2024 Groundwater Monitoring Report

Tidewater Fuel Leak Site
2900 Sacajawea Park Road
Pasco, Washington 99301
Facility ID 39378684
Cleanup Site ID 2331

for

Tidewater Terminal Company

October 10, 2024

GeoEngineers
Earth Science + Technology

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File No. 09991-005-03

October 10, 2024

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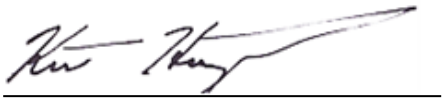

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1.0 INTRODUCTION

This report presents results of the June 2024 groundwater quality monitoring event conducted at the Tidewater Terminal Company (Tidewater) Fuel Leak Site in Pasco, Washington (herein referred to as "site"). Site groundwater has been contaminated with petroleum hydrocarbons resulting from a July 2000 leak of unleaded gasoline from one of Tidewater's fuel transfer lines located near groundwater monitoring well AR-1. The historical release resulted in localized degradation of groundwater quality within the unconfined groundwater zone beneath the site. Groundwater monitoring has been conducted on an annual basis at the site since the execution of a November 22, 2016 Consent Decree (No. 16-250951-11) (Ecology, 2016) to observe and document trends in groundwater conditions and quality.

The site is located on a 3-acre easement that crosses the 33-acre Pasco Bulk Terminal currently owned by Marathon Petroleum Corporation (Marathon). The site is located approximately as shown on Figure 1 Vicinity Map, at 2900 Sacajawea Park Road, Pasco, Washington 99301. Locations of groundwater monitoring wells and groundwater elevations are presented on Figure 2 Site Plan and Groundwater Elevations, June 18, 2024. The 2024 monitoring event was performed in accordance with the Compliance Monitoring Plan (CMP) dated November 30, 2017 (CH2M, 2017) and approved by the Washington Department of Ecology (Ecology) on December 8, 2017.

1.1. Purpose

This data summary report has been prepared by GeoEngineers, Inc. (GeoEngineers) to document the field measured parameters and chemical analytical results from the June 18 through June 19, 2024 groundwater monitoring event conducted at the site. As described in the CMP, the purpose of annual groundwater monitoring at the Site is to monitor indicator substances and secondary indicator parameters for the effectiveness of monitored natural attenuation (MNA) as the selected cleanup action for the site (CH2M, 2017). Indicator substances measured by a chemical analytical laboratory include benzene, toluene, ethylbenzene, and total xylenes (BTEX), and gasoline, diesel, and heavy oil-range total petroleum hydrocarbons (TPHg, TPHd, and TPHo). Secondary indicator parameters measured by a chemical analytical laboratory include ferrous iron, manganese, methane, and sulfate, and are used in conjugation with field measured parameters including dissolved oxygen, oxidation reduction potential, ferrous iron, and pH to evaluate the effectiveness of MNA at the site. The CMP provides the cleanup levels for indicator substances for the site (Table 1 of the CMP). The Sampling and Analysis Plan (SAP) (Appendix A of the CMP, Table A-2) provides a full list of analytical parameters.

1.2. Objectives

As required by the Consent Decree and defined in the Cleanup Action Plan (CAP), the CMP describes the monitoring locations, methods, frequency, analytical parameters, and reporting obligations required to ensure that the Ecology-selected cleanup objectives established in the CAP are eventually met (i.e., MNA, coupled with passive bioventing and institutional controls). To this end, this annual report summarizes the results of protection/performance water quality monitoring within and surrounding localized areas of residual contamination near the historical release. The sampling approach is described in the SAP (Appendix A) of the CMP (CH2M, 2017) and was designed to collect samples from compliance wells located within the site monitoring network (Figure 2).

This data summary report includes a summary of field activities, sampling methods and field observations, and a summary of analytical results. All fieldwork and laboratory analyses were performed in general accordance with the SAP as included in the 2017 CMP.

2.0 GROUNDWATER MONITORING PROGRAM

The current Tidewater compliance monitoring network includes one upgradient monitoring well (AR-11), three sentinel wells (MW-4, MW-6, and MW-8), one source area well (AR-1), and one downgradient interior plume well (AR-8). Annual groundwater monitoring activities generally include measuring the depth to groundwater in the 11 site monitoring wells listed in Table 1 Groundwater Elevations and Field Parameter Readings, measuring water quality parameters, collecting groundwater samples from the six compliance monitoring wells, submitting samples to an analytical laboratory for chemical analysis, interpreting data and trends on field and laboratory findings, and preparing this report.

Prior to 2021, well AR-4 was monitored as the downgradient interior plume source area well. During the 2020 groundwater monitoring event, a submersible sampling pump became stuck near the bottom of the 88-foot-deep well. As documented in the 2020 monitoring report (Jacobs, 2021), efforts to retrieve the pump were unsuccessful and Tidewater proposed to replace it in the CMP with well AR-1. Since AR-1 no longer contains separate-phase hydrocarbons (SPH), it can be used to evaluate natural attenuation rates within the source area. Measurable SPH has not been detected in AR-1 since 2010.

On July 21, 2021, representatives of GeoEngineers and Tidewater observed video camera deployment into wells AR-1 and AR-4 by Environmental West Exploration of Spokane, Washington. The video showed damage to the casing of AR-4 at approximately 5 feet below ground surface (bgs). The casing of AR-1 appeared to be intact. Subsequently, an aboveground steel monument set in concrete was constructed over AR-4 by Environmental West Exploration, a Washington licensed well driller, to support its long-term use for groundwater level monitoring.

Also on July 21, 2021, a caliper survey was conducted in well AR-1, which showed the well casing to be relatively straight and intact. Well AR-1 was re-developed by purging approximately 5 casing volumes from the well. Details of the camera investigation, caliper survey, purging observations, and other well repair activities were presented in the 2021 groundwater monitoring report (GeoEngineers, 2021).

On July 23, 2021, GeoEngineers notified Ecology concerning the condition of AR-4 and requested adopting AR-1 as a compliance sampling well. On July 26, 2021, Ecology approved the request via email. Since the 2021 groundwater monitoring event, well AR-1 has been sampled as the source area well. AR-4 is monitored for SPH and depth to groundwater.

During a May 20, 2024 site visit by Ecology as part of its 5-year review of post-cleanup site conditions, the surface conditions of several monitoring and remediation wells were found to be in need of potential maintenance. Specifically, several wells with flush-mounted covers do not have gaskets or are missing bolts holding the cover in place. Two wells (MW-1 and AR-2) could not be found and are currently missing. Some of the wells that are part of the interim action remedial system such as MW-5, MW-7, and MW-8, have polyvinyl chloride (PVC) casing that is exposed to the environment without covers. A copy of Ecology's review report is provided in Appendix F. We understand that Tidewater will be discussing and addressing these wellhead protection concerns with Ecology separately.

2.1. Groundwater Measurements and Elevations

The 2024 groundwater monitoring was conducted by GeoEngineers personnel on June 18 and June 19, 2024. Groundwater levels in all 11 wells listed in Table 1 of the CMP were measured prior to purging and sampling the six compliance wells. The water table interface in all 11 CMP wells was carefully gauged for SPH using an oil-water interface probe. The presence of SPH was not detected in the site's monitoring wells during the 2024 monitoring event.

Groundwater levels were measured from the top of casing of each well. Groundwater measurements were recorded on the groundwater field forms in Appendix A. Depths to water for all measured wells at the site ranged from 78.55 feet below top of casing in well MW-4 to 83.52 feet bgs in well MW-7. Well AR-12 was dry in June 2024. Based on depth-to-water measurements, groundwater elevations were calculated and are shown in Table 1.

The groundwater gradient for the site is flat with less than 0.001 foot/feet (ft/ft) variation between upgradient and downgradient wells. These groundwater elevations are consistent with historical measurements. Groundwater elevations measured during the 2024 monitoring event were approximately 0.056 foot lower than were measured in June 2023. However, since 2010 groundwater elevations have declined 0.6 foot on average. The groundwater flow direction to the south was inferred based on historical groundwater elevations and groundwater plume geometry. Historical groundwater elevations are included in Appendix B.

2.2. Groundwater Monitoring

Groundwater samples were collected from the following six CMP network wells (listed in Table 2 of the CMP): AR-1, AR-8, AR-11, MW-4, MW-6, and MW-8. Groundwater samples were collected using a 2-inch-diameter portable submersible pump powered by a direct current (DC) power battery with new polyethylene tubing at each well. Following purging and sampling in each well, the submersible pump and water level probe were decontaminated using a phosphate-free detergent and rinsed with de-ionized water.

Wells were generally sampled in order based on historical concentrations of petroleum hydrocarbons and starting with the lowest historical concentrations of petroleum hydrocarbons and moving to the highest. The order of sampling during the June 2024 monitoring event was AR-11, MW-4, MW-6, MW-8, AR-8, AR-1.

Well sampling was performed in accordance with the SAP using low-flow sampling techniques. Field parameters recorded on field forms for each well are summarized in Table 1. Well Sampling Forms are provided in Appendix A of this report. Wells were purged until field parameters stabilized over three consecutive 5-minute intervals. Groundwater samples were collected in laboratory-provided sample containers and placed immediately in an iced cooler under chain-of-custody protocol. Ferrous iron concentrations were field measured using a Hach® 890 colorimeter at the time of collecting samples and recorded on the Well Sampling Forms (Appendix A). Field measurements of ferrous iron are summarized in Table 1.

Field duplicates, matrix spike/matrix spike duplicates, and equipment rinsate blanks were collected as quality control for field and laboratory procedures as specified in the Quality Assurance Project Plan (QAPP) (Appendix B of the CMP). The field duplicate sample was collected from well MW-8, and the matrix spike duplicate was collected from well MW-6. Purge water was collected during sampling activities, contained in

a labeled 55-gallon drum, and stored at the site within a secured area pending characterization by groundwater results and disposal at the Tidewater Snake River Terminal.

3.0 RESULTS

Groundwater samples collected on June 18 and 19, 2024 were labeled, placed in a cooler with ice, and delivered under chain-of-custody protocol to Anatek Laboratories (Anatek) of Spokane, Washington. Groundwater samples were analyzed for the analytes (indicator substances) listed in Table 2 of the CMP as follows:

- Gasoline-range total petroleum hydrocarbon (TPHg) by NWTPH-Gx; and diesel-range total petroleum hydrocarbons (TPHd)/oil-range total petroleum hydrocarbons (TPHo) by NWTPH-Dx.
- Benzene, toluene, ethylbenzene, and xylenes (collectively BTEX) by EPA Method 8260D.

Groundwater concentrations of petroleum hydrocarbons and BTEX for the June 2024 monitoring event are detailed by well below. Analytical results are provided in Table 2. Laboratory reports are provided in Appendix C.

- **AR-11**: TPHg, BTEX, and TPHd were not detected in well AR-11. Non-target peaks were identified in the TPHo quantitation range that resulted in a TPHo detection of 465 micrograms per liter (µg/L). This TPHo concentration is below the Model Toxics Control Act (MTCA) Method A cleanup level of 500 µg/L.
- **MW-4**: Petroleum hydrocarbons and BTEX were not detected above laboratory method detection limits (MDLs).
- **MW-6**: Petroleum hydrocarbons and BTEX were not detected above laboratory MDLs.
- **MW-8**: TPHd and TPHo were not detected in well MW-8. TPHg was detected at a concentration of 7,400 µg/L. This concentration exceeds the MTCA Method A cleanup level of 800 µg/L. Toluene, ethylbenzene, and total xylenes were detected at concentrations less than corresponding MTCA Method A cleanup levels. Benzene was not detected in well MW-8 above laboratory MDLs.
- **AR-8**: TPHd and TPHo were not detected in well AR-8. TPHg was detected at a concentration of 7,500 µg/L, exceeding the MTCA Method A cleanup level. Ethylbenzene and total xylenes were detected at concentrations less than corresponding MTCA Method A cleanup levels. Benzene and toluene were not detected in well AR-8 above laboratory MDLs. As mentioned below in Sections 3.1.1 and 4.0, we have reasons to believe the laboratory inadvertently switched the sample identifications for well AR-8 and the field duplicate collected from MW-8 (labeled MW-8FD). Specifically, detected concentrations of TPHg in MW-8 and MW-8FD are 7,400 µg/L (consistent with previous data) and 3,160 µg/L, respectively. Meanwhile, the detected concentration of TPHg in AR-8 was 7,500 µg/L, which is the highest it's been in 17 years.
- **AR-1**: TPHo and TPHd were not detected in well AR-1. TPHg was detected at a concentration of 37,100 µg/L, exceeding the MTCA Method A cleanup level. Other detected concentrations are listed below:
    - Benzene was detected at 295 µg/L and exceeded the MTCA Method A cleanup level of 5 µg/L.
    - Toluene was detected at 1,460 µg/L and exceeded the MTCA Method A cleanup level of 1,000 µg/L.

- Ethylbenzene was detected at a concentration below the MTCA cleanup level.
- Total xylenes were detected at 3,720 µg/L and exceeded the MTCA Method A cleanup level of 1,000 µg/L.

In addition to the indicator substances, groundwater samples were analyzed for secondary indicator parameters manganese, sulfate, nitrate, methane and ferrous iron to determine if MNA processes are still occurring at the site. Natural attenuation analytes are provided in Table 2. The following is a summary of MNA parameters measured during the 2024 event:

- **Manganese**—Manganese was detected in all eight wells sampled. Manganese concentrations were highest in wells AR-8, AR-1, and MW-8 at 0.707 mg/L, 0.481 mg/L, and 1.65 mg/L, respectively. Sentinel wells without petroleum hydrocarbons exhibited much lower manganese levels ranging from 0.00264 to 0.0384 mg/L.
- **Sulfate**—Sulfate concentrations ranged from 73 to 119 mg/L in the sentinel wells and 52 mg/L in the source area. In general, concentrations of sulfate are lower in wells containing petroleum hydrocarbons.
- **Nitrate**: Nitrate concentrations ranged from 15.2 to 28.3 mg/L in the sentinel wells and 4.89 mg/L in the source area. In general, concentrations of nitrate are lower in wells containing petroleum hydrocarbons.
- **Methane**—Methane was detected at concentrations of 1.29, 6.49, and 119 µg/L in MW-8, AR-8, and AR-1, respectively. Methane was not detected in the remaining wells.
- **Iron**—Ferrous iron was not detected in any of the June 2024 groundwater samples using laboratory Standard Method (SM) 3500. Field measurements of soluble ferrous iron are discussed in Section 3.2.

3.1. Quality Assurance Summary

Quality assurance samples were collected by GeoEngineers in the field (e.g., field duplicates, equipment blank, and trip blanks). Additionally, the analytical laboratory performed quality assurance on samples during analysis.

3.1.1. Field Quality Assurance Samples

A field duplicate was collected from MW-8 during the June 2024 event. Of the eight analytes that were detected, in at least one of the two samples, six exceeded a relative percent difference (RPD) of 50 percent. This included toluene, ethylbenzene, xylenes, TPHg, nitrate, and methane. Except for sulfate, analytes detected in the field duplicate were detected at a lower concentration than in the non-duplicate sample. Field RPD is used to assess the reproducibility of a set of replicate measurements under a given set of conditions. A comparison of TPHg concentrations in MW-8, MW-8FD, and AR-8 suggests that the laboratory inadvertently switched the sample identifications for MW-8FD and AR-8. When asked, the laboratory denied any mix up and/or mistake recording the data. A review of the historical data in Appendix D suggests otherwise.

The RPD for manganese and sulfate was within limits. An equipment rinsate sample (AR-8 ER-2406) was also collected by GeoEngineers field staff from the submersible pump and oil/water interface probe during the sampling event to check field decontamination procedures. No analytes were detected for the equipment blank, indicating decontamination procedures were generally effective and no cross contamination is suspected. No analytes were detected in the trip blanks.

3.1.2. Laboratory Quality Assurance Samples

Laboratory performance criteria for calibration, precision (as measured by laboratory duplicate samples), and accuracy (as measured by spike and surrogate recovery and laboratory control sample analysis) were reviewed. All laboratory quality assurance results indicate that laboratory quality control requirements were met for the analyses performed.

3.1.3. Assessment

Based on our review of the laboratory quality assurance results, no data were rejected or qualified.

3.2. Water Quality Field Parameters

During groundwater sampling, field parameters were recorded to provide additional details of water quality. Dissolved oxygen (DO), pH, oxidation-reduction potential (ORP) and soluble ferrous iron were recorded and provide additional data whether biodegradation processes are occurring. Negative ORP field values, which indicate the potential of reducing conditions, were recorded in AR-1, AR-8, and MW-8. Lower DO readings, which indicate increasing anaerobic conditions, were recorded in AR-1, AR-8, and MW-8. Field pH readings ranged from 7.32 (AR-1) to 7.64 (AR-11). The field concentration of ferrous iron in AR-1 was 1.14 mg/L. Ferrous iron concentrations ranged from 0.00 mg/L to 0.05 mg/L in other wells. With the exception of AR-1, no clear association was observed between ferrous iron concentration and higher petroleum hydrocarbon concentrations. Field parameters are recorded on the well sampling field sheets in Appendix A and are provided in Table 1.

4.0 CONCLUSIONS

Consistent with previous compliance monitoring events TPH and BTEX compounds were not detected in groundwater samples obtained from wells MW-4 and MW-6 during the June 2024 monitoring event. TPHo was detected in AR-11 below the MTCA Method A cleanup level. However, this concentration is estimated and appears to be a function of matrix interference as the laboratory noted that non-target peaks were observed in the TPHo quantitation range.

Detected concentrations of TPHg, ethylbenzene and total xylenes in well MW-8 during the June 2024 monitoring event were generally consistent with previous events. Detected concentrations of TPHg, ethylbenzene, and total xylenes in well AR-8 during the June 2024 monitoring event were higher than prior events. However, when comparing historical concentrations of MW-8 to AR-8, it appears that the laboratory inadvertently switched the field duplicate for MW-8 (labeled MW-8FD) with the AR-8 sample identification. Field parameter data indicate that wells with historic and existing petroleum hydrocarbon detections showed negative ORP values (indicating potential for reducing conditions) and lower DO readings (indicating presence of anaerobic conditions). Historical groundwater monitoring results are provided in Appendix D. Time series plots for benzene and TPH-g are also provided in Appendix E.

Well AR-1 is located within the center of the petroleum hydrocarbon plume directly downgradient from the release area and had the highest TPHg and BTEX concentrations at the site. TPHg, benzene, toluene, and xylenes exceeded MTCA cleanup levels. This is consistent with previous monitoring events. Hydrocarbons were not detected in the diesel range in well AR-1.

A qualitative assessment of biodegradation of petroleum hydrocarbons by indigenous microbes through aerobic and/or anaerobic respiration was performed using geochemical parameters of groundwater samples collected from monitoring wells located within the source area (AR-1) and downgradient/cross-gradient plume wells (AR-8 and MW-8) and comparing those results with the results of similar analyses from groundwater samples collected from non-impacted sentinel wells (MW-4, MW-6 and AR-11). During microbial respiration, electrons are transferred from an electron donor (petroleum hydrocarbons) to an electron acceptor. In the process, naturally abundant electron acceptors in the aquifer are reduced (e.g., DO, nitrate, and sulfate) while products of biodegradation increase (dissolved manganese and methane). Consistent with previous sampling events, the geochemical parameters of the 2024 groundwater samples confirm that aerobic and anaerobic biodegradation of petroleum indicator substances is occurring in groundwater at the site. Specifically, by-products of microbial respiration (dissolved manganese and methane) were higher in wells with petroleum hydrocarbons as opposed to wells that have not had petroleum hydrocarbon detections. Conversely, with the exception of sulfate in well AR-8, electron acceptors (DO, nitrate, and sulfate) were lower in wells AR-1, AR-8, and MW-8, than wells where petroleum hydrocarbons were historically not detected.

