1.79U	0.781J	1.79U	3.41U
205-210	**4.8**	1.13J	0.607J	1.77	16.7	1.70U	1.79U	2.6	1.79U	1.79U	1.79U	0.729J	1.79U	3.40J
215-220	**19 D**	1.80U	1.07J	0.778J	8.49	1.71U	1.80U	1.8	1.80U	1.80U	1.80U	1.69U	1.80U	3.42U
FRB	--	1.75U	1.75U	1.56U	1.75U	1.66U	1.75U	1.59U	1.75U	1.75U	1.75U	1.65U	1.75U	3.33U

U: Analyte not detected.
J: Estimated concentration.
D: Dilution
DUP: Duplicate Sample
FRB: Field Reagent Blank
NA: Samples not analyzed for this chemical.
BLS: Depth below land surface
µg/L: Micrograms per liter
ng/L: Nanograms per liter
E: Results are over the calibration range on the raw data.

Table 3-9

OUIII South Boundary
2021 Temporary Well Data
SB-VP-02-2021
Installed: August 16-18, 2021
Brookhaven National Laboratory

Sample Depth (BLS)	1,4-D (µg/L)	PFOS (ng/L)	PFOA (ng/L)	PFBS (ng/L)	PFBA (ng/L)	PFHpS (ng/L)	PFHpA (ng/L)	PFHxS (ng/L)	PFHxA (ng/L)	PFNA (ng/L)	PFOSAm (ng/L)	PFPeS (ng/L)	PFPeA (ng/L)	6:2 FTS (ng/L)
95-100	0.20 U	6.59	7.1	1.31J	5.04	1.69U	1.16J	7.43	1.78U	1.19J	1.78	0.974J	1.78U	3.38U
105-110	0.12 J	8.38	9.78	1.82	7.4	1.71U	3.48	11.2	2.17	1.02J	1.80U	1.59J	3.07	3.43U
115-120	0.15 J	7.76	**10.2**	2.31	11.5	1.75U	3.18	18.6	1.56J	0.688J	1.85U	2.3	1.43J	3.51U
125-130	0.15 J	5.37	7.01	1.48J	9.69	1.69U	1.54J	10.3	1.64J	1.78U	1.78U	1.18J	1.19J	3.38U
135-140	0.53	2.44	3.55	1.36J	15.8	1.65U	0.741J	5.17	1.27J	1.74U	1.74U	1.06J	1.74U	3.30U
145-150	**1.3**	1.56J	2.13	0.949J	16.8	1.74U	1.83U	3.7	0.738J	1.83U	1.83U	1.06J	1.83U	3.48U
155-160	**2.7**	1.85U	1.85U	1.64U	6.15	1.76U	1.85U	1.15J	1.85	1.85U	1.85U	1.74U	1.85U	3.51U
165-170	0.40	2.85	2.06	1.27J	19.1	1.74U	1.83U	5.87	1.83U	1.83U	1.83U	1.19J	1.83U	3.47U
175-180	0.77	4	5.49	1.43J	18.9	1.69U	1.10J	6.36	1.10J	1.78U	1.78U	1.01J	0.607J	3.38U
185-190	**1.3**	6.05	4.12	1.65J	11.8	1.80U	1.23J	11.9	3.53	1.89U	1.89U	1.45J	2.01	3.59U
195-200	0.77	8.22	4.51	1.22J	7.65	1.70U	1.70J	11	4.78	0.639J	1.79U	1.13J	2.81	3.39U
205-210	**1.0**	7.37	5.04	1.34J	7.68	1.70U	1.45J	14.1	4.35	1.76U	1.76U	1.34J	2.34	3.41U
215-220	0.29	1.76U	1.76U	1.56U	1.76U	1.67U	1.76U	1.60U	1.76U	1.76U	1.76U	1.65U	1.76U	3.34U
FRB	--	1.73U	1.73U	1.54U	1.73U	1.64U	1.73U	1.57U	1.73U	1.73U	1.73U	1.62U	1.73U	3.28U

U: Analyte not detected.
J: Estimated concentration.
D: Dilution
DUP: Duplicate Sample
FRB: Field Reagent Blank
NA: Samples not analyzed for this chemical.
BLS: Depth below land surface
µg/L: Micrograms per liter
ng/L: Nanograms per liter
E: Results are over the calibration range on the raw data.

Section 4

Q3-2021 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	125	0*	0*	0*	125
July (Avg monthly gpm)	0	81**	88**	0	0	0	73**
August " " "	0	0**	0**	0	0	0	0**
September " " "	0	90**	92**	0	0	0	81**
Actual (Avg. over Qtr.)	**0**	**57**	**60**	**0**	**0**	**0**	**51**

* Extraction wells placed in standby mode: RW-4 and RW-5 (2003), RW-6 (2006), and RW-1 (2015).
** Extraction wells were off 7/19/2021 through 9/10/2021 to perform repairs due to lightning strike.

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

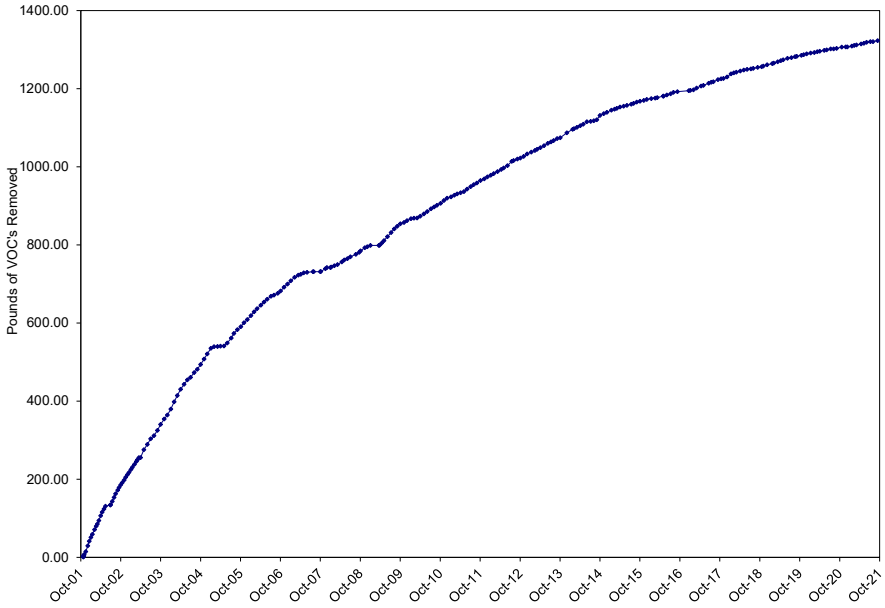


Figure 4-2
OU III Middle Road
Influent TVOC Concentrations vs. Time

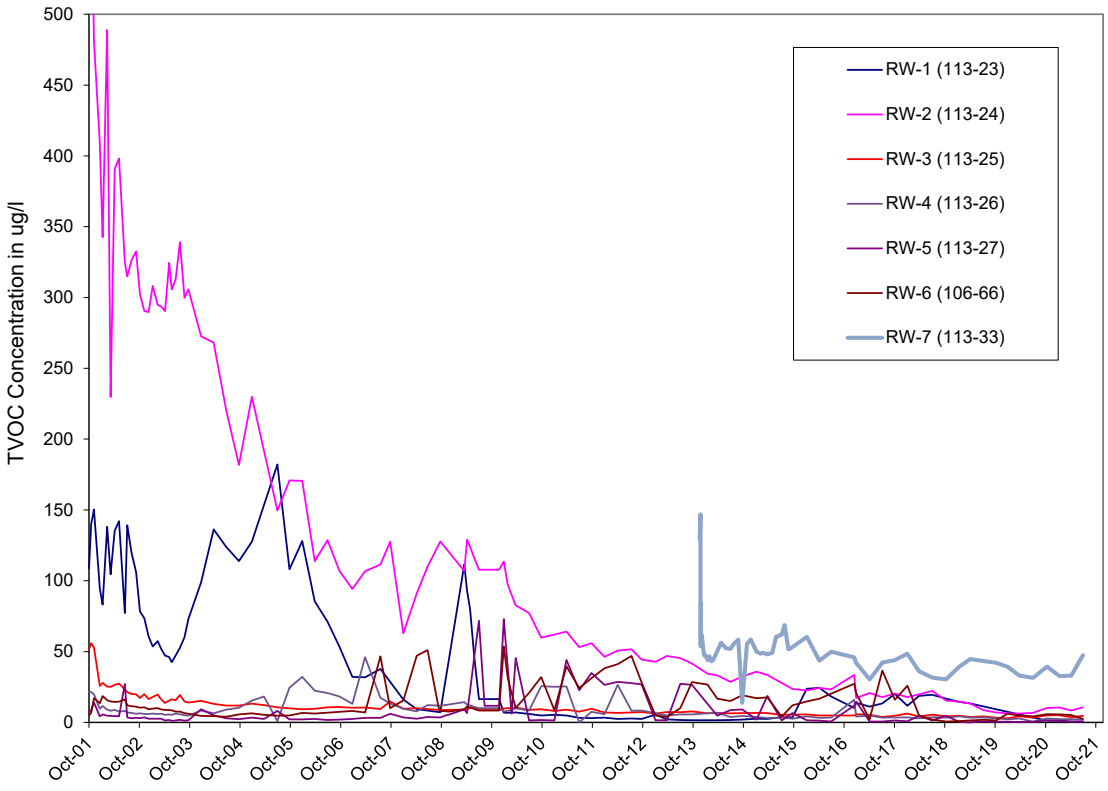


Table 4-2
OU III Middle Road Effluent Water Quality
SPDES Equivalency Permit Concentrations July 1, 2021 – September 30, 2021

Parameter	Permit Limit	Max. Measured Value	Units	Frequency
Flow	Monitor	1,234,743	GPD	Continuous
pH (range)	6.5 - 8.5	7.4– 7.6[2]	SU	Monthly[3]
Carbon Tetrachloride	5	<0.05	ug/L	Monthly[3]
Chloroform	7	<0.05	ug/L	Monthly[3]
Dichlorodifluoromethane	5	<0.66	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, and Western South Boundary 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 2021:

Extraction wells RW-2, RW-3, and RW-7 were in full time operation the first two weeks. The system was off the remainder of the month due to electrical repairs resulting from a lightning strike. Wells RW-1, RW-4, RW-5 and RW-6 remained in standby mode. The effluent sample was taken from the South Boundary air stripper tower effluent. The system treated approximately 10 million gallons of water.

August 2021:

The system was down for the month due to electrical repairs resulting from a lightning strike. Wells RW-1, RW-4, RW-5 and RW-6 remained in standby mode. An effluent sample was taken from the OU III South Boundary air stripper tower.

September 2021:

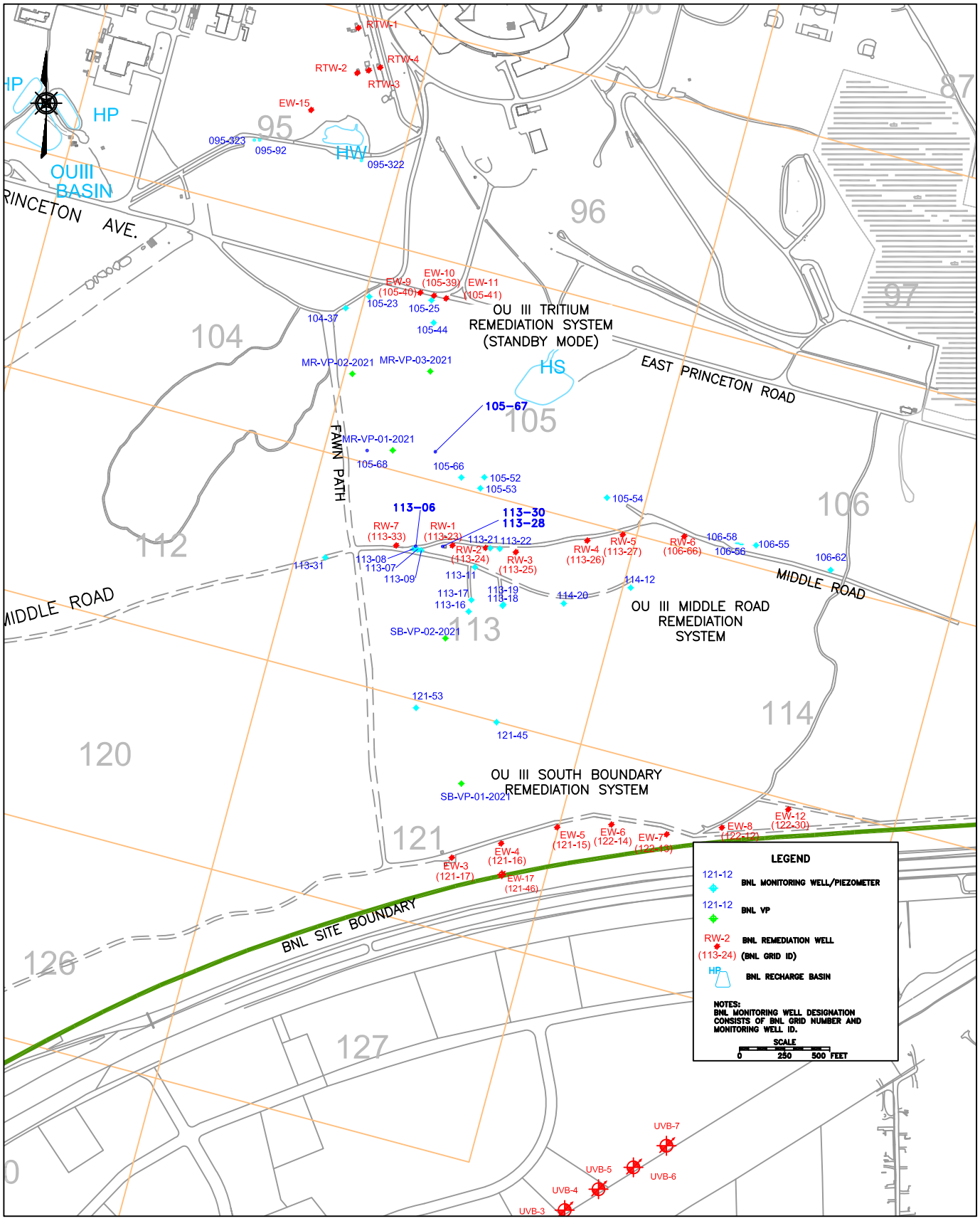
The system was down for the first two weeks of the month due to electrical repairs. Extraction wells RW-2, RW-3, and RW-7 were in full time operation the remainder of the month. Wells RW-1, RW- 4, RW-5 and RW-6 remained in standby mode. The effluent sample was taken from OU III South Boundary. The system treated approximately 11 million gallons of water.

The system treated approximately 21 million gallons of water during the third quarter of 2021.

As recommended in the 2020 Groundwater Status Report, in July and August 2021 three additional vertical profile wells (MR-VP-01-2021, MR-VP-02-2021 and MR-VP-03-2021) were installed to provide updated groundwater quality data for modeling simulations for potential placement of an additional extraction well(s). The location of the profile wells is shown on Figure 4-3 and the analytical data detections are included in Table 4-6, 4-7, 4-8 and 4-9. The maximum TVOC concentration was observed in MR-VP-01-2021 in the 175-180 feet bgs sample at 168 µg/L. The maximum 1,4 dioxane concentration and was observed in MR-VP-02-2021 in the 225-230 feet bgs sample at 6.5 µg/L. The maximum PFOA concentration observed in MR-VP-02-2021 was in the 195-200 feet bgs sample at 77.5 ng/L. The maximum PFOS concentration observed in MR-VP-02-2021 was in the 105-110 feet bgs sample at 17 ng/L.

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.
- Perform groundwater modeling simulations to help evaluate the need for additional extraction wells to optimize the system and achieve cleanup goals.
- Install one or two additional extraction wells as recommended in the 2020 Groundwater Status Report. The locations and screen intervals will be determined through groundwater characterization and groundwater modeling.



\\OERNT\GIS\GW_PROJECTS\ERD_QUARTERLIES\3Q_2021\FIG 4-3.DWG

ENVIRONMENTAL PROTECTION DIVISION

TITLE:

OU III MIDDLE ROAD MONITORING WELL NETWORK

SITEWIDE REMEDIATION SYSTEMS
THIRD QUARTER 2021 OPERATIONS REPORT

DWN:	VT:HZ.:	DATE:	PROJECT NO.:
JEB	–	02/08/07	–
CHKD:	APPD:	REV.:	NOTES:
LDS	––	10/19/21	–

FIGURE NO.: 4–3

Table 4-3
OU III Middle Road Monitoring Well Data
'Hits Only' July through September 2021

Site ID : 095-322

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/26/2021	38.05	--	--	UG/L	180.00	
1,1,1-Trichloroethane	07/26/2021	3.9	0.5	--	UG/L	180.00	
1,1-Dichloroethane	07/26/2021	0.68	0.5	--	UG/L	180.00	
1,1-Dichloroethylene	07/26/2021	6.4	0.5	--	UG/L	180.00	
Chloroform	07/26/2021	0.67	0.5	--	UG/L	180.00	
Tetrachloroethylene	07/26/2021	18	0.5	--	UG/L	180.00	
Trichloroethylene	07/26/2021	8.4	0.5	--	UG/L	180.00	

Site ID : 095-323

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/26/2021	20.8	--	--	UG/L	205.00	
1,1,1-Trichloroethane	07/26/2021	2.3	0.5	--	UG/L	205.00	
1,1,2,2-Tetrachloroethane	07/26/2021	1.2	0.5	--	UG/L	205.00	
1,1-Dichloroethylene	07/26/2021	1.2	0.5	--	UG/L	205.00	
Chloroform	07/26/2021	0.5	0.5	--	UG/L	205.00	
Tetrachloroethylene	07/26/2021	11	0.5	--	UG/L	205.00	
Trichloroethylene	07/26/2021	4.6	0.5	--	UG/L	205.00	

Site ID : 104-37

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/23/2021	117.9	--	--	UG/L	209.00	
1,1,1-Trichloroethane	07/23/2021	2.1	2	--	UG/L	209.00	D
1,1,2,2-Tetrachloroethane	07/23/2021	1.4	2	--	UG/L	209.00	J D
1,1-Dichloroethylene	07/23/2021	2.6	2	--	UG/L	209.00	D
Carbon tetrachloride	07/23/2021	5.5	2	--	UG/L	209.00	D
Chloroform	07/23/2021	1.3	2	--	UG/L	209.00	J D
Tetrachloroethylene	07/23/2021	100	2	--	UG/L	209.00	D
Trichloroethylene	07/23/2021	5	2	--	UG/L	209.00	D

Site ID : 105-23

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/28/2021	19.86	--	--	UG/L	180.00	
1,1,1-Trichloroethane	07/28/2021	0.72	0.5	--	UG/L	180.00	
1,1-Dichloroethane	07/28/2021	0.23	0.5	--	UG/L	180.00	J
1,1-Dichloroethylene	07/28/2021	1.5	0.5	--	UG/L	180.00	
Carbon tetrachloride	07/28/2021	0.51	0.5	--	UG/L	180.00	

Table 4-3
OU III Middle Road Monitoring Well Data
'Hits Only' July through September 2021

Site ID : 105-23

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Chloroform	07/28/2021	0.55	0.5	--	UG/L	180.00	
Tetrachloroethylene	07/28/2021	16	0.5	--	UG/L	180.00	
Trichloroethylene	07/28/2021	0.35	0.5	--	UG/L	180.00	J

Site ID : 105-66

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/23/2021	215.7	--	--	UG/L	184.00	
Tetrachloroethylene	07/23/2021	210	5	--	UG/L	184.00	D
Trichloroethylene	07/23/2021	5.7	5	--	UG/L	184.00	D

Site ID : 105-67

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/23/2021	120.79	--	--	UG/L	185.00	
1,1,1-Trichloroethane	07/23/2021	4.5	2	--	UG/L	185.00	D
1,1,2,2-Tetrachloroethane	07/23/2021	0.75	2	--	UG/L	185.00	J D
1,1-Dichloroethylene	07/23/2021	3.5	2	--	UG/L	185.00	D
Chloroform	07/23/2021	0.84	2	--	UG/L	185.00	J D
Tetrachloroethylene	07/23/2021	110	2	--	UG/L	185.00	D
Trichloroethylene	07/23/2021	1.2	2	--	UG/L	185.00	J D

Site ID : 105-68

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/26/2021	225	--	--	UG/L	205.00	
Carbon tetrachloride	07/26/2021	13	5	--	UG/L	205.00	D
Tetrachloroethylene	07/26/2021	200	5	--	UG/L	205.00	D
Trichloroethylene	07/26/2021	12	5	--	UG/L	205.00	D

Site ID : 113-11

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/27/2021	5.3	--	--	UG/L	201.00	
Chloroform	07/27/2021	0.4	0.5	--	UG/L	201.00	J
Tetrachloroethylene	07/27/2021	4.9	0.5	--	UG/L	201.00	

Site ID : 113-17

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/27/2021	17.04	--	--	UG/L	177.00	
Carbon tetrachloride	07/27/2021	0.34	0.5	--	UG/L	177.00	J
Chloroform	07/27/2021	1.4	0.5	--	UG/L	177.00	

Table 4-3
OU III Middle Road Monitoring Well Data
'Hits Only' July through September 2021

Site ID : 113-17

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Tetrachloroethylene	07/27/2021	15	0.5	--	UG/L	177.00	
Trichloroethylene	07/27/2021	0.3	0.5	--	UG/L	177.00	J

Site ID : 113-19

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/27/2021	29.04	--	--	UG/L	230.00	
1,1,1-Trichloroethane	07/27/2021	9.8	0.5	--	UG/L	230.00	
1,1-Dichloroethane	07/27/2021	0.88	0.5	--	UG/L	230.00	
1,1-Dichloroethylene	07/27/2021	5.3	0.5	--	UG/L	230.00	
Carbon tetrachloride	07/27/2021	7.1	0.5	--	UG/L	230.00	
Chloroform	07/27/2021	0.85	0.5	--	UG/L	230.00	
cis-1,2-Dichloroethylene	07/27/2021	0.41	0.5	--	UG/L	230.00	J
Trichloroethylene	07/27/2021	4.7	0.5	--	UG/L	230.00	

Site ID : 113-30

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/23/2021	50.78	--	--	UG/L	190.00	
1,1,1-Trichloroethane	07/23/2021	0.4	0.5	--	UG/L	190.00	J
1,1-Dichloroethylene	07/23/2021	0.23	0.5	--	UG/L	190.00	J
Carbon tetrachloride	07/23/2021	6.7	0.5	--	UG/L	190.00	
Chloroform	07/23/2021	1.9	0.5	--	UG/L	190.00	
Tetrachloroethylene	07/23/2021	41	0.5	--	UG/L	190.00	
Trichloroethylene	07/23/2021	0.55	0.5	--	UG/L	190.00	

Site ID : 113-31

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/26/2021	2.93	--	--	UG/L	190.00	
1,1,1-Trichloroethane	07/26/2021	1.6	0.5	--	UG/L	190.00	
1,1-Dichloroethylene	07/26/2021	0.54	0.5	--	UG/L	190.00	
Chloroform	07/26/2021	0.21	0.5	--	UG/L	190.00	J
Trichloroethylene	07/26/2021	0.58	0.5	--	UG/L	190.00	

Site ID : 114-12

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/26/2021	0.99	--	--	UG/L	155.00	
Chloroform	07/26/2021	0.99	0.5	--	UG/L	155.00	

Site ID : 121-45

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/27/2021	8.25	--	--	UG/L	199.50	

Table 4-3
OU III Middle Road Monitoring Well Data
'Hits Only' July through September 2021

Site ID : 121-45

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Carbon tetrachloride	07/27/2021	0.21	0.5	--	UG/L	199.50	J
Chloroform	07/27/2021	0.41	0.5	--	UG/L	199.50	J
Tetrachloroethylene	07/27/2021	7.1	0.5	--	UG/L	199.50	
Trichloroethylene	07/27/2021	0.53	0.5	--	UG/L	199.50	

Site ID : 121-53

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/28/2021	86.47	--	--	UG/L	229.00	
1,1,1-Trichloroethane	07/28/2021	1.8	0.5	--	UG/L	229.00	
1,1-Dichloroethane	07/28/2021	0.78	0.5	--	UG/L	229.00	
1,1-Dichloroethylene	07/28/2021	2.2	0.5	--	UG/L	229.00	
Carbon tetrachloride	07/28/2021	9.4	0.5	--	UG/L	229.00	
Chloroform	07/28/2021	2.1	0.5	--	UG/L	229.00	
Dichlorodifluoromethane	07/28/2021	0.49	0.5	--	UG/L	229.00	J
Tetrachloroethylene	07/28/2021	68	2	--	UG/L	229.00	D
Trichloroethylene	07/28/2021	1.7	0.5	--	UG/L	229.00	

Table 4-4
OU III Middle Road Extraction Well Data
'Hits Only' July through September 2021

Site ID : 106-66 (RW-6)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/08/2021	2.44	--	--	UG/L	0.00	
1,1,1-Trichloroethane	07/08/2021	0.22	0.5	--	UG/L	0.00	J
Chloroform	07/08/2021	0.22	0.5	--	UG/L	0.00	J
Tetrachloroethylene	07/08/2021	2	0.5	--	UG/L	0.00	

Site ID : 113-23 (RW-1)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/08/2021	0.44	--	--	UG/L	0.00	
Chloroform	07/08/2021	0.44	0.5	--	UG/L	0.00	J

Site ID : 113-24 (RW-2)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/08/2021	10.61	--	--	UG/L	0.00	
1,1-Dichloroethylene	07/08/2021	0.17	0.5	--	UG/L	0.00	J
Carbon tetrachloride	07/08/2021	0.76	0.5	--	UG/L	0.00	
Chloroform	07/08/2021	0.57	0.5	--	UG/L	0.00	
Tetrachloroethylene	07/08/2021	8.6	0.5	--	UG/L	0.00	
Trichloroethylene	07/08/2021	0.51	0.5	--	UG/L	0.00	

Site ID : 113-25 (RW-3)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/08/2021	4.48	--	--	UG/L	0.00	
1,1,1-Trichloroethane	07/08/2021	2	0.5	--	UG/L	0.00	
1,1-Dichloroethane	07/08/2021	0.46	0.5	--	UG/L	0.00	J
1,1-Dichloroethylene	07/08/2021	0.71	0.5	--	UG/L	0.00	
Carbon tetrachloride	07/08/2021	0.17	0.5	--	UG/L	0.00	J
Chloroform	07/08/2021	0.16	0.5	--	UG/L	0.00	J
Trichloroethylene	07/08/2021	0.98	0.5	--	UG/L	0.00	

Site ID : 113-26 (RW-4)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/08/2021	2.14	--	--	UG/L	0.00	
Carbon tetrachloride	07/08/2021	0.52	0.5	--	UG/L	0.00	
Chloroform	07/08/2021	0.77	0.5	--	UG/L	0.00	
Tetrachloroethylene	07/08/2021	0.2	0.5	--	UG/L	0.00	J
Trichloroethylene	07/08/2021	0.65	0.5	--	UG/L	0.00	

Site ID : 113-27 (RW-5)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/08/2021	0.74	--	--	UG/L	0.00	

Table 4-4
OU III Middle Road Extraction Well Data
'Hits Only' July through September 2021

Site ID : 113-27 (RW-5)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Chloroform	07/08/2021	0.74	0.5	--	UG/L	0.00	

Site ID : 113-33 (RW-7)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/08/2021	47.47	--	--	UG/L	0.00	
1,1,1-Trichloroethane	07/08/2021	0.93	0.5	--	UG/L	0.00	
1,1,2,2-Tetrachloroethane	07/08/2021	0.28	0.5	--	UG/L	0.00	J
1,1-Dichloroethylene	07/08/2021	0.49	0.5	--	UG/L	0.00	J
Carbon tetrachloride	07/08/2021	6	0.5	--	UG/L	0.00	
Chloroform	07/08/2021	0.65	0.5	--	UG/L	0.00	
Methyl tert-butyl ether	07/08/2021	0.19	0.5	--	UG/L	0.00	J
Tetrachloroethylene	07/08/2021	38	0.5	--	UG/L	0.00	
Trichloroethylene	07/08/2021	0.93	0.5	--	UG/L	0.00	

Table 4-5
OU III Middle Road Influent Data
'Hits Only' July through September 2021

Site ID : 113-34 (Combo Influent)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/08/2021	18.97	--	--	UG/L	0.00	
1,1,1-Trichloroethane	07/08/2021	0.82	0.5	--	UG/L	0.00	
1,1-Dichloroethylene	07/08/2021	0.2	0.5	--	UG/L	0.00	J
Carbon tetrachloride	07/08/2021	1.8	0.5	--	UG/L	0.00	
Chloroform	07/08/2021	0.4	0.5	--	UG/L	0.00	J
Tetrachloroethylene	07/08/2021	15	0.5	--	UG/L	0.00	
Trichloroethylene	07/08/2021	0.75	0.5	--	UG/L	0.00	
8260 TVOC	09/13/2021	18.71	--	--	UG/L	0.00	
1,1,1-Trichloroethane	09/13/2021	0.82	0.5	--	UG/L	0.00	
1,1-Dichloroethylene	09/13/2021	0.39	0.5	--	UG/L	0.00	J
Carbon tetrachloride	09/13/2021	2.3	0.5	--	UG/L	0.00	
Chloroform	09/13/2021	0.49	0.5	--	UG/L	0.00	J
Tetrachloroethylene	09/13/2021	14	0.5	--	UG/L	0.00	
Trichloroethylene	09/13/2021	0.71	0.5	--	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.

