

## Seeds, Tena (ECY)

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**From:** Seeds, Tena (ECY)  
**Sent:** Friday, April 11, 2025 6:19 PM  
**To:** 'Kristin Anderson'  
**Cc:** Kim Hempel; Mike Ciserella; Douglas Ciserella; Pamela Osterhout; Lynn Grochala  
**Subject:** RE: Quarterly Monitoring Update for Time Oil Bulk Terminal- Q1 2025

Hi Kristin,

Thanks for providing the Q1 2025 monitoring summary/update and recommendations. Ecology's comments are as follows.

- Bulk Terminal:
  - **Ecology agrees with the recommended semiannual monitoring at 01MW19R, 01MW40, and 01MW84 and annual at 01MW66.**
  - It's good to see the downward trend in concentrations at 01MW19R and 01MW84. I hope that continues. **Ecology agrees with discontinuing benzene analysis at 01MW84 based on the data for that well.**
  - The total DRO+ORO data for 01MW12 appear to show a slight increasing trend compared to the 2019 RI data. Since this well had to be decommissioned recently, **add periodic monitoring at a downgradient location like 01MW87** (assuming groundwater flows from 01MW12 around the east side of the CAA-2 ISS monolith toward 01MW87). **This could be either semiannually or annually.**
- ASKO:
  - Any thoughts on what caused the jump in concentrations at 01MW58R? I'm curious to see if it was a temporary increase caused by the drilling activities on the BNSF property the week prior.
  - Any thoughts on what caused the jump in concentrations at 01MW15? Could it be related to the ISS monolith in some way?
  - **Ecology agrees with continuing monitoring at the designated "initial" short-term monitoring network per the GMP, including continued monitoring at contingency well 01MW107 and at CPOC wells 01MW53R and 01MW85 during Q2.**
  - **Ecology agrees with installing 01MW60R and 01MW114 at the upgradient locations east and west of the ISS monolith.**
  - **Ecology recommends sampling 01MW60R and 01MW114 along with 01MW15 and 01MW58R during Q2 to assess the increased concentrations in the upgradient portion of ASKO. BNSF will also be sampling their wells during Q2, so this will be especially helpful for determining possible actions for source control.**
  - **Ecology also recommends sampling at contingency well 01MW89, given the increasing trend in 01MW15** (assuming groundwater flows from 01MW15 along the east side of the CAA-4 ISS monolith toward 01MW89).
- PRB Vaults and Gravity Well:
  - **Ecology agrees with collecting vault samples on a quarterly basis.**
  - **Ecology agrees with analyzing samples from 01MW114 for cVOCs and total DRO+ORO, but beginning in Q2 as recommended above.**

Let me know if you have any questions or would like to discuss. I expect to receive BNSF's Q1 progress report soon. I have not yet received any data from their well installations and sampling conducted during Q1.

Tena

**From:** Kristin Anderson <Kristin.Anderson@floydsnider.com>

**Sent:** Monday, March 31, 2025 4:20 PM

**To:** Seeds, Tena (ECY) <TSEE461@ECY.WA.GOV>

**Cc:** Kim Hempel <khempel@pioneerees.com>; Mike Ciserella <mike@cantera-group.com>; Douglas Ciserella <doug@cantera-group.com>; Pamela Osterhout <Pamela.Osterhout@floydsnider.com>; Lynn Grochala <Lynn.Grochala@floydsnider.com>

**Subject:** Quarterly Monitoring Update for Time Oil Bulk Terminal- Q1 2025

## External Email

Hi Tena,

Here is a summary of our Q1 2025 results and monitoring well network updates. As Kim relayed late last week, grading for redevelopment construction has been delayed. We are now anticipating to install the new/replacement wells during Q2. Please let us know if you have any questions about the results. We will communicate the schedule for drilling and the Q2 monitoring event once those are coordinated.

### Groundwater Elevations

- Water level measurements were collected in collaboration with BNSF at wells within the shallow WBZ on the ASKO, BNSF, and Bulk Terminal parcels.
- Water levels and primary flow paths across the Bulk Terminal and ASKO properties remain primarily north to northwest. The groundwater flow path on the BNSF/ASKO parcel boundaries continues to be westerly, influenced by the CAA-4 monolith, with a transition to northern flow across the ASKO parcel.