The results of the June 2024 monitoring event continue to support the conclusions presented in the September 2011 Remedial Investigation/Feasibility Study Report (CH2M/URS, 2011) as follows:

- The hydraulic gradient at the site is relatively flat with limited fluctuations.
- The petroleum hydrocarbon source in the vadose zone has been addressed through remedial activities.
- Residual dissolved-phase petroleum hydrocarbons remain on site and within localized areas of the former SPH plume. These areas include monitoring wells AR-1, AR-8, and MW-8.
- The lateral extent of the dissolved-phase plume has been stable since active remedial actions were discontinued.
- Measured concentrations of field parameters and analytical results of natural attenuation constituents, as well as the stable lateral extent and concentration of petroleum hydrocarbons in sampled wells, suggest that biodegradation processes continue at the site.
- Restoration timeframe is limited by the flat hydraulic gradient and inability to replenish electron acceptors in the source area. However, the flat hydraulic gradient is keeping the plume from expanding. Since implementation of the CMP in 2018, the extent of the plume has not changed.

5.0 RECOMMENDATION

Groundwater monitoring has been conducted on an annual basis at the site since the execution of a November 22, 2016 Consent Decree (No. 16-250951-11) to observe and document trends in groundwater conditions and quality. Since then, the results of groundwater quality monitoring have been relatively consistent and the groundwater containment plume stable. Subsequently, we recommend decreasing the frequency of monitoring from annually to once every 3 years. If approved by Ecology, the next groundwater monitoring event would occur in June 2027.

6.0 LIMITATIONS

GeoEngineers has prepared this report for use by Tidewater Terminal Company for the Fuel Leak Site in Pasco, Washington. Our services were conducted in general accordance with our proposal dated November 14, 2023.

Within the limitations of scope, schedule and budget, our services were executed in accordance with generally accepted practices in the field of environmental monitoring in this area at the time this report was prepared. No warranty or other conditions expressed or implied should be understood. Report limitations and guidelines for use are included in Appendix G.

We appreciate the opportunity to provide these continued services to Tidewater. Please call Kurt Harrington, PE at 503.502.1831 if you have questions regarding the contents of this report.

7.0 REFERENCES

CH2M/URS, 2011. Remedial Investigation/Feasibility Study Report for the NWTC Pasco Terminal, Pasco, Washington. September 29.

CH2M, 2017. Compliance Monitoring Plan for The Tidewater Fuel Leak Site, Pasco. October 3.

Jacobs, 2021. FINAL—Data Summary Report for Annual Groundwater Monitoring for the Tidewater Fuel Leak Site, Pasco, Washington. January 2021.

GeoEngineers, 2021. 2021 Groundwater Monitoring Report for the Tidewater Fuel Leak Site, Pasco, Washington. December 10, 2021.

Washington Department of Ecology, 2016. State of Washington, Department of Ecology v. Tidewater Terminal Company, Inc., Consent Decree No. 16-250951-11. November 22.

TABLES

GeoEngineers

Table 1. Groundwater Elevations and Field Parameter Readings

Tidewater Fuel Leak Site Compliance Monitoring Program

Well	Date Monitored [1]	Reference Point Elevation (ft)	Depth to Water (ft btc)	Groundwater Elevation (ft)	Temp (°C)	pH	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (mV)	Ferrous Iron (mg/L)	Conductivity (mS/cm)	Turbidity (NTU)	Comments
AR-1	6/18/2024	423.88 [3]	80.11	343.77	20.3	7.32	0.17	-128.5	1.14	1.094	8.6	--
AR-8	6/18/2024	423.02	79.27	343.75	17.6	7.43	0.29	-95.5	0.03	0.967	4.2	--
AR-11	6/18/2024	422.62	78.84	343.78	18.0	7.64	8.53	113.8	0.00	0.952	6.8	--
MW-4	6/18/2024	422.29	78.55	343.74	19.0	7.61	7.72	94.4	0.05	0.964	8.7	--
MW-6	6/18/2024	422.50	78.73	343.77	17.3	7.63	8.49	143.7	0.05	0.926	6.6	Also collected MS/MSD Lab QC Sample
MW-8	6/18/2024	427.15	83.43	343.72	18.0	7.43	2.89	-56.3	0.00	0.774	4.7	Also collected Field Duplicate Sample
Water Levels Only												
AR-4	6/18/2024	426.51 [2]	82.73	343.78	--	--	--	--	--	--	--	--
AR-7	6/18/2024	425.44	81.66	343.78	--	--	--	--	--	--	--	--
AR-12	6/18/2024	425.50	Dry	--	--	--	--	--	--	--	--	--
MW-5	6/18/2024	425.02	81.30	343.72	--	--	--	--	--	--	--	--
MW-7	6/18/2024	427.25	83.52	343.73	--	--	--	--	--	--	--	--

Notes:

1 - All water level measurements were conducted on June 18, 2024. Groundwater samples were collected on June 18 and 19, 2024.

2 - Reference point elevation was resurveyed on July 27, 2021.

3 - Reference point elevation was resurveyed on June 1, 2022.

" -- " = Not applicable, not available, and/or not measured.

Reference point elevation is top of PVC casing; all elevations are in feet above mean sea level (NAVD88).

Field parameter readings represent final stabilized readings obtained during low-flow purge immediately prior to collection of water-quality sample.

ft = feet

ft btc = feet below top of casing

°C = degrees celsius

mg/L = milligrams per liter

mV = millivolts

mS/cm = millisiemens per centimeter

NTU = Nephelometric Turbidity Units

Table 2. Groundwater Quality Data

Tidewater Fuel Leak Site Compliance Monitoring Program

Well Sample ID Sample Date				AR-11 AR-11-2406 6/18/2024	MW-4 MW-4-2406 6/18/2024	MW-6 MW-6-2406 6/18/2024	MW-8 MW8-2406 6/19/2024	FD (MW-8) FD-2406 6/19/2024	AR-8 AR-8-2406 6/19/2024	AR-1 AR1-2406 6/19/2024	Equipment Blank AR-8 ER-2406 6/19/2024
Field Parameters	**Method**	**Units**	**MTCA CUL [1]**								
pH	Field Probe	units	--	7.64	7.61	7.63	7.43	--	7.43	7.32	--
Temperature	Field Probe	°C	--	18.0	19.0	17.3	18.0	--	17.6	20.3	--
Conductivity	Field Probe	mS/cm	--	0.952	0.964	0.926	0.774	--	0.967	1.094	--
Dissolved Oxygen	Field Probe	mg/L	--	8.53	7.72	8.49	2.89	--	0.29	0.17	--
Oxygen Reduction Potential	Field Probe	mV	--	113.8	94.4	143.7	-56.3	--	-95.5	-128.5	--
Turbidity	Field Probe	NTU	--	6.8	8.7	6.6	4.7	--	4.2	8.6	--
Ferrous Iron	Field Screen	mg/L	--	0.00	0.05	0.05	0.00	--	0.03	1.14	--
Petroleum Hydrocarbons											
Benzene	EPA 624.1	µg/L	5	<0.500	<0.500	<0.500	<5.00	<0.500	<0.500	**295**	<0.500
Toluene	EPA 624.1	µg/L	1,000	<0.500	<0.500	<0.500	**16.5**	<0.500	<0.500	**1,460**	<0.500
Ethylbenzene	EPA 624.1	µg/L	700	<0.500	<0.500	<0.500	**67.7**	**23.0**	**208**	**226**	<0.500
Total Xylenes	EPA 624.1	µg/L	1,000	<0.500	<0.500	<0.500	**873**	**249.6**	**70.3**	**3,720**	<0.500
TPH-Gasoline Range	NWTPH-Gx	µg/L	800	<200	<200	<200	**7,400**	**3,160**	**7,500**	**37,100**	<200
TPH-Diesel Range	NWTPH-Dx	µg/L	500	<160	<160	<160	<160	<160	<160	<160	<160
TPH-Heavy Range	NWTPH-Dx	µg/L	500	465 [2]	<400	<400	<400	<400	<400	<400	<400
MNA Parameters											
Manganese	EPA 200.8	mg/L	--	0.00307	0.0384	0.00264	0.481	0.412	0.707	1.65	--
Sulfate	EPA 300.0	mg/L	--	119	119	113	73.0	81.2	147	52.2	--
Nitrate	EPA 300.0	mg/L	--	28.3	28.0	26.7	15.2	17.4	3.49	4.89	--
Methane	RSK-175 MOD	µg/L	--	<0.65	<0.65	<0.65	**1.29**	**0.71**	**6.49**	**119**	--
Ferrous Iron	SM-3500	mg/L	--	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	--

Notes:

[1] From the November 2016 Cleanup Action Plan Table 1.

[2] Concentration estimated. Non-target peak interference in quantitation range.

MNA field parameter readings represent final stabilized readings obtained during low-flow purge immediately prior to collection of water-quality sample.

BOLD = Detection

Grey shading = Exceeds MTCA Method A Cleanup Level

Non-detect values reported as "<" laboratory method detection limit.

" -- " = Not applicable, not available, and/or not measured.

MTCA CUL = Model Toxics Control Act Cleanup Level

°C = degrees celsius

µg/L = micrograms per liter

mg/L = milligrams per liter

mV = millivolts

mS/cm = millisiemens per centimeter

NTU = Nephelometric Turbidity Units

FIGURES

GeoEngineers

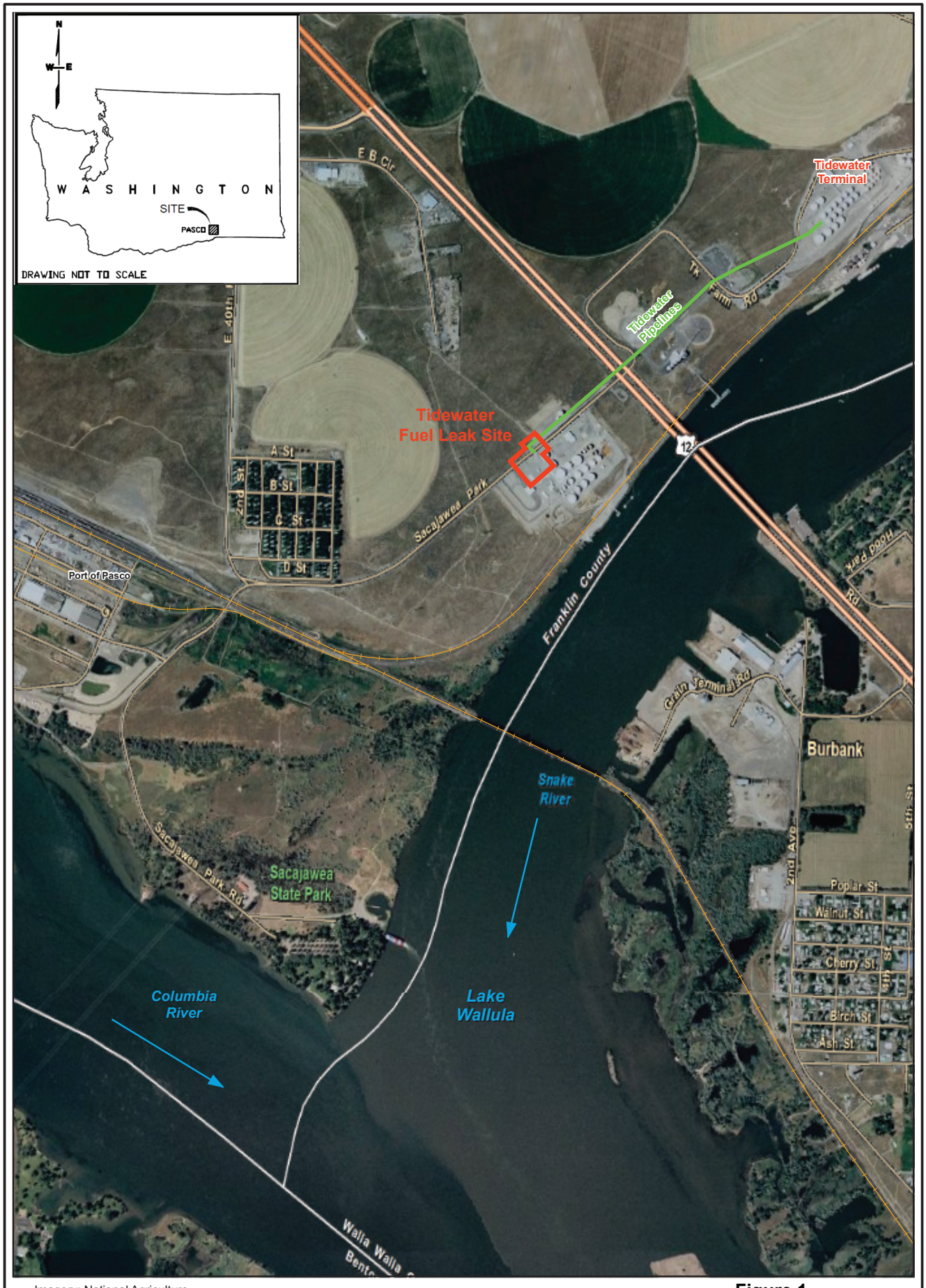


Figure 1
Site Location
Compliance Monitoring
Tidewater Fuel Leak Site
Pasco, WA

P:\9\9991005\GIS\9991005_Project\9991005_Project.aprx\9991005_F02 Date Exported: 08/12/24 by estrandhagen



Legend

- Compliance Monitoring Well
- Water Level Well
- Existing Tidewater Well

N

0 40

Feet

Source(s):
- Bing Imagery

Coordinate System: NAD 1983 StatePlane Washington South FIPS 4602 Feet

Disclaimer: This figure was created for a specific purpose and project. Any use of this figure for any other project or purpose shall be at the user's sole risk and without liability to GeoEngineers. The locations of features shown may be approximate. GeoEngineers makes no warranty or representation as to the accuracy, completeness, or suitability of the figure, or data contained therein. The file containing this figure is a copy of a master document, the original of which is retained by GeoEngineers and is the official document of record.

Tidewater's CMP Groundwater Well Network

Compliance Monitoring
Tidewater Fuel Leak Site
Pasco, WA

GeoEngineers

Figure 2

P:\9\9991005\GIS\9991005_Project\9991005_Project.aprx\9991005_F03 Date Exported: 08/13/24 by estrandhagen



Legend

- Compliance Monitoring Well
- Water Level Well
- Existing Tidewater Well

343.77 Groundwater Elevation in Feet Above Mean Sea Level (amsl)

Inferred Groundwater Flow Direction (Based on historical groundwater elevations and groundwater plume geometry)

N

0 40

Feet

Source(s):
- Bing Imagery

Coordinate System: NAD 1983 StatePlane Washington South FIPS 4602 Feet

Disclaimer: This figure was created for a specific purpose and project. Any use of this figure for any other project or purpose shall be at the user's sole risk and without liability to GeoEngineers. The locations of features shown may be approximate. GeoEngineers makes no warranty or representation as to the accuracy, completeness, or suitability of the figure, or data contained therein. The file containing this figure is a copy of a master document, the original of which is retained by GeoEngineers and is the official document of record.

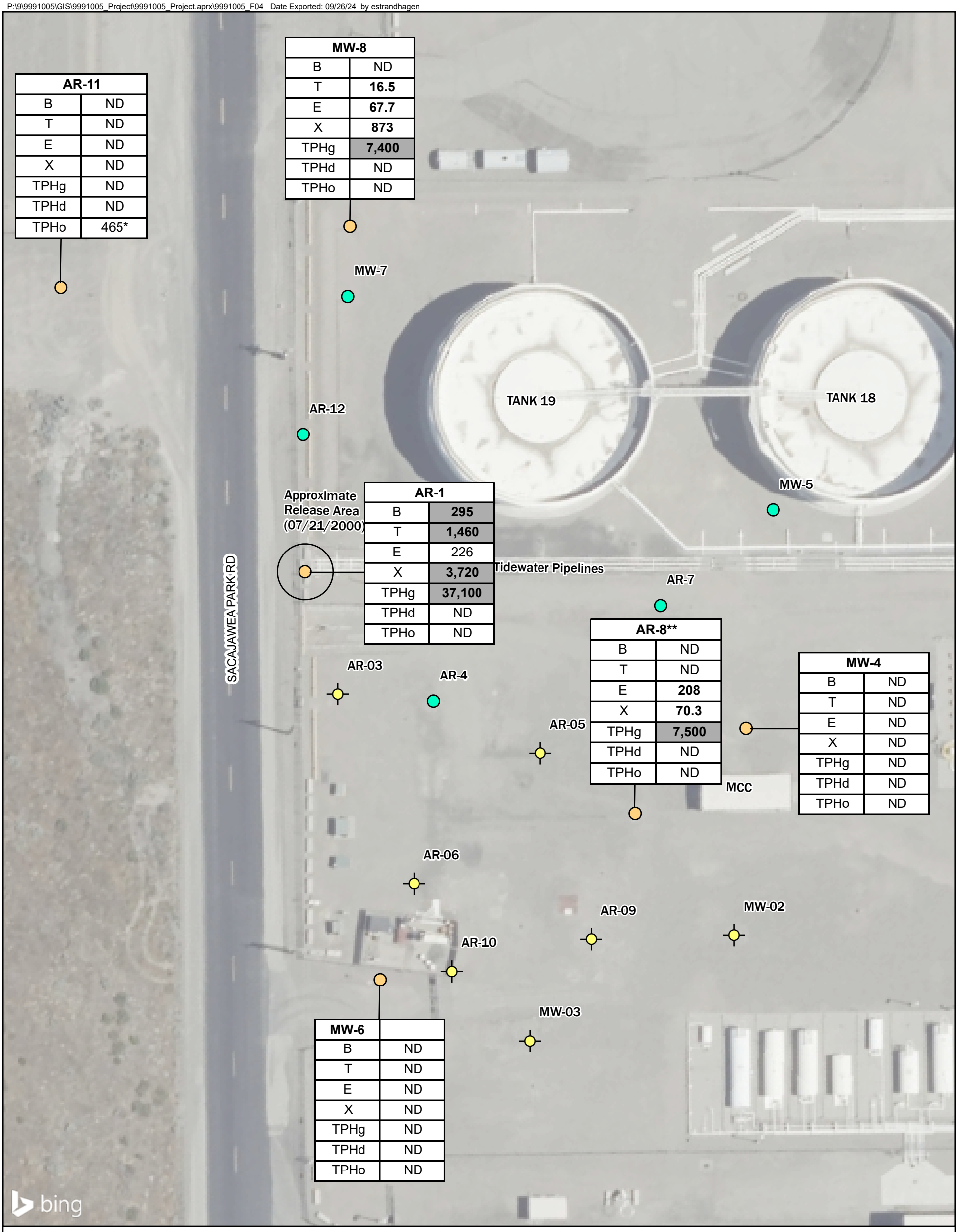
Groundwater Elevations – June 2024

Compliance Monitoring
Tidewater Fuel Leak Site
Pasco, WA

GeoEngineers

Figure 3

P:\9\9991005\GIS\9991005_Project\9991005_Project.aprx\9991005_F04 Date Exported: 09/26/24 by estrandhagen



Legend

- Compliance Monitoring Well
- Water Level Well
- Existing Tidewater Well

B = Benzene
T = Toluene
E = Ethylbenzene
X = Total xylenes
TPHg = Gasoline
TPHd = Diesel
TPHo = Heavy Oil

µg/L – micrograms per liter
BOLD = MCL exceedance
Grey shading = Exceeds MTCA Cleanup Level

* According to the lab report, detection related to matrix inference.
** Reason to believe lab inadvertently reported the field duplicate from MW-8 as AR-8.

N

0 40
Feet

Source(s):
• Bing Imagery

Coordinate System: NAD 1983 StatePlane Washington South FIPS 4602 Feet

Disclaimer: This figure was created for a specific purpose and project. Any use of this figure for any other project or purpose shall be at the user's sole risk and without liability to GeoEngineers. The locations of features shown may be approximate. GeoEngineers makes no warranty or representation as to the accuracy, completeness, or suitability of the figure, or data contained therein. The file containing this figure is a copy of a master document, the original of which is retained by GeoEngineers and is the official document of record.