Table 4-6
OU III Middle Road
2021 Temporary Well Data

MR-VP-01-2021															
Sample Depth	**235-240**	**225-230**	**215-220**	**205-210**	**195-200**	**185-190**	**175-180**	**165-170**	**155-160**	**145-150**	**135-140**	**125-130**	**115-120**	**105-110**	**95-100**
Date sampled	**8/6/2021**	**8/9/2021**	**8/9/2021**	**8/9/2021**	**8/9/2021**	**8/9/2021**	**8/9/2021**	**8/9/2021**	**8/10/2021**	**8/10/2021**	**8/10/2021**	**8/10/2021**	**8/10/2021**	**8/10/2021**	**8/10/2021**
	ug/L	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**
Compound															
1,1,2,2-Tetrachloroethane	-	5.32	6.02	3.07	2.31	1	0.41 J	-	-	-	-	-	-	-	-
1,1-Dichloroethane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichlorodifloromethane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MTBE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	4.62	0.360 J	0.570 J	0.210 J		-	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	-	0.510 J	1.64	0.980 J	3.87	1.12	4.28	-	-	-	-	-	-	-	-
Carbon tetrachloride	-	0.370 J	5.53	2.63	8.59	15.5	46.2	3.73	1.83	0.750 J	-	-	-	-	-
Chloroform	-	0.310 J	1.56	1.05	2.12	2.40	1.91	2.26	1.46	1.09	0.790 J	0.770 J	0.670 J	-	-
Tetrachloroethylene	-	14.5	80.3	34.5	87.1 D	86.9 D	114 D	24	9.03	5.11	1.72	1.91	2.16	1.69	6.34
Trichloroethylene	-	2.93	9.75	5.75	9.25	2.76	1.54	0.380 J	-	-	-	-	-	-	-
TVOC total	4.62	24.3	105.37	48.19	113.24	109.68	168.34	30.37	12.32	6.95	2.51	2.68	2.83	1.69	6.34

MR-VP-02-2021															
Sample Depth	**235-240**	**225-230**	**215-220**	**205-210**	**195-200**	**185-190**	**175-180**	**165-170**	**155-160**	**145-150**	**135-140**	**125-130**	**115-120**	**105-110**	**95-100**
Date sampled	**8/3/2021**	**8/3/2021**	**8/3/2021**	**8/4/2021**	**8/4/2021**	**8/4/2021**	**8/4/2021**	**8/4/2021**	**8/4/2021**	**8/4/2021**	**8/5/2021**	**8/5/2021**	**8/5/2021**	**8/5/2021**	**8/5/2021**
	ug/L	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**
Compound															
1,1,2,2-Tetrachloroethane	-	-	-	-	2.7	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichlorodifloromethane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MTBE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	-	0.390 J	0.590 J	0.500 J	-	-	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	-	-	-	-	0.850 J	-	-	-	-	-	-	-	-	-	-
Carbon tetrachloride	-	-	-	-	0.860 J	7.3	1.73	-	-	-	-	-	-	-	-
Chloroform	-	-	-	-	0.830 J	1.28	1.03	1.03	0.840 J	0.590 J	0.460 J	0.370 J	0.320 J	0.270 J	0.230 J
Tetrachloroethylene	-	-	-	-	59.3	58	15.5	24.3	6.41	1.41	0.280 J	0.980 J	0.410 J	0.450 J	0.780 J
Trichloroethylene	-	-	-	-	14	3.14	-	0.410 J	-	-	-	-	-	-	-
TVOC total	0	0.39	0.59	0.5	78.54	69.72	18.26	25.74	7.25	2	0.74	1.35	0.73	0.72	1.01

Table 4-6
OU III Middle Road
2021 Temporary Well Data

MR-VP-03-2021															
Sample Depth	**235-240**	**225-230**	**215-220**	**205-210**	**195-200**	**185-190**	**175-180**	**165-170**	**155-160**	**145-150**	**135-140**	**125-130**	**115-120**	**105-110**	**95-100**
Date sampled	**7/29/2021**	**7/29/2021**	**7/29/2021**	**7/30/2021**	**7/30/2021**	**7/30/2021**	**7/30/2021**	**7/30/2021**	**7/30/2021**	**8/2/2021**	**8/2/2021**	**8/2/2021**	**8/2/2021**	**8/2/2021**	**8/2/2021**
Compound	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**
1,1,2,2-Tetrachloroethane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	-	-	-	-	-	1.26	1.07	0.520 J	-	-	-	-	-	-	-
1,1-Dichloroethylene	-	-	-	-	-	1.1	1.93	-	-	-	-	-	-	-	-
Dichlorodifloromethane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MTBE	-	-	-	-	-	0.970 J	0.710 J	-	-	-	-	-	-	-	-
Naphthalene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	-	-	-	-	-	1.90	1.93	1.2	-	-	-	-	-	-	-
Carbon tetrachloride	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	-	-	-	-	0.900 J	1.04	1.36	0.640 J	-	-	-	-	-	-	-
Tetrachloroethylene	-	-	-	-	-	1.32	3.80	10.4	11.5	1.68	0.850 J	0.390 J	0.630 J	1.18	0.950 J
Trichloroethylene	-	-	-	-	-	1.06	0.940 J	0.500 J	0.250 J	-	-	-	-	-	-
TVOC total	0	0	0	0	0.9	8.65	11.74	13.26	11.75	1.68	0.85	0.39	0.63	1.18	0.95

J: Estimated concentration.

D: Results are reported from a diluted aliquot of the sample.

Table 4-7

OUIII Middle Road
2021 Temporary Well Data
MR-VP-01-2021
Installed: August 6-10, 2021
Brookhaven National Laboratory

Sample Depth (BLS)	1,4-D (µg/L)	PFOS (ng/L)	PFOA (ng/L)	PFBS (ng/L)	PFBA (ng/L)	PFHpS (ng/L)	PFHpA (ng/L)	PFHxS (ng/L)	PFHxA (ng/L)	PFNA (ng/L)	PFOSAm (ng/L)	PFPeS (ng/L)	PFPeA (ng/L)	6:2 FTS (ng/L)
95-100	0.24	8.41	7.37	2.44	8.96	1.65U	1.58J	7.61	2.4	0.681J	1.74U	1.36J	2.08	3.31U
105-110	0.27	**11**	6.97	3.59	12.2	1.64U	1.82	6.91	3.62	1.57J	1.73U	1.13J	3.22	3.28U
115-120	NA	**10.3**	6.45	4.69	12.3	1.74U	1.78J	5.63	3.35	1.83	1.83U	1.32J	2.39	3.48U
125-130	NA	**10.7**	7.82	4.64	15	1.67U	2.05	8.54	4	0.826J	1.76U	1.35J	3.04	3.34U
135-140	0.28	**10.3**	7.07	2.67	11	1.65U	1.89	14.4	2.81	0.614J	1.74U	1.63	1.32J	3.30U
145-150	0.32	7.23	8.42	2.23	12	1.73U	1.86	9.78	2.51	1.82U	1.82U	1.15J	1.06J	3.46U
155-160	0.18 J	6.32	5.94	1.92	13.4	1.67U	1.32J	9.92	2.82	1.76U	1.76U	1.47J	0.737J	3.35U
165-170	0.14 J	5.35	6.36	2.18	15.6	1.67U	1.64J	9.97	2.52	1.76U	1.76U	1.72	0.852J	3.35U
175-180	**1.1**	2.44	3.83	2.19	27.8	1.69U	1.02J	12.2	2.67	1.78U	1.78U	2.28	1.46J	3.38U
185-190	0.69	3.42	7.57	2.4	11.9	1.65U	0.988J	20.20	3.8	1.73U	1.73U	3.23	0.907J	3.29U
195-200	0.92	2.37	**11.7**	3.22	14	1.66U	1.48J	23.5	6.6	1.74U	1.74U	3.81	1.25J	3.31U
205-210	**1.5**	2.68	**37**	7.16	10.7	1.74U	3.68	60.4	21.4	1.83U	1.83U	8.7	3.22	3.48U
215-220	**1.3**	2.26	**26.5**	5.77	14	1.74U	2.9	47.1	16.2	1.83U	1.83U	6.9	2.58	3.48U
225-230	**4.0**	0.995J	7.5	2.48	8.56	1.65U	0.791J	12.9	4.3	1.74U	1.74U	2.13	0.722J	3.31U
235-240	**5.6 E**	1.73U	1.73U	1.45J	7.84	1.64U	1.73U	2.8	1.73U	1.73U	1.73U	0.798J	1.73U	3.29U
FRB	--	1.76U	1.76U	1.57U	1.76U	1.68U	1.76U	1.61U	1.76U	1.76U	1.76U	1.66U	1.76U	3.35U

U: Analyte not detected.
J: Estimated concentration.
D: Dilution
DUP: Duplicate Sample
FRB: Field Reagent Blank
NA: Samples not analyzed for this chemical.
BLS: Depth below land surface
µg/L: Micrograms per liter
ng/L: Nanograms per liter
E: Results are over the calibration range on the raw data.

Table 4-8

OUIII Middle Road
2021 Temporary Well Data
MR-VP-02-2021
Installed: August 3-5, 2021
Brookhaven National Laboratory

Sample Depth (BLS)	1,4-D (µg/L)	PFOS (ng/L)	PFOA (ng/L)	PFBS (ng/L)	PFBA (ng/L)	PFHpS (ng/L)	PFHpA (ng/L)	PFHxS (ng/L)	PFHxA (ng/L)	PFNA (ng/L)	PFOSAm (ng/L)	PFPeS (ng/L)	PFPeA (ng/L)	6:2 FTS (ng/L)
95-100	**1.4**	7.3	8.42	3.2	12.4	1.92U	1.68J	5.63	3.88	2.02U	2.02U	1.50J	1.64J	3.83U
105-110	0.20 U	**17**	9.65	3.15	13.3	1.62U	1.65J	5.44	3.09	0.969J	1.71U	1.13J	2.14	3.24U
115-120	0.20 U	**11.2**	7.92	5.25	16.4	1.65U	1.57J	6.92	2.64	0.701J	1.73U	1.08J	2.47	3.29U
125-130	0.30	**10.9**	8.72	4.63	20.6	1.65U	2.52	7.41	2.61	0.661J	1.74U	1.21J	2.02	3.30U
135-140	0.36	9.81	7.32	3.49	14.9	1.67U	1.8	7.43	2.04	1.75U	1.75U	1.21J	1.43J	3.33U
145-150	0.65	8.9	7.14	1.82	13.1	1.64U	2.21	6.93	2.74	1.73U	1.73U	0.980J	1.10J	3.29U
155-160	0.47	8.15	4.17	1.34J	8.16	1.70U	1.22J	8.66	1.23J	1.79U	1.79U	1.26J	0.629J	3.41U
165-170	0.39	6.13	4.03	1.68	7.05	1.62U	0.863J	12.1	1.79	1.70U	1.70U	1.46J	1.70U	3.24U
175-180	0.52	5.61	6	1.96	10.8	1.70U	1.63J	12.3	1.61J	1.79U	1.79U	2.04	1.79U	3.39U
185-190	**1.1**	2.60	7.5	2.51	12.7	1.65U	1.25J	12.90	2.61	1.73U	1.73U	2.46	0.762J	3.29U
195-200	**1.6**	4.43	**77.5**	9.41	10.4	0.585J	4.56	101	24.8	1.72U	1.72U	11.3	3.95	3.27U
205-210	**5.4 E**	1.82U	1.10J	6.21	19.3	1.73U	1.82U	4.79	4.28	1.82U	1.82U	4.69	0.890J	3.45U
215-220	**6.3 E**	1.76U	0.759J	6.67	22.6	1.67U	1.76U	3.52	4.82	1.76U	1.76U	4.6	0.972J	3.33U
225-230	**6.5 E**	1.73U	0.953J	6.39	23.1	1.64U	1.64U	6.03	5.52	1.73U	1.73U	4.41	0.953J	3.32U
235-240	**4.9**	1.75U	1.75U	5.9	19.7	1.66U	1.75U	1.8	2.13	1.75U	1.75U	2.92	1.75U	3.32U
FRB	--	1.77U	1.77U	1.57U	1.77U	1.68U	1.77U	1.61U	1.77U	1.77U	1.77U	1.66U	1.77U	3.36U

U: Analyte not detected.
J: Estimated concentration.
D: Dilution
DUP: Duplicate Sample
FRB: Field Reagent Blank
NA: Samples not analyzed for this chemical.
BLS: Depth below land surface
µg/L: Micrograms per liter
ng/L: Nanograms per liter
E: Results are over the calibration range on the raw data.

Table 4-9

OUIII Middle Road
2021 Temporary Well Data
MR-VP-03-2021
Installed: July 29-August 2, 2021
Brookhaven National Laboratory

Sample Depth (BLS)	1,4-D (µg/L)	PFOS (ng/L)	PFOA (ng/L)	PFBS (ng/L)	PFBA (ng/L)	PFHpS (ng/L)	PFHpA (ng/L)	PFHxS (ng/L)	PFHxA (ng/L)	PFNA (ng/L)	PFOSAm (ng/L)	PFPeS (ng/L)	PFPeA (ng/L)	6:2 FTS (ng/L)
95-100	0.22B	**10.3**	6.1	1.50J	6.7	1.70U	2.48	10.1	5.89	0.820J	1.79U	1.13J	4.28	3.39U
105-110	0.39B	9.98	5.97	1.39J	6.52	1.64U	2.33	9.81	5.26	0.736J	1.72U	1.07J	4.14	3.27U
115-120	0.19JB	**12.1**	6.50	1.42J	6.01	1.67U	2.27	12.9	4.35	0.846J	1.76U	1.22J	3.27	3.34U
125-130	0.18JB	9.08	7.06	1.25J	7.37	1.65U	1.94	13.6	2.64	1.73U	1.73U	1.17J	1.55J	3.29U
135-140	0.25B	5.94	7.33	1.12J	6.31	1.63U	2.18	12.2	2.95	1.72U	1.72U	1.09J	1.40J	3.26U
145-150	0.22B	5.25	5.66	1.13J	8.38	1.65U	1.47J	28	1.58J	1.73U	1.73U	2.1	0.585J	3.29U
155-160	0.52B	3.15	4.10	1.13J	8.85	1.63U	0.719J	13.3	1.18J	1.72U	1.72U	1.67	1.72U	3.26U
165-170	**2.3B**	3.13	4.14	1.18J	6.75	1.77U	1.87U	9.63	1.52J	1.87U	1.87U	1.41J	1.87U	3.55U
175-180	**3.0B**	3.92	2.27	1.24J	2.67	1.85U	1.95U	9.41	0.856J	1.95U	1.95U	1.42J	1.95U	3.70U
185-190	**4.8B**	3.90	5.74	2.8	3.44	1.66U	0.787J	18.10	3.75	1.74U	1.74U	3.28	0.89J	3.31U
195-200	**5.9EB**	1.73U	1.21J	0.781J	0.739J	1.65U	1.73U	4.48	1.09J	1.73U	1.73U	0.729J	1.73U	3.29U
205-210	0.59JB	1.93U	1.93U	1.72U	1.93U	1.83U	1.93U	1.76U	1.93U	1.93U	1.93U	1.82U	1.93U	3.67U
215-220	0.21B	1.84U	1.84U	1.63U	1.73J	1.74U	1.84U	1.67U	1.84U	1.84U	1.84U	1.73U	1.84U	3.49U
225-230	0.80B	1.73U	1.73U	1.54U	2.64	1.65U	1.73U	1.58U	1.73U	1.73U	1.73U	1.63U	1.73U	3.29U
235-240	**1.1B**	1.74U	1.74U	1.55U	2.75	1.65U	1.74U	1.58U	1.74U	1.74U	1.74U	1.63U	1.74U	3.30U
FRB	--	1.72U	1.72U	1.53U	1.72U	1.63U	1.72U	1.57U	1.72U	1.72U	1.72U	1.62U	1.72	3.27U

U: Analyte not detected.
J: Estimated concentration.
D: Dilution
DUP: Duplicate Sample
FRB: Field Reagent Blank
NA: Samples not analyzed for this chemical.
BLS: Depth below land surface
µg/L: Micrograms per liter
ng/L: Nanograms per liter
E: Results are over the calibration range on the raw data: however the actual amounts are within calibration range.
B: Blank contamination.The analyte was detected above one-half the reporting limit in an associated blank.

Section 5

Q3-2021 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

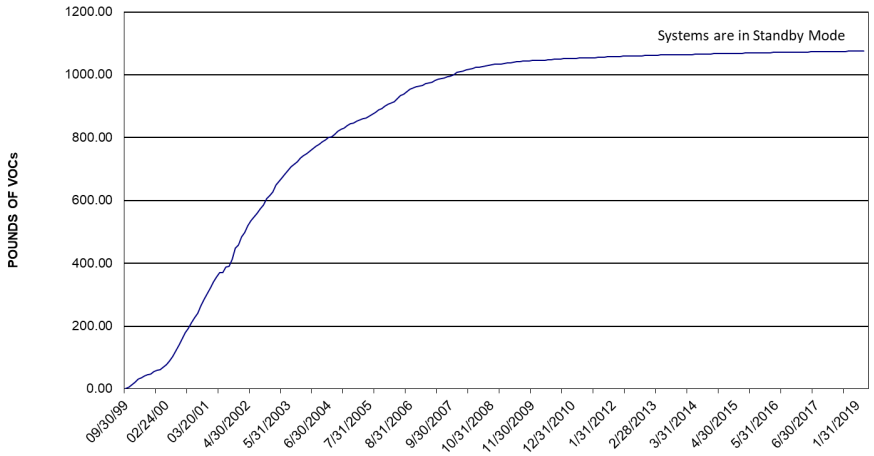
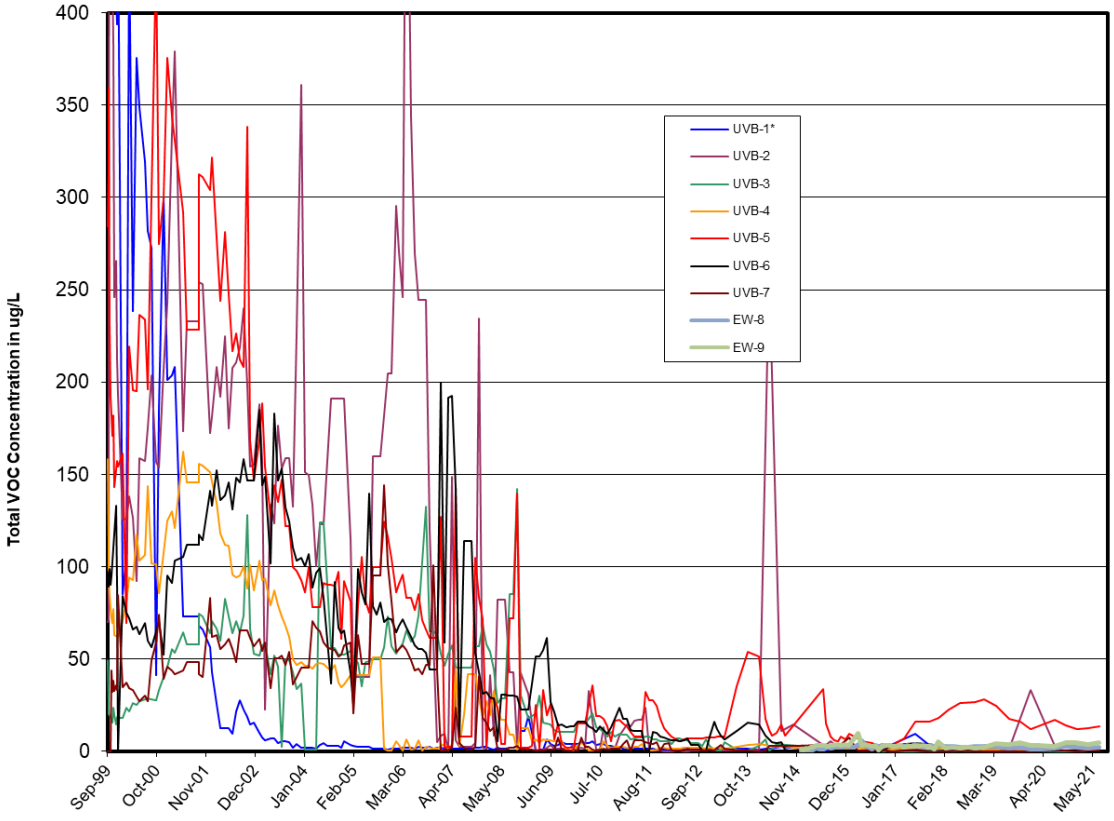


Figure 5-2
OU III Industrial Park
Influent TVOC Concentrations vs. Time



*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, 2021

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.

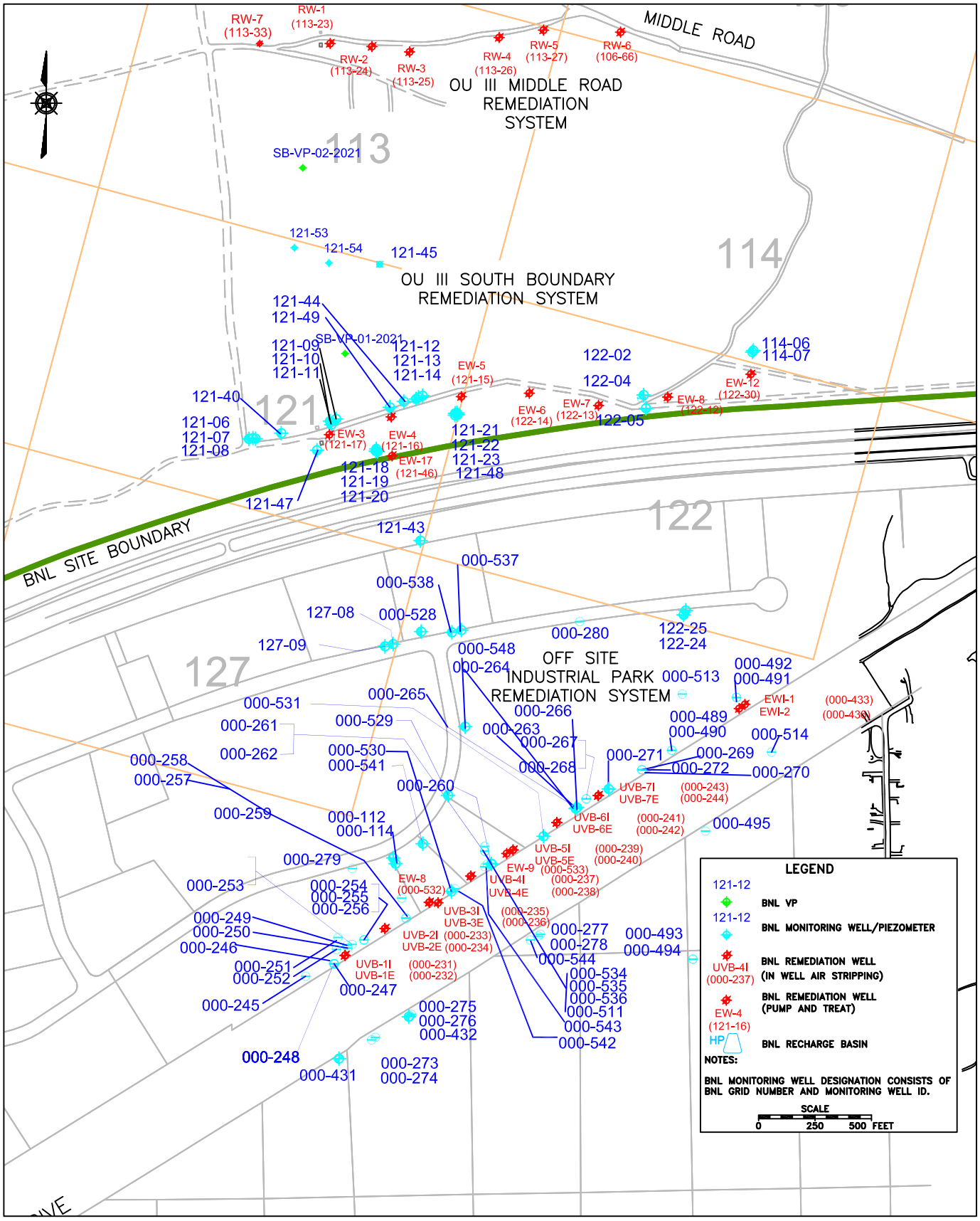
System Operation

July through September 2021:

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

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 treatment wells UVB-1 through UVB-7, extraction wells EW-8 and EW-9, and adjacent core monitoring wells were below 50 µg/L.
- If extraction and monitoring wells remain below the capture goal for four consecutive sample rounds (through 4th quarter 2021), prepare and submit a Petition for System Closure.