### Bulk Terminal

Samples were collected from Shallow WBZ wells 01MW12, 01MW19R, 01MW40, 01MW66, and 01MW84:

- TPH and benzene concentrations continue to trend downward at the downgradient well locations
  - 01MW19R had GRO less than the CUL and results near the CUL for total DRO+ORO (510 ug/L vs the CUL of 500 ug/L), and benzene continues to trend downward.
  - 01MW84R had GRO near the CUL (960 ug/L vs the CUL of 800 ug/L) and results less than the CULs for total DRO+ORO and benzene.
- TPH and benzene concentrations are stable to downward trending in the central portion of the property near CAA-1
  - 01MW12 continues to have GRO concentrations less than the CUL and benzene was additionally less than the CUL for the last 3 monitoring events. Total DRO+ORO are generally stable at concentrations between about 2 and 3 times the CUL.
  - 01MW40 continues to have GRO concentrations less than the CUL and benzene was additionally less than the CUL for the last 2 monitoring events. Total DRO+ORO are more variable at this location and were detected at 2,100 ug/L (about 4 times the CUL) during Q1.
- Penta concentrations at 01MW66 continue to decline.

Well decommissioning was performed, with the following deviations from the GMAR:

- Due to delays in the grading construction schedule, 01MW40 was retained for continued monitoring. This well is still planned to be replaced by 01MW90R after redevelopment to monitor the area of the most historically elevated TPH in groundwater adjacent to CAA-1.
- 01MW12 was found to be buried ~3 feet below grade after final construction of the entrance driveway on Parcel F. The soil was removed to allow sampling access per the GMAR, but this well was decommissioned as a BMP

while the drilling crew was on site due to concerns with creating a continuous seal if the monument were raised.

Recommendations:

- Continue monitoring semiannually at 01MW19R, 01MW40 and 01MW84 and annually at 01MW66. Begin sampling 01MW84 for TPH only beginning in Q3 per the decision tree in the GMP, as benzene has not been detected at this location in any post-remediation samples.
- After redevelopment grading, replace 01MW40 with 01MW90R to monitor performance where groundwater was historically most highly TPH-impacted in CAA-1 prior to remediation.
- We propose to cease semiannual performance monitoring at 01MW12, which is less informative than 01MW40 for assessing attenuation of residual contamination in CAA-1.

**ASKO**

Samples were collected from Shallow WBZ wells 01MW15, 01MW46, 01MW53R, 01MW58R, 01MW61, 01MW85, 01MW107, MW01, MW05, and MW06:

- CVOC and TPH concentrations increased at upgradient well locations
  - At 01MW58R near the upgradient property line, a maximum post-remediation TCE concentration of 380 ug/L was observed, versus a result of 92 ug/L detected during Q4 of 2024. Total DRO+ORO also exceeded the CUL and increased relative to Q4.
  - At 01MW15 upgradient of the ISS monolith, TCE increased to 7.4 ug/L, but remained less than the post-remediation maximum result. Vinyl chloride increased significantly at this location to 110 ug/L, versus a result of 36 ug/L detected during Q4 2024, indicating that biodegradation is occurring.
- TCE concentrations in the vicinity of the CAA-4 source area at 01MW46 continued to decline gradually while breakdown products continued to increase, indicating ongoing biodegradation. Benzene was non-detect for a second consecutive quarter, at elevated reporting limits due to analytical interferences from cVOCs.
- cVOC concentration trends in the downgradient portions of the property were variable
  - Concentrations at 01MW56 remain relatively low level but increased relative to Q4 2024.
  - Concentrations at MW05 continue to trend downward, and vinyl chloride concentrations continue to increase steeply, indicating ongoing biodegradation.
  - MW06 increased significantly to a post-remediation maximum TCE concentration of 410 ug/L.
- cVOC concentration trends were also variable near the CPOC
  - At 01MW53R, TCE increased relative to Q4 but remained less than the post-remediation maximum. Vinyl chloride remained stable at relatively low concentrations.
  - 01MW85, TCE decreased slightly relative to the Q4 result and the overall trend appears to be gradually downward. Vinyl chloride continues to increase at this location indicating ongoing biodegradation.
  - At contingency well 01MW107 downgradient of the CPOC, TCE was detected near the laboratory reporting limit at 0.07 ug/L, less than the CUL of 0.5 ug/L. Other cVOCs remained non-detect.
- cVOC and benzene results were non-detect at 01MW61 and MW01, which were outside the historical IHS plumes and sampled at Ecology request prior to decommissioning. Total DRO+ORO were detected at low levels less than the CUL and flagged as poor matches to the chromatographic standard at both locations, indicating the presence of naturally occurring organics.