Petroleum Hydrocarbons in Groundwater

Compliance Monitoring
Tidewater Fuel Leak Site
Pasco, WA

GeoEngineers

Figure 4

APPENDICES

GeoEngineers

APPENDIX A
Field Forms

Project: Pasco Terminal / 009991-005-03
Client: Tidewater
Sampler: CW

Date: 6/18/24
Permit: 608362

Well ID:	Time:	DTP:	DTW:	Product Thickness:	Notes:
AR-11	0754	-	78,84	-	
MW-06	0759	-	78,73	-	
MW-04	0806	-	78.55	-	
MW-05	0812	-	81,30	-	
AR-07	0819	-	81.66	-	
AR-08	0825	-	79.27	-	
MW-08	0833	-	83.43	-	
MW-07	0837	-	83.52	-	
AR-12	0844	-	DRY	-	
AR-04	0852	-	82.73	-	
AR-01	0859	-	80.11	-	

WELL MONITORING DATA SHEET

GEOENGINEERS

Well ID:	AR-11	Job Number:	09991-005-03
Client:	Tidewater - Pasco Terminal	Date:	6/18/24
Project:	GWM 06/2024	Sampler:	CW
Weather:	Sunny ~70°	Time In/Out:	

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:	2"	Depth to Free Product:	-
	Other: -	Well Depth:	-	Free Product Thickness:	-
Monument Condition:	Good	Depth to Water:	78.84	Water Column Length:	-
Well Cap Lock Present:	Yes No	Screened Interval:	-	Purge Volume:	-
Comments:	-				

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)				
Water height multipliers (gal):	1-inch well = 0.041	2-inch = 0.162	4-inch = 0.653	1 gal = 3.785 liters

PURGING DATA

Purge Method:	Monsoon Pro	Pump Intake Depth:	mid-screen
Sampling Method:	Low-flow	Tubing Material & Type:	NEW / DEDICATED

Time	Volume Purged (liters)	Purge Rate (L/min)	DTW (btc)	Turbidity (NTU)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
				+/- 10% /10 NTU	+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
0951	-	0.30	78.88	11.01	7.60	17.8	952	8.58	118.2	clear
0954	-	0.30	78.88	9.65	7.62	17.9	953	8.56	117.3	"
0957	-	0.30	78.88	7.90	7.64	18.0	953	8.54	114.7	"
1000	-	0.30	78.88	6.81	7.64	18.0	952	8.53	113.8	

Field Ferrous Iron: 0.00 mg/L

PURGING DATA

Sample ID:	AR-11-2406	Sampling Flow Rate:	0.30			Analytical Laboratory:	Anatek
Sample Time:	1000	Final Depth to Water:	78.86			Regulator Setting:	16.4 V
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
6x VOA	HCl	6x, Methane, VOC					
1x125	-	Nitrate, Sulfate					
1x250	-	Fe					
1x250	-	Metals					
2x250	HCl	Dx + 6.1					

NOTES/ADDITIONAL COMMENTS

Equipment: Monsoon Pro, YSI Pro DSS, Hach Dr ~~890~~ 900

WELL MONITORING DATA SHEET

GEOENGINEERS

Well ID:	MW-4	Job Number:	09991-005-03
Client:	Tidewater - Pasco Terminal	Date:	6/18/24
Project:	GWM 06/2024	Sampler:	CW
Weather:	Sunny - 80°	Time In/Out:	-

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:	2"	Depth to Free Product:	-
	Other: -	Well Depth:	-	Free Product Thickness:	-
Monument Condition:	Good	Depth to Water:	78.55	Water Column Length:	-
Well Cap Lock Present:	Yes No	Screened Interval:	78-90	Purge Volume:	-

Comments: -

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal):	1-inch well = 0.041	2-inch = 0.162	4-inch = 0.653	1 gal = 3.785 liters

PURGING DATA

Purge Method:	Monsoon Pro	Pump Intake Depth:	Mid-screen
Sampling Method:	Low-flow	Tubing Material & Type:	NEW / DEDICATED

Time	Volume Purged (liters)	Purge Rate (L/min)	DTW (btc)	Turbidity (NTU)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
				+/- 10% /10 NTU	+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1201	-	0.30	78.55	10.91	7.60	18.2	961	7.93	132.2	clear
1204	-	0.30	78.55	9.81	7.60	18.6	959	7.92	129.7	↓
1207	-	0.30	78.55	9.02	7.61	18.7	963	7.79	110.2	↓
1210	-	0.30	78.55	8.85	7.61	18.9	965	7.73	97.9	↓
1213	-	0.30	78.55	8.70	7.61	19.0	964	7.72	94.4	↓

Field Ferrous Iron: 0.05 mg/L

PURGING DATA

Sample ID:	MW-4-2406	Sampling Flow Rate:	0.30			Analytical Laboratory:	Anatek
Sample Time:	1213	Final Depth to Water:	78.55			Regulator Setting:	16.4v
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
6 x VOA	HCl	6x, VOC, Methane	|	|	|	|	|
1 x 125	-	Nitrate, Sulfate	|	|	|	|	|
2 x 250	-	metals, Fe	|	|	|	|	|
2 x 250	HCl	Dx, oil	|	|	|	|	|

NOTES/ADDITIONAL COMMENTS

Equipment: Monsoon Pro, YSI Pro DSS, Hach Dr 900

WELL MONITORING DATA SHEET

GeoEngineers

Well ID:	MW-6	Job Number:	09991-005-03
Client:	Tidewater - Pasco Terminal	Date:	6/18/24
Project:	GWM 06/2024	Sampler:	CW
Weather:	Sunny - 80°	Time In/Out:	–

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:	2"	Depth to Free Product:	–
	Other: –	Well Depth:	–	Free Product Thickness:	–
Monument Condition:	Good	Depth to Water:	78.73	Water Column Length:	–
Well Cap Lock Present:	Yes No	Screened Interval:	75-90	Purge Volume:	–

Comments:

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)

Water height multipliers (gal):	1-inch well = 0.041	2-inch = 0.162	4-inch = 0.653	1 gal = 3.785 liters

PURGING DATA

Purge Method:	Monsoon Pro	Pump Intake Depth:	mid-screen
Sampling Method:	Low-flow	Tubing Material & Type:	NEW / DEDICATED

Time	Volume Purged (liters)	Purge Rate (L/min)	DTW (btc)	Turbidity (NTU)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
				+/- 10% /10 NTU	+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1324	–	0.30	78.73	4.57	7.60	16.9	923	8.57	142.7	clear
1327	–	0.30	78.73	5.64	7.62	17.0	925	8.53	142.9	↓
1330	–	0.30	78.73	6.13	7.62	17.2	925	8.51	143.2	↓
1333	–	0.30	78.73	6.61	7.63	17.3	926	8.49	143.7	↓

Field Ferrous Iron: 0.05 mg/L

PURGING DATA

Sample ID:	MW-6-2406 + MSD	Sampling Flow Rate:	0.30		Analytical Laboratory:	Anatek
Sample Time:	1333	Final Depth to Water:	78.73		Regulator Setting:	16.5 ✓
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
10x VOA	HCl	8x, BTEX, Methane	✓	✓	MSD/2406 ✓	✓
2x250	–	metals, Fe	✓	✓	✓	✓
1x125	–	Nitrate, Sulfate	✓	✓	✓	✓
2x250	HCl	Dx, 0.1	✓	✓	✓	✓

NOTES/ADDITIONAL COMMENTS

Equipment: Monsoon Pro, YSI Pro DSS, Hach Dr ~~890~~ 900

WELL MONITORING DATA SHEET

GEOENGINEERS

Well ID:	MW-8	Job Number:	09991-005-03
Client:	Tidewater - Pasco Terminal	Date:	6/19/24
Project:	GWM 06/2024	Sampler:	CW
Weather:	Sunny - 65°	Time In/Out:	-

WELL DATA

Monument Type:	Flush-mount/Stick-up	Well Diameter:	2"	Depth to Free Product:	-
	Other: -	Well Depth:	-	Free Product Thickness:	-
Monument Condition:	Good	Depth to Water:	83.43	Water Column Length:	-
Well Cap Lock Present:	Yes No	Screened Interval:	75-90	Purge Volume:	-

Comments: -

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)				
Water height multipliers (gal):	1-inch well = 0.041	2-inch = 0.162	4-inch = 0.653	1 gal = 3.785 liters

PURGING DATA

Purge Method:	Monsoon Pro	Pump Intake Depth:	Mid-screen
Sampling Method:	Low-Flow	Tubing Material & Type:	NEW / DEDICATED

Time	Volume Purged (liters)	Purge Rate (L/min)	DTW (btc)	Turbidity (NTU)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
				+/- 10% /10 NTU	+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
0749	~	0.30	83.43	13.67	7.41	17.4	684	1.44	-71.1	clear
0752	-	0.30	83.43	9.77	7.40	17.7	716	1.81	-68.1	↓
0755	-	0.30	83.43	6.96	7.41	17.8	734	2.15	-64.0	↓
0758	-	0.30	83.43	5.81	7.42	17.9	749	2.48	-61.1	↓
0801	-	0.30	83.43	5.26	7.42	18.0	760	2.71	-58.6	↓
0804	-	0.30	83.43	4.65	7.43	18.0	774	2.89	-56.3	↓

Field Ferrous Iron: 0.00

PURGING DATA

Sample ID:	MW-8-2406 / FD-2406	Sampling Flow Rate:	0.30		Analytical Laboratory:		Anatek
Sample Time:	0804	Final Depth to Water:	83.43		Regulator Setting:		16.7 v
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
12 x VOA	HCl	Gx, BTEX, methane	↓	↓	↓	FD-2406	↓
2 x 125	-	Nitrate, Sulfate	↓	↓	↓	↓	↓
4 x 250	-	Metals, Fe	↓	↓	↓	↓	↓
4 x 250	HCl	Dx, 0.1	↓	↓	↓	↓	↓

NOTES/ADDITIONAL COMMENTS

Equipment: Monsoon Pro, YSI Pro DSS, Hach Dr ~~890~~ 900

WELL MONITORING DATA SHEET

GEOENGINEERS

Well ID:	AR-8	Job Number:	09991-005-03
Client:	Tidewater - Pasco Terminal	Date:	6/19/24
Project:	GWM 06/2024	Sampler:	CW
Weather:	Sunny - 70°	Time In/Out:	–

WELL DATA

Monument Type:	(Flush-mount)/Stick-up	Well Diameter:	2"	Depth to Free Product:	–
	Other: –	Well Depth:	–	Free Product Thickness:	–
Monument Condition:	Good	Depth to Water:	79.27	Water Column Length:	–
Well Cap Lock Present:	(Yes) No	Screened Interval:	73-88	Purge Volume:	–

Comments: –

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)				
Water height multipliers (gal):	1-inch well = 0.041	2-inch = 0.162	4-inch = 0.653	1 gal = 3.785 liters

PURGING DATA

Purge Method:	Monsoon Pro	Pump Intake Depth:	mid-screen
Sampling Method:	Low-flow	Tubing Material & Type:	(NEW) / DEDICATED

Time	Volume Purged (liters)	Purge Rate (L/min)	DTW (btc)	Turbidity (NTU)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
				+/- 10% /10 NTU	+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
0937	–	0.30	79.27	12.35	7.42	18.2	994	0.34	-93.5	clear
0940	–	0.30	79.27	8.61	7.42	17.8	991	0.28	-95.7	↓
0943	–	0.30	79.27	4.99	7.42	17.5	979	0.29	-96.1	↓
0946	–	0.30	79.27	4.73	7.42	17.5	971	0.30	-96.3	↓
0949	–	0.30	79.27	4.21	7.43	17.6	967	0.29	-95.5	↓

Field Ferrous Iron: 0.03 mg/L

PURGING DATA

Sample ID:	~~Monsoon~~ EW AR-8-2406	Sampling Flow Rate:	0.30			Analytical Laboratory:	Anatek
Sample Time:	0949	Final Depth to Water:	79.27			Regulator Setting:	16.5
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
10 x VOA	HCl	6x, ~~DRO~~, Methane	|	|	|	ER-2406	|
2 x 250	–	Metals, Fe	|	|	|	↓	|
1 x 125	–	Nitrate, Sulfate	|	|	|	↓	|
2 x 250	HCl	Dx, oil	|	|	|	↓	|

NOTES/ADDITIONAL COMMENTS

Equipment: Monsoon Pro, YSI Pro DSS, Hach Dr ~~890~~ 900

WELL MONITORING DATA SHEET

GEOENGINEERS

Well ID:	AR-1	Job Number:	09991-005-03
Client:	Tidewater - Pasco Terminal	Date:	6/19/24
Project:	GWM 06/2024	Sampler:	CW
Weather:	Sunny 80°	Time In/Out:	–

WELL DATA

Monument Type:	(Flush-mount)/Stick-up	Well Diameter:	2"	Depth to Free Product:	–
	Other: –	Well Depth:	–	Free Product Thickness:	–
Monument Condition:	Good	Depth to Water:	80.11	Water Column Length:	–
Well Cap Lock Present:	(Yes) No	Screened Interval:	73-88	Purge Volume:	–
Comments:	–				

Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes)				
Water height multipliers (gal):	1-inch well = 0.041	2-inch = 0.162	4-inch = 0.653	1 gal = 3.785 liters

PURGING DATA

Purge Method:	Monsoon Pro	Pump Intake Depth:	Mid-screen
Sampling Method:	Low-flow	Tubing Material & Type:	(NEW) / DEDICATED

Time	Volume Purged (liters)	Purge Rate (L/min)	DTW (btc)	Turbidity (NTU)	pH	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	Clarity/Color Other Remarks
				+/- 10% /10 NTU	+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1104	–	0.30	80.11	17.88	7.29	19.0	1093	0.35	-112.9	clear
1107	–	0.30	80.11	11.24	7.30	19.3	1091	0.28	-118.3	
1110	–	0.30	80.11	8.41	7.30	19.4	1096	0.26	-120.5	
1113	–	0.30	80.11	8.33	7.31	20.0	1096	0.23	-124.7	
1116	–	0.30	80.11	8.41	7.32	20.1	1097	0.19	-127.9	
1119	–	0.30	80.11	8.61	7.32	20.3	1094	0.17	-128.5	
Field Ferrous Iron: 1.14 mg/L										

PURGING DATA

Sample ID:	AR-1-2406	Sampling Flow Rate:	0.30		Analytical Laboratory:		Anatek
Sample Time:	~~1116~~ 1119	Final Depth to Water:	80.11		Regulator Setting:		16.2v
No. of Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
6 x VOA	HCl	6x, BTEX, Methane					
2 x 250	–	Metals, Fe					
1 x 125	–	Nitrate, Sulfate					
2 x 250	HCl	Dx, Oil					

NOTES/ADDITIONAL COMMENTS

Equipment: Monsoon Pro, YSI Pro DSS, Hach ~~DR890~~ 900

Slight yellow tint in clear bottle

APPENDIX B
Historical Groundwater Elevations

Appendix B—Historical Groundwater Elevation Measurements

Tidewater Fuel Leak Site Compliance Monitoring Program

Well	Date Measured	Reference Point Elevation (feet NGVD)	Depth to Water (feet)	Product Thickness (feet)	Groundwater Elevation (feet NGVD)	Groundwater Elevation Change from Previous Event (feet)
AR-1	6/29/2010	425.80	81.28	0.01	344.52	–
	12/16/2010		81.70	sheen	344.10	0.42
	5/28/2014		79.56	sheen	346.24	2.14
	5/1/2018[2]	423.99	79.38	0	344.61	1.63
	6/25/2019		80.13	0	343.86	0.75
	6/24/2020		79.83	0	344.16	0.30
	7/27/2021		80.83	0	343.16	1.00
	6/1/2022[4]	423.88	80.05	0	343.83	0.67
	6/27/2023		79.98	0	343.90	0.07
	6/18/2024		80.11	0	343.77	-0.13
AR-2[1]	6/29/2010	--	--	--	--	--
	12/16/2010	--	--	--	--	--
	5/28/2014	--	--	--	--	--
AR-3[1]	6/29/2010	428.01	--	--	--	--
	12/15/2010		--	--	--	--
	5/28/2014		--	--	--	--
AR-4	6/29/2010	426.47	81.90	0	344.57	–
	12/15/2010		82.38	0	344.09	0.48
	5/28/2014		81.99	0	344.48	0.39
	5/1/2018		81.93	0	344.54	0.06
	6/25/2019		82.76	0	343.71	0.83
	6/24/2020		82.52	0	343.95	0.24
	7/27/2021[3]		83.47	0	343.00	0.95
	6/1/2022		82.69	0	343.78	0.78
	6/27/2023		82.62	0	343.85	0.07
	6/18/2024		82.73	0	343.74	-0.11
AR-5	6/29/2010	423.08	78.52	0	344.56	–
	12/15/2010		79.00	0	344.08	0.48
	5/28/2014		78.62	0	344.46	0.38
AR-6	6/29/2010	425.17	80.61	0	344.56	–
	12/15/2010		81.11	0	344.06	0.5
	5/28/2014		80.72	0	344.45	0.39
AR-7	6/29/2010	425.44	80.82	sheen	344.62	–
	12/16/2010		81.33	sheen	344.11	0.51
	5/28/2014		80.96	0	344.48	0.37
	5/1/2018		80.92	0	344.52	0.04
	6/25/2019		81.68	0	343.76	0.76
	6/24/2020		81.41	0	344.03	0.27
	7/27/2021		82.39	0	343.05	0.98
	6/1/2022		81.63	0	343.81	0.76
	6/27/2023		81.55	0	343.89	0.08
	6/18/2024		81.66	0	343.78	-0.11
AR-8	6/29/2010	423.02	78.43	0	344.59	–
	12/15/2010		78.94	0	344.08	0.51
	5/28/2014		78.50	0	344.52	0.44
	5/1/2018		78.43	0	344.59	0.07
	6/25/2019		79.29	0	343.73	0.86
	6/24/2020		78.99	0	344.03	0.3
	7/27/2021		80.01	0	343.01	1.02
	6/1/2022		79.19	0	343.83	0.82
	6/27/2023		79.13	0	343.89	0.06
	6/18/2024		79.27	0	343.75	-0.14
AR-9	6/29/2010	423.05	78.46	0	344.59	–
	12/15/2010		78.95	0	344.10	0.49
	5/28/2014		78.60	0	344.45	0.35
AR-10	6/29/2010	422.59	78.01	0	344.58	–
	12/14/2010		78.50	0	344.09	0.49
	5/28/2014		78.13	0	344.46	0.37
AR-11	6/29/2010	422.62	78.00	0	344.62	–
	12/15/2010		78.49	0	344.13	0.49
	5/28/2014		78.15	0	344.47	0.34
	5/1/2018		78.09	0	344.53	0.06
	6/25/2019		78.83	0	343.79	0.74
	6/24/2020		78.54	0	344.08	0.29
	7/27/2021		79.59	0	343.03	1.05
	6/1/2022		78.79	0	343.83	0.80
	6/27/2023		78.74	0	343.88	0.05
	6/18/2024		78.84	0	343.78	-0.10
AR-12	6/29/2010	425.50	80.96	sheen	344.54	–
	12/16/2010		dry	--	--	--
	5/28/2014		dry	--	--	--
	5/1/2018		81.02	0	344.48	0.06
	6/25/2019		dry	--	--	--
	6/24/2020		81.50	0	344.00	0.48
	7/27/2021		dry	--	--	--
	6/1/2022		dry	--	--	--
	6/27/2023		dry	--	--	--
	6/18/2024		dry	--	--	--
MW-4	6/29/2010	422.29	77.72	0	344.57	--
	12/15/2010		78.22	0	344.07	-0.5
	5/29/2014		77.82	0	344.47	0.4
	5/1/2018		77.80	0	344.49	0.02
	6/25/2019		78.52	0	343.77	-0.72
	6/24/2020		78.24	0	344.05	0.28
	7/27/2021		79.28	0	343.01	-1.04
	6/1/2022		78.48	0	343.81	0.8
	6/27/2023		78.42	0	343.87	0.06
	6/18/2024		78.55	0	343.74	-0.13
MW-5	6/29/2010	425.02	80.48	0	344.54	--
	12/15/2010		80.95	0	344.07	-0.47
	5/29/2014		80.59	0	344.43	0.36
	5/1/2018		80.51	0	344.51	0.08
	6/25/2019		81.29	0	343.73	-0.78
	6/24/2020		80.97	0	344.05	0.32
	7/27/2021		82.02	0	343.00	-1.05
	6/1/2022		81.24	0	343.78	0.78
	6/27/2023		81.17	0	343.85	0.07
	6/18/2024		81.30	0	343.72	-0.13
MW-6	6/28/2010	422.50	77.92	0	344.58	--
	12/14/2010		78.41	0	344.09	-0.49
	5/28/2014		77.99	0	344.51	0.42
	5/1/2018		77.98	0	344.52	0.01
	6/25/2019		78.72	0	343.78	-0.74
	6/24/2020		78.44	0	344.06	0.28
	7/27/2021		79.47	0	343.03	-1.03
	6/1/2022		78.68	0	343.82	0.79
	6/27/2023		78.62	0	343.88	0.06
	6/18/2024		78.73	0	343.77	-0.11
MW-7	6/29/2010	427.25	82.74	sheen	344.51	–
	12/16/2010		83.19	0	344.06	-0.45
	5/29/2014		82.79	0	344.46	0.4
	5/1/2018		82.78	0	344.47	0.01
	6/25/2019		83.55	0	343.70	-0.77
	6/24/2020		83.26	0	343.99	0.29
	7/27/2021		84.23	0	343.02	-0.97
	6/1/2022		83.47	0	343.78	0.76
	6/27/2023		83.40	0	343.85	0.07
	6/18/2024		83.52	0	343.73	-0.12
MW-8	6/29/2010	427.15	82.62	sheen	344.53	–
	12/16/2010		83.09	0	344.06	-0.47
	5/29/2014		82.69	0	344.46	0.4
	5/1/2018		82.61	0	344.54	0.08
	6/25/2019		83.44	0	343.71	-0.83
	6/24/2020		83.16	0	343.99	0.28
	7/27/2021		84.13	0	343.02	-0.97
	6/1/2022		83.36	0	343.79	0.74
	6/27/2023		83.30	0	343.85	0.06
	6/18/2024		83.43	0	343.72	-0.13

Notes:

1 - Well not part of CMP program

2 - Well was re-surveyed in December 2018

3 - Reference point elevation was resurveyed on July 27, 2021.