\\OERNT\GIS\GW_PROJECTS\ERD_QUARTERLIES\3Q_2021\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 2021 OPERATIONS REPORT

DWN:	VT:HZ.:	DATE:	PROJECT NO.:
JEB	–	09/12/14	–
CHKD:	APPD:	REV.:	NOTES:
LDS	–	10/19/21	–

FIGURE NO.: 5–3

Table 5-3
OU III Industrial Park Monitoring Well Data
'Hits Only' July through September 2021

Site ID : 127-08

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	09/10/2021	29.13	--	--	UG/L	240.00	
1,1,1-Trichloroethane	09/10/2021	0.82	0.5	--	UG/L	240.00	
1,1-Dichloroethylene	09/10/2021	0.51	0.5	--	UG/L	240.00	
Carbon tetrachloride	09/10/2021	5.6	0.5	--	UG/L	240.00	
Chloroform	09/10/2021	1.2	0.5	--	UG/L	240.00	
Tetrachloroethylene	09/10/2021	19	0.5	--	UG/L	240.00	
Trichloroethylene	09/10/2021	2	0.5	--	UG/L	240.00	

Site ID : 127-09

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	09/10/2021	4.36	--	--	UG/L	225.00	
Carbon tetrachloride	09/10/2021	0.46	0.5	--	UG/L	225.00	J
Chloroform	09/10/2021	1.1	0.5	--	UG/L	225.00	
Tetrachloroethylene	09/10/2021	2.8	0.5	--	UG/L	225.00	

Table 5-4
OU III Industrial Park Extraction Well Data
'Hits Only' July through September 2021

Site ID : 000-532 (EW-8)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/15/2021	2.1	--	--	UG/L	253.00	
1,1,1-Trichloroethane	07/15/2021	0.6	0.5	--	UG/L	253.00	
1,1-Dichloroethane	07/15/2021	0.29	0.5	--	UG/L	253.00	J
1,1-Dichloroethylene	07/15/2021	0.31	0.5	--	UG/L	253.00	J
Tetrachloroethylene	07/15/2021	0.9	0.5	--	UG/L	253.00	

Site ID : 000-533 (EW-9)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/15/2021	4.53	--	--	UG/L	243.00	
1,1,1-Trichloroethane	07/15/2021	0.95	0.5	--	UG/L	243.00	
1,1-Dichloroethane	07/15/2021	1.2	0.5	--	UG/L	243.00	
1,1-Dichloroethylene	07/15/2021	1.7	0.5	--	UG/L	243.00	
Methyl tert-butyl ether	07/15/2021	0.36	0.5	--	UG/L	243.00	J
Trichloroethylene	07/15/2021	0.32	0.5	--	UG/L	243.00	J

Table 5-5
OU III Industrial Park Influent Data
'Hits Only' July through September 2021

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

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/26/2021	0.22	--	--	UG/L	230.00	
1,1,1-Trichloroethane	07/26/2021	0.22	0.5	--	UG/L	230.00	J

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

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/26/2021	1.46	--	--	UG/L	205.00	
Chloroform	07/26/2021	0.19	0.5	--	UG/L	205.00	J
Tetrachloroethylene	07/26/2021	0.67	0.5	--	UG/L	205.00	
Toluene	07/26/2021	0.6	0.5	--	UG/L	205.00	

Site ID : 000-235 (UVB-3 Influent)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/26/2021	0.16	--	--	UG/L	204.00	
1,1,1-Trichloroethane	07/26/2021	0.16	0.5	--	UG/L	204.00	J

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

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/26/2021	0.51	--	--	UG/L	180.00	
1,1,1-Trichloroethane	07/26/2021	0.2	0.5	--	UG/L	180.00	J
Toluene	07/26/2021	0.31	0.5	--	UG/L	180.00	J

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

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/26/2021	13.4	--	--	UG/L	190.00	
1,1,1-Trichloroethane	07/26/2021	0.99	0.5	--	UG/L	190.00	
1,1-Dichloroethylene	07/26/2021	0.61	0.5	--	UG/L	190.00	
Carbon tetrachloride	07/26/2021	4.6	0.5	--	UG/L	190.00	
Chloroform	07/26/2021	0.62	0.5	--	UG/L	190.00	
cis-1,2-Dichloroethylene	07/26/2021	0.58	0.5	--	UG/L	190.00	
Tetrachloroethylene	07/26/2021	1.8	0.5	--	UG/L	190.00	
Trichloroethylene	07/26/2021	4.2	0.5	--	UG/L	190.00	

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

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/26/2021	0.48	--	--	UG/L	200.00	
1,1,1-Trichloroethane	07/26/2021	0.29	0.5	--	UG/L	200.00	J
1,1-Dichloroethylene	07/26/2021	0.19	0.5	--	UG/L	200.00	J

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

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/26/2021	0.46	--	--	UG/L	215.00	

Table 5-5
OU III Industrial Park Influent Data
'Hits Only' July through September 2021

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

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	07/26/2021	0.29	0.5	--	UG/L	215.00	J
1,1-Dichloroethylene	07/26/2021	0.17	0.5	--	UG/L	215.00	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 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
Q3-2021 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	0	0	0
July	59	0	0	0
August	58	0	0	0
September	55	0	0	0
Actual (Avg. over Qtr.)	**57**	**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

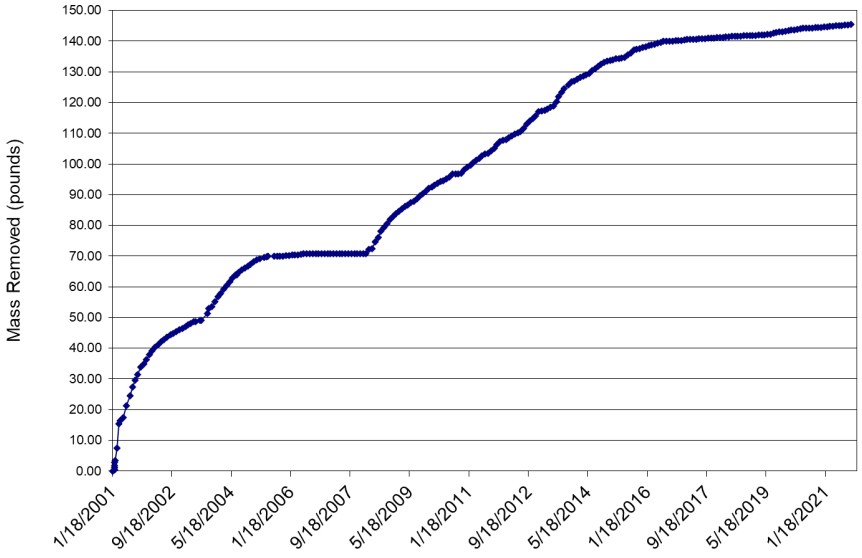


Figure 7-2
OU III Building 96
Influent TVOC Concentrations vs. Time

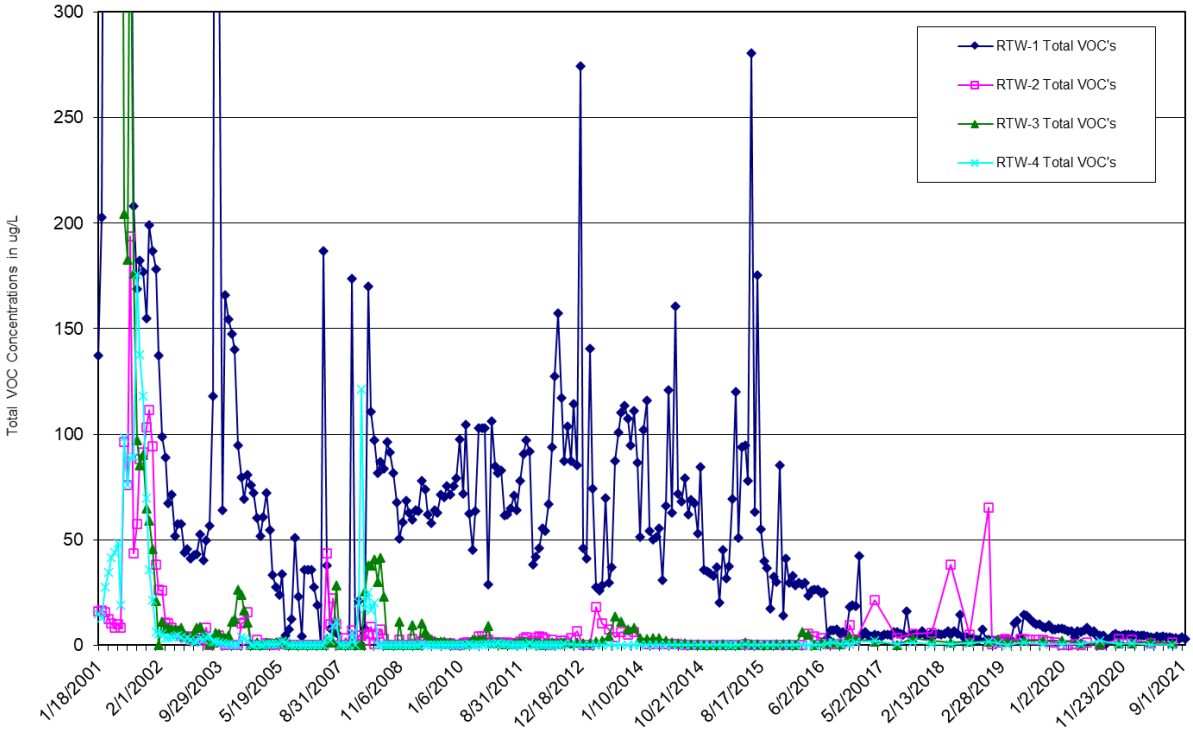


Table 7-2
Effluent Water Quality for RTW-1
SPDES Equivalency Permit Concentrations July 1, 2021– September 30, 2021

Parameter	Permit Limit	Max. Measured Value	Units	Frequency*
Flow	**120**	**59**	**GPM**	**Continuous**
pH (range)	**5.0 - 8.5**	**7.5 – 7.8**	**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 2021:

Extraction well RTW-1 ran normally for the month. The system treated approximately 2.5 million gallons of water.

August 2021:

Extraction well RTW-1 ran normally for the month. The system treated approximately 2.5

million gallons of water.

September 2021:

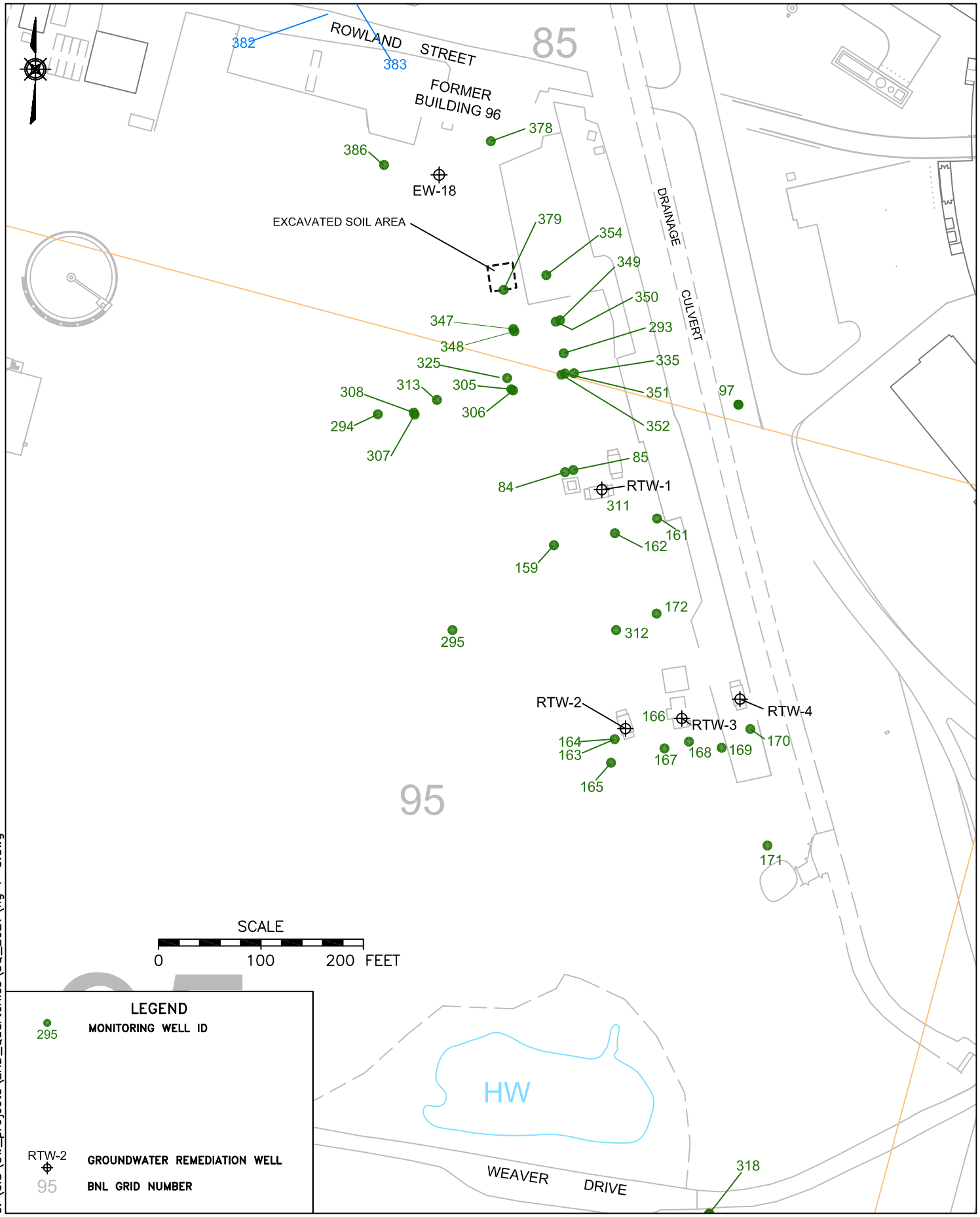
Extraction well RTW-1 ran normally for the month. The system treated approximately 2.5 million gallons of water.

The system treated approximately 7.5 million gallons of water during the third quarter of 2021.

During the third quarter of 2021, the highest PCE concentration in the Building 96 monitoring wells was 47 µg/L in well 095-84. The maximum PCE detection in extraction well RTW-1 in the third quarter was 3.4 µg/L. Trichlorofluoromethane (Freon-11) was not detected in the third quarter in RTW-1.

Planned Operational Changes

- Maintain full time operation of treatment well RTW-1. Monitor VOC concentrations in well 085-379 to determine when RTW-1 can be shut down. Maintain a monthly sampling frequency of RTW-1 influent and effluent.
- As per a recommendation in the 2021 CERCLA Five-Year Review Report, closely monitor TVOC concentrations in the plume source area and evaluate/implement a liquid carbon with zero-valent iron in-situ treatment for the immediate source area.
- 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 2021, the maximum TVOC concentration was 2.8 µg/L in monitoring well 095-168. This well is located immediately downgradient of extraction well RTW-3. Extraction wells RTW-2, RTW-3 or RTW-4 did not exceed a TVOC concentration of 50 µg/L.



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ENVIRONMENTAL PROTECTION DIVISION

TITLE:

OU III BUILDING 96 MONITORING WELL NETWORK

SITEWIDE REMEDIATION SYSTEMS
THIRD QUARTER 2021 OPERATIONS REPORT

DWN:	VT: HZ.:	DATE:	PROJECT NO.:
AJZ	–	06/15/18	–
CHKD:	APPD:	REV.:	NOTES:
LDS	--	10/26/21	–

FIGURE NO.: 7-3

Table 7-3
OU III Building 96 Monitoring Well Data
'Hits Only' July through September 2021

Site ID : 085-293

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/13/2021	1.1	--	--	UG/L	50.00	
Chloroform	07/13/2021	1.1	0.5	--	UG/L	50.00	

Site ID : 085-335

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/13/2021	28.19	--	--	UG/L	35.00	
1,1,1-Trichloroethane	07/13/2021	0.19	0.5	--	UG/L	35.00	J
Tetrachloroethylene	07/13/2021	28	0.5	--	UG/L	35.00	

Site ID : 085-348

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/12/2021	19.72	--	--	UG/L	34.50	
Chloroform	07/12/2021	0.34	0.5	--	UG/L	34.50	J
cis-1,2-Dichloroethylene	07/12/2021	0.38	0.5	--	UG/L	34.50	J
Tetrachloroethylene	07/12/2021	19	0.5	--	UG/L	34.50	

Site ID : 085-349

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/13/2021	2.9	--	--	UG/L	22.50	
Tetrachloroethylene	07/13/2021	2.9	0.5	--	UG/L	22.50	

Site ID : 085-350

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/13/2021	10.08	--	--	UG/L	34.50	
1,1,1-Trichloroethane	07/13/2021	0.18	0.5	--	UG/L	34.50	J
Tetrachloroethylene	07/13/2021	9.9	0.5	--	UG/L	34.50	

Site ID : 085-351

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/13/2021	6.5	--	--	UG/L	22.50	
Tetrachloroethylene	07/13/2021	6.5	0.5	--	UG/L	22.50	

Site ID : 085-352

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/13/2021	17	--	--	UG/L	34.50	
Tetrachloroethylene	07/13/2021	17	0.5	--	UG/L	34.50	

Site ID : 085-354

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/09/2021	7.1	--	--	UG/L	22.50	

Table 7-3
OU III Building 96 Monitoring Well Data
'Hits Only' July through September 2021

Site ID : 085-354

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Tetrachloroethylene	07/09/2021	7.1	0.5	--	UG/L	22.50	

Site ID : 085-379

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/13/2021	21	--	--	UG/L	17.00	
Tetrachloroethylene	07/13/2021	21	0.5	--	UG/L	17.00	

Site ID : 095-159

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	08/25/2021	6.38	--	--	UG/L	50.00	
1,1,1-Trichloroethane	08/25/2021	0.18	0.5	--	UG/L	50.00	J
Tetrachloroethylene	08/25/2021	6.2	0.5	--	UG/L	50.00	
8260 TVOC	09/03/2021	6.4	--	--	UG/L	50.00	
Tetrachloroethylene	09/03/2021	6.4	0.5	--	UG/L	50.00	

Site ID : 095-162

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/13/2021	0.75	--	--	UG/L	50.00	
Chloroform	07/13/2021	0.75	0.5	--	UG/L	50.00	

Site ID : 095-163

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/08/2021	1.61	--	--	UG/L	50.00	
Chloroform	07/08/2021	0.24	0.5	--	UG/L	50.00	J
Tetrachloroethylene	07/08/2021	0.79	0.5	--	UG/L	50.00	
Trichlorofluoromethane	07/08/2021	0.58	0.5	--	UG/L	50.00	

Site ID : 095-165

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/08/2021	1.9	--	--	UG/L	50.00	
Tetrachloroethylene	07/08/2021	1.9	0.5	--	UG/L	50.00	

Site ID : 095-166

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/07/2021	1.33	--	--	UG/L	50.00	
Chloroform	07/07/2021	1	0.5	--	UG/L	50.00	
Tetrachloroethylene	07/07/2021	0.33	0.5	--	UG/L	50.00	J

Site ID : 095-168

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/07/2021	2.78	--	--	UG/L	50.00	

Table 7-3
OU III Building 96 Monitoring Well Data
'Hits Only' July through September 2021

Site ID : 095-168

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Chloroform	07/07/2021	2.4	0.5	--	UG/L	50.00	
Tetrachloroethylene	07/07/2021	0.38	0.5	--	UG/L	50.00	J

Site ID : 095-169

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/07/2021	1.37	--	--	UG/L	50.00	
Chloroform	07/07/2021	1.1	0.5	--	UG/L	50.00	
Tetrachloroethylene	07/07/2021	0.27	0.5	--	UG/L	50.00	J

Site ID : 095-172

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/08/2021	1.3	--	--	UG/L	50.00	
Chloroform	07/08/2021	1.3	0.5	--	UG/L	50.00	

Site ID : 095-305

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/12/2021	1.8	--	--	UG/L	22.50	
Tetrachloroethylene	07/12/2021	1.8	0.5	--	UG/L	22.50	

Site ID : 095-306

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/12/2021	22	--	--	UG/L	34.50	
Tetrachloroethylene	07/12/2021	22	0.5	--	UG/L	34.50	

Site ID : 095-312

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/08/2021	0.63	--	--	UG/L	50.00	
Chloroform	07/08/2021	0.63	0.5	--	UG/L	50.00	

Site ID : 095-318

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/12/2021	1.51	--	--	UG/L	65.00	
Chloroform	07/12/2021	0.51	0.5	--	UG/L	65.00	
Tetrachloroethylene	07/12/2021	1	0.5	--	UG/L	65.00	

Site ID : 095-325

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/13/2021	16.96	--	--	UG/L	45.00	
Chloroform	07/13/2021	0.6	0.5	--	UG/L	45.00	
cis-1,2-Dichloroethylene	07/13/2021	0.36	0.5	--	UG/L	45.00	J

Table 7-3
OU III Building 96 Monitoring Well Data
'Hits Only' July through September 2021

Site ID : 095-325

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Tetrachloroethylene	07/13/2021	16	0.5	--	UG/L	45.00	

Site ID : 095-84

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/08/2021	43	--	--	UG/L	35.00	
Tetrachloroethylene	07/08/2021	43	0.5	--	UG/L	35.00	
8260 TVOC	07/13/2021	47	--	--	UG/L	25.00	
Tetrachloroethylene	07/13/2021	47	0.5	--	UG/L	25.00	

Site ID : 095-85

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/08/2021	0.66	--	--	UG/L	95.00	
Chloroform	07/08/2021	0.66	0.5	--	UG/L	95.00	

Table 7-5
OU III Building 96 Influent Data
'Hits Only' July through September 2021

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

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/09/2021	3.9	--	--	UG/L	0.00	
Chloroform	07/09/2021	0.5	0.5	--	UG/L	0.00	
Tetrachloroethylene	07/09/2021	3.4	0.5	--	UG/L	0.00	
8260 TVOC	07/19/2021	3.55	--	--	UG/L	0.00	
Chloroform	07/19/2021	0.45	0.5	--	UG/L	0.00	J
Tetrachloroethylene	07/19/2021	3.1	0.5	--	UG/L	0.00	
8260 TVOC	08/03/2021	3.34	--	--	UG/L	0.00	
Chloroform	08/03/2021	0.44	0.5	--	UG/L	0.00	J
Tetrachloroethylene	08/03/2021	2.9	0.5	--	UG/L	0.00	
8260 TVOC	08/16/2021	3.24	--	--	UG/L	0.00	
Chloroform	08/16/2021	0.44	0.5	--	UG/L	0.00	J
Tetrachloroethylene	08/16/2021	2.8	0.5	--	UG/L	0.00	
8260 TVOC	09/01/2021	3.84	--	--	UG/L	0.00	
1,2,4-Trichlorobenzene	09/01/2021	0.17	0.5	--	UG/L	0.00	J
Chloroform	09/01/2021	0.49	0.5	--	UG/L	0.00	J
Naphthalene	09/01/2021	0.38	0.5	--	UG/L	0.00	J
Tetrachloroethylene	09/01/2021	2.8	0.5	--	UG/L	0.00	
8260 TVOC	09/14/2021	3.23	--	--	UG/L	0.00	
8260 TVOC	09/14/2021	3.23	--	--	UG/L	0.00	
Chloroform	09/14/2021	0.43	0.5	--	UG/L	0.00	J
Chloroform	09/14/2021	0.43	0.5	--	UG/L	0.00	J
Tetrachloroethylene	09/14/2021	2.8	0.5	--	UG/L	0.00	
Tetrachloroethylene	09/14/2021	2.8	0.5	--	UG/L	0.00	

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

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/19/2021	1.61	--	--	UG/L	0.00	
Chloroform	07/19/2021	1.3	0.5	--	UG/L	0.00	
Tetrachloroethylene	07/19/2021	0.31	0.5	--	UG/L	0.00	J

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

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/19/2021	1	--	--	UG/L	0.00	
Chloroform	07/19/2021	1	0.5	--	UG/L	0.00	

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

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/19/2021	0	--	--	UG/L	0.00	

Table 7-6
OU III Building 96 Effluent Data
'Hits Only' July through September 2021

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

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/09/2021	0	--	--	UG/L	0.00	
8260 TVOC	07/19/2021	0	--	--	UG/L	0.00	
8260 TVOC	08/03/2021	0	--	--	UG/L	0.00	
8260 TVOC	08/16/2021	0	--	--	UG/L	0.00	
8260 TVOC	09/01/2021	0	--	--	UG/L	0.00	
8260 TVOC	09/14/2021	0	--	--	UG/L	0.00	
8260 TVOC	09/14/2021	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

Q3-2021 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	159	185
August	32	129
September	38	183
Actual (Avg. over Qtr.)	**76**	**166**

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

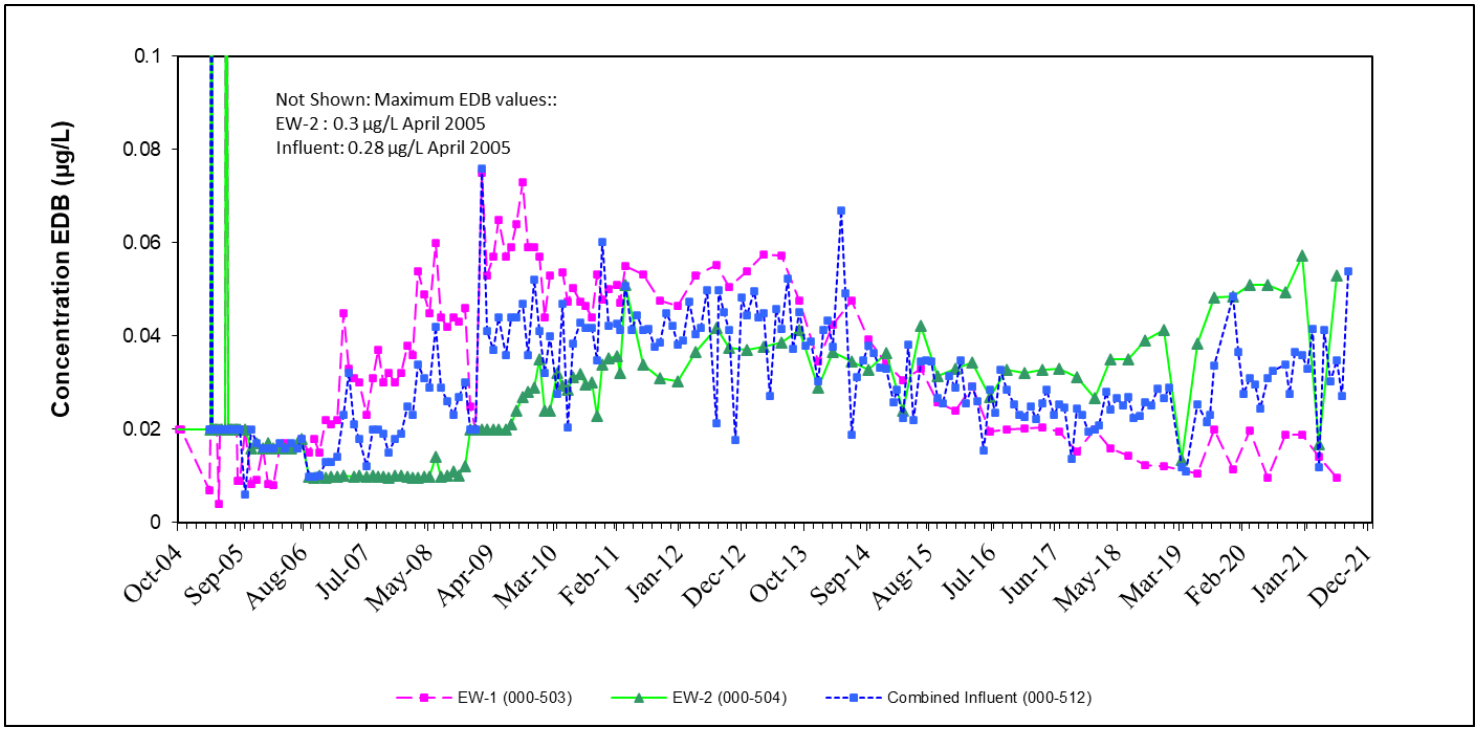


Table 9-2
OU VI Ethylene Dibromide Effluent Water Quality
SPDES Equivalency Permit Concentrations July 1, 2021 – September 30, 2021

Parameter	Permit Limit	Max. Measured Value	Units	Frequency
Flow	450	344	GPM	Continuous
pH	5.0 - 8.5	5.8-5.9	SU	Weekly
Ethylene Dibromide	.03	<0.02	ug/L	Monthly**
Chloroform	7.0	1.0	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 2021:

The system operated normally for the month. The system treated approximately 14 million gallons of water.