Well decommissioning was performed as described in the GMAR with no deviations. Decommissioning of 01MW52, which is in a travel lane of the right-of-way, was deferred until construction.

Additional injection of PlumeStop was performed on March 12-13, 2025 in accordance with Ecology email approval received on February 19, 2025. These injections were designed to supplement the in situ treatment barrier upgradient of the CPOC at key locations where challenging injection conditions were encountered during the cleanup action. For this additional injection, the PlumeStop was supplemented with a soluble organic carbon electron donor to achieve enhanced reductive dechlorination of TCE as well as its breakdown products, which have increased since remediation.

Recommendations:

- Continue monitoring per the GMP from the designated “initial” short-term monitoring network with the following considerations:  
Install 01MW60R and 01MW114 in Q2 and begin monitoring in Q3.  
Retain the contingency well 01MW107 for the Q2 2025 monitoring event.  
Continue sampling 01MW53R and 01MW85 on a quarterly basis.  
Continue monitoring Total DRO+ORO at 01MW58R.
- Reassess contingency monitoring after receipt of the Q2 samples, which will represent the first round of monitoring following supplemental PlumeStop injection.

### **PRB Vaults and Gravity Well**

Grab samples were collected from the gravity well, clear vault, and influent vault and analyzed for select cVOCs

- TCE increased significantly in the PRB influent vault, where a post-remediation maximum concentration of 91 ug/L was detected. TCE decreased in the clear (effluent) PRB vault following modifications to the vault made in Q4 to increase contact time with the ZVI media.
- Concurrent BNSF results for perched WBZ groundwater flowing into the PRB have not been received, however the groundwater elevations in the perched WBZ were approximately 2 feet higher than during the same quarter in 2024. Perched water may be in contact with more highly contaminated soil at shallower depths on the BSNF property, causing increased TCE concentrations in perched groundwater flowing into the interceptor trench.
- Recent perched WBZ results were not available for performance evaluation because sampling was not performed on the BNSF property in Q4 of 2024. Removal efficiency calculations will be updated as additional results are available for perched WBZ wells on BNSF.
- TCE in the gravity well decreased but remains at elevated concentrations. This decrease, and a corresponding water level about 0.5 feet higher than the same reporting period in 2024, are attributed to increased flow of treated water from the PRB which would cause dilution of the grab sample in the gravity well.

### **Recommendations**

- Sample planned new well 01MW114 for cVOCs and total DRO+ORO beginning in Q3 2025 in place of lower-quality and more variable grab samples from the gravity well.
- Continue to collect vault samples quarterly for subsequent monitoring events through at least Q3, or until source control is implemented on the BNSF property.

Thanks!