4 - Reference point elevation was resurveyed on June 1, 2022.

" -- " = Not applicable, not available, and/or not measured.

Reference point elevation is top of PVC casing; all elevations are in feet above mean sea level (NAVD88).

APPENDIX C
Analytical Laboratory Reports



Analytical Results Report For:

GeoEngineers, Inc.- Portland

Project Number:

Pasco Terminal

Anatek Work Order:

WEF0848

Anatek Moscow - 1282 Alturas Drive - Moscow, ID 83843 - 208-883-2839 - moscow@anateklabs.com - FL NELAP E87893
Anatek Spokane - 504 E Sprague Ste. D - Spokane, WA 99202 - 509-838-3999 - spokane@anateklabs.com - FL NELAP E871099
Anatek Yakima - 4802 Tieton Drive - Yakima, WA 98908 - 509-225-9404 - yakima@anateklabs.com - FL NELAP E871190
Anatek Wenatchee - 3019 Gs Center Rd - Wenatchee, WA 98801 - 509-701-8362

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Client:	GeoEngineers, Inc.- Portland	Work Order:	WEF0848
Address:	5820 S Kelly Ave Suite B	Project:	Pasco Terminal
	Portland, OR 97239	Reported:	7/21/2024 21:48
Attn:	Kurt Harrington		

Analytical Results Report

Sample Location:	MW 8 2406		
Lab/Sample Number:	WEF0848-01	Collect Date:	06/19/24 08:04
Date Received:	06/20/24 10:00	Collected By:	Colin Watson
Matrix:	Water		

Analyte	Result	Units	PQL	Analyzed	Analyst	Method	Qualifier
Inorganics							
Nitrate/N	15.2	mg/L	1.00	6/21/24 21:43	BDM	EPA 300.0	D10
Sulfate	73.0	mg/L	1.50	6/21/24 21:43	BDM	EPA 300.0	
Total Metals							
Iron (II)	ND	mg/L	0.0100	6/21/24 16:00	ILG	SM 3500-Fe B	*
Metals by ICP-MS							
Manganese	0.481	mg/L	0.00100	6/24/24 17:32	JLG	EPA 200.8	
Hydrocarbons							
Diesel	ND	mg/L	0.160	7/3/24 3:18	ARY	NWTPH-Dx	
Lube Oil	ND	mg/L	0.400	7/3/24 3:18	ARY	NWTPH-Dx	
Mineral Oil	ND	mg/L	0.160	7/3/24 3:18	ARY	NWTPH-Dx	
Surrogate: n-Hexacosane	*101%*		*50-150*	*7/3/24 3:18*	*ARY*	*NWTPH-Dx*	
Volatiles							
Benzene	ND	ug/L	5.00	6/24/24 16:13	BKP	EPA 8260D	*
Ethylbenzene	67.7	ug/L	5.00	6/24/24 16:13	BKP	EPA 8260D	*
m+p-Xylene	596	ug/L	5.00	6/24/24 16:13	BKP	EPA 8260D	*
o-Xylene	277	ug/L	5.00	6/24/24 16:13	BKP	EPA 8260D	*
Toluene	16.5	ug/L	5.00	6/24/24 16:13	BKP	EPA 8260D	*
Surrogate: 1,2-Dichlorobenzene-d4	*100%*		*70-130*	*6/24/24 16:13*	*BKP*	*EPA 8260D*	
Surrogate: 4-Bromofluorobenzene	*102%*		*70-130*	*6/24/24 16:13*	*BKP*	*EPA 8260D*	
Surrogate: Toluene-d8	*99.2%*		*70-130*	*6/24/24 16:13*	*BKP*	*EPA 8260D*	
Gasoline	7.40	mg/L	2.00	6/24/24 16:13	BKP	NWTPH-Gx	*

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Sample Location:	MW 8 FD 2406		
Lab/Sample Number:	WEF0848-02	Collect Date:	06/19/24 08:04
Date Received:	06/20/24 10:00	Collected By:	Colin Watson
Matrix:	Water		

Analyte	Result	Units	PQL	Analyzed	Analyst	Method	Qualifier
Inorganics							
Nitrate/N	17.4	mg/L	1.00	6/21/24 22:04	BDM	EPA 300.0	D10
Sulfate	81.2	mg/L	1.50	6/21/24 22:04	BDM	EPA 300.0	
Total Metals							
Iron (II)	ND	mg/L	0.0100	6/21/24 16:00	ILG	SM 3500-Fe B	*
Metals by ICP-MS							
Manganese	0.412	mg/L	0.00100	6/24/24 17:35	JLG	EPA 200.8	
Hydrocarbons							
Diesel	ND	mg/L	0.160	7/3/24 4:13	ARY	NWTPH-Dx	
Lube Oil	ND	mg/L	0.400	7/3/24 4:13	ARY	NWTPH-Dx	
Mineral Oil	ND	mg/L	0.160	7/3/24 4:13	ARY	NWTPH-Dx	
Surrogate: n-Hexacosane	*96.3%*		*50-150*	*7/3/24 4:13*	*ARY*	*NWTPH-Dx*	
Volatiles							
Benzene	ND	ug/L	0.500	6/24/24 14:20	BKP	EPA 8260D	*
Ethylbenzene	23.0	ug/L	0.500	6/24/24 14:20	BKP	EPA 8260D	*
m+p-Xylene	170	ug/L	5.00	6/24/24 14:20	BKP	EPA 8260D	*
o-Xylene	79.6	ug/L	5.00	6/24/24 14:20	BKP	EPA 8260D	*
Toluene	ND	ug/L	0.500	6/24/24 14:20	BKP	EPA 8260D	*
Surrogate: 1,2-Dichlorobenzene-d4	*101%*		*70-130*	*6/24/24 14:20*	*BKP*	*EPA 8260D*	
Surrogate: 4-Bromofluorobenzene	*99.9%*		*70-130*	*6/24/24 14:20*	*BKP*	*EPA 8260D*	
Surrogate: Toluene-d8	*97.5%*		*70-130*	*6/24/24 14:20*	*BKP*	*EPA 8260D*	
Gasoline	3.16	mg/L	0.200	6/24/24 14:20	BKP	NWTPH-Gx	*

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Sample Location:	AR 8 2406		
Lab/Sample Number:	WEF0848-03	Collect Date:	06/19/24 09:49
Date Received:	06/20/24 10:00	Collected By:	Colin Watson
Matrix:	Water		

Analyte	Result	Units	PQL	Analyzed	Analyst	Method	Qualifier
Inorganics							
Nitrate/N	3.49	mg/L	0.100	6/20/24 20:19	BDM	EPA 300.0	
Sulfate	147	mg/L	1.50	6/22/24 5:22	BDM	EPA 300.0	
Total Metals							
Iron (II)	ND	mg/L	0.0100	6/21/24 16:00	ILG	SM 3500-Fe B	*
Metals by ICP-MS							
Manganese	0.707	mg/L	0.00100	6/24/24 18:27	JLG	EPA 200.8	
Hydrocarbons							
Diesel	ND	mg/L	0.160	7/3/24 5:08	ARY	NWTPH-Dx	
Lube Oil	ND	mg/L	0.400	7/3/24 5:08	ARY	NWTPH-Dx	
Mineral Oil	ND	mg/L	0.160	7/3/24 5:08	ARY	NWTPH-Dx	
Surrogate: n-Hexacosane	*95.5%*		*50-150*	*7/3/24 5:08*	*ARY*	*NWTPH-Dx*	
Volatiles							
Benzene	ND	ug/L	0.500	6/24/24 14:48	BKP	EPA 8260D	*
Ethylbenzene	208	ug/L	2.50	6/25/24 12:06	BKP	EPA 8260D	*
m+p-Xylene	24.2	ug/L	0.500	6/24/24 14:48	BKP	EPA 8260D	*
o-Xylene	46.1	ug/L	2.50	6/25/24 12:06	BKP	EPA 8260D	*
Toluene	ND	ug/L	0.500	6/24/24 14:48	BKP	EPA 8260D	*
Surrogate: 1,2-Dichlorobenzene-d4	*103%*		*70-130*	*6/24/24 14:48*	*BKP*	*EPA 8260D*	
Surrogate: 4-Bromofluorobenzene	*101%*		*70-130*	*6/24/24 14:48*	*BKP*	*EPA 8260D*	
Surrogate: Toluene-d8	*97.9%*		*70-130*	*6/24/24 14:48*	*BKP*	*EPA 8260D*	
Gasoline	7.50	mg/L	1.00	6/25/24 12:06	BKP	NWTPH-Gx	*

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Sample Location:	AR 8 ER 2406		
Lab/Sample Number:	WEF0848-04	Collect Date:	06/19/24 09:49
Date Received:	06/20/24 10:00	Collected By:	Colin Watson
Matrix:	Water		

Analyte	Result	Units	PQL	Analyzed	Analyst	Method	Qualifier
Hydrocarbons							
Diesel	ND	mg/L	0.160	7/3/24 6:03	ARY	NWTPH-Dx	
Lube Oil	ND	mg/L	0.400	7/3/24 6:03	ARY	NWTPH-Dx	
Mineral Oil	ND	mg/L	0.160	7/3/24 6:03	ARY	NWTPH-Dx	
Surrogate: n-Hexacosane	*96.0%*		*50-150*	*7/3/24 6:03*	*ARY*	*NWTPH-Dx*	
Volatiles							
Benzene	ND	ug/L	0.500	6/24/24 15:16	BKP	EPA 8260D	*
Ethylbenzene	ND	ug/L	0.500	6/24/24 15:16	BKP	EPA 8260D	*
m+p-Xylene	ND	ug/L	0.500	6/24/24 15:16	BKP	EPA 8260D	*
o-Xylene	ND	ug/L	0.500	6/24/24 15:16	BKP	EPA 8260D	*
Toluene	ND	ug/L	0.500	6/24/24 15:16	BKP	EPA 8260D	*
Surrogate: 1,2-Dichlorobenzene-d4	*102%*		*70-130*	*6/24/24 15:16*	*BKP*	*EPA 8260D*	
Surrogate: 4-Bromofluorobenzene	*101%*		*70-130*	*6/24/24 15:16*	*BKP*	*EPA 8260D*	
Surrogate: Toluene-d8	*98.5%*		*70-130*	*6/24/24 15:16*	*BKP*	*EPA 8260D*	
Gasoline	ND	mg/L	0.200	6/24/24 15:16	BKP	NWTPH-Gx	*

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Sample Location:	AR 1 2406		
Lab/Sample Number:	WEF0848-05	Collect Date:	06/19/24 11:19
Date Received:	06/20/24 10:00	Collected By:	Colin Watson
Matrix:	Water		

Analyte	Result	Units	PQL	Analyzed	Analyst	Method	Qualifier
Inorganics							
Nitrate/N	4.89	mg/L	0.100	6/20/24 21:42	BDM	EPA 300.0	
Sulfate	52.2	mg/L	1.50	6/22/24 5:43	BDM	EPA 300.0	
Total Metals							
Iron (II)	ND	mg/L	0.0100	6/21/24 16:00	ILG	SM 3500-Fe B	*
Metals by ICP-MS							
Manganese	1.65	mg/L	0.00100	6/24/24 18:30	JLG	EPA 200.8	
Hydrocarbons							
Diesel	ND	mg/L	0.160	7/3/24 6:58	ARY	NWTPH-Dx	
Lube Oil	ND	mg/L	0.400	7/3/24 6:58	ARY	NWTPH-Dx	
Mineral Oil	ND	mg/L	0.160	7/3/24 6:58	ARY	NWTPH-Dx	
Surrogate: n-Hexacosane	*94.3%*		*50-150*	*7/3/24 6:58*	*ARY*	*NWTPH-Dx*	
Volatiles							
Benzene	295	ug/L	5.00	6/25/24 12:34	BKP	EPA 8260D	*
Ethylbenzene	226	ug/L	5.00	6/25/24 12:34	BKP	EPA 8260D	*
m+p-Xylene	1970	ug/L	50.0	6/24/24 15:44	BKP	EPA 8260D	*
o-Xylene	1750	ug/L	50.0	6/24/24 15:44	BKP	EPA 8260D	*
Toluene	1460	ug/L	50.0	6/24/24 15:44	BKP	EPA 8260D	*
Surrogate: 1,2-Dichlorobenzene-d4	*97.3%*		*70-130*	*6/24/24 15:44*	*BKP*	*EPA 8260D*	
Surrogate: 4-Bromofluorobenzene	*111%*		*70-130*	*6/24/24 15:44*	*BKP*	*EPA 8260D*	
Surrogate: Toluene-d8	*96.4%*		*70-130*	*6/24/24 15:44*	*BKP*	*EPA 8260D*	
Gasoline	37.1	mg/L	2.00	6/25/24 12:34	BKP	NWTPH-Gx	*

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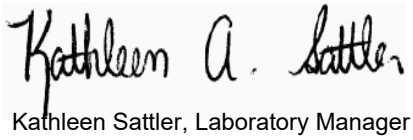
Authorized Signature,



Kathleen Sattler, Laboratory Manager

D10	Initial analysis witthin holding time. Dilution analysis was past holding time.
M3	Spike recovery value is unusable. Analyte concentration disproportionate to the spike level. Blank spike recovery acceptable.
R1	RPD/RSD exceeded the method acceptance limit
PQL	Practical Quantitation Limit
ND	Not Detected
MCL	EPA's Maximum Contaminant Level
Dry	Sample results reported on a dry weight basis
*	Not a state-certified analyte

RPD	Relative Percent Difference
%REC	Percent Recovery
Source	Sample that was spiked or duplicated.

This report shall not be reproduced except in full, without the written approval of the laboratory
The results reported related only to the samples indicated.

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Certifications

Code	Description	Facility	Number
W WA DOE	Washington Department of Ecology	Anatek-Spokane, WA	C585

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Quality Control Data

Inorganics

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: BEF0919 - W Ions										
Blank (BEF0919-BLK1)					Prepared & Analyzed: 06/20/24 13:42					
Nitrate as N	ND		0.100	mg/L						
Blank (BEF0919-BLK2)					Prepared & Analyzed: 06/21/24 06:24					
Nitrate as N	ND		0.100	mg/L						
LCS (BEF0919-BS1)					Prepared & Analyzed: 06/21/24 05:21					
Nitrate as N	3.90			mg/L	4.00		97.5	90-110		
LCS Dup (BEF0919-BSD1)					Prepared & Analyzed: 06/20/24 10:55					
Nitrate as N	3.90			mg/L	4.00		97.6	90-110	0.0769	20
Matrix Spike (BEF0919-MS1)		**Source: WEF0836-01**			Prepared & Analyzed: 06/20/24 16:08					
Nitrate as N	5.74		0.100	mg/L	4.00	1.85	97.0	80-120		
Matrix Spike Dup (BEF0919-MSD1)		**Source: WEF0836-01**			Prepared & Analyzed: 06/20/24 16:29					
Nitrate as N	5.59		0.100	mg/L	4.00	1.85	93.3	80-120	2.61	20
Batch: BEF0985 - W Ions										
Blank (BEF0985-BLK1)					Prepared & Analyzed: 06/21/24 10:56					
Nitrate as N	ND		0.100	mg/L						
Sulfate	ND		0.150	mg/L						
Blank (BEF0985-BLK2)					Prepared & Analyzed: 06/22/24 19:17					
Nitrate as N	ND		0.100	mg/L						
Sulfate	ND		0.150	mg/L						

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Quality Control Data
(Continued)

Inorganics (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: BEF0985 - W Ions (Continued)										
LCS (BEF0985-BS1)					Prepared & Analyzed: 06/22/24 09:53					
Nitrate as N	3.90			mg/L	4.00		97.4	90-110		
Sulfate	3.94			mg/L	4.00		98.5	90-110		
LCS (BEF0985-BS2)					Prepared & Analyzed: 06/22/24 18:35					
Nitrate as N	3.91			mg/L	4.00		97.6	90-110		
Sulfate	3.92			mg/L	4.00		98.0	90-110		
LCS Dup (BEF0985-BSD1)					Prepared & Analyzed: 06/21/24 10:14					
Nitrate as N	3.91			mg/L	4.00		97.6	90-110	0.231	20
Sulfate	3.98			mg/L	4.00		99.6	90-110	1.06	20
Matrix Spike (BEF0985-MS1)		**Source: WEF0900-02**			Prepared & Analyzed: 06/21/24 16:50					
Nitrate as N	3.90		0.100	mg/L	4.00	0.0880	95.4	80-120		
Sulfate	48.1	M3	0.150	mg/L	4.00	45.1	77.2	80-120		
Matrix Spike (BEF0985-MS2)		**Source: WEF0910-01**			Prepared & Analyzed: 06/22/24 08:51					
Nitrate as N	3.74		0.100	mg/L	4.00	0.0550	92.2	80-120		
Sulfate	21.0		0.150	mg/L	4.00	17.5	89.4	80-120		
Matrix Spike Dup (BEF0985-MSD1)		**Source: WEF0900-02**			Prepared & Analyzed: 06/21/24 17:11					
Nitrate as N	3.62		0.100	mg/L	4.00	0.0880	88.2	80-120	7.61	20
Sulfate	47.9	M3	0.150	mg/L	4.00	45.1	71.1	80-120	0.504	20
Matrix Spike Dup (BEF0985-MSD2)		**Source: WEF0910-01**			Prepared & Analyzed: 06/22/24 09:12					
Nitrate as N	3.64		0.100	mg/L	4.00	0.0550	89.7	80-120	2.76	20
Sulfate	20.9		0.150	mg/L	4.00	17.5	86.5	80-120	0.553	20