August 2021:

The system was off for most of the month for repairs to the Programmable Logic Controller, a faulty starter motor, repairs to a broken pipe and a carbon change-out. The system treated approximately 7 million gallons of water.

September 2021:

Well EW-1 remained off until September 22 when the starter motor was replaced. The system treated approximately 9 million gallons of water.

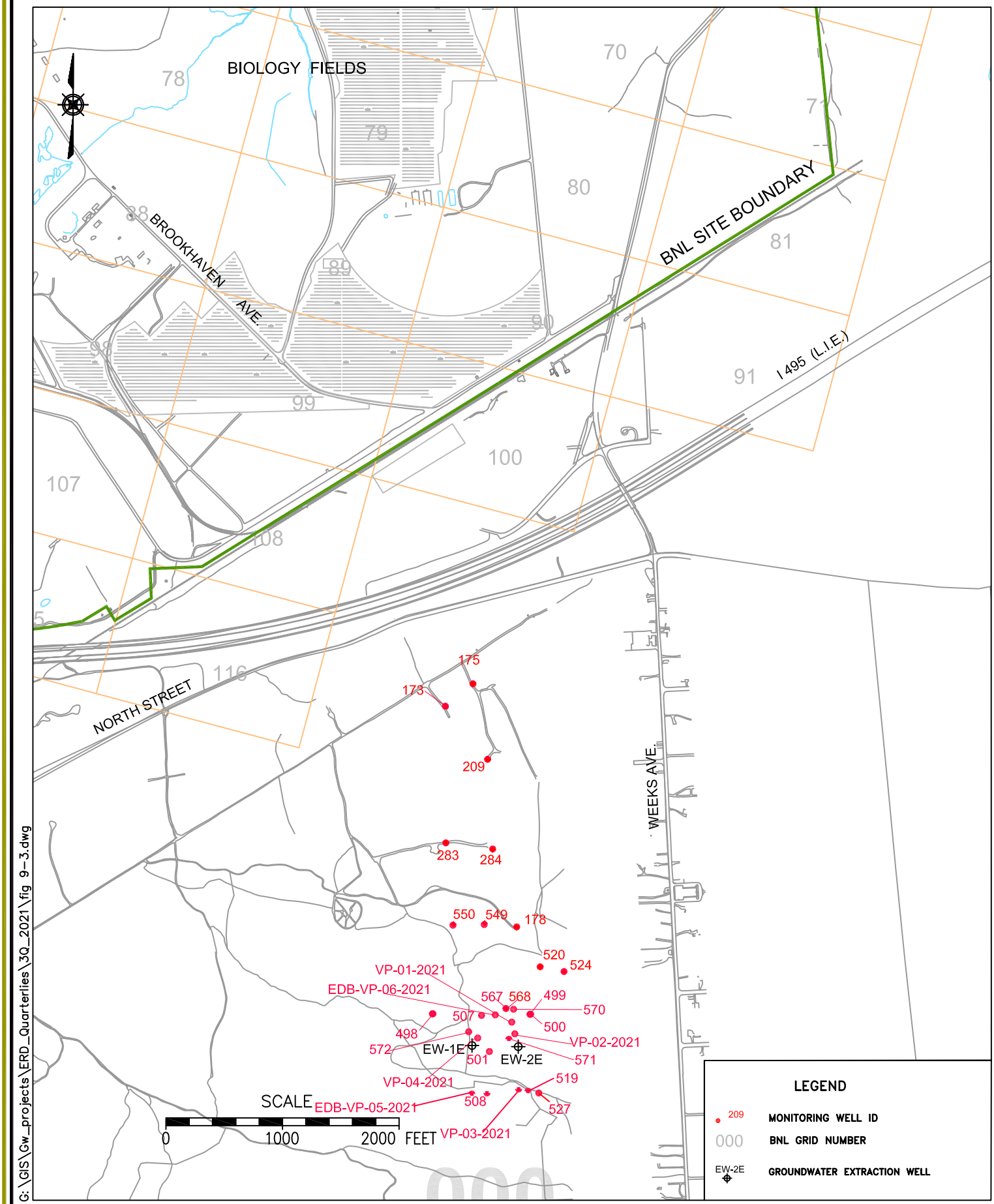
The system treated approximately 30 million gallons of water during the third quarter of 2021.

As recommended in the 2020 Groundwater Status Report, in June and July 2021 two additional vertical profile wells (EDB-VP-05-2021 and EDB-VP-06-2021) were installed to provide updated geologic and groundwater quality data at the base of the Deep Upper Glacial aquifer. In addition, three permanent monitoring wells were installed in July to enhance monitoring of the EDB plume (000-570, 000-571 and 000-572). The location of the profile wells is shown on Figure 9-3 and the analytical data detections are included in

Table 9-7. The maximum EDB concentration in EDB-VP-06-2021 was 0.43 µg/L at 157 feet below grade. EDB was not detected in EDB-VP-05-2021.

Planned Operational Changes

- Maintain full time operation of the treatment system and continue quarterly sampling of the extraction wells.
- Based on the geologic and vertical profile well data collected over the last year, perform groundwater modeling simulations to help determine the scope of system modification in the form of additional extraction wells to re-establish plume capture and ensure the achievement of ROD cleanup goals.



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ENVIRONMENTAL PROTECTION DIVISION

TITLE:

OU VI EDB

SITEWIDE REMEDIATION SYSTEMS
THIRD QUARTER 2021 OPERATIONS REPORT

DWN:	VT: HZ.:	DATE:	PROJECT NO.:
JEB	–	09/26/05	–
CHKD:	APPD:	REV.:	NOTES:
LDS	––	10/26/21	–
FIGURE NO.:		9–3	

Table 9-3
OU VI Ethylene Dibromide Monitoring Well Data
'Hits Only' July through September 2021

Site ID : 000-500

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
EDB	09/28/2021	0.0889	0.0188	--	UG/L	135.00	

Site ID : 000-549

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
EDB	09/28/2021	0.321	0.0191	--	UG/L	145.00	

Site ID : 000-550

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
EDB	09/29/2021	0.14	0.019	--	UG/L	130.00	

Table 9-4
OU VI Ethylene Dibromide Extraction Well Data
'Hits Only' July through September 2021

Site ID : 000-503 (EW-1)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/07/2021	1.9	--	--	UG/L	0.00	
1,2,3-Trichlorobenzene	07/07/2021	0.24	0.5	--	UG/L	0.00	BJ
1,2,4-Trichlorobenzene	07/07/2021	0.23	0.5	--	UG/L	0.00	BJ
Chloroform	07/07/2021	0.91	0.5	--	UG/L	0.00	J
EDB	07/07/2021	0.00962	0.019	--	UG/L	0.00	J
Naphthalene	07/07/2021	0.34	0.5	--	UG/L	0.00	BJ
p-Dichlorobenzene	07/07/2021	0.18	0.5	--	UG/L	0.00	BJ

Site ID : 000-504 (EW-2)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/07/2021	0.93	--	--	UG/L	0.00	
Chloroform	07/07/2021	0.93	0.5	--	UG/L	0.00	J
EDB	07/07/2021	0.053	0.0189	--	UG/L	0.00	

Table 9-5
OU VI Ethylene Dibromide Influent Data
'Hits Only' July through September 2021

Site ID : 000-512 (Combined Influent)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/07/2021	0.96	--	--	UG/L	0.00	
Chloroform	07/07/2021	0.96	0.5	--	UG/L	0.00	J
EDB	07/07/2021	0.0349	0.0188	--	UG/L	0.00	
8260 TVOC	08/03/2021	0.96	--	--	UG/L	0.00	
Chloroform	08/03/2021	0.96	0.5	--	UG/L	0.00	J
EDB	08/03/2021	0.0272	0.0191	--	UG/L	0.00	
8260 TVOC	09/09/2021	0.97	--	--	UG/L	0.00	
Chloroform	09/09/2021	0.97	0.5	--	UG/L	0.00	
EDB	09/09/2021	0.054	0.01	--	UG/L	0.00	

Table 9-6
OU VI Ethylene Dibromide Effluent Data
'Hits Only' July through September 2021

Site ID : 000-510 (System Effluent)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/07/2021	1.01	--	--	UG/L	0.00	
Chloroform	07/07/2021	1.01	0.5	--	UG/L	0.00	
EDB	07/07/2021	0.0191	0.0191	--	UG/L	0.00	U
EDB	07/07/2021	0.5	0.5	--	UG/L	0.00	U
8260 TVOC	08/03/2021	1	--	--	UG/L	0.00	
Chloroform	08/03/2021	1	0.5	--	UG/L	0.00	
EDB	08/03/2021	0.0188	0.0188	--	UG/L	0.00	U
EDB	08/03/2021	0.5	0.5	--	UG/L	0.00	U
8260 TVOC	09/09/2021	0	--	--	UG/L	0.00	
EDB	09/09/2021	0.01	0.01	--	UG/L	0.00	U
EDB	09/09/2021	0.5	0.5	--	UG/L	0.00	U

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 2021 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

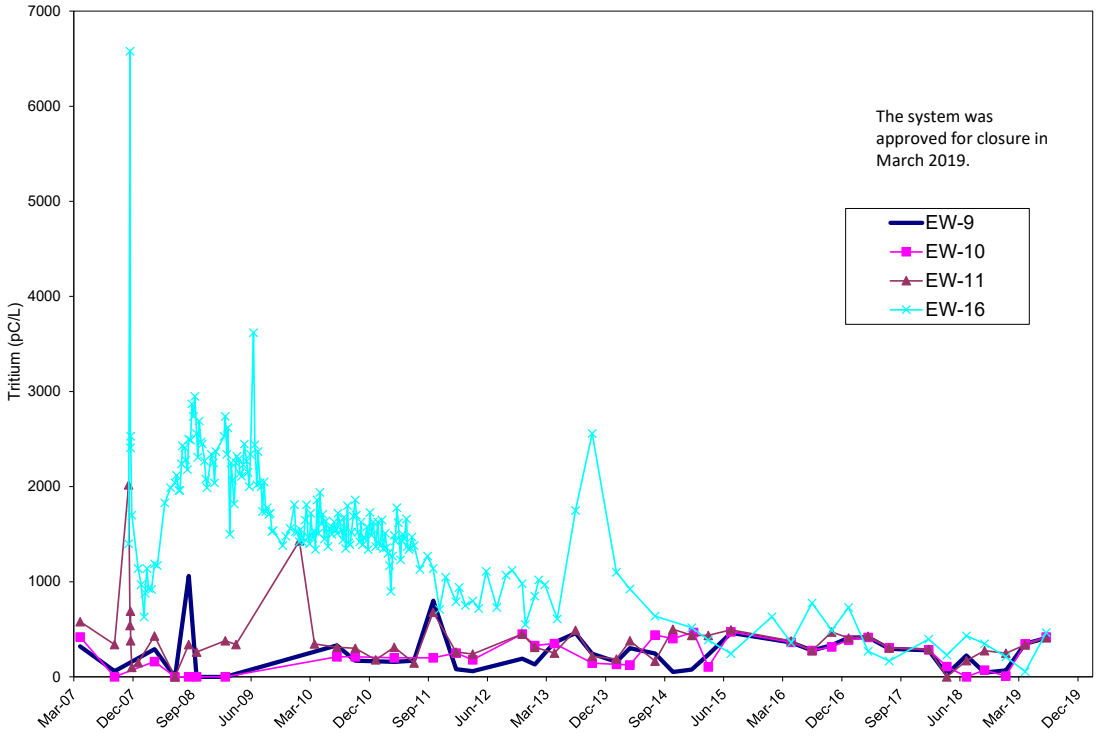


Table 10-2
Effluent Water Quality
SPDES Equivalency Permit Concentrations July 1, 2021 – September 30, 2021

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**
Methyl Chloride	**5.0**	**NA**	**ug/L**	**2/Month**
Methylene Chloride	**5.0**	**NA**	**ug/L**	**2/Month**
Methyl Bromide	**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 third quarter of 2021 was 2,850 pCi/L in well 075-804. Sampling of the extraction wells for this system was discontinued in July 2019.

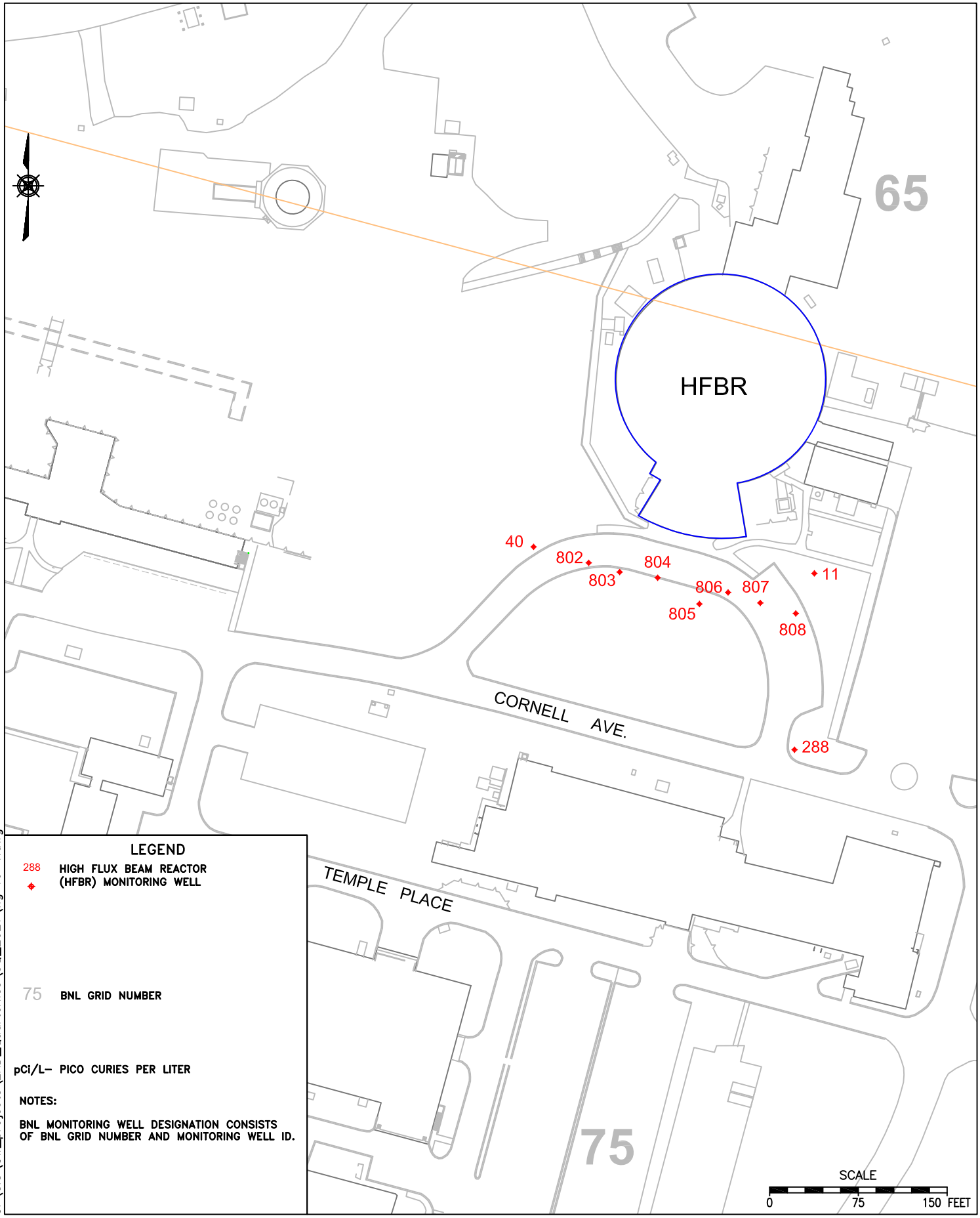
System Operations

July through September 2021:

The system remained closed.

Planned Operational Changes

- Maintain the monitoring wells and extraction wells. The carbon vessels and related equipment is planned to be reutilized for the operation of a new groundwater treatment system that will treat Per- and Poly fluoroalkyl Substances (PFAS) downgradient of the Former Firehouse.



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ENVIRONMENTAL PROTECTION DIVISION

TITLE:

OU III HFBR AOC 29

THIRD QUARTER 2021 OPERATIONS REPORT

DWN:	VT: HZ.:	DATE:	PROJECT NO.:
AJZ	–	06/14/16	–
CHKD:	APPD:	REV.:	NOTES:
LDS	–	10/26/21	–

FIGURE NO.: 10–1

Table 10-3
OU III HFBR Tritium Plume Monitoring Well Data
'Hits Only' July through September 2021

Site ID : 075-11

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Tritium	08/23/2021	428	390	258	PCI/L	61.50	

Site ID : 075-803

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Tritium	09/01/2021	437	374	256	PCI/L	55.00	

Site ID : 075-804

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Tritium	08/24/2021	2850	306	432	PCI/L	54.95	

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

Q3-2021 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 (Avg monthly gpm)	43**	0	50**	47**	63**	56**
August " "	154	0	100	63	109	102
September " "	91	0	76	***29	83	82
Actual (Avg. over Qtr.)	**96**	**0**	**75**	**46**	**85**	**80**

* Extraction well WSB-2 is in standby mode. Extraction wells WSB-3 through WSB-6 became operational in March 2019.
** System down first week of July 2021.
***WSB-4 Pump malfunction, off 9/7/2021 to 9/21/2021.

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

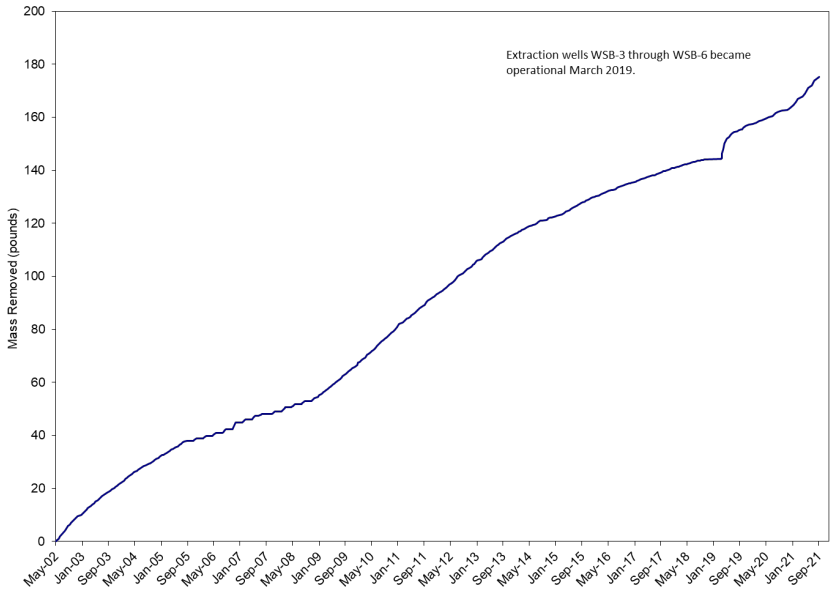


Figure 11-2
OU III Western South Boundary Pump & Treat System
Influent TVOC Concentrations vs. Time

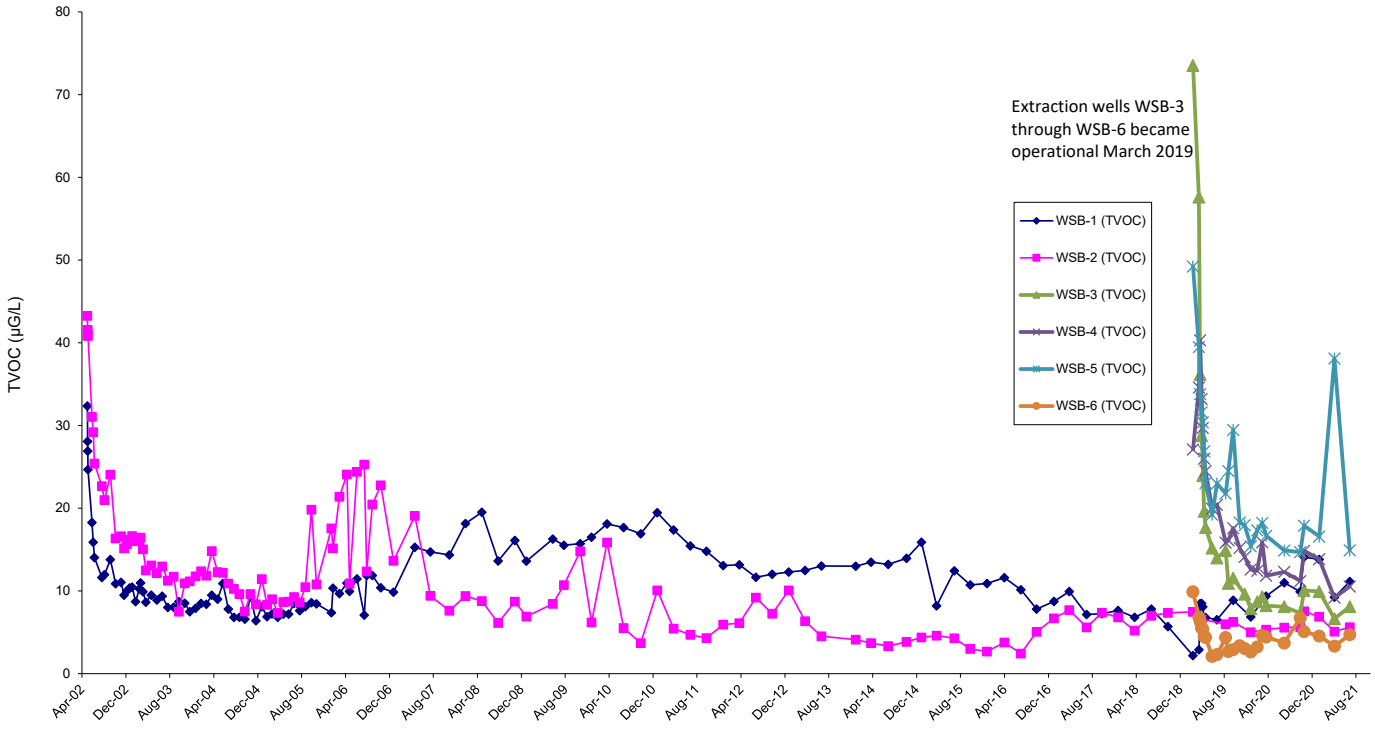


Table 11-2
OUIII Western South Boundary Effluent Water Quality
SPDES Equivalency Permit Concentrations July 1, 2021 – September 30, 2021

Parameter	Permit Limit	Max. Measured Value	Units	Frequency
Flow	**Monitor**	**1,234,743[1]**	**GPD**	**Continuous**
pH (range)	**6.5 - 8.5**	**7.4– 7.6[2]**	**SU**	**Monthly[3]**
Carbon Tetrachloride	**5**	**<0.05**	**ug/L**	**Monthly[3]**
Chloroform	**7**	**<0.05**	**ug/L**	**Monthly[3]**
Dichlorodifluoromethane	**5**	**<0.66**	**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, and Western South Boundary 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.
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 2021:

The system was down at the end of the month for one week due to electrical repairs resulting from a lightning strike. Extraction well WSB-1, WSB-3, WSB-4, WSB-5 and WSB-6 were running normally. Extraction well WSB-2 was in standby mode. The system treated approximately 11 million gallons of water.

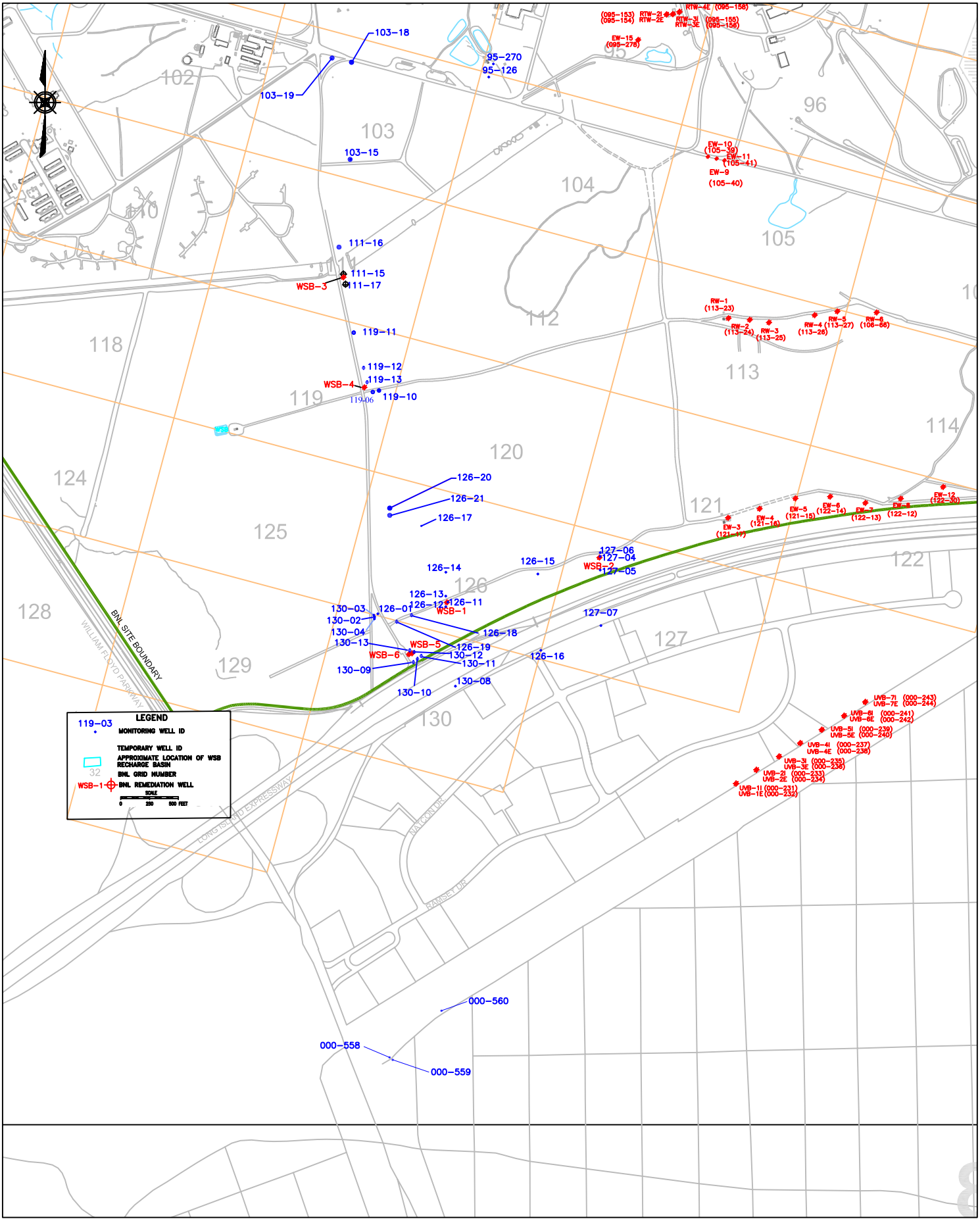
August 2021:
Extraction well WSB-1, WSB-3, WSB-4, WSB-5 and WSB-6 were running normally. Extraction well WSB-2 was in standby mode. The system treated approximately 22 million gallons of water.