**Kristin Anderson, LHG** Associate Principal, Senior Geologist (she/her)

**FLOYD | SNIDER**

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Discussion Draft

Pre- and Post-Remediation Groundwater Results for Indicator Hazardous Substances

Analyte Class		Metals	TPH		VOCs	cVOCs		SVOCs
Analyte		Arsenic	GRO	Total DRO + ORO	Benzene	TCE	cis-1,2-DCE	Vinyl Chloride
CAS No.		7440-38-2	--	-- (U=0)	71-43-2	79-01-6	156-59-2	75-01-4
Unit		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Cleanup Level		5.0	800	500	0.44	0.50	--	0.20
Parcel	Location	Sample Date						
Bulk Terminal	01MW12							
	Pre-remediation	4/30/2019		100 U	590 <sup>(1)</sup>	3.0		
	Post-remediation	1/31/2023		100 U	1,000 <sup>(1)</sup>	0.35 U		
		6/28/2023		110	1,200 <sup>(1)</sup>	1.3		
		2/26/2024		100 U	550 <sup>(1)</sup>	0.35 U		
		8/7/2024		100 U	1,300 <sup>(1)</sup>	0.35 U		
		3/3/2025		100 U	1,400 <sup>(1)</sup>	0.35 U		
	01MW19/01MW19R							
	Pre-remediation	4/30/2019		10,000	1,900 <sup>(1)</sup>	2,600	1.0 U	1.0 U
	Post-remediation	1/31/2023		990	910 <sup>(1)</sup>	5.2		
		4/7/2023		1,100	700 <sup>(1)</sup>	4.4		
		6/28/2023		1,300	810 <sup>(1)</sup>	2.1		
		10/10/2023		1,200	890 <sup>(1)</sup>	1.6		
				1,300	920 <sup>(1)</sup>	1.8		
		2/26/2024		560	600 <sup>(1)</sup>	1.9		
		5/15/2024		750	680 <sup>(1)</sup>	2.1		
				1,000	720 <sup>(1)</sup>	2.2		
		8/7/2024		500	580 <sup>(1)</sup>	0.98		
		11/20/2024		490	1,100 <sup>(1)</sup>	1.0		
		3/3/2025		500	510 <sup>(1)</sup>	1.1		
	01MW35							
	Pre-remediation	5/1/2019		100 U	550 <sup>(1)</sup>	0.35 UJ		
	Post-remediation	1/31/2023		100 U	110 <sup>(1)</sup>	0.35 U		
		4/7/2023		100 U	120 <sup>(1)</sup>	0.35 U		
		6/28/2023		100 U	76 <sup>(1)</sup>	0.35 U		
		10/10/2023		100 U	56 <sup>(1)</sup>	0.35 U		
	01MW40							
	Pre-remediation	4/30/2019			1,100 <sup>(1)</sup>	0.35 UJ		
	Post-remediation	1/31/2023		100 U	5,300 <sup>(1)</sup>	0.73		
		6/28/2023		100 U	620 <sup>(1)</sup>	0.35 U		
		2/26/2024		110	5,500 <sup>(1)</sup>	1.6		
		8/7/2024		100 U	980 <sup>(1)</sup>	0.35 U		
		3/3/2025		100 U	2,100 <sup>(1)</sup>	0.35 U		
	01MW49/01MW49R							
	Pre-remediation	5/1/2019		100 U	850 <sup>(1)</sup>	0.35 UJ		
	Post-remediation	1/31/2023		100 U	260 <sup>(1)</sup>	0.35 U		
		6/29/2023		100 U	160 <sup>(1)</sup>	0.35 U		
		2/26/2024		100 U	200 <sup>(1)</sup>	0.35 U		
		8/7/2024		100 U	240 <sup>(1)</sup>	0.35 U		
	01MW51							
	Pre-remediation	5/26/2016		370	1,800 <sup>(1)</sup>	1.0 U		
	Post-remediation	4/7/2023		100 U	250 U	0.35 U		
	01MW66							
	Pre-remediation	4/30/2019		100 U	250	0.35 UJ		3.6
	Post-remediation	1/31/2023						1.9
		2/26/2024						0.76
		3/3/2025						0.84
	01MW84							
	Pre-remediation	5/1/2019		8,400	2,800 <sup>(1)</sup>	5.0 U		
	Post-remediation	1/31/2023		2,300	810 <sup>(1)</sup>	0.35 U		
				2,200	830 <sup>(1)</sup>	0.35 U		
		4/7/2023		5,500	1,500 <sup>(1)</sup>	0.35 U		
		6/28/2023		4,600	1,400 <sup>(1)</sup>	0.35 U		
				4,300	1,300 <sup>(1)</sup>	0.35 U		
		10/10/2023		3,500	1,500 <sup>(1)</sup>	0.35 U		
		2/26/2024		1,800	540 <sup>(1)</sup>	0.35 U		
		5/15/2024		3,900	1,400 <sup>(1)</sup>	0.35 U		
		8/7/2024		2,500	970 <sup>(1)</sup>	0.35 U		
		11/20/2024		1,800	1,200 <sup>(1)</sup>	0.35 U		
		3/3/2025		960	440 <sup>(1)</sup>	0.35 U		
	01MW87							
	Pre-remediation	5/26/2019		100 U		1.0 U		
		5/1/2019			110			
	Post-remediation	4/7/2023		100 U	250 U	0.35 U		