Quality Control Data
(Continued)

Metals by ICP-MS

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: BEF0980 - W 3010 Digest										
Blank (BEF0980-BLK1)					Prepared: 06/24/24 09:06- Analyzed: 06/24/24 17:43					
Manganese	ND		0.00100	mg/L						
LCS (BEF0980-BS1)					Prepared: 06/24/24 09:06- Analyzed: 06/24/24 18:45					
Manganese	0.0541		0.00100	mg/L	0.0500		108	85-115		
Matrix Spike (BEF0980-MS1)		**Source: WEF0640-02**			Prepared: 06/24/24 09:06- Analyzed: 06/24/24 18:09					
Manganese	0.0961		0.00100	mg/L	0.0500	0.0384	115	70-130		
Matrix Spike (BEF0980-MS2)		**Source: WEF0848-05**			Prepared: 06/24/24 09:06- Analyzed: 06/24/24 18:33					
Manganese	1.73		0.00100	mg/L	0.0500	1.65	168	70-130		
Matrix Spike Dup (BEF0980-MSD1)		**Source: WEF0640-02**			Prepared: 06/24/24 09:06- Analyzed: 06/24/24 18:12					
Manganese	0.103		0.00100	mg/L	0.0500	0.0384	129	70-130	6.67	20

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Quality Control Data
(Continued)

Metals by ICP-MS (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: BEF0980 - W 3010 Digest (Continued)										
Matrix Spike Dup (BEF0980-MSD2)		**Source: WEF0848-05**			Prepared: 06/24/24 09:06- Analyzed: 06/24/24 18:35					
Manganese	1.73		0.00100	mg/L	0.0500	1.65	172	70-130	0.105	20
Batch: BEF1003 - W 3010 Digest										
Blank (BEF1003-BLK1)					Prepared: 06/24/24 13:10- Analyzed: 06/24/24 17:03					
Manganese	ND		0.00100	mg/L						
LCS (BEF1003-BS1)					Prepared: 06/24/24 13:10- Analyzed: 06/24/24 17:08					
Manganese	0.0407		0.00100	mg/L	0.0400		102	85-115		
Matrix Spike (BEF1003-MS1)		**Source: WEF0844-01**			Prepared: 06/24/24 13:10- Analyzed: 06/24/24 17:14					
Manganese	0.0363		0.00100	mg/L	0.0400	0.00101	88.3	70-130		
Matrix Spike Dup (BEF1003-MSD1)		**Source: WEF0844-01**			Prepared: 06/24/24 13:10- Analyzed: 06/24/24 17:16					
Manganese	0.0379		0.00100	mg/L	0.0400	0.00101	92.2	70-130	4.19	20

Quality Control Data
(Continued)

Hydrocarbons

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: BEG0080 - W TPH-Dx										
Blank (BEG0080-BLK1)					Prepared: 07/02/24 10:38- Analyzed: 07/02/24 19:56					
Diesel	ND		0.160	mg/L						
Lube Oil	ND		0.400	mg/L						
Mineral Oil	ND		0.160	mg/L						
Surrogate: n-Hexacosane			*0.186*	*mg/L*	*0.200*		*93.1*	*50-150*		
LCS (BEG0080-BS1)					Prepared: 07/02/24 10:38- Analyzed: 07/02/24 20:51					
Diesel	1.63		0.160	mg/L	2.00		81.3	70-130		
Lube Oil	ND		0.400	mg/L				70-130		
Surrogate: n-Hexacosane			*0.161*	*mg/L*	*0.200*		*80.6*	*50-150*		
LCS Dup (BEG0080-BSD1)					Prepared: 07/02/24 10:38- Analyzed: 07/02/24 21:47					
Diesel	2.13	R1	0.160	mg/L	2.00		106	70-130	26.8	20
Lube Oil	ND		0.400	mg/L				70-130		20
Surrogate: n-Hexacosane			*0.199*	*mg/L*	*0.200*		*99.6*	*50-150*		

Quality Control Data
(Continued)

Volatiles

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit

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Quality Control Data
(Continued)

Volatiles (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: BEF0990 - VOC										
Blank (BEF0990-BLK1)					Prepared: 06/24/24 09:38- Analyzed: 06/24/24 09:40					
Gasoline	ND		0.200	mg/L						
Surrogate: 4-Bromofluorobenzene			*0.0187*	*mg/L*	*0.0200*		*93.3*	*70-130*		
LCS (BEF0990-BS1)					Prepared: 06/24/24 09:38- Analyzed: 06/24/24 10:08					
Gasoline	1.07		0.200	mg/L	1.00		107	80-120		
Surrogate: 4-Bromofluorobenzene			*0.0200*	*mg/L*	*0.0200*		*100*	*70-130*		
Matrix Spike (BEF0990-MS1)		**Source: WEF0640-01**			Prepared: 06/24/24 09:38- Analyzed: 06/24/24 17:36					
Gasoline	0.820		0.200	mg/L	1.18	ND	69.3	50-150		
Surrogate: 4-Bromofluorobenzene			*0.0200*	*mg/L*	*0.0237*		*84.5*	*70-130*		
Batch: BEG0637 - VOC										
Blank (BEG0637-BLK1)					Prepared & Analyzed: 06/24/24 09:40					
o-Xylene (MCL for total)	ND		0.500	ug/L						
Toluene	ND		0.500	ug/L						
m/p Xylenes (MCL for total)	ND		0.500	ug/L						
Ethylbenzene	ND		0.500	ug/L						
Benzene	ND		0.500	ug/L						
Surrogate: 4-Bromofluorobenzene			*18.7*	*ug/L*	*20.0*		*93.3*	*70-130*		
Surrogate: Toluene-d8			*18.6*	*ug/L*	*20.0*		*93.2*	*70-130*		
Surrogate: 1,2-Dichlorobenzene-d4			*18.6*	*ug/L*	*20.0*		*93.2*	*70-130*		
LCS (BEG0637-BS1)					Prepared & Analyzed: 06/24/24 22:16					
Benzene	9.71		0.500	ug/L	10.0		97.1	80-120		
Ethylbenzene	9.89		0.500	ug/L	10.0		98.9	80-120		
m/p Xylenes (MCL for total)	19.4		0.500	ug/L	20.0		97.2	80-120		
o-Xylene (MCL for total)	9.93		0.500	ug/L	10.0		99.3	80-120		
Toluene	9.94		0.500	ug/L	10.0		99.4	80-120		
Surrogate: Toluene-d8			*20.6*	*ug/L*	*20.0*		*103*	*70-130*		
Surrogate: 4-Bromofluorobenzene			*20.0*	*ug/L*	*20.0*		*100*	*70-130*		
Surrogate: 1,2-Dichlorobenzene-d4			*20.1*	*ug/L*	*20.0*		*100*	*70-130*		

ANATEK LABS

Chain of Custody Record

Anatek Labs
1282 Alturas Drive, Moscow ID
504 E Sprague Ste D, Spokane W.

WET 0646

Due 07/05/24

Company Name: GeoEngineers	Project Manager: Kurt Harrington
Address: 5820 S Kelly Ave Suite B	Project Name & # : Pasco Terminal
City: Portland State: OR Zip: 97239	Purchase Order #: 009991-005-03
Phone: 503-906-9577	Sampler Name & Phone: Colin Watson 503-756-6285
Email Address(es): kharrington@geoengineers.com	

Turn Around

Please refer to our normal turn around times at www.anateklabs.com/pricing-lists

- ✓ Normal
- Next Day*
- 2nd Day*
- Other*

- Phone
- ✓ Email

*All rush order requests must have prior approval

List Analyses Requested

Lab ID	Sample Identification	Sampling Date/Time	Matrix	# of Containers	Preservative: Sample Volume	BTEX 8260	NWTPH-Gx	NWTPH-Dx	NWTPH-Oil	Ferrous Fe	Mn	SO4, NO3	Methane
	MW-8-2406	6/19/24 - 0804	H2O	11	-	X	X	X	X	X	X	X	X
	MW-8-FD-2406	6/19/24 - 0804	H2O	11	-	X	X	X	X	X	X	X	X
	AR-8-2406	6/19/24 - 0949	H2O	11	-	X	X	X	X	X	X	X	X
	AR-8-ER-2406	6/19/24 - 0949	H2O	6	-	X	X	X	X				
	AR-1-2406	6/19/24 - 1119	H2O	11	-	X	X	X	X	X	X	X	X
	Trip Blanks					H	H						

Note Special Instructions/Comments

H = Hold trip blanks for PM requested analysis if needed

Inspection Checklist

Received Intact?	(Y)	N
Labels & Chains Agree?	(Y)	N
Containers Sealed?	(Y)	N
No VOC Head Space?	(Y)	N
Cooler?	(Y)	N
Ice/Ice Packs Present?	(Y)	N

Temperature (°C): 3.7, 3.5 IR-6

Number of Containers:

Shipped Via: Fed Ex

Preservative:

Date & Time: 6/20/24 1000

Inspected By: DE

	Printed Name	Signature	Company	Date	Time
Relinquished by	Colin Watson	CW	GeoEngineers	6/19/24	1300
Received by	Kelly Gree	KG	Anatek	6/20/24	1000
Relinquished by					
Received by					
Relinquished by					
Received by					

Samples submitted to Anatek Labs may be subcontacted to other accredited labs if necessary. This message serves as notice of this possibility. Subcontracted analyses will be clearly noted on the analytical report.

Analytical Resources, LLC
Analytical Chemists and Consultants
Tukwila, WA

02 July 2024

Emily Wengrowski
Anatek Labs, Inc. Spokane
504 East Sprague, Suite D
Spokane, WA 99202

RE: WEF0848

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)	Associated SDG ID(s)
24F0502	N/A

Shelly Fishel

Digitally signed by Shelly Fishel
Date: 2024.07.02 18:56:09 -07'00'

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclose Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, LLC

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Shelly Fishel, Project Manager

ACCREDITED IN ACCORDANCE WITH nelac
Cert# 100006-012

Anatek Labs, Inc.

SUBCONTRACT ORDER

A 6121 ~~24F0491~~

24F0502

1282 Alturas Drive - Moscow, ID 83843 - (208) 8832839 - Fax (208) 8829246 - email moscow@anateklabs.com
504 E Sprague Ste. D - Spokane, WA 99202 - (509) 838-3999 - fax (509) 838-4433 - email spokane@anateklabs.com

Sending Laboratory:

Anatek Labs, Inc.- Spokane
504 E Sprague Ave, Suite D
Spokane, WA 99202
Phone: 509-838-3999
Fax: 509-838-4433

Project Manager: Kathleen Sattler
kathy@anateklabs.com

Subcontracted Laboratory:

Analytical Resources LLC
4611 S. 134TH Place, Suite 100
Tukwila, WA 98168
Phone: (206) 695-6200
Fax: (206) 695-6202

Work Order: WEF0848

Analysis	Due	Expires	Comments
Lab Sample ID: WEF0848-01 ***Water*** ***Sampled: 06/19/2024 08:04*** **Client Sample Name: MW 8 2406**			
Methane	07/02/2024	07/03/2024 08:04	
Containers Supplied:			
Lab Sample ID: WEF0848-02 ***Water*** ***Sampled: 06/19/2024 08:04*** **Client Sample Name: MW 8 FD 2406**			
Methane	07/02/2024	07/03/2024 08:04	
Containers Supplied:			
Lab Sample ID: WEF0848-03 ***Water*** ***Sampled: 06/19/2024 09:49*** **Client Sample Name: AR 8 2406**			
Methane	07/02/2024	07/03/2024 09:49	
Containers Supplied:			
Lab Sample ID: WEF0848-05 ***Water*** ***Sampled: 06/19/2024 11:19*** **Client Sample Name: AR 1 2406**			
Methane	07/02/2024	07/03/2024 11:19	
Containers Supplied:			

Sierra Schenk — Released By — 6/20/24 — Date

[signature] SA — Received By — 6/21/24 — Date

Anatek Labs, Inc. Spokane	Project: WEF0848	
504 East Sprague, Suite D	Project Number: [none]	**Reported:**
Spokane WA, 99202	Project Manager: Emily Wengrowski	02-Jul-2024 18:53

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
WEF0848-01	24F0502-01	Water	19-Jun-2024 08:04	21-Jun-2024 10:33
WEF0848-02	24F0502-02	Water	19-Jun-2024 08:04	21-Jun-2024 10:33
WEF0848-03	24F0502-03	Water	19-Jun-2024 09:49	21-Jun-2024 10:33
WEF0848-05	24F0502-04	Water	19-Jun-2024 11:19	21-Jun-2024 10:33

Anatek Labs, Inc. Spokane	Project: WEF0848	
504 East Sprague, Suite D	Project Number: [none]	**Reported:**
Spokane WA, 99202	Project Manager: Emily Wengrowski	02-Jul-2024 18:53

Work Order Case Narrative

Client: Anatek Labs, Inc. Spokane
Project: WEF0848
Work Order: 24F0502

Sample receipt

Samples as listed on the preceding page were received 21-Jun-2024 10:33 under ARI work order 24F0502. For details regarding sample receipt, please refer to the Cooler Receipt Form.

Volatile Gases - MEE by RSK175

The sample(s) were analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Analytical Resources, LLC
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Antek

COC No(s): _____ NA

Assigned ARI Job No: 24F0444 AG 502

Project Name: _____

Delivered by: Fed-Ex UPS Courier Hand Delivered SA Other: _____

Tracking No: 1Z 20A 95V 03 2574 4831

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of the cooler? YES NO

Were custody papers included with the cooler? YES NO

Were custody papers properly filled out (ink, signed, etc.) YES NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)

Time 1033 1.4

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: 9708

Cooler Accepted by: SA Date: 6/21/24 Time: 1033

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? YES NO

What kind of packing material was used? Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: _____

Was sufficient ice used (if appropriate)? NA YES NO

How were bottles sealed in plastic bags? Individually Grouped Not

Did all bottles arrive in good condition (unbroken)? YES NO

Were all bottle labels complete and legible? YES NO

Did the number of containers listed on COC match with the number of containers received? YES NO

Did all bottle labels and tags agree with custody papers? YES NO

Were all bottles used correct for the requested analyses? YES NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs) NA YES NO

Were all VOC vials free of air bubbles? NA YES NO AG

Was sufficient amount of sample sent in each bottle? YES NO

Date VOC Trip Blank was made at ARI NA _____

Were the sample(s) split by ARI? NA YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: Anthony G Date: 6/21/24 Time: 10:56 Labels checked by: AG

*** Notify Project Manager of discrepancies or concerns ***

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

By: Date:

Analytical Resources, LLC
Analytical Chemists and Consultants

Cooler Temperature Compliance Form

AG

ARI Work Order: ~~24F0497~~ 24F0502

Cooler#: _____ **Temperature(°C):** _____

Sample ID	Bottle Count	Bottle Type

Cooler#: _____ **Temperature(°C):** _____

Sample ID	Bottle Count	Bottle Type

Cooler#: _____ **Temperature(°C):** _____

Sample ID	Bottle Count	Bottle Type

Cooler#: _____ **Temperature(°C):** _____

Sample ID	Bottle Count	Bottle Type

Completed by: _____ Date: _____ Time: _____

Anatek Labs, Inc. Spokane	Project: WEF0848	
504 East Sprague, Suite D	Project Number: [none]	**Reported:**
Spokane WA, 99202	Project Manager: Emily Wengrowski	02-Jul-2024 18:53

WEF0848-01

24F0502-01 (Water)

Dissolved Gases

Method: EPA RSK-175 — Sampled: 06/19/2024 08:04
Instrument: FID6 Analyst: LH — Analyzed: 06/24/2024 13:45

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 24F0502-01 B
Preparation Batch: BMF0589 — Sample Size: 10 mL
Prepared: 06/24/2024 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Methane	74-82-8	1	0.65	1.29	ug/L	
Surrogate: Propane			*62-122 %*	*79.3*	*%*	

Anatek Labs, Inc. Spokane	Project: WEF0848	
504 East Sprague, Suite D	Project Number: [none]	**Reported:**
Spokane WA, 99202	Project Manager: Emily Wengrowski	02-Jul-2024 18:53

WEF0848-02

24F0502-02 (Water)

Dissolved Gases

Method: EPA RSK-175 — Sampled: 06/19/2024 08:04

Instrument: FID6 Analyst: LH — Analyzed: 06/24/2024 14:03

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 24F0502-02 B

Preparation Batch: BMF0589 — Sample Size: 10 mL

Prepared: 06/24/2024 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Methane	74-82-8	1	0.65	0.71	ug/L	
Surrogate: Propane			*62-122 %*	*81.7*	*%*	

Anatek Labs, Inc. Spokane	Project: WEF0848	
504 East Sprague, Suite D	Project Number: [none]	**Reported:**
Spokane WA, 99202	Project Manager: Emily Wengrowski	02-Jul-2024 18:53

WEF0848-03

24F0502-03 (Water)

Dissolved Gases

Method: EPA RSK-175 — Sampled: 06/19/2024 09:49

Instrument: FID6 Analyst: LH — Analyzed: 06/24/2024 14:21

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 24F0502-03 B

Preparation Batch: BMF0589 — Sample Size: 10 mL

Prepared: 06/24/2024 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Methane	74-82-8	1	0.65	6.49	ug/L	
Surrogate: Propane			*62-122 %*	*75.6*	*%*	

Anatek Labs, Inc. Spokane	Project: WEF0848	
504 East Sprague, Suite D	Project Number: [none]	**Reported:**
Spokane WA, 99202	Project Manager: Emily Wengrowski	02-Jul-2024 18:53

WEF0848-05

24F0502-04 (Water)

Dissolved Gases

Method: EPA RSK-175 — Sampled: 06/19/2024 11:19

Instrument: FID6 Analyst: LH — Analyzed: 06/24/2024 14:39

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 24F0502-04 A

Preparation Batch: BMF0589 — Sample Size: 10 mL

Prepared: 06/24/2024 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Methane	74-82-8	1	0.65	119	ug/L	
Surrogate: Propane			*62-122 %*	*70.9*	*%*	

Anatek Labs, Inc. Spokane	Project: WEF0848	
504 East Sprague, Suite D	Project Number: [none]	**Reported:**
Spokane WA, 99202	Project Manager: Emily Wengrowski	02-Jul-2024 18:53

Analysis by: Analytical Resources, LLC

Dissolved Gases - Quality Control

Batch BMF0589 - EPA RSK-175

Instrument: FID6 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BMF0589-BLK1)				Prepared: 24-Jun-2024 Analyzed: 24-Jun-2024 08:14						
Methane	ND	0.65	ug/L							U
Surrogate: Propane	1790		ug/L	*1800*		*99.3*	*62-122*			

Anatek Labs, Inc. Spokane	Project: WEF0848	
504 East Sprague, Suite D	Project Number: [none]	**Reported:**
Spokane WA, 99202	Project Manager: Emily Wengrowski	02-Jul-2024 18:53

Analysis by: Analytical Resources, LLC

Dissolved Gases - Quality Control

Batch BMF0589 - EPA RSK-175

Instrument: FID6 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BMF0589-BS1)				Prepared: 24-Jun-2024 Analyzed: 24-Jun-2024 07:38						
Methane	721	0.65	ug/L	656		110	80-120			
Surrogate: Propane	1650		ug/L	*1800*		*91.7*	*62-122*			

Anatek Labs, Inc. Spokane	Project: WEF0848	
504 East Sprague, Suite D	Project Number: [none]	**Reported:**
Spokane WA, 99202	Project Manager: Emily Wengrowski	02-Jul-2024 18:53

Analysis by: Analytical Resources, LLC

Dissolved Gases - Quality Control

Batch BMF0589 - EPA RSK-175

Instrument: FID6 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BMF0589-BSD1)				Prepared: 24-Jun-2024 Analyzed: 24-Jun-2024 07:56						
Methane	733	0.65	ug/L	656		112	80-120	1.65	30	
Surrogate: Propane	1690		ug/L	*1800*		*93.9*	*62-122*			

Anatek Labs, Inc. Spokane	Project: WEF0848	
504 East Sprague, Suite D	Project Number: [none]	**Reported:**
Spokane WA, 99202	Project Manager: Emily Wengrowski	02-Jul-2024 18:53

Certified Analyses included in this Report

Analyte	Certifications
EPA RSK-175 in Water	
Methane	NELAP

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	03/28/2025
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program, PJLA Testing	66169	02/28/2025
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006-012	05/12/2025
WADOE	WA Dept of Ecology	C558	06/30/2024
WA-DW	Ecology - Drinking Water	C558	06/30/2024

Anatek Labs, Inc. Spokane	Project: WEF0848	
504 East Sprague, Suite D	Project Number: [none]	**Reported:**
Spokane WA, 99202	Project Manager: Emily Wengrowski	02-Jul-2024 18:53

Notes and Definitions

*	Flagged value is not within established control limits.
U	This analyte is not detected above the reporting limit (RL) or if noted, not detected above the limit of detection (LOD).
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
[2C]	Indicates this result was quantified on the second column on a dual column analysis.