September 2021:
Extraction well WSB-1, WSB-3, WSB-5 and WSB-6 were running normally. Extraction well WSB-4 was off for two weeks due to a pump malfunction. 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 2021.

Planned Operational Changes

- Continue full-time operation of extraction well WSB-1 based on elevated concentrations persisting in well 126-14.
- Continue full time operation of extraction wells WSB-3 through WSB-6.
- Based on the 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.



\\OERNT\GIS\GW_PROJECTS\ERD QUARTERLIES\3Q_2021\FIG 11-3.DWG

ENVIRONMENTAL PROTECTION DIVISION

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

SITEWIDE REMEDIATION SYSTEMS
THIRD QUARTER 2021 OPERATIONS REPORT

DWN:	VT: HZ.:	DATE:	PROJECT NO.:
JEB	–	09/26/05	–
CHKD:	APPD:	REV.:	NOTES:
LDS	--	10/26/21	–

FIGURE NO.: 11-3

Table 11-3
OU III Western South Boundary Monitoring Well Data
'Hits Only' July through September 2021

Site ID : 000-558

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	09/10/2021	18.7	--	--	UG/L	165.00	
1,1,1-Trichloroethane	09/10/2021	3.1	0.5	--	UG/L	165.00	
1,1-Dichloroethane	09/10/2021	1.1	0.5	--	UG/L	165.00	
1,1-Dichloroethylene	09/10/2021	4.1	0.5	--	UG/L	165.00	
Chloroform	09/10/2021	4.5	0.5	--	UG/L	165.00	
Dichlorodifluoromethane	09/10/2021	1.9	0.5	--	UG/L	165.00	
Trichloroethylene	09/10/2021	4	0.5	--	UG/L	165.00	

Site ID : 000-559

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	09/10/2021	6.47	--	--	UG/L	215.00	
1,1,1-Trichloroethane	09/10/2021	0.78	0.5	--	UG/L	215.00	
1,1-Dichloroethane	09/10/2021	0.22	0.5	--	UG/L	215.00	J
1,1-Dichloroethylene	09/10/2021	1.1	0.5	--	UG/L	215.00	
Chloroform	09/10/2021	1	0.5	--	UG/L	215.00	
Dichlorodifluoromethane	09/10/2021	2.9	0.5	--	UG/L	215.00	
Trichloroethylene	09/10/2021	0.47	0.5	--	UG/L	215.00	J

Site ID : 000-560

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	09/27/2021	11.72	--	--	UG/L	159.50	
1,1,1-Trichloroethane	09/27/2021	1.7	0.5	--	UG/L	159.50	
1,1-Dichloroethane	09/27/2021	0.52	0.5	--	UG/L	159.50	
1,1-Dichloroethylene	09/27/2021	2.4	0.5	--	UG/L	159.50	
Chloroform	09/27/2021	1.6	0.5	--	UG/L	159.50	
Dichlorodifluoromethane	09/27/2021	3.4	0.5	--	UG/L	159.50	
Trichloroethylene	09/27/2021	2.1	0.5	--	UG/L	159.50	

Site ID : 103-15

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/30/2021	28.1	--	--	UG/L	200.00	
1,1-Dichloroethane	07/30/2021	5.5	0.5	--	UG/L	200.00	
1,1-Dichloroethylene	07/30/2021	6.6	0.5	--	UG/L	200.00	
Dichlorodifluoromethane	07/30/2021	10	0.5	--	UG/L	200.00	
Trichloroethylene	07/30/2021	6	0.5	--	UG/L	200.00	

Site ID : 103-18

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	08/02/2021	10.3	--	--	UG/L	170.00	

Table 11-3
OU III Western South Boundary Monitoring Well Data
'Hits Only' July through September 2021

Site ID : 103-18

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1-Dichloroethane	08/02/2021	1.2	0.5	--	UG/L	170.00	
1,1-Dichloroethylene	08/02/2021	1.7	0.5	--	UG/L	170.00	
Dichlorodifluoromethane	08/02/2021	4.4	0.5	--	UG/L	170.00	
Trichloroethylene	08/02/2021	3	0.5	--	UG/L	170.00	

Site ID : 103-19

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/30/2021	7.16	--	--	UG/L	170.00	
1,1-Dichloroethane	07/30/2021	1.1	0.5	--	UG/L	170.00	
1,1-Dichloroethylene	07/30/2021	1.3	0.5	--	UG/L	170.00	
cis-1,2-Dichloroethylene	07/30/2021	0.16	0.5	--	UG/L	170.00	J
Dichlorodifluoromethane	07/30/2021	1.6	0.5	--	UG/L	170.00	
Trichloroethylene	07/30/2021	3	0.5	--	UG/L	170.00	

Site ID : 111-16

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	08/02/2021	4.52	--	--	UG/L	173.00	
1,1-Dichloroethane	08/02/2021	0.77	0.5	--	UG/L	173.00	
1,1-Dichloroethylene	08/02/2021	2	0.5	--	UG/L	173.00	
Chloroform	08/02/2021	0.46	0.5	--	UG/L	173.00	J
Dichlorodifluoromethane	08/02/2021	0.43	0.5	--	UG/L	173.00	J
Tetrachloroethylene	08/02/2021	0.18	0.5	--	UG/L	173.00	J
Trichloroethylene	08/02/2021	0.68	0.5	--	UG/L	173.00	

Site ID : 119-10

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	08/02/2021	9.3	--	--	UG/L	200.00	
1,1-Dichloroethane	08/02/2021	2.3	0.5	--	UG/L	200.00	
1,1-Dichloroethylene	08/02/2021	2	0.5	--	UG/L	200.00	
Dichlorodifluoromethane	08/02/2021	3.4	0.5	--	UG/L	200.00	
Trichloroethylene	08/02/2021	1.6	0.5	--	UG/L	200.00	

Site ID : 119-11

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	08/02/2021	73.91	--	--	UG/L	180.00	
1,1,1-Trichloroethane	08/02/2021	12	0.5	--	UG/L	180.00	
1,1-Dichloroethane	08/02/2021	7.6	0.5	--	UG/L	180.00	

Table 11-3
OU III Western South Boundary Monitoring Well Data
'Hits Only' July through September 2021

Site ID : 119-11

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1-Dichloroethylene	08/02/2021	48	0.5	--	UG/L	180.00	
1,2-Dichloroethane	08/02/2021	0.51	0.5	--	UG/L	180.00	
Chloroform	08/02/2021	0.2	0.5	--	UG/L	180.00	J
Dichlorodifluoromethane	08/02/2021	1.8	0.5	--	UG/L	180.00	
Trichloroethylene	08/02/2021	3.8	0.5	--	UG/L	180.00	

Site ID : 119-12

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	08/02/2021	11.45	--	--	UG/L	179.00	
1,1,1-Trichloroethane	08/02/2021	4.1	0.5	--	UG/L	179.00	
1,1-Dichloroethane	08/02/2021	0.52	0.5	--	UG/L	179.00	
1,1-Dichloroethylene	08/02/2021	3.8	0.5	--	UG/L	179.00	
Chloroform	08/02/2021	0.53	0.5	--	UG/L	179.00	
Trichloroethylene	08/02/2021	2.5	0.5	--	UG/L	179.00	

Site ID : 126-14

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	08/03/2021	26.3	--	--	UG/L	155.00	
1,1,1-Trichloroethane	08/03/2021	13	0.5	--	UG/L	155.00	
1,1-Dichloroethylene	08/03/2021	11	0.5	--	UG/L	155.00	
Trichloroethylene	08/03/2021	2.3	0.5	--	UG/L	155.00	

Site ID : 126-16

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	09/09/2021	15.74	--	--	UG/L	135.00	
1,1,1-Trichloroethane	09/09/2021	2.2	0.5	--	UG/L	135.00	
1,1-Dichloroethane	09/09/2021	0.94	0.5	--	UG/L	135.00	
1,1-Dichloroethylene	09/09/2021	3.4	0.5	--	UG/L	135.00	
Chloroform	09/09/2021	2.9	0.5	--	UG/L	135.00	
Dichlorodifluoromethane	09/09/2021	3	0.5	--	UG/L	135.00	
Trichloroethylene	09/09/2021	3.3	0.5	--	UG/L	135.00	

Site ID : 126-17

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	08/03/2021	0.2	--	--	UG/L	140.00	
1,1-Dichloroethylene	08/03/2021	0.2	0.5	--	UG/L	140.00	J

Site ID : 126-18

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	08/03/2021	1.75	--	--	UG/L	165.00	

Table 11-3
OU III Western South Boundary Monitoring Well Data
'Hits Only' July through September 2021

Site ID : 126-18

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	08/03/2021	0.54	0.5	--	UG/L	165.00	
1,1-Dichloroethylene	08/03/2021	0.53	0.5	--	UG/L	165.00	
1,2-Dichloroethane	08/03/2021	0.25	0.5	--	UG/L	165.00	J
Tetrachloroethylene	08/03/2021	0.23	0.5	--	UG/L	165.00	J
Trichloroethylene	08/03/2021	0.2	0.5	--	UG/L	165.00	J

Site ID : 126-19

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	08/03/2021	17.7	--	--	UG/L	195.00	
1,1,1-Trichloroethane	08/03/2021	1.8	0.5	--	UG/L	195.00	
1,1-Dichloroethane	08/03/2021	2.1	0.5	--	UG/L	195.00	
1,1-Dichloroethylene	08/03/2021	4.2	0.5	--	UG/L	195.00	
Chloroform	08/03/2021	1.1	0.5	--	UG/L	195.00	
Dichlorodifluoromethane	08/03/2021	8.5	0.5	--	UG/L	195.00	

Site ID : 126-20

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	08/03/2021	18.24	--	--	UG/L	140.00	
1,1,1-Trichloroethane	08/03/2021	7.6	0.5	--	UG/L	140.00	
1,1-Dichloroethylene	08/03/2021	8.8	0.5	--	UG/L	140.00	
1,2-Dichloroethane	08/03/2021	0.3	0.5	--	UG/L	140.00	J
Chloroform	08/03/2021	0.3	0.5	--	UG/L	140.00	J
Tetrachloroethylene	08/03/2021	0.5	0.5	--	UG/L	140.00	
Trichloroethylene	08/03/2021	0.74	0.5	--	UG/L	140.00	

Site ID : 126-21

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	08/03/2021	0.56	--	--	UG/L	204.00	
1,1-Dichloroethylene	08/03/2021	0.32	0.5	--	UG/L	204.00	J
Chloroform	08/03/2021	0.24	0.5	--	UG/L	204.00	J

Site ID : 127-07

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	09/09/2021	2.11	--	--	UG/L	151.00	
1,1,1-Trichloroethane	09/09/2021	0.17	0.5	--	UG/L	151.00	J
1,1-Dichloroethane	09/09/2021	0.26	0.5	--	UG/L	151.00	J
1,1-Dichloroethylene	09/09/2021	0.42	0.5	--	UG/L	151.00	J

Table 11-3
OU III Western South Boundary Monitoring Well Data
'Hits Only' July through September 2021

Site ID : 127-07

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Chloroform	09/09/2021	0.23	0.5	--	UG/L	151.00	J
Dichlorodifluoromethane	09/09/2021	0.64	0.5	--	UG/L	151.00	
Tetrachloroethylene	09/09/2021	0.17	0.5	--	UG/L	151.00	J
Trichloroethylene	09/09/2021	0.22	0.5	--	UG/L	151.00	J

Site ID : 130-08

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	09/10/2021	2.56	--	--	UG/L	150.00	
Chloroform	09/10/2021	1.6	0.5	--	UG/L	150.00	
Tetrachloroethylene	09/10/2021	0.6	0.5	--	UG/L	150.00	
Trichloroethylene	09/10/2021	0.36	0.5	--	UG/L	150.00	J

Site ID : 130-09

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	09/09/2021	0.39	--	--	UG/L	140.00	
Chloroform	09/09/2021	0.39	0.5	--	UG/L	140.00	J

Site ID : 130-10

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	09/09/2021	0.42	--	--	UG/L	155.00	
Chloroform	09/09/2021	0.42	0.5	--	UG/L	155.00	J

Site ID : 130-11

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	09/09/2021	1.93	--	--	UG/L	200.00	
1,1,1-Trichloroethane	09/09/2021	0.55	0.5	--	UG/L	200.00	
1,1-Dichloroethylene	09/09/2021	0.73	0.5	--	UG/L	200.00	
Chloroform	09/09/2021	0.65	0.5	--	UG/L	200.00	

Site ID : 130-14

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	08/03/2021	20.1	--	--	UG/L	208.00	
1,1-Dichloroethane	08/03/2021	1	0.5	--	UG/L	208.00	
1,1-Dichloroethylene	08/03/2021	1.1	0.5	--	UG/L	208.00	
Dichlorodifluoromethane	08/03/2021	18	0.5	--	UG/L	208.00	

Table 11-4
OU III Western South Boundary Extraction Well Data
'Hits Only' July through September 2021

Site ID : 111-17 (WSB-3)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/08/2021	8.1	--	--	UG/L	0.00	
1,1,1-Trichloroethane	07/08/2021	1	0.5	--	UG/L	0.00	
1,1-Dichloroethane	07/08/2021	0.89	0.5	--	UG/L	0.00	
1,1-Dichloroethylene	07/08/2021	4.5	0.5	--	UG/L	0.00	
Chloroform	07/08/2021	0.83	0.5	--	UG/L	0.00	
Tetrachloroethylene	07/08/2021	0.17	0.5	--	UG/L	0.00	J
Trichloroethylene	07/08/2021	0.71	0.5	--	UG/L	0.00	

Site ID : 119-13 (WSB-4)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/08/2021	10.54	--	--	UG/L	0.00	
1,1,1-Trichloroethane	07/08/2021	3.2	0.5	--	UG/L	0.00	
1,1-Dichloroethane	07/08/2021	0.58	0.5	--	UG/L	0.00	
1,1-Dichloroethylene	07/08/2021	5.2	0.5	--	UG/L	0.00	
Chloroform	07/08/2021	0.26	0.5	--	UG/L	0.00	J
Dichlorodifluoromethane	07/08/2021	0.47	0.5	--	UG/L	0.00	J
Trichloroethylene	07/08/2021	0.83	0.5	--	UG/L	0.00	

Site ID : 126-12 (WSB-1)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/08/2021	11.14	--	--	UG/L	0.00	
1,1,1-Trichloroethane	07/08/2021	4	0.5	--	UG/L	0.00	
1,1-Dichloroethylene	07/08/2021	5.6	0.5	--	UG/L	0.00	
Chloroform	07/08/2021	0.76	0.5	--	UG/L	0.00	
Trichloroethylene	07/08/2021	0.78	0.5	--	UG/L	0.00	

Site ID : 127-05 (WSB-2)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/08/2021	5.63	--	--	UG/L	0.00	
1,1,1-Trichloroethane	07/08/2021	0.87	0.5	--	UG/L	0.00	
1,1-Dichloroethane	07/08/2021	0.34	0.5	--	UG/L	0.00	J
1,1-Dichloroethylene	07/08/2021	0.96	0.5	--	UG/L	0.00	
Chloroform	07/08/2021	0.9	0.5	--	UG/L	0.00	
Dichlorodifluoromethane	07/08/2021	0.26	0.5	--	UG/L	0.00	J
Trichloroethylene	07/08/2021	2.3	0.5	--	UG/L	0.00	

Site ID : 130-12 (WSB-5)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/08/2021	14.92	--	--	UG/L	0.00	

Table 11-4
OU III Western South Boundary Extraction Well Data
'Hits Only' July through September 2021

Site ID : 130-12 (WSB-5)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
1,1,1-Trichloroethane	07/08/2021	5	0.5	--	UG/L	0.00	
1,1-Dichloroethane	07/08/2021	0.42	0.5	--	UG/L	0.00	J
1,1-Dichloroethylene	07/08/2021	5.1	0.5	--	UG/L	0.00	
Chloroform	07/08/2021	1.7	0.5	--	UG/L	0.00	
Dichlorodifluoromethane	07/08/2021	1.4	0.5	--	UG/L	0.00	
Trichloroethylene	07/08/2021	1.3	0.5	--	UG/L	0.00	

Site ID : 130-13 (WSB-6)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/08/2021	4.71	--	--	UG/L	0.00	
1,1,1-Trichloroethane	07/08/2021	0.24	0.5	--	UG/L	0.00	J
1,1-Dichloroethane	07/08/2021	0.55	0.5	--	UG/L	0.00	
1,1-Dichloroethylene	07/08/2021	0.62	0.5	--	UG/L	0.00	
Dichlorodifluoromethane	07/08/2021	3.3	0.5	--	UG/L	0.00	

Table 11-5
OU III Western South Boundary Influent Data
'Hits Only' July through September 2021

Site ID : 121-55 (System Influent)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/08/2021	10.54	--	--	UG/L	0.00	
1,1,1-Trichloroethane	07/08/2021	3	0.5	--	UG/L	0.00	
1,1-Dichloroethane	07/08/2021	0.45	0.5	--	UG/L	0.00	J
1,1-Dichloroethylene	07/08/2021	4.5	0.5	--	UG/L	0.00	
Chloroform	07/08/2021	0.64	0.5	--	UG/L	0.00	
Dichlorodifluoromethane	07/08/2021	1.2	0.5	--	UG/L	0.00	
Trichloroethylene	07/08/2021	0.75	0.5	--	UG/L	0.00	
8260 TVOC	08/03/2021	10.08	--	--	UG/L	0.00	
1,1,1-Trichloroethane	08/03/2021	2.9	0.5	--	UG/L	0.00	
1,1-Dichloroethane	08/03/2021	0.43	0.5	--	UG/L	0.00	J
1,1-Dichloroethylene	08/03/2021	4.3	0.5	--	UG/L	0.00	
Chloroform	08/03/2021	0.76	0.5	--	UG/L	0.00	
Dichlorodifluoromethane	08/03/2021	1.2	0.5	--	UG/L	0.00	
Trichloroethylene	08/03/2021	0.49	0.5	--	UG/L	0.00	J
8260 TVOC	09/13/2021	10.26	--	--	UG/L	0.00	
1,1,1-Trichloroethane	09/13/2021	2.4	0.5	--	UG/L	0.00	
1,1-Dichloroethane	09/13/2021	0.49	0.5	--	UG/L	0.00	J
1,1-Dichloroethylene	09/13/2021	4.4	0.5	--	UG/L	0.00	
Chloroform	09/13/2021	0.88	0.5	--	UG/L	0.00	
Dichlorodifluoromethane	09/13/2021	1.4	0.5	--	UG/L	0.00	
Trichloroethylene	09/13/2021	0.69	0.5	--	UG/L	0.00	

Table 11-6
OU III Western South Boundary Effluent Data
'Hits Only' July through September 2021

Site ID : 095-126 (System Effluent)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/08/2021	0	--	--	UG/L	0.00	
8260 TVOC	08/03/2021	0	--	--	UG/L	0.00	
8260 TVOC	09/13/2021	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
Q3-2021 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

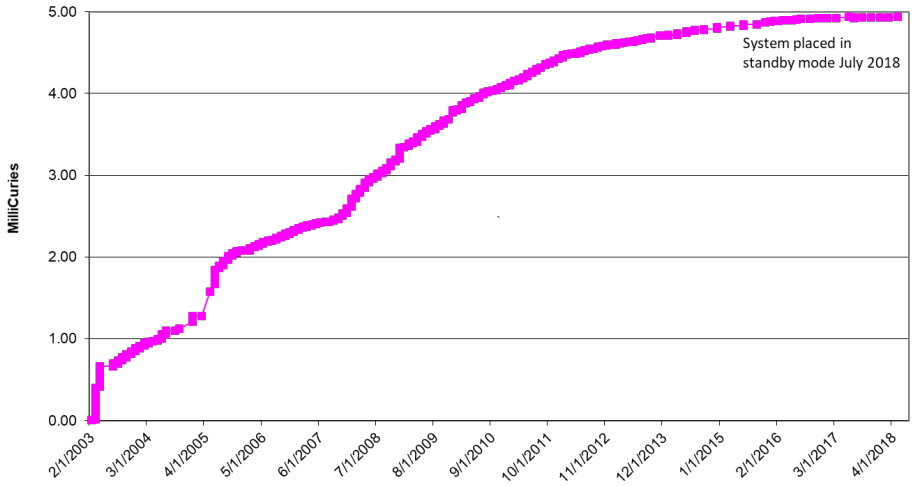


Figure 12-2
Chemical Holes Influent Strontium-90 Concentrations

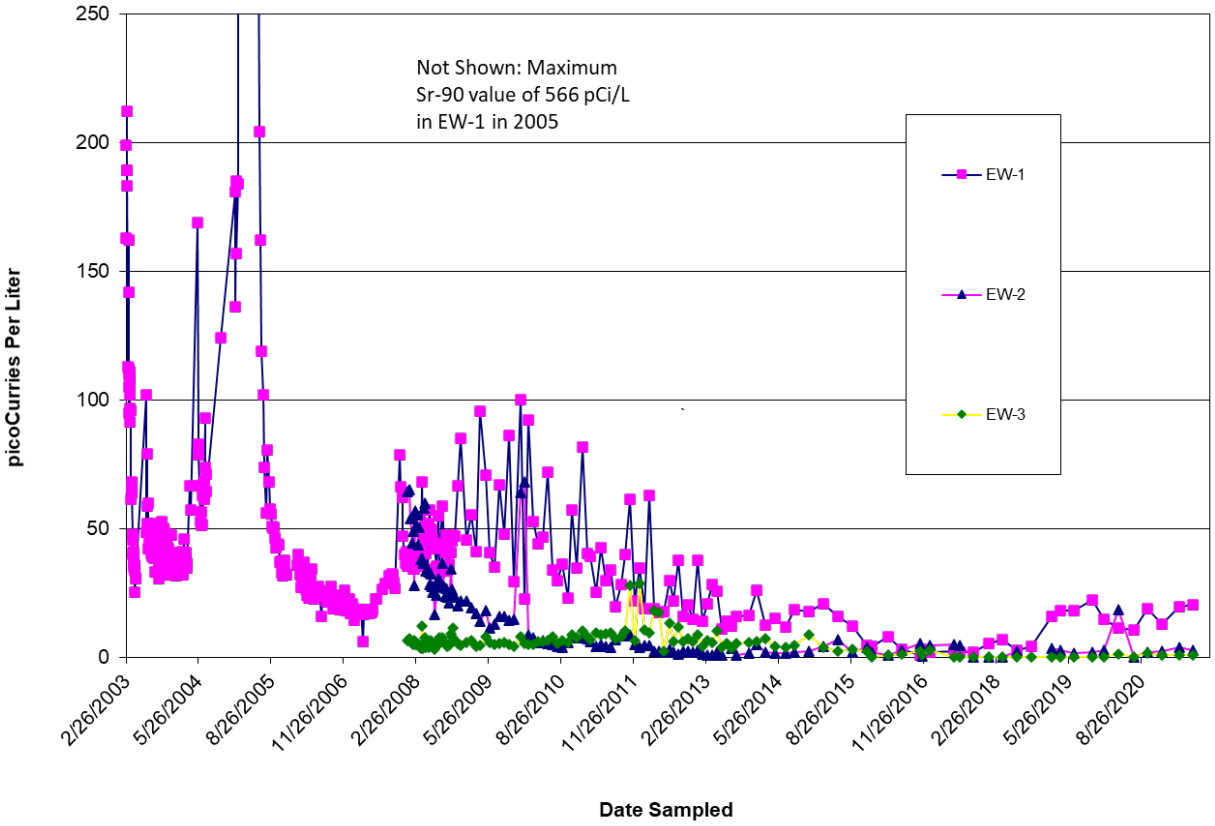


Table 12-2
OU III Sr-90 Chemical Holes Treatment System Effluent Water Quality
SPDES Equivalency Permit Concentrations July 1 – September 30, 2021

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.

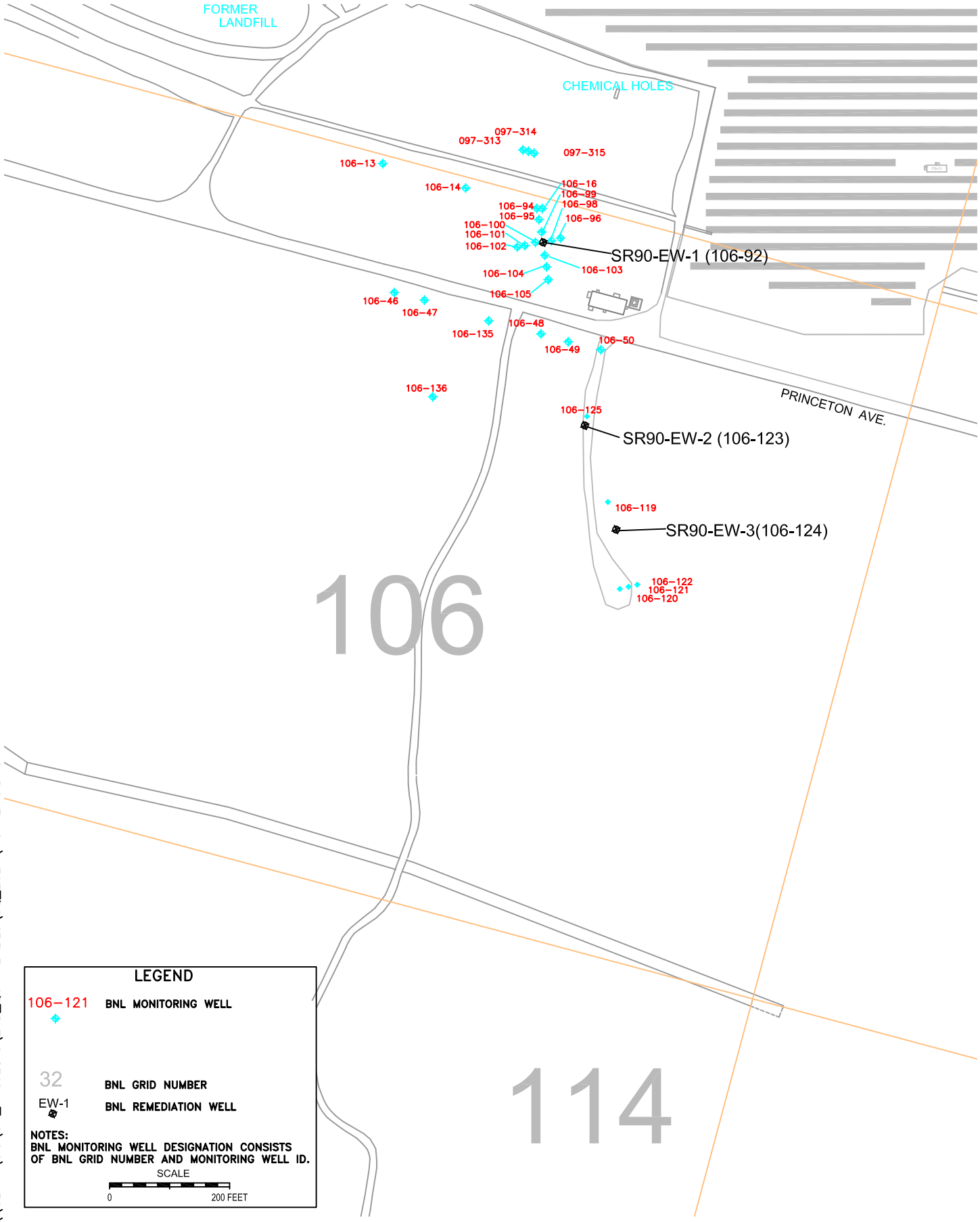
Systems Operations

July through September 2021:

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 2.87 pCi/L and 0.95 pCi/L, respectively. Extraction well EW-1 had Sr-90 concentration of 20.5 pCi/L. The maximum Sr-90 concentration in the monitoring wells during the third quarter was 72 pCi/L in well 097-314, which is located upgradient of EW-1. The first quarter 2021 Sr-90 result for this well was 44 pCi/L.
- If Sr-90 concentrations in the monitoring and extraction wells do not show any significant rebound through 2021, then a Petition for Closure of the treatment system may be prepared.