Discussion Draft

Pre- and Post-Remediation Groundwater Results for Indicator Hazardous Substances

Analyte Class			Metals	TPH		VOCs	cVOCs		SVOCs
Analyte			Arsenic	GRO	Total DRO + ORO	Benzene	TCE	cis-1,2-DCE	Vinyl Chloride
CAS No.			7440-38-2	--	-- (U=0)	71-43-2	79-01-6	156-59-2	75-01-4
Unit			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Cleanup Level			5.0	800	500	0.44	0.50	--	0.20
Parcel	Location	Sample Date							
ASKO	01MW15								
	Pre-remediation	5/2/2019		100 U	220 <sup>(1)</sup>	0.41	0.50 U	1.7	7.2
	Post-remediation	2/1/2023					0.50 U	6.4	36
		6/28/2023					0.50 U	5.7	28
		2/26/2024					27	88	59
		5/15/2024					2.7	18	58
		8/7/2024					0.59	8.9	36
		3/3/2025					7.4	41	110
	01MW46								
	Pre-remediation	5/2/2019			280 <sup>(1)</sup>	14	880	220	11
	Post-remediation	2/1/2023				3.8	240	140	17
		4/7/2023				3.5 U	140	110	9.3
		6/28/2023				4.3	280	260	25
		10/10/2023				4.8	300	400	36
		2/26/2024				3.1	220	520	69
		5/15/2024				2.8 J	220	490	69
		8/7/2024				3.1 J	160	610	96
		11/20/2024				3.5 U	130	770	160
		3/3/2025				3.5 U	130	550	130
	01MW53/01MW53R								
	Pre-remediation	5/2/2019			94 <sup>(1)</sup>	0.35 U	0.50 U	4.4	0.26
	Post-remediation	2/1/2023					2.9	5.4	0.57
		4/7/2023					2.1	3.2	0.36
		6/28/2023					2.0	2.9	0.51
		10/10/2023					1.5	2.4	0.59
		2/27/2024					26	2.9	0.60
		5/15/2024					12	1.6	0.33
		8/8/2024					13	2.0	0.76
		11/20/2024					15	2.2	0.41
		3/3/2025					22	2.2	0.38
	01MW56								
	Pre-remediation	5/2/2019			1,000 <sup>(1)</sup>	0.35 U	0.50 U	1.0 U	0.61
	Post-remediation	2/1/2023					0.81	1.0 U	0.99
		6/28/2023					0.62	1.0 U	0.97
		2/26/2024					2.1	1.0 U	1.1
		8/7/2024					0.97	1.0 U	1.2
		3/3/2025					3.7	1.1	1.4
	01MW58/01MW58R								
	Pre-remediation	5/2/2019			100 <sup>(1)</sup>		42	1.6	0.30
	Post-remediation	2/27/2024					40	520	31
		5/15/2024					38	490	33
		8/7/2024			1,300 <sup>(1)</sup>		23	270	13
		11/20/2024			570 <sup>(1)</sup>		92	200	24
		3/3/2025			770 <sup>(1)</sup>		340	380	75
					1,000 <sup>(1)</sup>		380	390	79
	01MW61								
	Post-remediation	3/3/2025			470 <sup>(1)</sup>	0.35 U	0.050 U	1.0 U	0.020 U
	01MW80								
	Pre-remediation	5/2/2019			380 <sup>(1)</sup>	16	710	250	10
	Post-remediation	5/15/2024					190	350	51
		8/8/2024				2.4 J	180	350	65
	01MW85								
	Pre-remediation	5/3/2019			450 <sup>(1)</sup>		0.50 U	2.4	7.9
	Post-remediation	1/31/2023					5.7	1,200	13
		4/7/2023					6.2	1,200	17
		6/28/2023					110	1,000	13
		10/10/2023					13	1,100	18
		2/27/2024					5.0 U	990	28
		5/15/2024					6.2	970	26
		8/8/2024					6.5	1,100	33
		11/20/2024					5.0	990	36
		3/3/2025					4.7	1,200	42