ANATEK LABS

Analytical Results Report For:

GeoEngineers, Inc.- Portland

Project Number:

Pasco Terminal

Anatek Work Order:

WEF0640

Anatek Moscow - 1282 Alturas Drive - Moscow, ID 83843 - 208-883-2839 - moscow@anateklabs.com - FL NELAP E87893
Anatek Spokane - 504 E Sprague Ste. D - Spokane, WA 99202 - 509-838-3999 - spokane@anateklabs.com - FL NELAP E871099
Anatek Yakima - 4802 Tieton Drive - Yakima, WA 98908 - 509-225-9404 - yakima@anateklabs.com - FL NELAP E871190
Anatek Wenatchee - 3019 Gs Center Rd - Wenatchee, WA 98801 - 509-701-8362

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504 E Sprague Ste. D - Spokane, WA 99202 - (509) 838-3999 - email spokane@anateklabs.com

Client:	GeoEngineers, Inc.- Portland	Work Order:	WEF0640
Address:	5820 S Kelly Ave Suite B	Project:	Pasco Terminal
	Portland, OR 97239	Reported:	9/12/2024 08:25
Attn:	Kurt Harrington		

Case Narrative

This report is an amended version of report WEF0640, originally issued on 07/21/2024

The original report had the BTEX 8260 result for WEF0640-03 (MW-6-2406) ommitted.

This report is an amended version of report WEF0640, originally issued on 07/25/2024

This report supersedes all previous reports issued for work order WEF0640

The original report had a data entry error for TPH-Dx on WEF0640-03 (MW-6-2406) and a missing qualifier on the TPH-Dx result for WEF0640-01 (AR-11-2406).

We apologize for the inconvenience.

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Analytical Results Report

Sample Location: AR-11-2406
Lab/Sample Number: WEF0640-01 Collect Date: 06/18/24 10:00
Date Received: 06/19/24 10:09 Collected By: Colin Watson
Matrix: Water

Analyte	Result	Units	PQL	Analyzed	Analyst	Method	Qualifier
Inorganics							
Nitrate/N	28.3	mg/L	1.00	6/21/24 6:03	BDM	EPA 300.0	D10
Sulfate	119	mg/L	1.50	6/21/24 6:03	BDM	EPA 300.0	
Total Metals							
Iron (II)	ND	mg/L	0.0100	6/21/24 16:00	ILG	SM 3500-Fe B	*
Metals by ICP-MS							
Manganese	0.00307	mg/L	0.00100	6/20/24 15:16	JLG	EPA 200.8	
Hydrocarbons							
Diesel	ND	mg/L	0.160	7/2/24 23:37	ARY	NWTPH-Dx	
Lube Oil	0.465	mg/L	0.400	7/2/24 23:37	ARY	NWTPH-Dx	E11
Mineral Oil	ND	mg/L	0.160	7/2/24 23:37	ARY	NWTPH-Dx	
Surrogate: n-Hexacosane	*90.9%*		*50-150*	*7/2/24 23:37*	*ARY*	*NWTPH-Dx*	
Volatiles							
Benzene	ND	ug/L	0.500	6/24/24 11:32	BKP	EPA 8260D	
Ethylbenzene	ND	ug/L	0.500	6/24/24 11:32	BKP	EPA 8260D	
m+p-Xylene	ND	ug/L	0.500	6/24/24 11:32	BKP	EPA 8260D	
o-Xylene	ND	ug/L	0.500	6/24/24 11:32	BKP	EPA 8260D	
Toluene	ND	ug/L	0.500	6/24/24 11:32	BKP	EPA 8260D	
Surrogate: 1,2-Dichlorobenzene-d4	*102%*		*70-130*	*6/24/24 11:32*	*BKP*	*EPA 8260D*	
Surrogate: 4-Bromofluorobenzene	*96.5%*		*70-130*	*6/24/24 11:32*	*BKP*	*EPA 8260D*	
Surrogate: Toluene-d8	*100%*		*70-130*	*6/24/24 11:32*	*BKP*	*EPA 8260D*	
Gasoline	ND	mg/L	0.200	6/24/24 11:32	BKP	NWTPH-Gx	

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Sample Location: MW-4-2406
Lab/Sample Number: WEF0640-02 Collect Date: 06/18/24 12:13
Date Received: 06/19/24 10:09 Collected By: Colin Watson
Matrix: Water

Analyte	Result	Units	PQL	Analyzed	Analyst	Method	Qualifier
Inorganics							
Nitrate/N	28.0	mg/L	1.00	6/21/24 7:06	BDM	EPA 300.0	D10
Sulfate	119	mg/L	1.50	6/21/24 7:06	BDM	EPA 300.0	
Total Metals							
Iron (II)	ND	mg/L	0.0100	6/21/24 16:00	ILG	SM 3500-Fe B	*
Metals by ICP-MS							
Manganese	0.0384	mg/L	0.00100	6/24/24 18:07	JLG	EPA 200.8	
Hydrocarbons							
Diesel	ND	mg/L	0.160	7/3/24 0:32	ARY	NWTPH-Dx	
Lube Oil	ND	mg/L	0.400	7/3/24 0:32	ARY	NWTPH-Dx	
Mineral Oil	ND	mg/L	0.160	7/3/24 0:32	ARY	NWTPH-Dx	
Surrogate: n-Hexacosane	*96.9%*		*50-150*	*7/3/24 0:32*	*ARY*	*NWTPH-Dx*	
Volatiles							
Benzene	ND	ug/L	0.500	6/24/24 12:29	BKP	EPA 8260D	
Ethylbenzene	ND	ug/L	0.500	6/24/24 12:29	BKP	EPA 8260D	
m+p-Xylene	ND	ug/L	0.500	6/24/24 12:29	BKP	EPA 8260D	
o-Xylene	ND	ug/L	0.500	6/24/24 12:29	BKP	EPA 8260D	
Toluene	ND	ug/L	0.500	6/24/24 12:29	BKP	EPA 8260D	
Surrogate: 1,2-Dichlorobenzene-d4	*103%*		*70-130*	*6/24/24 12:29*	*BKP*	*EPA 8260D*	
Surrogate: 4-Bromofluorobenzene	*93.6%*		*70-130*	*6/24/24 12:29*	*BKP*	*EPA 8260D*	
Surrogate: Toluene-d8	*98.0%*		*70-130*	*6/24/24 12:29*	*BKP*	*EPA 8260D*	
Gasoline	ND	mg/L	0.200	6/24/24 12:29	BKP	NWTPH-Gx	

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Sample Location:	MW-6-2406		
Lab/Sample Number:	WEF0640-03	Collect Date:	06/18/24 13:33
Date Received:	06/19/24 10:09	Collected By:	Colin Watson
Matrix:	Water		

Analyte	Result	Units	PQL	Analyzed	Analyst	Method	Qualifier
Inorganics							
Nitrate/N	26.7	mg/L	1.00	6/21/24 7:27	BDM	EPA 300.0	D10
Sulfate	113	mg/L	1.50	6/21/24 7:27	BDM	EPA 300.0	
Total Metals							
Iron (II)	ND	mg/L	0.0100	6/21/24 16:00	ILG	SM 3500-Fe B	*
Metals by ICP-MS							
Manganese	0.00264	mg/L	0.00100	6/20/24 15:25	JLG	EPA 200.8	
Hydrocarbons							
Diesel	ND	mg/L	0.160	7/3/24 1:27	ARY	NWTPH-Dx	
Lube Oil	ND	mg/L	0.400	7/3/24 1:27	ARY	NWTPH-Dx	
Mineral Oil	ND	mg/L	0.160	7/3/24 1:27	ARY	NWTPH-Dx	
Surrogate: n-Hexacosane	*83.1%*		*50-150*	*7/3/24 1:27*	*ARY*	*NWTPH-Dx*	
Volatiles							
Benzene	ND	ug/L	0.500	6/24/24 12:56	BKP	EPA 8260D	
Ethylbenzene	ND	ug/L	0.500	6/24/24 12:56	BKP	EPA 8260D	
m+p-Xylene	ND	ug/L	0.500	6/24/24 12:56	BKP	EPA 8260D	
o-Xylene	ND	ug/L	0.500	6/24/24 12:56	BKP	EPA 8260D	
Toluene	ND	ug/L	0.500	6/24/24 12:56	BKP	EPA 8260D	
Surrogate: 1,2-Dichlorobenzene-d4	*99.2%*		*70-130*	*6/24/24 12:56*	*BKP*	*EPA 8260D*	
Surrogate: 4-Bromofluorobenzene	*96.4%*		*70-130*	*6/24/24 12:56*	*BKP*	*EPA 8260D*	
Surrogate: Toluene-d8	*97.7%*		*70-130*	*6/24/24 12:56*	*BKP*	*EPA 8260D*	
Gasoline	ND	mg/L	0.200	6/24/24 12:56	BKP	NWTPH-Gx	

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Sample Location:	MW-6-MSD-2406		
Lab/Sample Number:	WEF0640-04	Collect Date:	06/18/24 13:33
Date Received:	06/19/24 10:09	Collected By:	Colin Watson
Matrix:	Water		

Analyte	Result	Units	PQL	Analyzed	Analyst	Method	Qualifier
Hydrocarbons							
Diesel	ND	mg/L	0.160	7/3/24 2:22	ARY	NWTPH-Dx	
Lube Oil	ND	mg/L	0.400	7/3/24 2:22	ARY	NWTPH-Dx	
Mineral Oil	ND	mg/L	0.160	7/3/24 2:22	ARY	NWTPH-Dx	
Surrogate: n-Hexacosane	*91.3%*		*50-150*	*7/3/24 2:22*	*ARY*	*NWTPH-Dx*	
Volatiles							
Benzene	ND	ug/L	0.500	6/24/24 13:24	BKP	EPA 8260D	
Ethylbenzene	ND	ug/L	0.500	6/24/24 13:24	BKP	EPA 8260D	
m+p-Xylene	ND	ug/L	0.500	6/24/24 13:24	BKP	EPA 8260D	
o-Xylene	ND	ug/L	0.500	6/24/24 13:24	BKP	EPA 8260D	
Toluene	ND	ug/L	0.500	6/24/24 13:24	BKP	EPA 8260D	
Surrogate: 1,2-Dichlorobenzene-d4	*102%*		*70-130*	*6/24/24 13:24*	*BKP*	*EPA 8260D*	
Surrogate: 4-Bromofluorobenzene	*97.9%*		*70-130*	*6/24/24 13:24*	*BKP*	*EPA 8260D*	
Surrogate: Toluene-d8	*98.1%*		*70-130*	*6/24/24 13:24*	*BKP*	*EPA 8260D*	
Gasoline	ND	mg/L	0.200	6/24/24 13:24	BKP	NWTPH-Gx	

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Authorized Signature,



Leah Clappes for Kathleen Sattler, Lab Manager

D10	Initial analysis witthin holding time. Dilution analysis was past holding time.
E11	Concentration estimated. Non-target peak interference in quantitation range.
M3	Spike recovery value is unusable. Analyte concentration disproportionate to the spike level. Blank spike recovery acceptable.
R1	RPD/RSD exceeded the method acceptance limit
PQL	Practical Quantitation Limit
ND	Not Detected
MCL	EPA's Maximum Contaminant Level
Dry	Sample results reported on a dry weight basis
*	Not a state-certified analyte

RPD	Relative Percent Difference
%REC	Percent Recovery
Source	Sample that was spiked or duplicated.

This report shall not be reproduced except in full, without the written approval of the laboratory
The results reported related only to the samples indicated.

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Certifications

Code	Description	Facility	Number
W WA DOE	Washington Department of Ecology	Anatek-Spokane, WA	C585
DOE WA	Washington Department of Ecology	Anatek-Moscow, ID	C595

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Quality Control Data

Inorganics

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: BEF0919 - W Ions										
Blank (BEF0919-BLK1)					Prepared & Analyzed: 06/20/24 13:42					
Nitrate as N	ND		0.100	mg/L						
Sulfate	ND		0.150	mg/L						
Blank (BEF0919-BLK2)					Prepared & Analyzed: 06/21/24 06:24					
Nitrate as N	ND		0.100	mg/L						
Sulfate	ND		0.150	mg/L						
LCS (BEF0919-BS1)					Prepared & Analyzed: 06/21/24 05:21					
Nitrate as N	3.90			mg/L	4.00		97.5	90-110		
Sulfate	3.98			mg/L	4.00		99.4	90-110		
LCS Dup (BEF0919-BSD1)					Prepared & Analyzed: 06/20/24 10:55					
Nitrate as N	3.90			mg/L	4.00		97.6	90-110	0.0769	20
Sulfate	4.00			mg/L	4.00		99.9	90-110	0.477	20
Matrix Spike (BEF0919-MS1)		**Source: WEF0836-01**			Prepared & Analyzed: 06/20/24 16:08					
Nitrate as N	5.74		0.100	mg/L	4.00	1.85	97.0	80-120		
Sulfate	321	M3	0.150	mg/L	4.00	321	7.17	80-120		
Matrix Spike Dup (BEF0919-MSD1)		**Source: WEF0836-01**			Prepared & Analyzed: 06/20/24 16:29					
Nitrate as N	5.59		0.100	mg/L	4.00	1.85	93.3	80-120	2.61	20
Sulfate	321	M3	0.150	mg/L	4.00	321	6.97	80-120	0.00249	20

Quality Control Data

Metals by ICP-MS

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: BEF0872 - W 3010 Digest										
Blank (BEF0872-BLK1)					Prepared: 06/20/24 11:24- Analyzed: 06/20/24 15:06					
Manganese	ND		0.00100	mg/L						
LCS (BEF0872-BS1)					Prepared: 06/20/24 11:24- Analyzed: 06/20/24 15:13					
Manganese	0.0481		0.00100	mg/L	0.0500		96.2	85-115		
Matrix Spike (BEF0872-MS1)		**Source: WEF0640-01**			Prepared: 06/20/24 11:24- Analyzed: 06/20/24 15:19					
Manganese	0.0493		0.00100	mg/L	0.0500	0.00307	92.4	70-130		
Matrix Spike Dup (BEF0872-MSD1)		**Source: WEF0640-01**			Prepared: 06/20/24 11:24- Analyzed: 06/20/24 15:22					
Manganese	0.0491		0.00100	mg/L	0.0500	0.00307	92.1	70-130	0.252	20
Batch: BEF0980 - W 3010 Digest										
Blank (BEF0980-BLK1)					Prepared: 06/24/24 09:06- Analyzed: 06/24/24 17:43					
Manganese	ND		0.00100	mg/L						
LCS (BEF0980-BS1)					Prepared: 06/24/24 09:06- Analyzed: 06/24/24 18:45					

Quality Control Data
(Continued)

Metals by ICP-MS (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: BEF0980 - W 3010 Digest (Continued)										
LCS (BEF0980-BS1)					Prepared: 06/24/24 09:06- Analyzed: 06/24/24 18:45					
Manganese	0.0541		0.00100	mg/L	0.0500		108	85-115		
Matrix Spike (BEF0980-MS1)		**Source: WEF0640-02**			Prepared: 06/24/24 09:06- Analyzed: 06/24/24 18:09					
Manganese	0.0961		0.00100	mg/L	0.0500	0.0384	115	70-130		
Matrix Spike (BEF0980-MS2)		**Source: WEF0848-05**			Prepared: 06/24/24 09:06- Analyzed: 06/24/24 18:33					
Manganese	1.73		0.00100	mg/L	0.0500	1.65	168	70-130		
Matrix Spike Dup (BEF0980-MSD1)		**Source: WEF0640-02**			Prepared: 06/24/24 09:06- Analyzed: 06/24/24 18:12					
Manganese	0.103		0.00100	mg/L	0.0500	0.0384	129	70-130	6.67	20
Matrix Spike Dup (BEF0980-MSD2)		**Source: WEF0848-05**			Prepared: 06/24/24 09:06- Analyzed: 06/24/24 18:35					
Manganese	1.73		0.00100	mg/L	0.0500	1.65	172	70-130	0.105	20

Quality Control Data
(Continued)

Hydrocarbons

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: BEG0080 - W TPH-Dx										
Blank (BEG0080-BLK1)					Prepared: 07/02/24 10:38- Analyzed: 07/02/24 19:56					
Diesel	ND		0.160	mg/L						
Lube Oil	ND		0.400	mg/L						
Mineral Oil	ND		0.160	mg/L						
Surrogate: n-Hexacosane			*0.186*	*mg/L*	*0.200*		*93.1*	*50-150*		
LCS (BEG0080-BS1)					Prepared: 07/02/24 10:38- Analyzed: 07/02/24 20:51					
Diesel	1.63		0.160	mg/L	2.00		81.3	70-130		
Lube Oil	ND		0.400	mg/L				70-130		
Surrogate: n-Hexacosane			*0.161*	*mg/L*	*0.200*		*80.6*	*50-150*		
LCS Dup (BEG0080-BSD1)					Prepared: 07/02/24 10:38- Analyzed: 07/02/24 21:47					
Diesel	2.13	R1	0.160	mg/L	2.00		106	70-130	26.8	20
Lube Oil	ND		0.400	mg/L				70-130		20
Surrogate: n-Hexacosane			*0.199*	*mg/L*	*0.200*		*99.6*	*50-150*		

Quality Control Data
(Continued)

Volatiles

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: BEF0990 - VOC										
Blank (BEF0990-BLK1)					Prepared: 06/24/24 09:38- Analyzed: 06/24/24 09:40					

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Quality Control Data
(Continued)