ENVIRONMENTAL PROTECTION DIVISION

TITLE:

CHEMICAL HOLES
Sr-90 MONITORING WELL NETWORK

SITEWIDE REMEDIATION SYSTEMS
THIRD QUARTER 2021 OPERATIONS REPORT

DWN:	VT: HZ.:	DATE:	PROJECT NO.:
JEB	–	07/15/08	–
CHKD:	APPD:	REV.:	NOTES:
LDS	--	10/26/21	–

FIGURE NO.: 12-3

Table 12-3
OU III Strontium-90 Chemical Holes Monitoring Well Data
'Hits Only' July through September 2021

Site ID : 097-313

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	07/22/2021	5.62	0.747	0.556	PCI/L	33.75	

Site ID : 097-314

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	07/22/2021	71.9	0.677	1.35	PCI/L	39.00	

Site ID : 097-315

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	07/22/2021	5.51	0.757	0.575	PCI/L	33.59	

Site ID : 106-100

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	07/16/2021	3.47	0.477	0.332	PCI/L	30.41	

Site ID : 106-101

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	07/16/2021	6.33	0.641	0.549	PCI/L	32.81	

Site ID : 106-103

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	07/15/2021	3.25	0.496	0.346	PCI/L	29.85	

Site ID : 106-104

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	07/15/2021	5.22	0.485	0.509	PCI/L	29.69	

Site ID : 106-125

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	07/20/2021	2.77	0.836	0.559	PCI/L	40.00	

Site ID : 106-13

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	07/20/2021	1.43	0.481	0.33	PCI/L	34.00	

Site ID : 106-136

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	07/20/2021	6.75	0.647	0.562	PCI/L	32.00	

Site ID : 106-16

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	07/22/2021	20.9	0.637	0.796	PCI/L	35.47	

Site ID : 106-49

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	07/23/2021	0.754	0.725	0.458	PCI/L	37.00	J

Table 12-3
OU III Strontium-90 Chemical Holes Monitoring Well Data
'Hits Only' July through September 2021

Site ID : 106-94

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	07/21/2021	18.3	0.677	0.727	PCI/L	35.65	

Site ID : 106-95

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	07/21/2021	16.7	0.484	0.683	PCI/L	35.39	

Site ID : 106-98

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	07/15/2021	2.21	0.476	0.337	PCI/L	30.69	

Site ID : 106-99

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	07/16/2021	19	0.758	0.815	PCI/L	31.77	

Table 12-4
OU III Strontium-90 Chemical Holes Extraction Well Data
'Hits Only' July through September 2021

Site ID : 106-123 (EW-2)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	07/15/2021	2.87	0.688	0.606	PCI/L	0.00	

Site ID : 106-124 (EW-3)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	07/15/2021	0.958	0.542	0.399	PCI/L	0.00	

Site ID : 106-92 (EW-1)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	07/15/2021	20.5	0.785	1.49	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

Q3-2021 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

Q3-2021 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	0*	0*
August	0*	0*
September	0*	0*
Actual (Avg. over Qtr.)	0*	0*

*=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

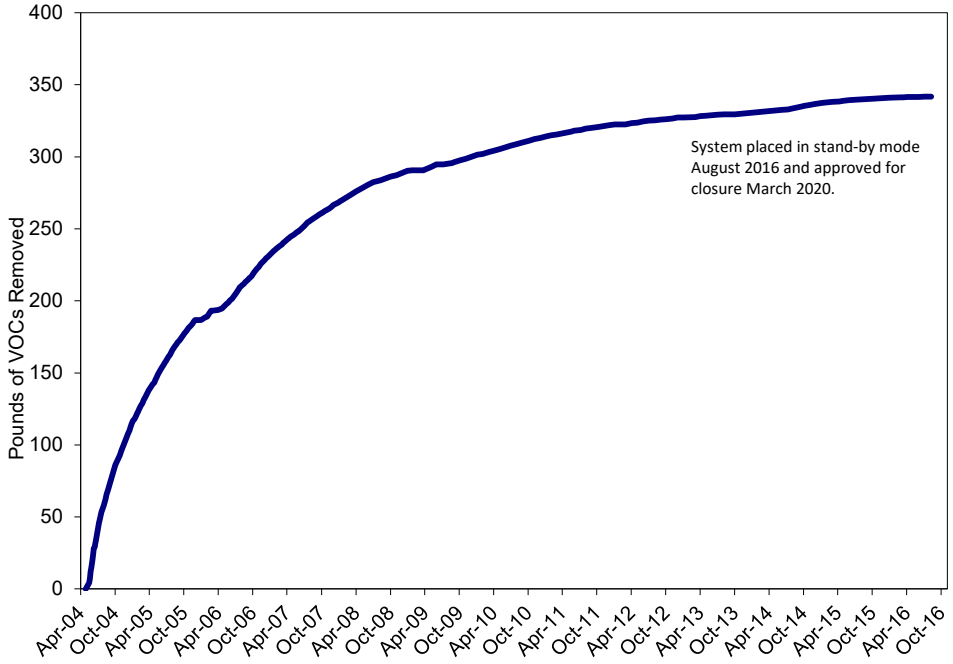


Figure 14-2
OU III North Street Pump & Treat System
Influent TVOC Concentrations vs. Time

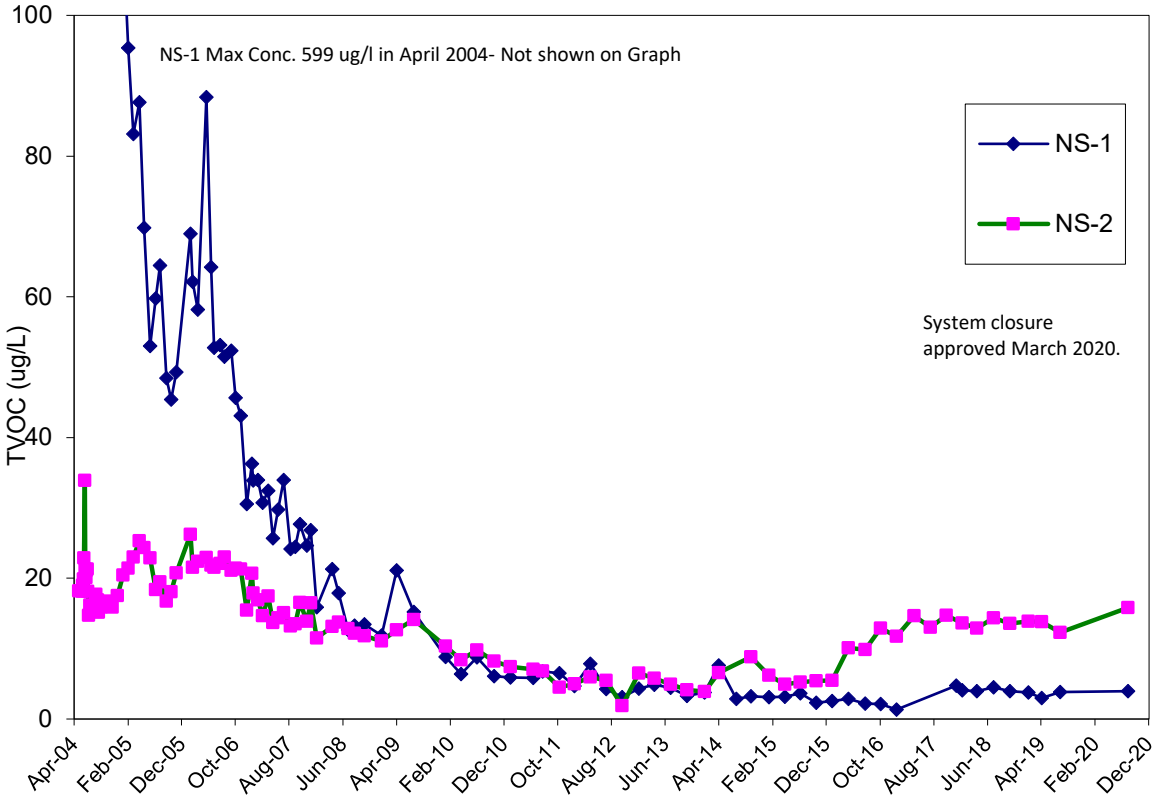


Table 14-2
Effluent Water Quality
SPDES Equivalency Permit Concentrations July 1 – September 30, 2021

Parameter	Permit Limit	Max. Measured Value	Units	Frequency
Flow	**Monitor**	NA [1]	**GPD**	**Continuous**
pH (range)	**5.5 - 8.5**	NA [1]	**SU**	**Monthly**
Carbon Tetrachloride	**5**	NA [1]	**ug/L**	**Monthly**
Chloroform	**5**	NA [1]	**ug/L**	**Monthly**
1,1-Dichloroethane	**5**	NA [1]	**ug/L**	**Monthly**
1,2-Dichloroethane	**0.6**	NA [1]	**ug/L**	**Monthly**
1,1-Dichloroethylene	**5**	NA [1]	**ug/L**	**Monthly**
Tetrachloroethylene	**5**	NA [1]	**ug/L**	**Monthly**
Toluene	**5**	NA [1]	**ug/L**	**Monthly**
1,1,1-Trichloroethane	**5**	NA [1]	**ug/L**	**Monthly**
Trichloroethylene	**5**	NA [1]	**ug/L**	**Monthly**
Ethylene Dibromide (EDB)	**0.03**	NA [1]	**ug/L**	**Monthly**

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

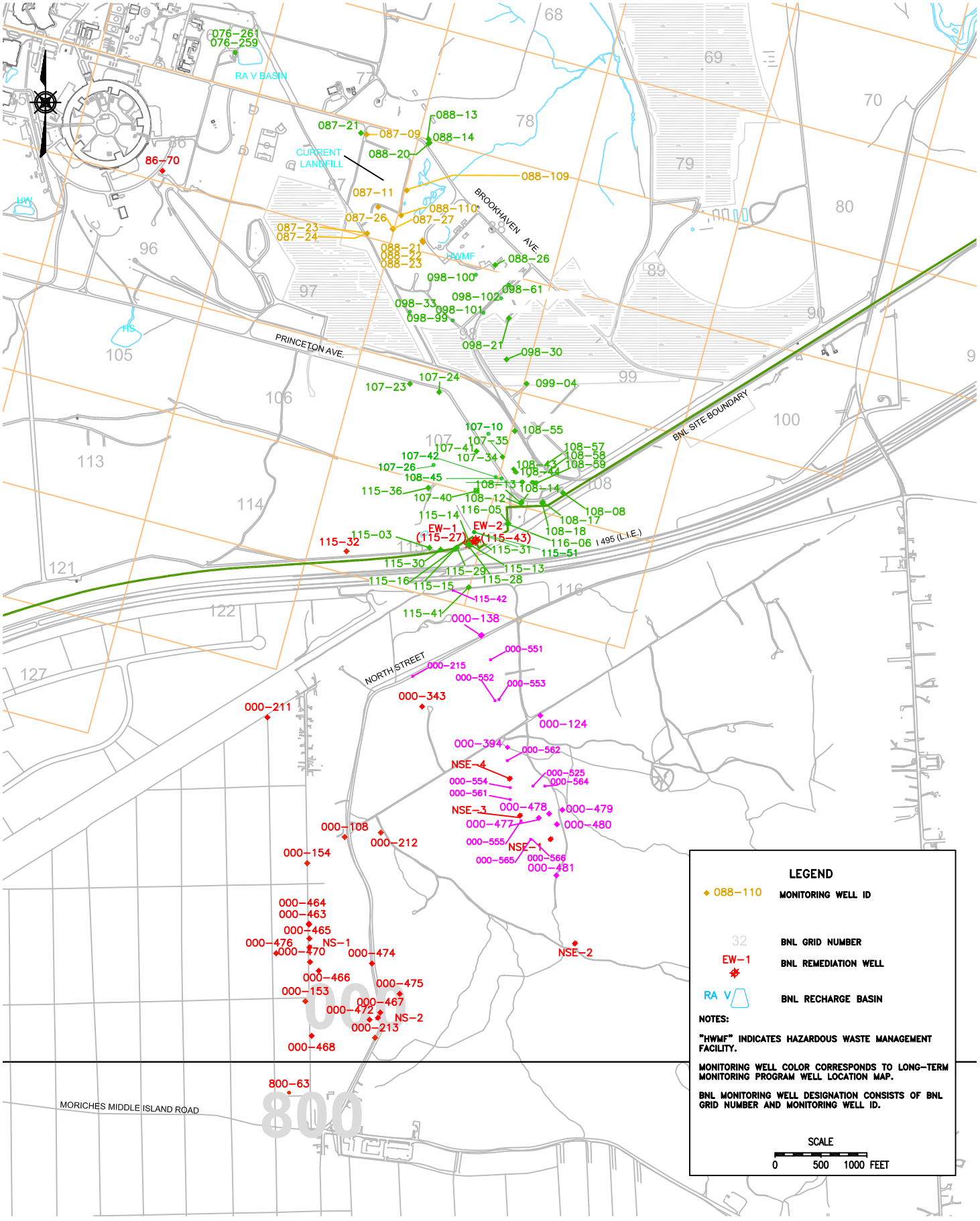
System Operations

July through September 2021:

The system remained closed.

Planned Operational Changes

- NS-1 and NS-2 will remain shut down until the PFAS and 1,4 dioxane characterization is completed. After the completion of this characterization, a determination of the future use of these wells and treatment system infrastructure will be determined.



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ENVIRONMENTAL PROTECTION DIVISION

TITLE:

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

SITEWIDE REMEDIATION SYSTEMS
THIRD QUARTER 2021 OPERATIONS REPORT

DWN:	VT: HZ.:	DATE:	PROJECT NO.:
JEB	–	08/08/11	–
CHKD:	APPD:	REV.:	NOTES:
LDS	––	10/26/21	–

FIGURE NO.: 14-3

Section 15

Q3-2021 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*	95	94
August	0*	0*	108	100
September	0*	0*	112	99
Actual (Avg. over Qtr.)	0*	0*	105	98

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

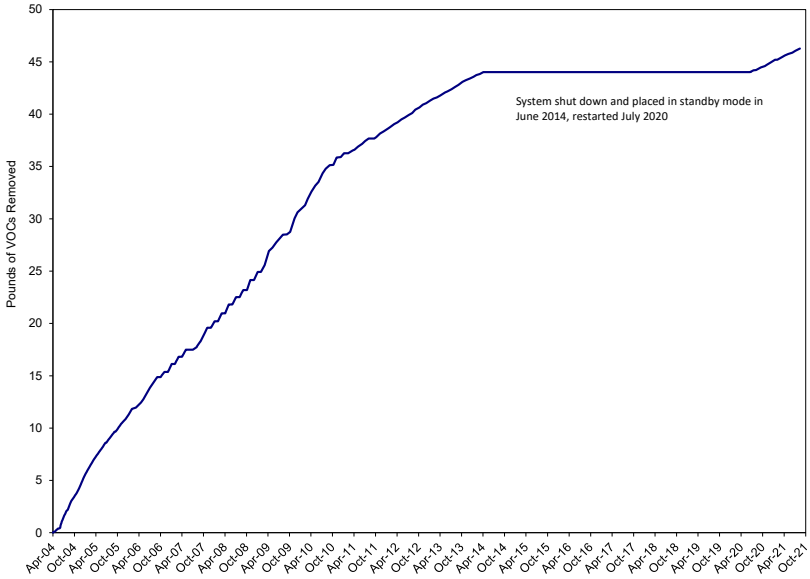


Figure 15-2
OU III North Street East Pump & Treat System
Influent TVOC Concentrations vs. Time

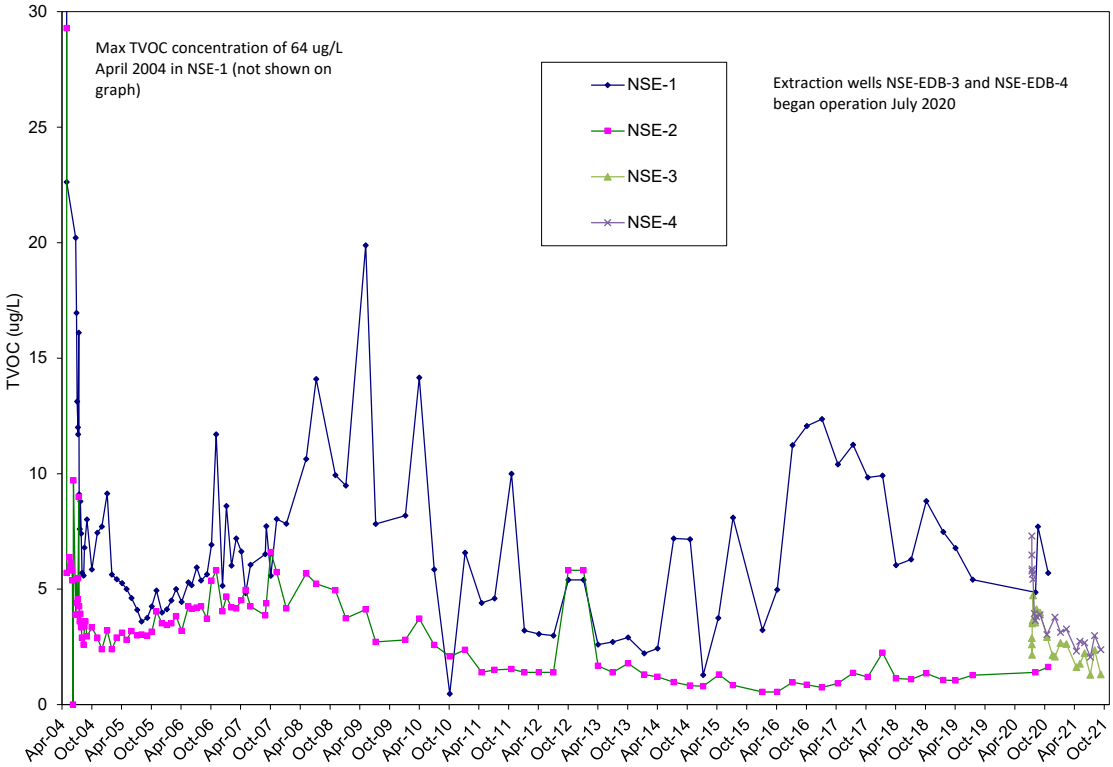


Figure 15-3
OU III North Street East Pump & Treat System
Influent EDB Concentrations vs. Time

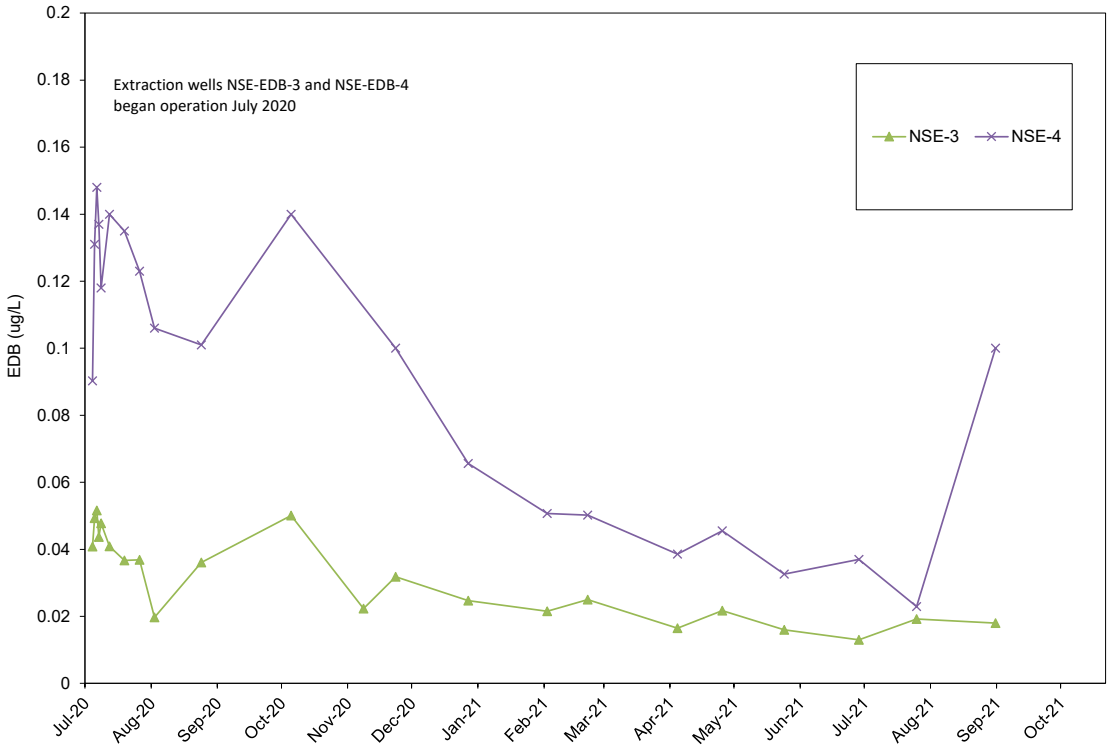


Table 15-2
Effluent Water Quality
SPDES Equivalency Permit Concentrations July 1 – September 30, 2021

Parameter	Permit Limit	Max. Measured Value	Units	Frequency
Flow	Monitor	293,355	GPD	Continuous
pH (range)	5.5 - 8.5	5.6-6.4	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	**5**	**<0.5**	**ug/L**	**Monthly**
Ethylene Dibromide (EDB)	**0.03**	**<0.02**	**ug/L**	**Monthly**

System Operations

July 2021:

Extraction wells NSE-EDB-3 and NSE-EDB-4 operated normally for the month. The system treated approximately 8 million gallons of water.

August 2021:

Extraction wells NSE-EDB-3 and NSE-EDB-4 were operational. The system treated approximately 9 million gallons of water.

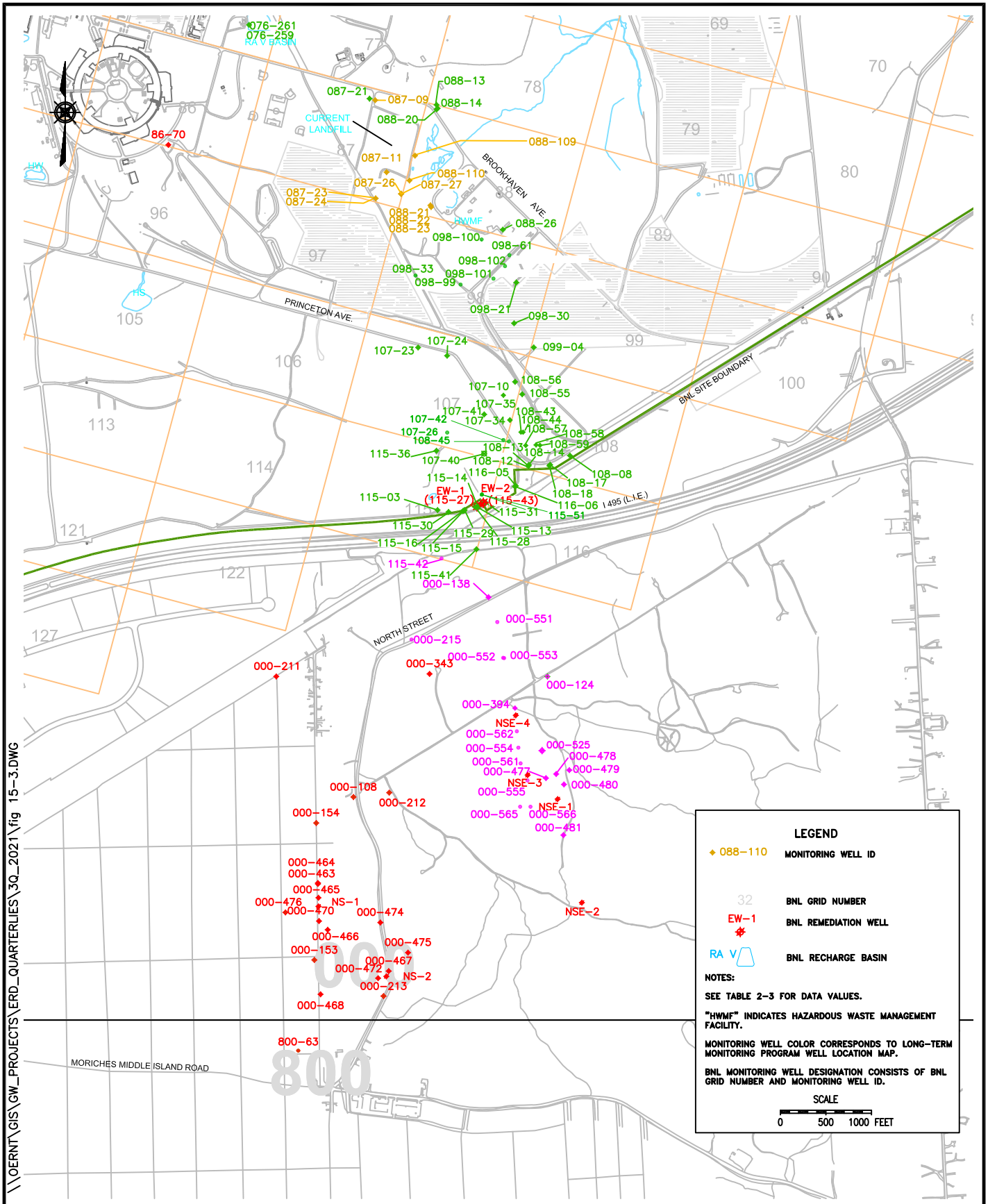
September 2021:

Extraction wells NSE-EDB-3 and NSE-EDB-4 operated normally for the month. The system treated approximately 9 million gallons of water.

The system treated approximately 26 million gallons of water during the third quarter of 2021.

Planned Operational Changes

- Continue full time operation of the EDB treatment system and maintain a monthly sampling of extraction wells NSE-EDB-EW-3 and NSE-EDB-EW-4.