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Analyte Class			Metals	TPH		VOCs	cVOCs			SVOCs
Analyte			Arsenic	GRO	Total DRO + ORO	Benzene	TCE	cis-1,2-DCE	Vinyl Chloride	Penta
CAS No.			7440-38-2	--	-- (U=0)	71-43-2	79-01-6	156-59-2	75-01-4	87-86-5
Unit			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Cleanup Level			5.0	800	500	0.44	0.50	--	0.20	0.20
Parcel	Location	Sample Date								
ASKO (Cont'd)	01MW89									
	Pre-remediation	5/16/2016			350 <sup>(1)</sup>	1.0 U	1.0 U	1.0 U	0.020 U	
	Post-remediation	2/27/2024					0.50 U	1.0 U	0.020 U	
	01MW107									
	Pre-remediation	5/6/2019					0.50 U	1.0 U	0.020 U	
	Post-remediation	6/28/2023					0.50 U	1.0 U	0.020 U	
		10/10/2023					0.50 U	1.0 U	0.020 U	
		2/26/2024					0.50 U	1.0 U	0.020 U	
		5/15/2024					0.50 U	1.0 U	0.020 U	
		8/8/2024					0.50 U	1.0 U	0.020 U	
		11/20/2024					0.50 U	1.0 U	0.020 U	
		3/3/2025					0.070	1.0 U	0.020 U	
	01MW108									
	Pre-remediation	5/3/2019					0.50 U	1.0 U	0.33	
	Post-remediation	2/1/2023					0.50 U	1.0 U	0.27	
		6/29/2023					0.50 U	1.0 U	0.065	
		2/26/2024					0.50 U	1.0 U	0.11	
		8/7/2024					0.50 U	1.0 U	0.081	
	MW01									
	Post-remediation	3/3/2025			140 <sup>(1)</sup>	0.35 U	0.050 U	1.0 U	0.020 U	
	MW05									
	Pre-remediation	5/3/2019		140	310 <sup>(1)</sup>	1.0	240	120	27	
	Post-remediation	2/1/2023				1.4	140	360	6.8	
		6/28/2023				1.5 J	160	360	6.9	
		2/27/2024				1.1 J	120	840	24	
		8/8/2024				0.83 J	51	840	81	
		3/3/2025				3.5 U	23	680	110	
	MW06									
	Pre-remediation	5/3/2019			370 <sup>(1)</sup>	2.6	330	31	2.8	
	Post-remediation	2/1/2023				0.35 U	0.50 U	1.0 U	2.6	
		2/27/2024				0.35 U	7.7	68	4.5	
		8/8/2024				0.35 U	48	50	2.1	
		3/3/2025				3.5 U	410	99	3.6	