Volatiles (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: BEF0990 - VOC (Continued)										
Blank (BEF0990-BLK1)					Prepared: 06/24/24 09:38- Analyzed: 06/24/24 09:40					
Gasoline	ND		0.200	mg/L						
Surrogate: 4-Bromofluorobenzene			*0.0187*	*mg/L*	*0.0200*		*93.3*	*70-130*		
LCS (BEF0990-BS1)					Prepared: 06/24/24 09:38- Analyzed: 06/24/24 10:08					
Gasoline	1.07		0.200	mg/L	1.00		107	80-120		
Surrogate: 4-Bromofluorobenzene			*0.0200*	*mg/L*	*0.0200*		*100*	*70-130*		
Matrix Spike (BEF0990-MS1)		**Source: WEF0640-01**			Prepared: 06/24/24 09:38- Analyzed: 06/24/24 17:36					
Gasoline	0.820		0.200	mg/L	1.18	ND	69.3	50-150		
Surrogate: 4-Bromofluorobenzene			*0.0200*	*mg/L*	*0.0237*		*84.5*	*70-130*		
Batch: BEG0637 - VOC										
Blank (BEG0637-BLK1)					Prepared & Analyzed: 06/24/24 09:40					
o-Xylene (MCL for total)	ND		0.500	ug/L						
Ethylbenzene	ND		0.500	ug/L						
Benzene	ND		0.500	ug/L						
Toluene	ND		0.500	ug/L						
m/p Xylenes (MCL for total)	ND		0.500	ug/L						
Surrogate: Toluene-d8			*18.6*	*ug/L*	*20.0*		*93.2*	*70-130*		
Surrogate: 4-Bromofluorobenzene			*18.7*	*ug/L*	*20.0*		*93.3*	*70-130*		
Surrogate: 1,2-Dichlorobenzene-d4			*18.6*	*ug/L*	*20.0*		*93.2*	*70-130*		
LCS (BEG0637-BS1)					Prepared & Analyzed: 06/24/24 22:16					
o-Xylene (MCL for total)	9.93		0.500	ug/L	10.0		99.3	80-120		
Toluene	9.94		0.500	ug/L	10.0		99.4	80-120		
m/p Xylenes (MCL for total)	19.4		0.500	ug/L	20.0		97.2	80-120		
Ethylbenzene	9.89		0.500	ug/L	10.0		98.9	80-120		
Benzene	9.71		0.500	ug/L	10.0		97.1	80-120		
Surrogate: Toluene-d8			*20.6*	*ug/L*	*20.0*		*103*	*70-130*		
Surrogate: 4-Bromofluorobenzene			*20.0*	*ug/L*	*20.0*		*100*	*70-130*		
Surrogate: 1,2-Dichlorobenzene-d4			*20.1*	*ug/L*	*20.0*		*100*	*70-130*		

WEF0640

Due. 07/03/24

ANATEK LABS

Chain of Custody Record

Anatek Labs
1282 Alturas Drive, Moscow ID
504 E Sprague Ste D, Spokane W

Turn Aroun

Company Name: GeoEngineers	Project Manager: Kurt Harrington
Address: 5820 S Kelly Ave Suite B	Project Name & #: Pasco Terminal
City: Portland State: OR Zip: 97239	Purchase Order #: 009991-005-03
Phone: 503-906-9577	Sampler Name & Phone: Colin Watson 503-756-6285
Email Address(es): kharrington@geoengineers.com	

Please refer to our ... www.anateklabs.com/pricing-lists

✓ Normal
__ Next Day*
__ 2nd Day*
__ Other*

__ Phone
✓ Email

*All rush order requests must have prior approval

List Analyses Requested

Lab ID	Sample Identification	Sampling Date/Time	Matrix	# of Containers	Sample Volume	BTEX 8260	NWTPH-Gx	NWTPH-Dx	NWTPH-Oil	Ferrous Fe	Mn	SO4, NO3	Methane		
	AR-11-2406	6/18/24-1000	H2O	11	-	X	X	X	X	X	X	X	X		
	MW-4-2406	6/18/24-1213	H2O	11	-	X	X	X	X	X	X	X	X		
	MW-6-2406	6/18/24-1333	H2O	11	-	X	X	X	X	X	X	X	X		
	MW-6-MSD-2406	6/18/24-1333	H2O	6	-	X	X	X	X						
	Trip Blanks					H	H								

Preservative:

Note Special Instructions/Comments

H = Hold trip blanks for PM requested analysis if needed

Inspection Checklist

Received Intact?	Y	N
Labels & Chains Agree?	Y	N
Containers Sealed?	Y	N
No VOC Head Space?	Y	N
Cooler?	Y	N
Ice/Ice Packs Present?	Y	N

Temperature (°C): 3.5 P-6

Number of Containers: 4P250, 3P125, 8Y250, -4944

Shipped Via: Fedex

Preservative: HCl 2401399

Date & Time: KG ~~6/18/24~~ 1009 6/19/24

Inspected By: [signature]

	Printed Name	Signature	Company	Date	Time
Relinquished by	Colin Watson	[signature]	GeoEngineers	6/18/24	1610
Received by	Kolley Gu	[signature]	Anatek	~~6/18/24~~ 6/19/24	1009
Relinquished by					
Received by					
Relinquished by					
Received by					

Samples submitted to Anatek Labs may be subcontacted to other accredited labs if necessary. This message serves as notice of this possibility. Subcontracted analyses will be clearly noted on the analytical report.

Form COC01.02 - Eff 1 Mar 2021

Analytical Resources, LLC
Analytical Chemists and Consultants
Tukwila, WA

02 July 2024

Kathleen Sattler
Anatek Labs, Inc.
4802 Tieton Drive
Yakima, WA 98908

RE: WEF0640

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)	Associated SDG ID(s)
24F0491	N/A

Shelly Fishel
Digitally signed by Shelly Fishel
Date: 2024.07.02 18:47:17 -07'00'

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclose Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, LLC

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Shelly Fishel, Project Manager

ACCREDITED IN ACCORDANCE WITH nelac
Cert# 100006-012

SUBCONTRACT ORDER

24F0491

Anatek Labs, Inc.

1282 Alturas Drive - Moscow, ID 83843 - (208) 8832839 - Fax (208) 8829246 - email moscow@anateklabs.com
504 E Sprague Ste. D - Spokane, WA 99202 - (509) 838-3999 - fax (509) 838-4433 - email spokane@anateklabs.com

Sending Laboratory:

Anatek Labs, Inc.- Spokane
504 E Sprague Ave, Suite D
Spokane, WA 99202
Phone: 509-838-3999
Fax: 509-838-4433

Project Manager: Kathleen Sattler
kathy@anateklabs.com

Subcontracted Laboratory:

Analytical Resources LLC
4611 S. 134TH Place, Suite 100
Tukwila, WA 98168
Phone: (206) 695-6200
Fax: (206) 695-6202

Work Order: WEF0640

Analysis	Due	Expires	Comments
Lab Sample ID: WEF0640-01 ***Water*** ***Sampled: 06/18/2024 10:00***			
Client Sample Name: AR 11 2406			
Methane	07/01/2024	07/02/2024 10:00	
Containers Supplied:			
Lab Sample ID: WEF0640-02 ***Water*** ***Sampled: 06/18/2024 12:13***			
Client Sample Name: MW 4 2406			
Methane	07/01/2024	07/02/2024 12:13	
Containers Supplied:			
Lab Sample ID: WEF0640-03 ***Water*** ***Sampled: 06/18/2024 13:33***			
Client Sample Name: MW 6 2406			
Methane	07/01/2024	07/02/2024 13:33	
Containers Supplied:			

Sierra Schert — Released By — 6/20/24 — Date

Received By SA — 6/21/24 — Date

Anatek Labs, Inc.	Project: WEF0640	
4802 Tieton Drive	Project Number: [none]	**Reported:**
Yakima WA, 98908	Project Manager: Kathleen Sattler	02-Jul-2024 18:45

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
WEF0640-01	24F0491-01	Water	18-Jun-2024 10:00	21-Jun-2024 10:33
WEF0640-02	24F0491-02	Water	18-Jun-2024 12:13	21-Jun-2024 10:33
WEF0640-03	24F0491-03	Water	18-Jun-2024 13:33	21-Jun-2024 10:33

Anatek Labs, Inc.	Project: WEF0640	
4802 Tieton Drive	Project Number: [none]	**Reported:**
Yakima WA, 98908	Project Manager: Kathleen Sattler	02-Jul-2024 18:45

Work Order Case Narrative

Client: Anatek Labs, Inc.
Project: WEF0640
Work Order: 24F0491

Sample receipt

Samples as listed on the preceding page were received 21-Jun-2024 10:33 under ARI work order 24F0491. For details regarding sample receipt, please refer to the Cooler Receipt Form.

Volatile Gases - MEE by RSK175

The sample(s) were analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Analytical Resources, LLC
Analytical Chemists and Consultants

Printed: 6/21/2024 12:19:32PM

WORK ORDER

24F0491

Samples will be discarded 90 days after submission of a final report unless other instructions are received

Client: Anatek Labs, Inc. | **Project Manager: Shelly Fishel**

Project: WEF0640 | **Project Number: [none]**

Report To:
Anatek Labs, Inc.
Kathleen Sattler
4802 Tieton Drive
Yakima, WA 98908
Phone: (509) 225-9404
Fax: -

Invoice To:
Anatek Labs, Inc.
Cheri Price Accounting Department
1282 Alturas Drive
Moscow, ID 83843
Phone :(208) 883-2839
Fax: -

Date Due: 08-Jul-2024 18:00 (10 day TAT)

Received By: Sydni Acevedo | Date Received: 21-Jun-2024 10:33

Logged In By: Anthony Giuliani | Date Logged In: 21-Jun-2024 10:56

Samples Received at **11.4°C**

Intact, properly signed and dated custody seals attached to outside of cooler(s)	Yes	Custody papers included with the cooler	Yes
Custody papers properly filled out (ink, signed, analyses requested, etc)	Yes	Was a temperature blank included in the cooler	No
Was sufficient ice used (if appropriate)	No	All bottles sealed in individual plastic bags	No
All bottles arrived in good condition (unbroken)	Yes	All bottle labels complete and legible	Yes
Number of containers listed on COC match number received	Yes	Bottle labels and tags agree with COC	Yes
Correct bottles used for the requested analyses	Yes	All VOC vials free of air bubbles	Yes
Analyses/bottles require preservation (attach preservation sheet excluding VOC)	No	Sufficient amount of sample sent in each bottle	Yes
Sample split at ARI	No		

24F0491-01 WEF0640-01 [Water] Sampled 18-Jun-2024 10:00				Methane only version
RSK-175 Dissolved Gases (MEE)	07/08/2024	10	7/2/2024	
24F0491-02 WEF0640-02 [Water] Sampled 18-Jun-2024 12:13				Methane only version
RSK-175 Dissolved Gases (MEE)	07/08/2024	10	7/2/2024	
24F0491-03 WEF0640-03 [Water] Sampled 18-Jun-2024 13:33				Methane only version
RSK-175 Dissolved Gases (MEE)	07/08/2024	10	7/2/2024	

Preservation Confirmation

Container ID	Container Type	pH
24F0491-01 A	VOA Vial, Amber, 40 mL, HCL	
24F0491-01 B	VOA Vial, Amber, 40 mL, HCL	
24F0491-02 A	VOA Vial, Amber, 40 mL, HCL	
24F0491-02 B	VOA Vial, Amber, 40 mL, HCL	
24F0491-03 A	VOA Vial, Amber, 40 mL, HCL	
24F0491-03 B	VOA Vial, Amber, 40 mL, HCL	

Preservation Confirmed By

6/21/24
Date

Reviewed By

Date

Analytical Resources, LLC
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Antek

COC No(s): _____ NA

Assigned ARI Job No: 24F0491

Project Name: _____

Delivered by: Fed-Ex UPS Courier Hand Delivered SA Other: _____

Tracking No: 1Z 20A 95V 03 2574 4831 NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of the cooler? YES NO

Were custody papers included with the cooler? ..... YES NO

Were custody papers properly filled out (ink, signed, etc.) ..... YES NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)

Time 1033 11.4

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: 9708

Cooler Accepted by: SA Date: 6/21/24 Time: 1033

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? ..... YES NO

What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: _____

Was sufficient ice used (if appropriate)? ..... NA YES NO

How were bottles sealed in plastic bags? ..... Individually Grouped Not

Did all bottles arrive in good condition (unbroken)? ..... YES NO

Were all bottle labels complete and legible? ..... YES NO

Did the number of containers listed on COC match with the number of containers received? ..... YES NO

Did all bottle labels and tags agree with custody papers? ..... YES NO

Were all bottles used correct for the requested analyses? ..... YES NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs) ... NA YES NO

Were all VOC vials free of air bubbles? ..... NA YES NO AG

Was sufficient amount of sample sent in each bottle? ..... YES NO

Date VOC Trip Blank was made at ARI..... NA _____

Were the sample(s) split by ARI? NA YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: Anthony G Date: 6/21/24 Time: 10:56 Labels checked by: AG

*****Notify Project Manager of discrepancies or concerns *****

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

By: Date:

Cooler Temperature Compliance Form

ARI Work Order: 24F0491

Cooler#:_____ **Temperature(°C):**_____

Sample ID	Bottle Count	Bottle Type

Cooler#:_____ **Temperature(°C):**_____

Sample ID	Bottle Count	Bottle Type

Cooler#:_____ **Temperature(°C):**_____

Sample ID	Bottle Count	Bottle Type

Cooler#:_____ **Temperature(°C):**_____

Sample ID	Bottle Count	Bottle Type

Completed by:_____ Date:_____ Time:_____

Anatek Labs, Inc.	Project: WEF0640	
4802 Tieton Drive	Project Number: [none]	**Reported:**
Yakima WA, 98908	Project Manager: Kathleen Sattler	02-Jul-2024 18:45

WEF0640-01

24F0491-01 (Water)

Dissolved Gases

Method: EPA RSK-175 — Sampled: 06/18/2024 10:00
Instrument: FID6 Analyst: LH — Analyzed: 06/24/2024 12:51

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 24F0491-01 B
Preparation Batch: BMF0589 — Sample Size: 10 mL
Prepared: 06/24/2024 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Methane	74-82-8	1	0.65	ND	ug/L	U
Surrogate: Propane			*62-122 %*	*86.2*	*%*	

Anatek Labs, Inc.	Project: WEF0640	
4802 Tieton Drive	Project Number: [none]	**Reported:**
Yakima WA, 98908	Project Manager: Kathleen Sattler	02-Jul-2024 18:45

WEF0640-02

24F0491-02 (Water)

Dissolved Gases

Method: EPA RSK-175 — Sampled: 06/18/2024 12:13

Instrument: FID6 Analyst: LH — Analyzed: 06/24/2024 13:09

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 24F0491-02 B

Preparation Batch: BMF0589 — Sample Size: 10 mL

Prepared: 06/24/2024 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Methane	74-82-8	1	0.65	ND	ug/L	U
Surrogate: Propane			*62-122 %*	*78.9*	*%*	

Anatek Labs, Inc.	Project: WEF0640	
4802 Tieton Drive	Project Number: [none]	**Reported:**
Yakima WA, 98908	Project Manager: Kathleen Sattler	02-Jul-2024 18:45

WEF0640-03

24F0491-03 (Water)

Dissolved Gases

Method: EPA RSK-175 — Sampled: 06/18/2024 13:33

Instrument: FID6 Analyst: LH — Analyzed: 06/24/2024 13:27

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 24F0491-03 B

Preparation Batch: BMF0589 — Sample Size: 10 mL

Prepared: 06/24/2024 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Methane	74-82-8	1	0.65	ND	ug/L	U
Surrogate: Propane			*62-122 %*	*83.0*	*%*	

Anatek Labs, Inc.	Project: WEF0640	
4802 Tieton Drive	Project Number: [none]	**Reported:**
Yakima WA, 98908	Project Manager: Kathleen Sattler	02-Jul-2024 18:45

Analysis by: Analytical Resources, LLC

Dissolved Gases - Quality Control

Batch BMF0589 - EPA RSK-175

Instrument: FID6 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BMF0589-BLK1)				Prepared: 24-Jun-2024 Analyzed: 24-Jun-2024 08:14						
Methane	ND	0.65	ug/L							U
Surrogate: Propane	1790		ug/L	*1800*		*99.3*	*62-122*			

Anatek Labs, Inc.	Project: WEF0640	
4802 Tieton Drive	Project Number: [none]	**Reported:**
Yakima WA, 98908	Project Manager: Kathleen Sattler	02-Jul-2024 18:45

Analysis by: Analytical Resources, LLC

Dissolved Gases - Quality Control

Batch BMF0589 - EPA RSK-175

Instrument: FID6 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BMF0589-BS1)				Prepared: 24-Jun-2024 Analyzed: 24-Jun-2024 07:38						
Methane	721	0.65	ug/L	656		110	80-120			
Surrogate: Propane	1650		ug/L	*1800*		*91.7*	*62-122*			

Anatek Labs, Inc.	Project: WEF0640	
4802 Tieton Drive	Project Number: [none]	**Reported:**
Yakima WA, 98908	Project Manager: Kathleen Sattler	02-Jul-2024 18:45

Analysis by: Analytical Resources, LLC

Dissolved Gases - Quality Control

Batch BMF0589 - EPA RSK-175

Instrument: FID6 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BMF0589-BSD1)				Prepared: 24-Jun-2024 Analyzed: 24-Jun-2024 07:56						
Methane	733	0.65	ug/L	656		112	80-120	1.65	30	
Surrogate: Propane	1690		ug/L	*1800*		*93.9*	*62-122*			

Anatek Labs, Inc.	Project: WEF0640	
4802 Tieton Drive	Project Number: [none]	**Reported:**
Yakima WA, 98908	Project Manager: Kathleen Sattler	02-Jul-2024 18:45

Certified Analyses included in this Report

Analyte	Certifications
EPA RSK-175 in Water	
Methane	NELAP

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	03/28/2025
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program, PJLA Testing	66169	02/28/2025
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006-012	05/12/2025
WADOE	WA Dept of Ecology	C558	06/30/2024
WA-DW	Ecology - Drinking Water	C558	06/30/2024

Anatek Labs, Inc.	Project: WEF0640	
4802 Tieton Drive	Project Number: [none]	**Reported:**
Yakima WA, 98908	Project Manager: Kathleen Sattler	02-Jul-2024 18:45

Notes and Definitions

*	Flagged value is not within established control limits.
U	This analyte is not detected above the reporting limit (RL) or if noted, not detected above the limit of detection (LOD).
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
[2C]	Indicates this result was quantified on the second column on a dual column analysis.