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ENVIRONMENTAL PROTECTION DIVISION

TITLE:

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

SITEWIDE REMEDIATION SYSTEMS
THIRD QUARTER 2021 OPERATIONS REPORT

DWN:	VT: HZ.:	DATE:	PROJECT NO.:
JEB	–	08/08/11	NA
CHKD:	APPD:	REV.:	NOTES:
LDS	--	10/26/21	–

FIGURE NO.: 15-3

Table 15-3
OU III North Street East Monitoring Well Data
'Hits Only' July through September 2021

Site ID : 000-394

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
EDB	09/23/2021	0.043	0.0189	--	UG/L	178.00	

Site ID : 000-552

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
EDB	09/23/2021	0.115	0.019	--	UG/L	155.00	

Site ID : 000-553

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
EDB	09/23/2021	0.0313	0.0191	--	UG/L	175.00	

Site ID : 000-554

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
EDB	09/23/2021	0.778	0.0938	--	UG/L	195.00	D

Site ID : 000-563

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
EDB	09/23/2021	0.129	0.019	--	UG/L	197.00	

Site ID : 000-565

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
EDB	09/23/2021	0.0536	0.0192	--	UG/L	210.00	

Site ID : 000-566

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
EDB	09/23/2021	0.0237	0.0188	--	UG/L	210.00	

Table 15-4
OU III North Street East Extraction Well Data
'Hits Only' July through September 2021

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

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/07/2021	1.29	--	--	UG/L	0.00	
1,1,1-Trichloroethane	07/07/2021	0.24	0.5	--	UG/L	0.00	J
Chloroform	07/07/2021	0.72	0.5	--	UG/L	0.00	J
EDB	07/07/2021	0.013	0.0189	--	UG/L	0.00	J
Trichloroethylene	07/07/2021	0.33	0.5	--	UG/L	0.00	J
8260 TVOC	08/03/2021	2.36	--	--	UG/L	0.00	
Chloroform	08/03/2021	0.7	0.5	--	UG/L	0.00	J
Methylene chloride	08/03/2021	1.24	0.5	--	UG/L	0.00	BJ
Trichloroethylene	08/03/2021	0.42	0.5	--	UG/L	0.00	J
8260 TVOC	09/09/2021	1.31	--	--	UG/L	0.00	
Chloroform	09/09/2021	0.74	0.5	--	UG/L	0.00	
EDB	09/09/2021	0.018	0.01	--	UG/L	0.00	
Tetrachloroethylene	09/09/2021	0.2	0.5	--	UG/L	0.00	J
Trichloroethylene	09/09/2021	0.37	0.5	--	UG/L	0.00	J

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

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/07/2021	2.06	--	--	UG/L	0.00	
Chloroform	07/07/2021	0.66	0.5	--	UG/L	0.00	J
EDB	07/07/2021	0.037	0.0189	--	UG/L	0.00	
Methyl tert-butyl ether	07/07/2021	0.36	0.5	--	UG/L	0.00	J
Tetrachloroethylene	07/07/2021	0.61	0.5	--	UG/L	0.00	J
Trichloroethylene	07/07/2021	0.43	0.5	--	UG/L	0.00	J
8260 TVOC	08/03/2021	2.99	--	--	UG/L	0.00	
Chloroform	08/03/2021	0.74	0.5	--	UG/L	0.00	J
EDB	08/03/2021	0.0229	0.0191	--	UG/L	0.00	
Methylene chloride	08/03/2021	1.3	0.5	--	UG/L	0.00	BJ
Tetrachloroethylene	08/03/2021	0.59	0.5	--	UG/L	0.00	J
Trichloroethylene	08/03/2021	0.36	0.5	--	UG/L	0.00	J
8260 TVOC	09/09/2021	2.38	--	--	UG/L	0.00	
Chloroform	09/09/2021	0.77	0.5	--	UG/L	0.00	
Methyl tert-butyl ether	09/09/2021	0.4	0.5	--	UG/L	0.00	J
Tetrachloroethylene	09/09/2021	0.74	0.5	--	UG/L	0.00	
Trichloroethylene	09/09/2021	0.47	0.5	--	UG/L	0.00	J

Table 15-5
OU III North Street East Influent Data
'Hits Only' July through September 2021

Site ID : 000-441 (Combined Influent)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/07/2021	1.62	--	--	UG/L	0.00	
1,1,1-Trichloroethane	07/07/2021	0.21	0.5	--	UG/L	0.00	J
Chloroform	07/07/2021	0.77	0.5	--	UG/L	0.00	J
EDB	07/07/2021	0.0201	0.0192	--	UG/L	0.00	
Tetrachloroethylene	07/07/2021	0.28	0.5	--	UG/L	0.00	J
Trichloroethylene	07/07/2021	0.36	0.5	--	UG/L	0.00	J
8260 TVOC	08/03/2021	2.95	--	--	UG/L	0.00	
Chloroform	08/03/2021	0.74	0.5	--	UG/L	0.00	J
EDB	08/03/2021	0.0152	0.0189	--	UG/L	0.00	J
Methylene chloride	08/03/2021	1.56	0.5	--	UG/L	0.00	BJ
Tetrachloroethylene	08/03/2021	0.33	0.5	--	UG/L	0.00	J
Trichloroethylene	08/03/2021	0.32	0.5	--	UG/L	0.00	J
8260 TVOC	09/09/2021	2.22	--	--	UG/L	0.00	
1,1,1-Trichloroethane	09/09/2021	0.28	0.5	--	UG/L	0.00	J
Chloroform	09/09/2021	0.78	0.5	--	UG/L	0.00	
EDB	09/09/2021	0.029	0.011	--	UG/L	0.00	
Methyl tert-butyl ether	09/09/2021	0.25	0.5	--	UG/L	0.00	J
Tetrachloroethylene	09/09/2021	0.47	0.5	--	UG/L	0.00	J
Trichloroethylene	09/09/2021	0.44	0.5	--	UG/L	0.00	J

Table 15-6
OU III North Street East Effluent Data
'Hits Only' July through September 2021

Site ID : 000-444 (System Effluent)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/07/2021	0	--	--	UG/L	0.00	
EDB	07/07/2021	0.019	0.019	--	UG/L	0.00	U
EDB	07/07/2021	0.5	0.5	--	UG/L	0.00	U
8260 TVOC	08/03/2021	1.64	--	--	UG/L	0.00	
EDB	08/03/2021	0.019	0.019	--	UG/L	0.00	U
EDB	08/03/2021	0.5	0.5	--	UG/L	0.00	U
Methylene chloride	08/03/2021	1.64	0.5	--	UG/L	0.00	BJ
8260 TVOC	09/09/2021	0.44	--	--	UG/L	0.00	
EDB	09/09/2021	0.011	0.011	--	UG/L	0.00	U
EDB	09/09/2021	0.5	0.5	--	UG/L	0.00	U
Methyl tert-butyl ether	09/09/2021	0.44	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 16

Q3-2021 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	0	0	100	0***	200
July	0	0	0	0	93	0	0	164	0	140
August	0	0	0	0	125	0	0	168	0	188
September	0	0	0	0	117	0	0	184	0	175
Actual (Avg. over QTR.)	**0**	**0**	**0**	**0**	**112**	**0**	**0**	**172**	**0**	**168**

***** EW-4L and RTW-4A are Magothy aquifer extraction wells.
****** EW-1L, EW-2L, EW-3L and EW-4L are in standby mode. EW-4L was put in standby January 2017. RTW-2A and RTW-3A were placed in standby mode in March 2020.
***RTW-5A was placed in standby mode in September 2016.

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

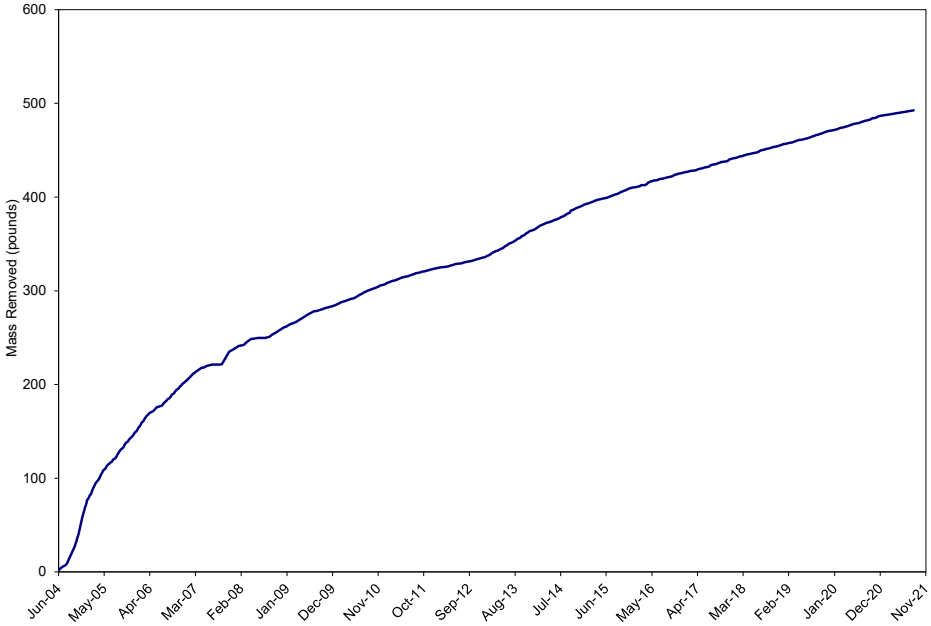


Figure 16-2
OU III LIPA/ Airport Treatment System
Influent TVOC Concentrations vs. Time

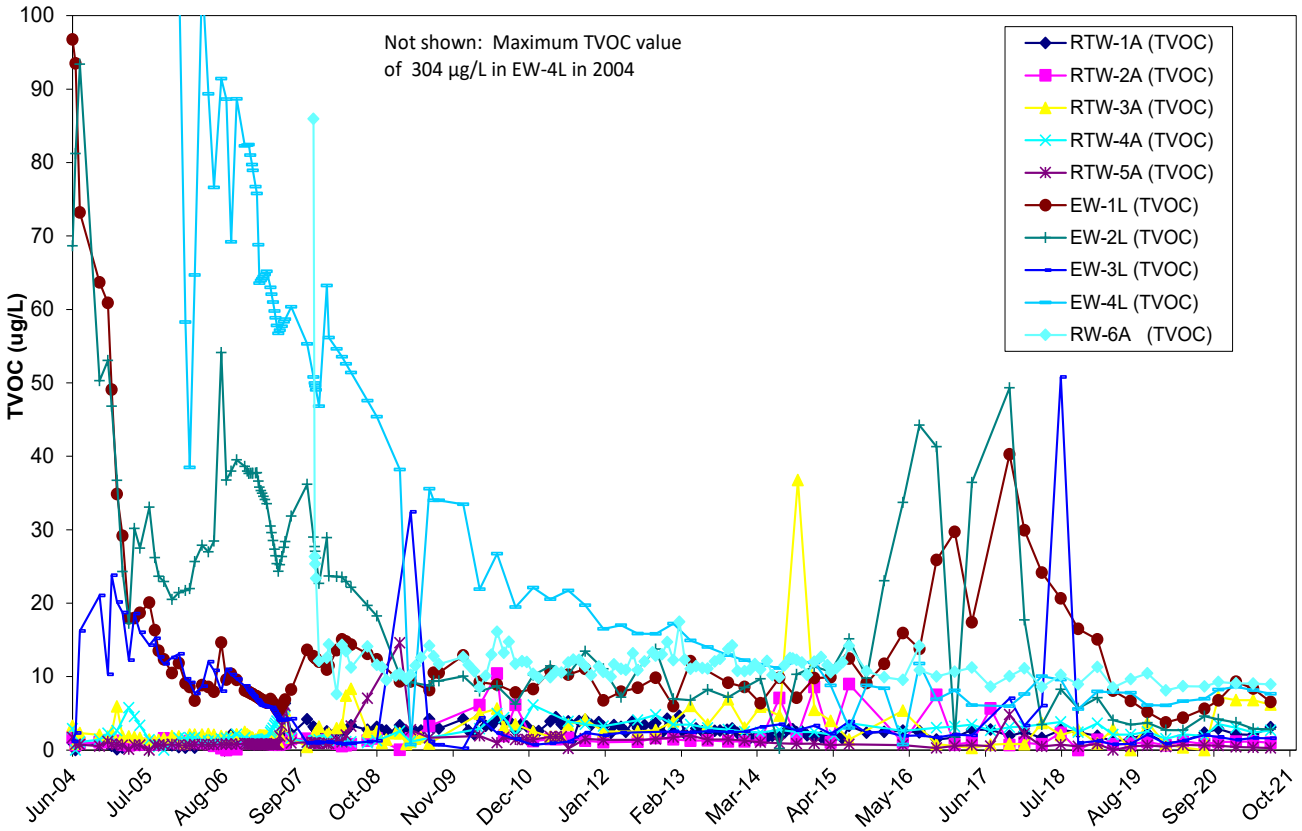


Table 16-2
Effluent Water Quality
SPDES Equivalency Permit Concentrations July 1 – September 30, 2021

Parameter	Permit Limit	Max. Measured Value	Units	Frequency
Flow	Monitor	671,227 [1]	GPD	Continuous
pH (range)	5.5 – 7.5	5.9-6.0	SU	Monthly
Carbon Tetrachloride	5	<0.50	ug/L	Monthly
Chloroform	7	0.76	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 2021:

Extraction wells RTW-1A, RTW-4A, and RTW-6A ran normally for the month except for a carbon change-out on the lead vessel that occurred on July 27th. The four LIPA extraction wells and Airport extraction wells RTW-2A, RTW-3A, and RTW-5A remained in standby mode. The system treated approximately 17 million gallons of water.

August 2021:

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 21 million gallons of water.

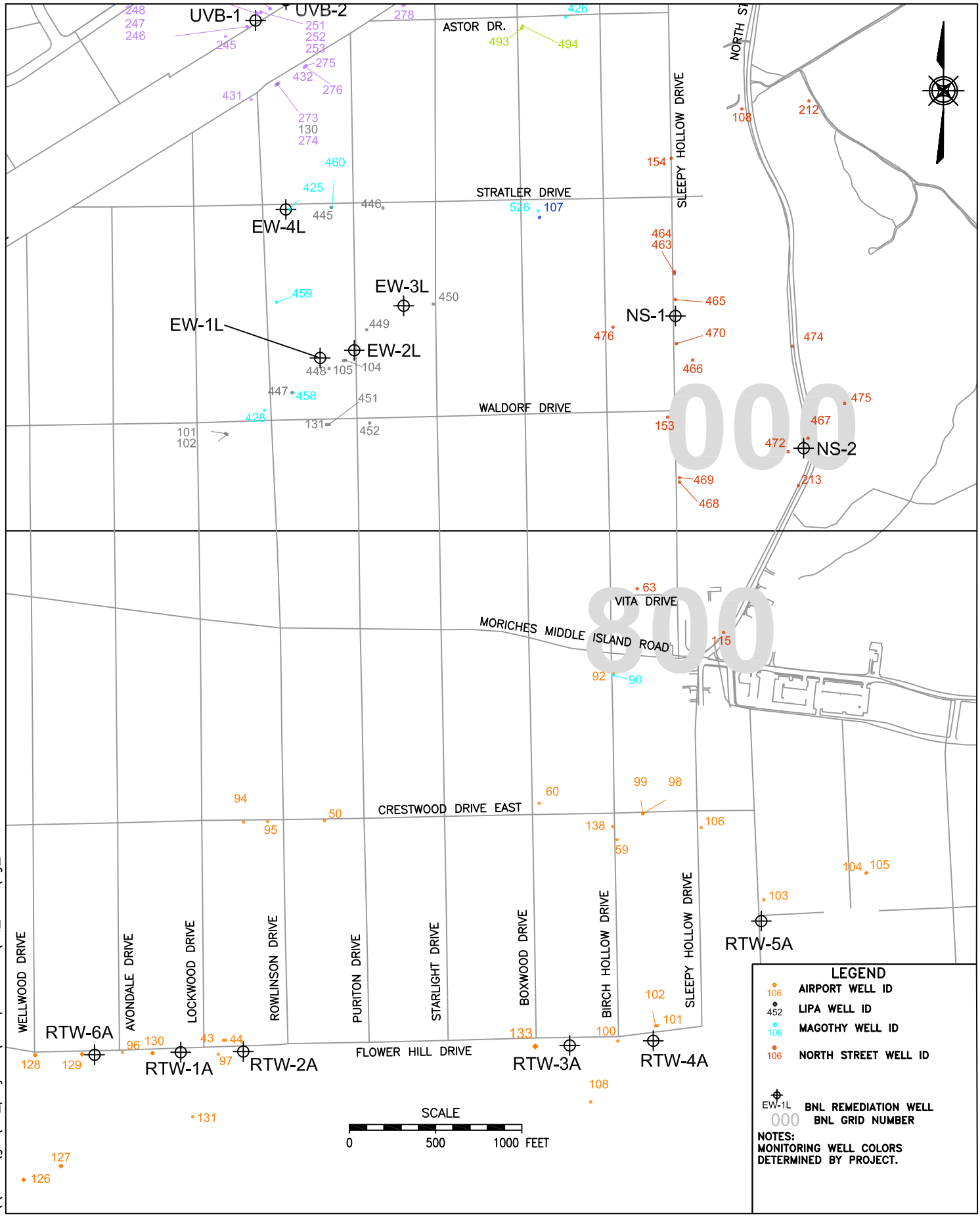
September 2021:

Extraction wells RTW-1A, RTW-4A and RTW-6A were in operation 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 21 million gallons of water.

The system treated approximately 59 million gallons of water during the third quarter of 2021.

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 2021, 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 2021, none of the LIPA monitoring wells or extraction wells detected TVOCs above the capture goal of 50 µg/L.
- Based upon the low VOC concentrations for the past several years, submit a petition for closure of the LIPA system in early 2022.



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ENVIRONMENTAL PROTECTION DIVISION

TITLE:

OU III AIRPORT/LIPA

SITEWIDE REMEDIATION SYSTEMS
THIRD QUARTER 2021 OPERATIONS REPORT

DWN:	VT: HZ.:	DATE:	PROJECT NO.:
JEB	–	09/26/05	–
CHKD:	APPD:	REV.:	NOTES:
LDS	––	10/26/21	–

FIGURE NO.: 16–3

Table 16-3
OU III LIPA/Airport Monitoring Well Data
'Hits Only' July through September 2021

Site ID : 800-108

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	09/27/2021	0.31	--	--	UG/L	216.00	
Chloroform	09/27/2021	0.31	0.5	--	UG/L	216.00	J

Site ID : 800-131

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	09/27/2021	1.05	--	--	UG/L	194.00	
Carbon tetrachloride	09/27/2021	0.64	0.5	--	UG/L	194.00	
Chloroform	09/27/2021	0.41	0.5	--	UG/L	194.00	J

Site ID : 800-133

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	09/27/2021	1.3	--	--	UG/L	225.00	
Chloroform	09/27/2021	1.3	0.5	--	UG/L	225.00	

Site ID : 800-60

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	09/27/2021	0.75	--	--	UG/L	210.00	
Chloroform	09/27/2021	0.75	0.5	--	UG/L	210.00	

Table 16-4
OU III LIPA/Airport Extraction Well Data
'Hits Only' July through September 2021

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

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/07/2021	6.55	--	--	UG/L	227.00	
1,1,1-Trichloroethane	07/07/2021	2.4	0.5	--	UG/L	227.00	
1,1-Dichloroethylene	07/07/2021	1.7	0.5	--	UG/L	227.00	
1,2-Dichloroethane	07/07/2021	0.37	0.5	--	UG/L	227.00	J
Carbon tetrachloride	07/07/2021	0.39	0.5	--	UG/L	227.00	J
Chloroform	07/07/2021	0.59	0.5	--	UG/L	227.00	
Trichloroethylene	07/07/2021	1.1	0.5	--	UG/L	227.00	

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

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/07/2021	2.82	--	--	UG/L	234.00	
1,1,1-Trichloroethane	07/07/2021	0.79	0.5	--	UG/L	234.00	
1,1-Dichloroethylene	07/07/2021	0.44	0.5	--	UG/L	234.00	J
1,2-Dichloroethane	07/07/2021	0.23	0.5	--	UG/L	234.00	J
Carbon tetrachloride	07/07/2021	0.25	0.5	--	UG/L	234.00	J
Chloroform	07/07/2021	0.32	0.5	--	UG/L	234.00	J
Trichloroethylene	07/07/2021	0.79	0.5	--	UG/L	234.00	

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

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/07/2021	1.6	--	--	UG/L	226.00	
Chloroform	07/07/2021	1.3	0.5	--	UG/L	226.00	
Trichloroethylene	07/07/2021	0.3	0.5	--	UG/L	226.00	J

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

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/07/2021	7.65	--	--	UG/L	314.00	
1,1,1-Trichloroethane	07/07/2021	0.24	0.5	--	UG/L	314.00	J
Carbon tetrachloride	07/07/2021	1	0.5	--	UG/L	314.00	
Chloroform	07/07/2021	0.91	0.5	--	UG/L	314.00	
Tetrachloroethylene	07/07/2021	4	0.5	--	UG/L	314.00	
Trichloroethylene	07/07/2021	1.5	0.5	--	UG/L	314.00	

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

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/07/2021	3.09	--	--	UG/L	198.00	
Carbon tetrachloride	07/07/2021	1.6	0.5	--	UG/L	198.00	

Table 16-4
OU III LIPA/Airport Extraction Well Data
'Hits Only' July through September 2021

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

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Chloroform	07/07/2021	0.85	0.5	--	UG/L	198.00	
Trichloroethylene	07/07/2021	0.64	0.5	--	UG/L	198.00	

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

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/07/2021	0.99	--	--	UG/L	198.00	
Carbon tetrachloride	07/07/2021	0.21	0.5	--	UG/L	198.00	J
Chloroform	07/07/2021	0.78	0.5	--	UG/L	198.00	

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

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/07/2021	6.19	--	--	UG/L	220.00	
1,1,1-Trichloroethane	07/07/2021	1.2	0.5	--	UG/L	220.00	
1,1,2,2-Tetrachloroethane	07/07/2021	0.36	0.5	--	UG/L	220.00	J
1,1-Dichloroethylene	07/07/2021	0.87	0.5	--	UG/L	220.00	
Carbon tetrachloride	07/07/2021	0.76	0.5	--	UG/L	220.00	
Chloroform	07/07/2021	1.1	0.5	--	UG/L	220.00	
Trichloroethylene	07/07/2021	1.9	0.5	--	UG/L	220.00	

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

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/07/2021	2.66	--	--	UG/L	278.00	
1,1,2,2-Tetrachloroethane	07/07/2021	0.44	0.5	--	UG/L	278.00	J
Carbon tetrachloride	07/07/2021	0.27	0.5	--	UG/L	278.00	J
Chloroform	07/07/2021	0.75	0.5	--	UG/L	278.00	
Trichloroethylene	07/07/2021	1.2	0.5	--	UG/L	278.00	

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

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/07/2021	0.28	--	--	UG/L	230.00	
Chloroform	07/07/2021	0.28	0.5	--	UG/L	230.00	J

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

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/07/2021	8.93	--	--	UG/L	175.00	
1,1,1-Trichloroethane	07/07/2021	0.23	0.5	--	UG/L	175.00	J
1,1-Dichloroethylene	07/07/2021	0.28	0.5	--	UG/L	175.00	J
Carbon tetrachloride	07/07/2021	2.3	0.5	--	UG/L	175.00	

Table 16-4
OU III LIPA/Airport Extraction Well Data
'Hits Only' July through September 2021

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

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Chloroform	07/07/2021	0.72	0.5	--	UG/L	175.00	
Trichloroethylene	07/07/2021	5.4	0.5	--	UG/L	175.00	

Table 16-5
OU III LIPA/Airport Influent Data
'Hits Only' July through September 2021

Site ID : 800-122 (Combined Influent)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/07/2021	5.11	--	--	UG/L	0.00	
1,1,2,2-Tetrachloroethane	07/07/2021	0.17	0.5	--	UG/L	0.00	J
1,1-Dichloroethylene	07/07/2021	0.19	0.5	--	UG/L	0.00	J
Carbon tetrachloride	07/07/2021	1.3	0.5	--	UG/L	0.00	
Chloroform	07/07/2021	0.75	0.5	--	UG/L	0.00	
Trichloroethylene	07/07/2021	2.7	0.5	--	UG/L	0.00	
8260 TVOC	07/19/2021	4.69	--	--	UG/L	0.00	
1,1,1-Trichloroethane	07/19/2021	0.17	0.5	--	UG/L	0.00	J
Carbon tetrachloride	07/19/2021	1.2	0.5	--	UG/L	0.00	
Chloroform	07/19/2021	0.72	0.5	--	UG/L	0.00	
Trichloroethylene	07/19/2021	2.6	0.5	--	UG/L	0.00	
8260 TVOC	08/03/2021	4.89	--	--	UG/L	0.00	
1,1,1-Trichloroethane	08/03/2021	0.18	0.5	--	UG/L	0.00	J
Carbon tetrachloride	08/03/2021	1.3	0.5	--	UG/L	0.00	
Chloroform	08/03/2021	0.71	0.5	--	UG/L	0.00	
Trichloroethylene	08/03/2021	2.7	0.5	--	UG/L	0.00	
8260 TVOC	09/01/2021	4.56	--	--	UG/L	0.00	
1,1-Dichloroethylene	09/01/2021	0.2	0.5	--	UG/L	0.00	J
Carbon tetrachloride	09/01/2021	1.1	0.5	--	UG/L	0.00	
Chloroform	09/01/2021	0.76	0.5	--	UG/L	0.00	
Trichloroethylene	09/01/2021	2.5	0.5	--	UG/L	0.00	

Table 16-6
OU III LIPA/Airport Effluent Data
'Hits Only' July through September 2021

Site ID : 800-124 (System Effluent)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
8260 TVOC	07/07/2021	0.7	--	--	UG/L	0.00	
Chloroform	07/07/2021	0.7	0.5	--	UG/L	0.00	
8260 TVOC	07/19/2021	0.76	--	--	UG/L	0.00	
Chloroform	07/19/2021	0.76	0.5	--	UG/L	0.00	
8260 TVOC	08/04/2021	0	--	--	UG/L	0.00	
8260 TVOC	09/01/2021	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 17

Q3-2021 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)	5.4	5.4	6.8	0	0	0	0	10	10
August "	5.4	5.4	5.6	0	0	0	0	0	10
September "	5.4	5.4	6.4	0	0	0	0	12.1	10
Actual (Avg. over Qtr.)	**5.4**	**5.4**	**6.3**	**0**	**0**	**0**	**0**	**7.4**	**10**

*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

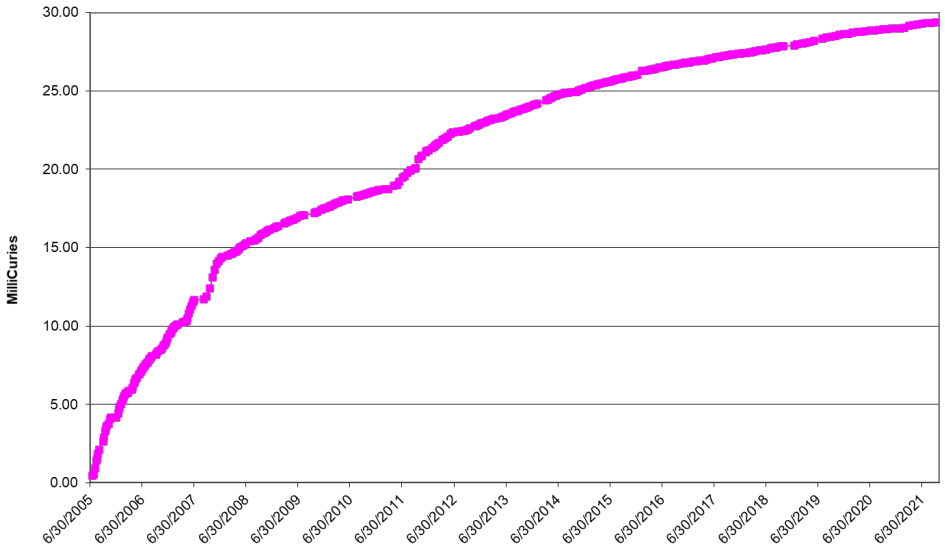

Figure 17-2
Strontium-90 BGRR/WCF Treatment System
Influent Sr-90 Concentrations vs. Time

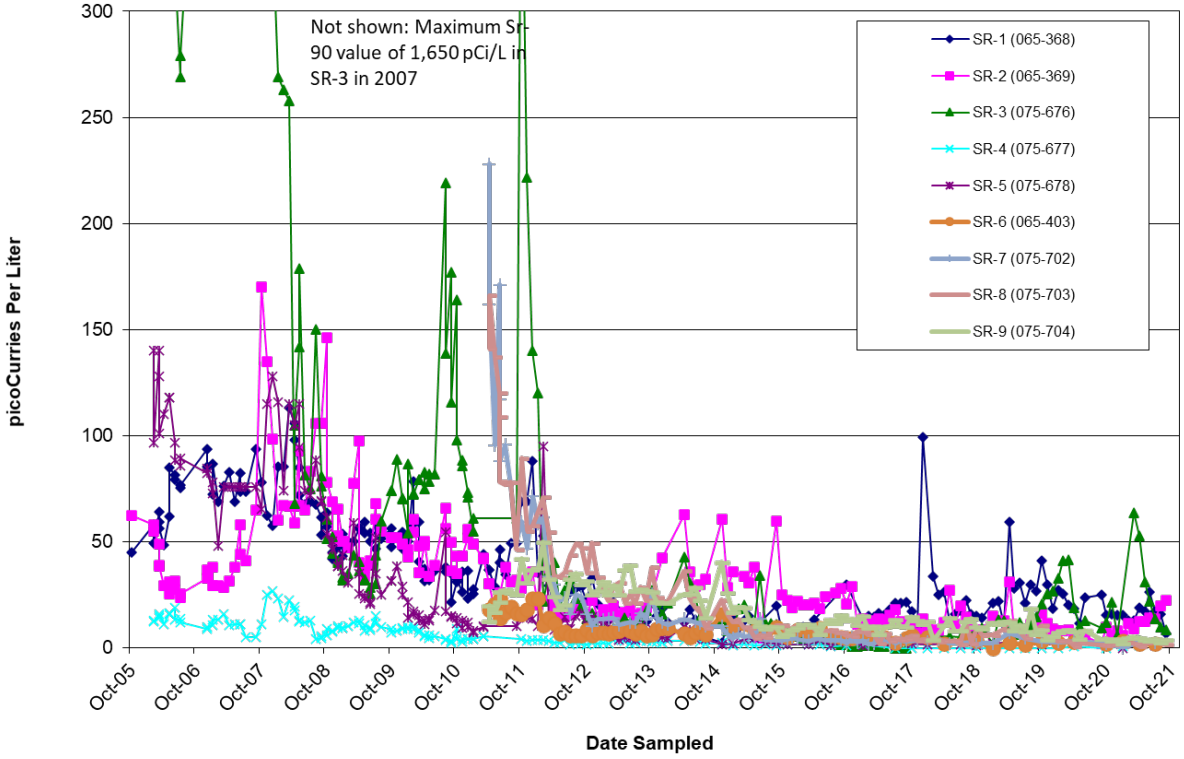

Table 17-2
Strontium-90 BGRR/WCF Treatment System Effluent Water Quality
SPDES Equivalency Permit Concentrations July 1, 2021 – September 30, 2021

Parameter	Permit Limit	Max. Measured Value	Units	Frequency
Flow	75	39	GPM	Continuous
pH (range)	5.5 – 8.5	6.4– 6.5	SU	Weekly
Strontium-90	8.0	2.1	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 2021:

The system ran normally for the month. The system treated approximately 1.6 million gallons of water.