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Analyte			Arsenic	GRO	Total DRO + ORO	Benzene	TCE	cis-1,2-DCE	Vinyl Chloride
CAS No.			7440-38-2	--	-- (U=0)	71-43-2	79-01-6	156-59-2	75-01-4
Unit			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Cleanup Level			5.0	800	500	0.44	0.50	--	0.20
Parcel	Location	Sample Date							
East Waterfront	02MW04/02MW04R								
	Pre-remediation	5/18/2016		3,100	2,000 <sup>(1)</sup>	19			
		5/3/2019				3.7			
	Post-remediation	2/1/2023		100 U	69 <sup>(1)</sup>	0.35 U			
		4/7/2023		100 U	250 U	0.35 U			
		6/29/2023		100 U	65 <sup>(1)</sup>	29			
		10/10/2023		100 U	250 U	0.35 U			
		2/27/2024		100 U	250 U	0.35 U			
				100 U	250 U	0.35 U			
		5/15/2024		100 U	52 <sup>(1)</sup>	0.35 U			
		8/7/2024		100 U	96 <sup>(1)</sup>	0.35 U			
	02MW07								
	Pre-remediation	5/19/2016		100 U	160 <sup>(1)</sup>	1.0 U			
		5/3/2019			670 <sup>(1)</sup>				
		7/25/2019	3.9						
	Post-remediation	2/1/2023	1.0 U	100 U	86 <sup>(1)</sup>	0.35 U			
		4/7/2023	1.0 U	100 U	250 U	0.35 U			
		6/29/2023	1.1	100 U	76 <sup>(1)</sup>	0.35 U			
		10/10/2023	1.2	100 U	73 <sup>(1)</sup>	0.35 U			
		2/27/2024	1.0 U	100 U	250 U	0.35 U			
	02MW19								
	Pre-remediation	5/6/2019		100 U	380 <sup>(1)</sup>				
		7/25/2019	14						
	Post-remediation	2/1/2023	3.3	100 U	150 <sup>(1)</sup>	0.35 U			
		4/7/2023	4.7	100 U	76 <sup>(1)</sup>	0.35 U			
			4.8	100 U	84 <sup>(1)</sup>	0.35 U			
		6/29/2023	4.2	100 U	76 <sup>(1)</sup>	0.35 U			
		10/10/2023	3.1	100 U	81 <sup>(1)</sup>	0.35 U			
		2/27/2024	4.8	100 U	110 <sup>(1)</sup>	0.35 U			

Notes:

Blanks are intentional. Data not collected for specific analyte.

*Italic* Reporting limit exceeds cleanup level.

**BOLD** Detected exceedance of cleanup level.

1 Laboratory noted that the sample chromatographic pattern does not resemble the fuel standard used for quantitation for one or more of the detected concentrat

Abbreviations:

CAS Chemical Abstracts Service

cVOC Chlorinated volatile organic compound

DCE Dichloroethene

DRO Diesel-range organics

GRO Gasoline-range organics

µg/L Micrograms per liter

ORO Oil-range organics

Penta Pentachlorophenol

SVOC Semivolatile organic compound

TCE Trichloroethene

TPH Total petroleum hydrocarbons

VOC Volatile organic compound

Qualifiers:

J Analyte was detected; concentration is an estimate.

U Analyte was not detected at the given reporting limit.

UJ Analyte was not detected at the given reporting limit, which is considered estimated.



Discussion Draft  
Permeable Reactive Barrier Grab Sample Results

Analyte Class			TPH	cVOCs		
Analyte			Total DRO + ORO	TCE	cis-1,2-DCE	Vinyl Chloride
CAS No.			71-55-6	79-01-6	156-59-2	75-01-4
Unit			µg/L	µg/L	µg/L	µg/L
Cleanup Level			500	0.50	--	0.20
Parcel	Location	Sample Date				
ASKO	Gravity Well	10/10/2023		490	130	11
		11/9/2023		370	98	21
		2/26/2024		110	23	27
		5/15/2024		700	610	260
		8/7/2024	380 <sup>(1)</sup>	840	540	6.3
		11/20/2024		370	410	35
		3/3/2025		16	2.6	0.63
	Clear Vault	11/9/2023		31	1.4	0.058
		2/26/2024		17	1.0 U	0.020 U
		5/15/2024		13	1.0 U	0.020 U
		8/7/2024		9.2	1.0 U	0.020 U
		11/20/2024		11 J	1.4	0.020 U
		3/3/2025		7.3	1.0 U	0.020 U
	Influent Vault	2/26/2024		40	3.6	0.15
		5/15/2024		25	4.2	0.16
		8/7/2024		26	4.6	0.18
		11/20/2024		14	4.9	0.22
		3/3/2025		91	2.0	0.081

## Notes:

**BOLD** Detected exceedance of cleanup level.

1 Laboratory noted that the sample chromatographic pattern does not resemble the fuel standard used for quantitation for one or more of the detected concentrations in the sum.

## Abbreviations:

cVOC Chlorinated volatile organic compound  
DCE Dichloroethene  
DRO Diesel-range organics  
µg/L Micrograms per liter  
ORO Oil-range organics  
TCE Trichloroethene  
TPH Total petroleum hydrocarbons

## Qualifier:

U Analyte was not detected at the given reporting limit.