August 2021:

The system ran normally for the month. Well SR-8 was off for pulsed-pumping. The system was off for two days at the end of the month for change-out of the resin vessels. The system treated approximately 1.1 million gallons of water.

September 2021:

The system ran normally for the month. The system treated approximately 1.6 million gallons of water.

Extraction wells SR-4 through SR-7 were off in stand-by mode for this quarter. The system treated approximately 4.3 million gallons of water during the third quarter of 2021.

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, SR-6 and SR-7 have remained below the drinking water standard (DWS) since May 2016.
- If Sr-90 concentrations in SR-3 and monitoring well 075-701 remain below DWS for 6 consecutive months, place SR-3 on standby. During the third quarter 2021, Sr-90 was detected in SR-3 above the DWS each month. The maximum Sr-90 concentration in SR-3 was 13.6 pCi/L in July. However, Sr-90 was not detected above the DWS in well 075-701 in the third quarter.
- 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.
- Install several temporary wells along Temple Place to supplement monitoring of the downgradient segment of the WCF plume. Install temporary wells as necessary to monitor high concentrations segments of the downgradient portions of the BGRR and Building 801/PFS plumes.

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ENVIRONMENTAL PROTECTION DIVISION

TITLE:

OU III BGRR/WCF

SITEWIDE REMEDIATION SYSTEMS
THIRD QUARTER 2021 OPERATIONS
REPORT

DWN:	VT: HZ.:	DATE:	PROJECT NO.:
JEB	–	03/15/13	
CHKD:	APPD:	REV.:	NOTES:
LDS	--	10/27/21	
FIGURE NO.:		17–3	

Table 17-3
OU III Strontium-90 BGRR/WCF Monitoring Well Data
'Hits Only' July through September 2021

Site ID : 065-405

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	08/25/2021	8.18	0.249	0.833	1.00000	PCI/L	80.00

Site ID : 075-664

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	07/21/2021	0.764	0.209	0.192	1.00000	PCI/L	66.00
Strontium-90	08/25/2021	1.52	0.225	0.266	1.00000	PCI/L	63.00
Strontium-90	09/03/2021	0.864	0.28	0.23	1.00000	PCI/L	68.00

Site ID : 075-701

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	07/21/2021	4.47	0.683	0.501	1.00000	PCI/L	61.77
Strontium-90	08/25/2021	3.03	0.887	0.604	1.00000	PCI/L	62.50
Strontium-90	09/03/2021	2.37	0.772	0.521	1.00000	PCI/L	61.50

Site ID : 085-402

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	07/02/2021	12.6	0.566	1.37	1.00000	PCI/L	100.00

Table 17-4
OU III Strontium-90 BGRR/WCF Extraction Well Data
'Hits Only' July through September 2021

Site ID : 065-368 (SR-1)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	07/14/2021	17.3	0.78	1.4	1.00000	PCI/L	0.00
Strontium-90	08/03/2021	16	0.647	0.714	1.00000	PCI/L	0.00
Strontium-90	09/07/2021	6.85	1.46	1.01	1.00000	PCI/L	0.00

Site ID : 065-369 (SR-2)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	07/14/2021	13.6	0.776	1.12	1.00000	PCI/L	0.00
Strontium-90	08/03/2021	19.7	1.03	0.954	1.00000	PCI/L	0.00
Strontium-90	09/07/2021	22.3	0.857	1.13	1.00000	PCI/L	0.00

Site ID : 065-403 (SR-6)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	07/14/2021	1.78	0.791	0.627	1.00000	PCI/L	0.00

Site ID : 075-676 (SR-3)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	07/14/2021	13.6	0.696	1.26	1.00000	PCI/L	0.00
Strontium-90	08/03/2021	10	0.426	0.474	1.00000	PCI/L	0.00
Strontium-90	09/07/2021	8.54	0.556	0.548	1.00000	PCI/L	0.00

Site ID : 075-677 (SR-4)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	07/14/2021	1.54	0.787	0.581	1.00000	PCI/L	0.00

Site ID : 075-678 (SR-5)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	07/14/2021	1.22	0.734	0.532	1.00000	PCI/L	0.00

Site ID : 075-702 (SR-7)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	07/14/2021	2.55	0.735	0.699	1.00000	PCI/L	0.00

Site ID : 075-703 (SR-8)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	07/14/2021	2.66	0.732	0.657	1.00000	PCI/L	0.00
Strontium-90	09/07/2021	1.48	0.868	0.543	1.00000	PCI/L	0.00

Site ID : 075-704 (SR-9)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	07/14/2021	4.17	0.664	0.689	1.00000	PCI/L	0.00
Strontium-90	08/03/2021	2.22	0.519	0.353	1.00000	PCI/L	0.00

Table 17-4
OU III Strontium-90 BGRR/WCF Extraction Well Data
'Hits Only' July through September 2021

Site ID : 075-704 (SR-9)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual
Strontium-90	09/07/2021	3.78	0.719	0.514	1.00000	PCI/L	0.00

Table 17-5
OU III Strontium-90 BGRR/WCF Influent Data
'Hits Only' July through September 2021

Site ID : 066-216 (Combined Influent)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual	
8260 TVOC	07/14/2021	0	--	--	1.00000	UG/L	0.00	
Strontium-90	07/14/2021	5.7	0.619	0.828	1.00000	PCI/L	0.00	
8260 TVOC	08/03/2021	0.28	--	--	1.00000	UG/L	0.00	
Ethene, 1,2-dichloro-, (E)-	08/03/2021	0.28	0.5	--	1.00000	UG/L	0.00	J
8260 TVOC	09/07/2021	0.41	--	--	1.00000	UG/L	0.00	
8260 TVOC	09/07/2021	0.41	--	--	1.00000	UG/L	0.00	
Ethene, 1,2-dichloro-, (E)-	09/07/2021	0.41	0.5	--	1.00000	UG/L	0.00	J
Ethene, 1,2-dichloro-, (E)-	09/07/2021	0.41	0.5	--	1.00000	UG/L	0.00	J
Strontium-90	09/07/2021	3.97	0.269	0.493	1.00000	PCI/L	0.00	
Strontium-90	09/07/2021	3.97	0.269	0.493	1.00000	PCI/L	0.00	

Table 17-6
OU III Strontium-90 BGRR/WCF Effluent Data
'Hits Only' July through September 2021

Site ID : 066-219 (System Effluent)

Chemical	Sample Date	Value	Det. Limit	Error	Units	Depth	Qual	
8260 TVOC	07/14/2021	0	--	--	1.00000	UG/L	0.00	
Strontium-90	07/14/2021	2.12	0.739	0.632	1.00000	PCI/L	0.00	
8260 TVOC	08/03/2021	0	--	--	1.00000	UG/L	0.00	
Strontium-90	08/03/2021	2.08	0.401	0.286	1.00000	PCI/L	0.00	UJ(-)B
8260 TVOC	09/07/2021	0	--	--	1.00000	UG/L	0.00	
8260 TVOC	09/07/2021	0	--	--	1.00000	UG/L	0.00	
Strontium-90	09/07/2021	0.164	0.269	0.166	1.00000	PCI/L	0.00	U
Strontium-90	09/07/2021	0.164	0.269	0.166	1.00000	PCI/L	0.00	U

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 18

Q-3 2021 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 samples were collected during the 3rd Quarter. During the 2nd Quarter 2021 sampling period, the maximum tritium concentration in source area monitoring wells was 23,200 pCi/L in well 054-07 (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.

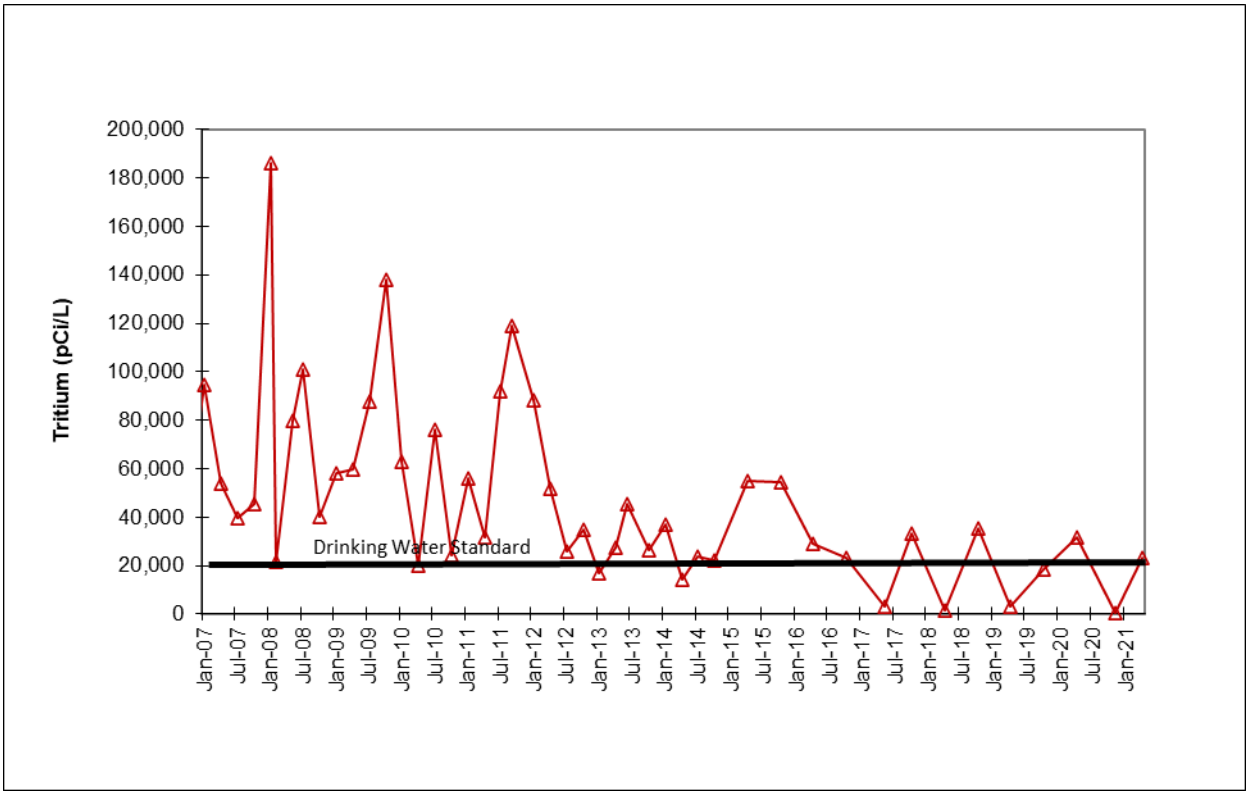


Figure 18-1. Maximum tritium concentrations observed from January 2007 through April 2021 in groundwater downgradient of the g-2 source area.

Section 19

Q-3 2021 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. 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 samples were collected during the 3rd Quarter. During the 2nd Quarter 2021 sample period, the maximum tritium concentration was detected in downgradient well 064-67 at a concentration of 1,610 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.

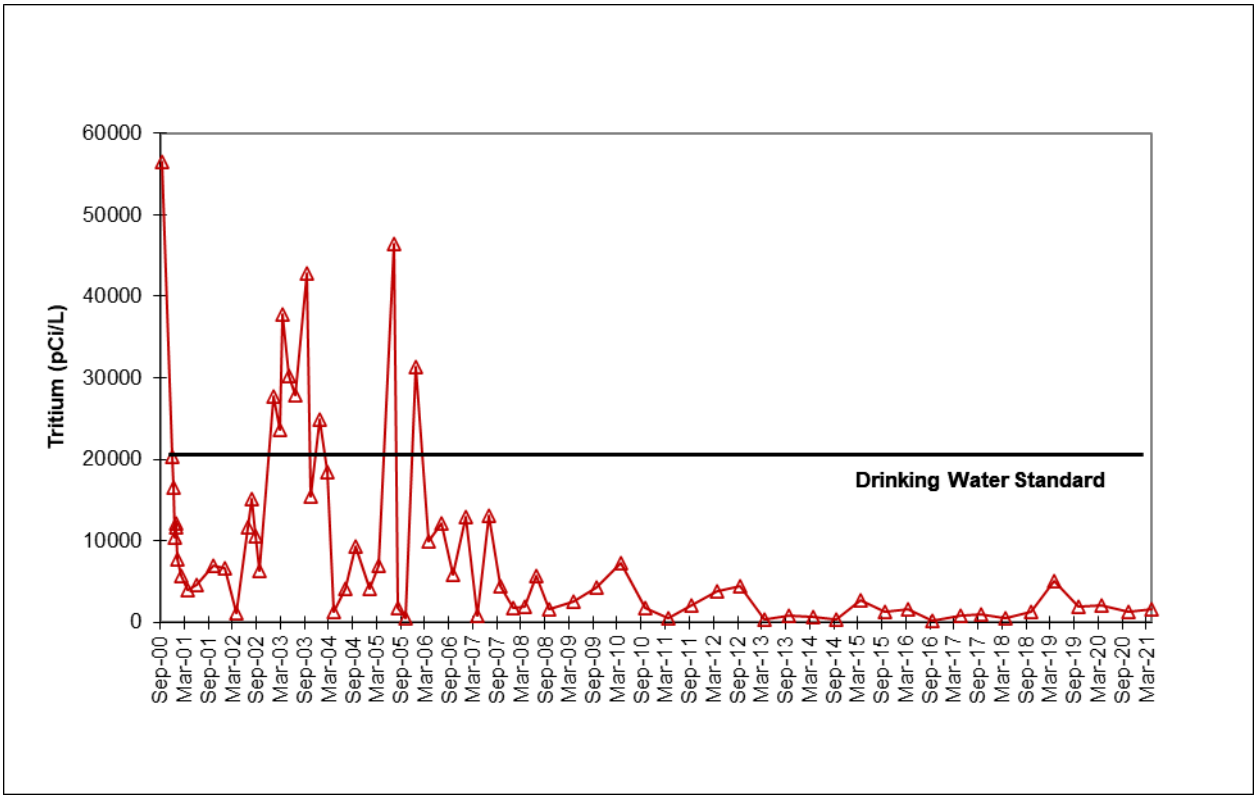


Figure 19-1. Maximum tritium concentrations observed from 2000 through April 2021 in groundwater immediately downgradient of the BLIP Facility.

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
Q3-2021 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*
System Closed	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

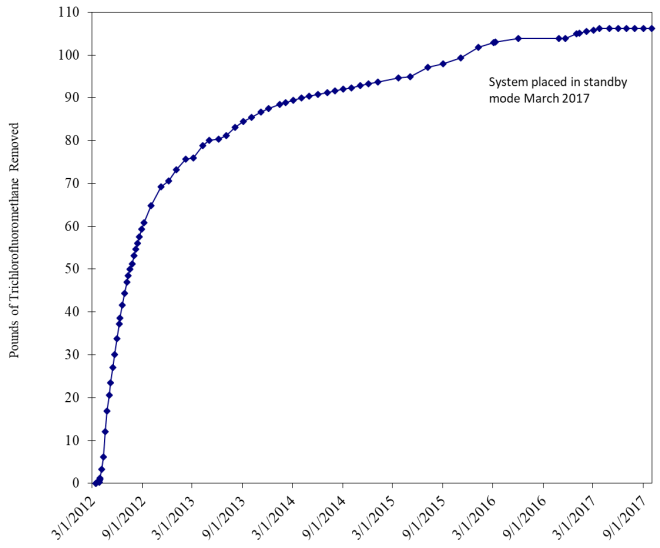


Figure 20-2
OU III Building 452 Freon-11 Pump & Treat System
Influent Trichlorofluoromethane Concentrations vs. Time

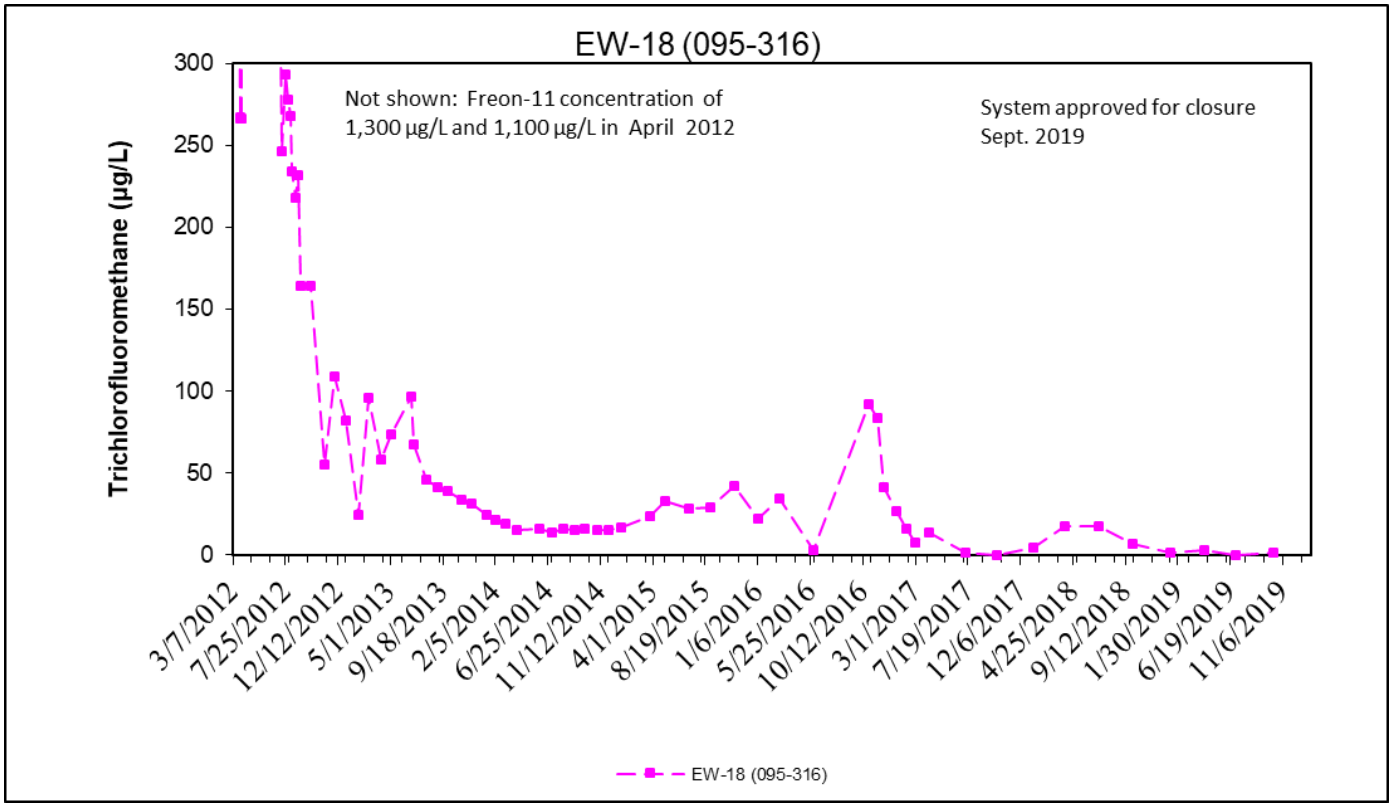


Table 20-2
Effluent Water Quality
SPDES Equivalency Permit Concentrations (System Closed)

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

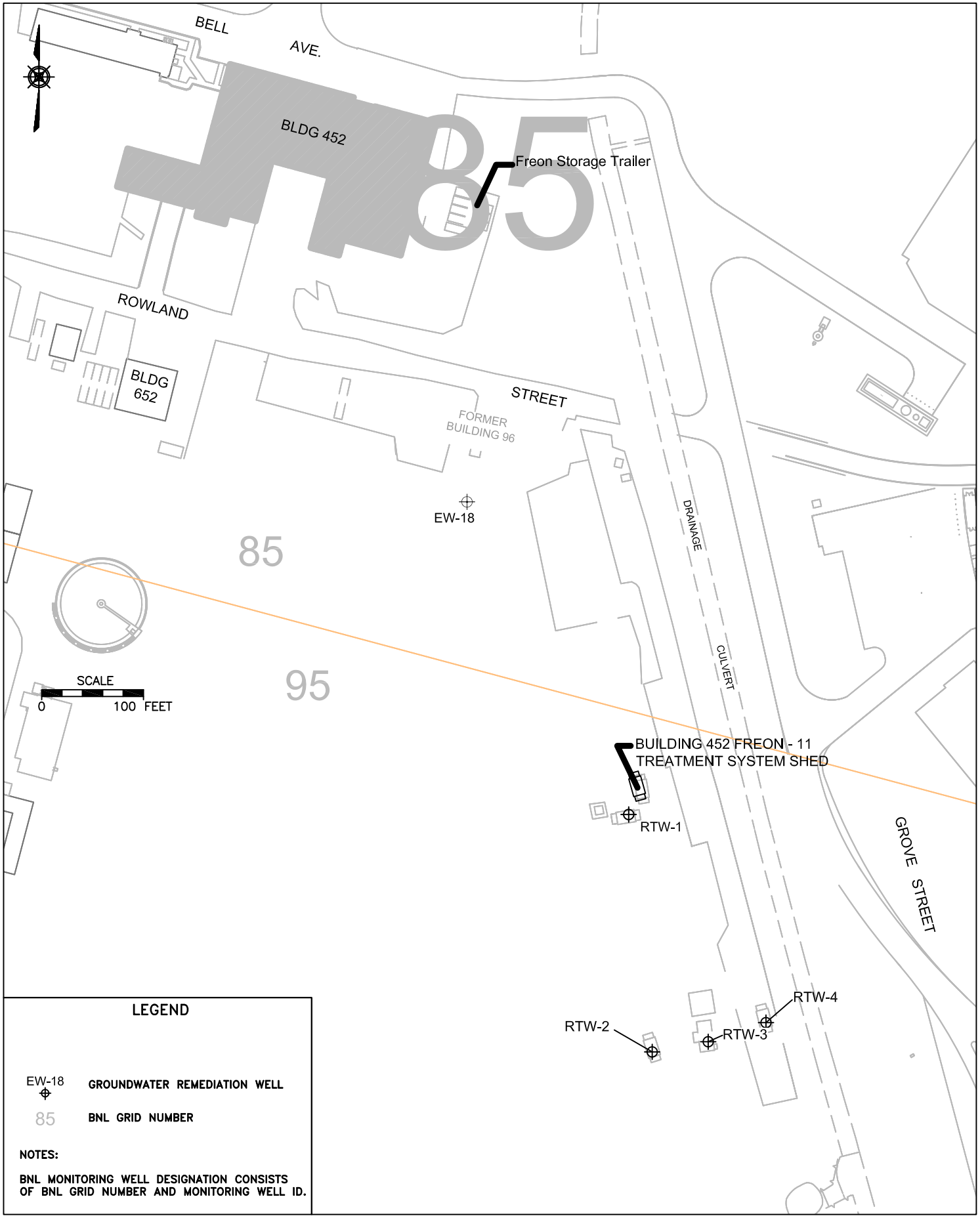
Monitoring Report (DMR), the RTW-1 discharge is formally reported under the Freon-11 Equivalency Permit.

System Operations

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.



LEGEND

EW-18 — GROUNDWATER REMEDIATION WELL

85 — BNL GRID NUMBER

NOTES:

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

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ENVIRONMENTAL PROTECTION DIVISION

TITLE:

BUILDING 452 AREA FREON-11 MONITORING WELL NETWORK

SITEWIDE REMEDIATION SYSTEMS
THIRD QUARTER 2021 OPERATIONS REPORT

DWN:	VT: HZ.:	DATE:	PROJECT NO.:
AJZ	–	08/24/12	
CHKD:	APPD:	REV.:	NOTES:
LDS	--	10/27/21	--

FIGURE NO.: 20-3