APPENDIX D
Historical Groundwater Monitoring Results

Appendix D

Tidewater Fuel Leak Site Historical Groundwater Monitoring Results

Pasco, Washington

Well ID	Date	Benzene MTCA Method A CUL= 5 (µg/L)	Toluene MTCA Method A CUL = 1,000 (µg/L)	Ethylbenzene MTCA Method A CUL= 700 (µg/L)	Total Xylenes MTCA Method A CUL = 1,000 (µg/L)	TPHg - Gas MTCA Method A CUL = 800/1,000 (µg/L)	TPHd - Diesel MTCA Method A CUL = 500 (µg/L)	TPHo - Heavy Oil MTCA Method A CUL = 500 (µg/L)
AR-1	Feb-03	**191**	**2,130**	153	**4,570**	**31,700**	NA	NA
	Jun-03	**77**	**1,340**	179	**3,590**	**20,000**	NA	NA
	Jun-10	NS	NS	NS	NS	NS	NS	NS
	Dec-10	NS	NS	NS	NS	NS	NS	NS
	May-14	NS	NS	NS	NS	NS	NS	NS
	Jun-20	NS	NS	NS	NS	NS	NS	NS
	Jul-21	**1,530**	**3,550**	**730**	**4,850**	**45,200**	**2,700**	**1,200**
	Jun-22	**1,080**	**1,080**	376	**4,750**	**43,600**	*160 U*	*400 U*
	Jun-23	**723**	**3,800**	434	**6,740**	**85,000**	**6,010**	*400 U*
	Jun-24	**295**	**1,460**	226	**3,720**	**37,100**	*160 U*	*400 U*
AR-3	Feb-03	**754**	**3,870**	148	**6,350**	**38,900**	NA	NA
	Jun-03	**6,750**	**6,270**	649	**7,170**	**37,400**	NA	NA
	Mar-06	NS	NS	NS	NS	NS	NS	NS
	Nov-07	NS	NS	NS	NS	NS	NS	NS
	Oct-08	NS	NS	NS	NS	NS	NS	NS
	Jun-10	NS	NS	NS	NS	NS	NS	NS
	Dec-10	NS	NS	NS	NS	NS	NS	NS
	May-14	NS	NS	NS	NS	NS	NS	NS
AR-4	Apr-02	**52**	337	13.9	**1,989**	**10,500**	NA	NA
	Jul-02	**90**	816	10.7	705	**6,400**	NA	NA
	Nov-02	**10.3**	118	5.5	345	**3,080**	NA	NA
	Feb-03	*1.0 U*	*1.0 U*	*1.0 U*	4.8	195	NA	NA
	Jun-03	**10.1**	66	10	326	**5,090**	NA	NA
	Sep-03	**797**	70	27	321	**3,430**	NA	NA
	Mar-06	**2,210**	**3,430**	481	**5,600**	**26,600**	**4,400**	NA
	Nov-07	**640**	**2,800**	220	**4,400**	**28,000**	**4,500**	**1,400**
	Oct-08	**340**	**2,100**	170	**2,700**	**17,000**	**2,500**	**5,900**
	Jun-10	**380**	**1,900**	270	**4,400**	**21,000**	**5,300**	**650**
FD (AR-4 Dup)	Jun-10	**370**	**1,800**	250	**4,000**	**20,000**	**3,700**	440
	Dec-10	**350**	**1,400**	230	**3,600**	**17,000**	**3,700**	*260 U*
	May-14	**535**	789	385	**10,290**	**45,900**	*20 U*	*50 U*
	May-18	**141**	15.4	280	**5,450**	**28,100**	*50 U*	*250 U*
	Jun-19	**123**	10.5	305	**4,870**	**22,000**	*100 U*	*500 U*
	Jun-20	**132**	*50 U*	276	**3,780**	**20,100**	*160 U*	*400 U*
AR-5	Jul-02	**379**	**1,010**	17.5	**3,850**	**39,000**	NA	NA
	Nov-02	0.7	10.6	*ND*	124	**2,900**	NA	NA
	Feb-03	4.3	12.2	1	90	**830**	NA	NA
	Jun-03	**15.2**	8.8	3.4	136	**1,740**	NA	NA
	Sep-03	**8.5**	4.6	1.3	33	557	NA	NA
	Dec-03	*1 U*	26.1	14.1	739	**6,010**	NA	NA
	Mar-06	*0.5 U*	*0.5 U*	*0.5 U*	0.57	250	NA	NA
	Nov-07	NS	NS	NS	NS	NS	NS	NS
	Oct-08	*0.9 U*	*0.9 U*	*0.5 U*	10	65	120	*95 U*
	Jun-10	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	*120 U*	*250 U*
	Dec-10	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	260	730	*270 U*
	May-14	*1.0 U*	*1.0 U*	*1.0 U*	2.09	*100 U*	*20 U*	*50 U*
AR-6	Nov-01	**29.8**	**402**	82	**2,800**	**2,390**	NA	NA
	Apr-02	**713**	559	27	**2,060**	**17,700**	NA	NA
	Jul-02	**1,820**	**3,100**	85	**4,780**	**24,700**	NA	NA
	Nov-02	**104**	289	67	**2,886**	**11,900**	NA	NA
	Feb-03	**531**	**1,280**	93	**2,900**	**23,700**	NA	NA
	Jun-03	**475**	**2,340**	110	**3,750**	**23,500**	NA	NA
	Sep-03	**221**	**3,140**	241	**4,610**	**25,000**	NA	NA
	Mar-06	*0.5 U*	*0.5 U*	*0.5 U*	6.7	330	260	NA
	Nov-07	0.6	2.5	0.7	73	670	**1,500**	**990**
	Oct-08	NS	NS	NS	NS	NS	NS	NS
	Jun-10	*1.0 U*	*1.0 U*	*1.0 U*	2.4	*50 U*	*120 U*	*250 U*
	Dec-10	*1.0 U*	*1.0 U*	*1.0 U*	8.6	81	*120 U*	*240 U*
	May-14	*1.0 U*	*1.0 U*	21.2	331	**4,640**	*20 U*	*50 U*
AR-7	Mar-06	NS	NS	NS	NS	NS	NS	NS
	Nov-07	NS	NS	NS	NS	NS	NS	NS
	Oct-08	NS	NS	NS	NS	NS	NS	NS
	Jun-10	NS	NS	NS	NS	NS	NS	NS
	Dec-10	NS	NS	NS	NS	NS	NS	NS
AR-7	May-14	*1.0 U*	1.4	21	86	1,280	*20 U*	*50 U*
FD (AR-7 Dup)	May-14	*1.0 U*	*1.0 U*	16	65	883	*20 U*	*50 U*

Appendix D

Tidewater Fuel Leak Site Historical Groundwater Monitoring Results

Pasco, Washington

Well ID	Date	Benzene MTCA Method A CUL= 5 (µg/L)	Toluene MTCA Method A CUL = 1,000 (µg/L)	Ethylbenzene MTCA Method A CUL= 700 (µg/L)	Total Xylenes MTCA Method A CUL = 1,000 (µg/L)	TPHg - Gas MTCA Method A CUL = 800/1,000 (µg/L)	TPHd - Diesel MTCA Method A CUL = 500 (µg/L)	TPHo - Heavy Oil MTCA Method A CUL = 500 (µg/L)
AR-8	Jul-02	**47.3**	229	32	918	**5,330**	NA	NA
	Nov-02	**19.2**	**1,070**	384	**4,170**	**57,400**	NA	NA
	Feb-03	**43.8**	577	276	**3,410**	**59,600**	NA	NA
	Jun-03	**1470**	**2,050**	651	**2,760**	**22,700**	NA	NA
	Sep-03	**3,350**	**1,740**	**1,480**	**2,520**	**16,000**	NA	NA
	Nov-07	**8.0**	46	35	610	**7,400**	**23,000**	**<4,700**
	Jun-10	2.0	15	99	420	**3,300**	**2,000**	250
	Dec-10	1.7	26	100	460	**3,700**	**1,500**	*260 U*
FD (AR-8 Dup)	Dec-10	1.7	36	100	590	**3,500**	**1,500**	*280 U*
	May-14	*1.0 U*	11	280	755	**9,570**	*20 U*	*50 U*
FD (AR-8 Dup)	May-14	*1.0 U*	12	312	812	**9,880**	*20 U*	*50 U*
	May-18	*0.5 U*	0.90	145	200	**4,970**	*50 U*	*250 U*
FD (AR-8 Dup)	May-18	*0.5 U*	0.94	150	223	**4,980**	*50 U*	*250 U*
	Jun-19	*0.5 U*	0.53	88.0	157.2	**4,830**	*100 U*	*500 U*
FD (AR-8 Dup)	Jun-19	*0.5 U*	0.53	82.7	147.0	**4,610**	*100 U*	*500 U*
	Jun-20	*1.25 U*	*1.25 U*	61.7	109.7	**3,520**	*160 U*	*400 U*
FD (AR-8 Dup)	Jun-20	*1.25 U*	*1.25 U*	62.6	103.8	**3,220**	*160 U*	*400 U*
	Jul-21	*2.50 U*	*2.50 U*	119	121.5	**4,500**	*160 U*	*400 U*
FD (AR-8 Dup)	Jul-21	*2.50 U*	*2.50 U*	112	129.6	**4,720**	*160 U*	*400 U*
	Jun-22	*0.5 U*	*0.5 U*	25.8	27.8	**1,660**	*160 U*	*400 U*
FD (AR-8 Dup)	Jun-22	*0.5 U*	*0.5 U*	25.6	27.6	**1,650**	*160 U*	*400 U*
	Jun-23	*0.5 U*	*0.5 U*	48.0	55.6	**3,360**	*160 U*	*400 U*
	Jun-24	*0.5 U*	*0.5 U*	208	70.3	**7,500**	*160 U*	*400 U*
AR-9	Nov-01	*1 U*	*1 U*	*1 U*	*2 U*	*50 U*	NA	NA
FD (AR-9 dup)	Nov-01	*1 U*	*1 U*	*1.1*	*2 U*	*50 U*	NA	NA
	Nov-02	*1 U*	*1 U*	*1 U*	*2 U*	*50 U*	NA	NA
	Dec-03	*1 U*	*1 U*	*1 U*	*2 U*	*50 U*	NA	NA
	Mar-06	*0.5 U*	*0.5 U*	*0.5 U*	*1 U*	*250 U*	*250 U*	NA
	Jun-10	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	*120 U*	*240 U*
	Dec-10	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	*130 U*	*270 U*
	May-14	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*100 U*	*20 U*	*50 U*
AR-10	Nov-01	**54**	13.7	*ND*	221	311	NA	NA
	Apr-02	3.1	*1.0 U*	3.5	*2.0 U*	*50 U*	NA	NA
	Nov-02	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	78	NA	NA
	Feb-03	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	NA	NA
	Jun-03	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	NA	NA
	Sep-03	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	NA	NA
	Mar-06	*0.5 U*	*0.5 U*	*0.5 U*	*1.0 U*	*250 U*	*250 U*	NA
	Jun-10	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	*120 U*	*240 U*
	Dec-10	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	*120 U*	*240 U*
	May-14	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*100 U*	*20 U*	*50 U*
AR-11	Mar-01	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	*230 U*	*560 U*
	Aug-01	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	NA	NA
	Nov-02	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	NA	NA
	Dec-03	*1.0 U*	1.9	*1.0 U*	1.1	*50 U*	NA	NA
	Mar-06	*0.5 U*	*0.5 U*	*0.5 U*	*1.0 U*	*250 U*	*250 U*	NA
	Jun-10	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	*120 U*	*240 U*
	Dec-10	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	*120 U*	*240 U*
	May-14	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*100 U*	*20 U*	*50 U*
	May-18	*0.5 U*	*0.5 U*	*0.5 U*	*0.5 U*	*100 U*	*50 U*	*250 U*
	Jun-19	*0.5 U*	*0.5 U*	*0.5 U*	*1.0 U*	*100 U*	*100 U*	*500 U*
	Jun-20	*0.5 U*	*0.5 U*	*0.5 U*	*1.0 U*	*100 U*	*160 U*	*400 U*
	Jul-21	*0.5 U*	*0.5 U*	*0.5 U*	*0.5 U*	*100 U*	*160 U*	*400 U*
	Jun-22	*0.5 U*	*0.5 U*	*0.5 U*	*0.5 U*	*100 U*	*160 U*	*400 U*
	Jun-23	*0.5 U*	*0.5 U*	*0.5 U*	*0.5 U*	*200 U*	*160 U*	*400 U*
	Jun-24	*0.5 U*	*0.5 U*	*0.5 U*	*0.5 U*	*200 U*	*160 U*	465
AR-12	Feb-03	**3,860**	**10,400**	**1,000**	**13,560**	**84,700**	NA	NA
	Jun-03	**3,810**	**8,060**	**731**	**9,190**	**55,100**	NA	NA
	Nov-07	NS	NS	NS	NS	NS	NS	NS
	Oct-08	NS	NS	NS	NS	NS	NS	NS
	Jun-10	NS	NS	NS	NS	NS	NS	NS
	Dec-10	NS	NS	NS	NS	NS	NS	NS
	May-14	NS	NS	NS	NS	NS	NS	NS

Appendix D

Tidewater Fuel Leak Site Historical Groundwater Monitoring Results

Pasco, Washington

Well ID	Date	Benzene MTCA Method A CUL= 5 (µg/L)	Toluene MTCA Method A CUL = 1,000 (µg/L)	Ethylbenzene MTCA Method A CUL= 700 (µg/L)	Total Xylenes MTCA Method A CUL = 1,000 (µg/L)	TPHg - Gas MTCA Method A CUL = 800/1,000 (µg/L)	TPHd - Diesel MTCA Method A CUL = 500 (µg/L)	TPHo - Heavy Oil MTCA Method A CUL = 500 (µg/L)
MW-1	Mar-01	**20**	21	*1.0 U*	*2 U*	110	*230 U*	*580 U*
	Aug-01	**1,890**	**1,900**	9.5	**1,109**	**5,980**	NA	NA
	Nov-01	**336**	**88**	1 U	**211**	321	NA	NA
	Apr-02	**880**	33	5.3	43	667	NA	NA
	Jul-02	**1,040**	22	41	40	**1,600**	NA	NA
	Nov-02	**434**	36	57	131	**1,040**	NA	NA
	Nov-02	**385**	31	38	95	712	NA	NA
FD (MW-1 dup)	Feb-03	**453**	19.7	43	43.8	263	NA	NA
	Feb-03	**369**	15	32	33.8	240	NA	NA
FD (MW-1 dup)	Jun-03	**240**	131	78	257	**841**	NA	NA
	Jun-03	**131**	68	35	128	**1,420**	NA	NA
FD (MW-1 dup)	Sep-03	**149**	77	38	145	589	NA	NA
	Sep-03	**112**	69	26	NR	431	NA	NA
FD (MW-1 dup)	Dec-03	**20.2**	58	3.1	26	102	NA	NA
	Dec-03	**8.0**	22	1.2	9.3	143	NA	NA
	Mar-06	*0.5 U*	0.71	8.4	8.7	250	*250 U*	NA
FD (MW-1 dup)	Mar-06	*0.5 U*	0.69	6.8	6.1	250	*250 U*	NA
	Nov-07	*0.2 U*	0.20	0.5	*0.6 U*	*50 U*	*190*	**670**
	Jun-10	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	*120 U*	*240 U*
	Dec-10	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	*120 U*	*240 U*
	May-14	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*100 U*	*20 U*	*50 U*
MW-2	Mar-01	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	*220 U*	*540 U*
	Aug-01	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	NA	NA
	Nov-01	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	NA	NA
	Nov-02	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	82	NA	NA
	Mar-06	*0.5 U*	*0.5 U*	*0.5 U*	*1.0 U*	*250 U*	*250 U*	NA
	Oct-08	*0.2 U*	*0.2 U*	*0.2 U*	*0.6 U*	*50 U*	78	*96 U*
	Jun-10	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	*120 U*	*250 U*
	Dec-10	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	*130 U*	*260 U*
	May-14	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*100 U*	*20 U*	*50 U*
MW-3	Mar-01	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	270	NA
	Aug-01	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	NA	NA
	Nov-02	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	117	NA	NA
	Mar-06	*0.5 U*	*0.5 U*	*0.5 U*	*1.0 U*	*250 U*	*250 U*	NA
	Oct-08	*0.2 U*	*0.2 U*	*0.2 U*	*0.6 U*	*50 U*	*80 U*	*100 U*
	Jun-10	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	*140*	*270 U*
	Dec-10	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	*120 U*	*250 U*
	May-14	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*100 U*	*20 U*	*50 U*
MW-4	Mar-01	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	*200 U*	*680 U*
	Aug-01	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	NA	NA
	Nov-01	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	NA	NA
	Nov-02	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	55	NA	NA
	Dec-03	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	NA	NA
	Mar-06	*0.5 U*	*0.5 U*	*0.5 U*	*1.0 U*	*250 U*	*250 U*	NA
	Oct-08	*0.2 U*	*0.2 U*	*0.2 U*	*0.6 U*	*50 U*	*77 U*	*97 U*
	Jun-10	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	*120 U*	*250 U*
	Dec-10	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	*140 U*	*280 U*
	May-14	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*100 U*	*20 U*	*50 U*
	May-18	*0.5 U*	*0.5 U*	*0.5 U*	*0.5 U*	*100 U*	*50 U*	*250 U*
	Jun-19	*0.5 U*	*0.5 U*	*0.5 U*	*1.0 U*	*100 U*	*100 U*	*500 U*
	Jun-20	*0.5 U*	*0.5 U*	*0.5 U*	*1.0 U*	*100 U*	*160 U*	*400 U*
	Jul-21	*0.5 U*	*0.5 U*	*0.5 U*	*0.5 U*	*100 U*	*160 U*	*400 U*
	Jun-22	*0.5 U*	*0.5 U*	*0.5 U*	*0.5 U*	*100 U*	*160 U*	*400 U*
	Jun-23	*0.5 U*	*0.5 U*	*0.5 U*	*0.5 U*	*200 U*	*160 U*	*400 U*
	Jun-24	*0.5 U*	*0.5 U*	*0.5 U*	*0.5 U*	*200 U*	*160 U*	*400 U*
MW-5	Mar-01	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	*200 U*	NA
	Aug-01	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	NA	NA
	Nov-02	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	**954**	NA	NA
	Mar-06	*0.5 U*	*0.5 U*	*0.5 U*	*1.0 U*	*250 U*	**4,300**	NA
	Nov-07	*0.2 U*	*0.2 U*	*0.2 U*	*0.6 U*	*50 U*	**1,300**	**1,100**
	Oct-08	*0.2 U*	*0.2 U*	*0.2 U*	*0.6 U*	*50 U*	91	*98 U*
	Jun-10	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	*120 U*	*250 U*
	Dec-10	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	*130 U*	*260 U*
	May-14	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*100 U*	*100 U*	*500 U*

Appendix D

Tidewater Fuel Leak Site Historical Groundwater Monitoring Results

Pasco, Washington

Well ID	Date	Benzene MTCA Method A CUL= 5 (µg/L)	Toluene MTCA Method A CUL = 1,000 (µg/L)	Ethylbenzene MTCA Method A CUL= 700 (µg/L)	Total Xylenes MTCA Method A CUL = 1,000 (µg/L)	TPHg - Gas MTCA Method A CUL = 800/1,000 (µg/L)	TPHd - Diesel MTCA Method A CUL = 500 (µg/L)	TPHo - Heavy Oil MTCA Method A CUL = 500 (µg/L)
MW-6	Mar-01	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	*190 U*	*480 U*
	Aug-01	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	NA	NA
	Nov-01	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	NA	NA
	Nov-02	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	62	NA	NA
	Sep-03	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	NA	NA
	Dec-03	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	NA	NA
	Mar-06	*0.5 U*	*0.5 U*	*0.5 U*	*1.0 U*	*250 U*	*250 U*	NA
	Jun-10	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	*120 U*	*240 U*
	Dec-10	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*50 U*	*120 U*	*240 U*
	May-14	*1.0 U*	*1.0 U*	*1.0 U*	*2.0 U*	*100 U*	*20 U*	*50 U*
	May-18	*0.5 U*	*0.5 U*	*0.5 U*	*0.5 U*	*100 U*	*50 U*	*250 U*
	Jun-19	*0.5 U*	*0.5 U*	*0.5 U*	*1.0 U*	*145*	*100 U*	*500 U*
	Jun-20	*0.5 U*	*0.5 U*	*0.5 U*	*1.0 U*	*100 U*	*160 U*	*400 U*
	Jul-21	*0.5 U*	*0.5 U*	*0.5 U*	*0.5 U*	*100 U*	*160 U*	*400 U*
	Jun-22	*0.5 U*	*0.5 U*	*0.5 U*	*0.5 U*	*100 U*	*160 U*	*400 U*
	Jun-23	*0.5 U*	*0.5 U*	*0.5 U*	*0.5 U*	*200 U*	*160 U*	*400 U*
	Jun-24	*0.5 U*	*0.5 U*	*0.5 U*	*0.5 U*	*200 U*	*160 U*	*400 U*
MW-7	Mar-01	**990**	**3,000**	130	**1,260**	**11,000,000**	**1,240**	**510**
	Nov-07	**70**	530	53	930	**7,000**	**2,000**	300
	Dec-10	*1.0 U*	4.1	*1.0 U*	27	350	*120 U*	*240 U*
	May-14	**88**	**1,910**	133	**2,702**	**19,200**	*20 U*	*50 U*
MW-8	Mar-01	**5,300**	**17,000**	**1,500**	**10,800**	**77,000,000**	**72,400**	**1,210**
	Feb-03	**3,630**	**8,540**	**931**	**8,450**	**51,500**	NA	NA
	Jun-03	**6,490**	**14,500**	**1,320**	**12,590**	**80,900**	NA	NA
	Mar-06	**183**	**5,440**	452	**5,140**	**25,700**	**8,400**	NA
	Nov-07	**29**	**2,200**	**410**	**5,500**	**36,000**	**6,500**	**1,900 U**
	Dec-10	2.4	500	210	**2,000**	**9,900**	**2,500**	*260 U*
	May-14	*1.0 U*	286	462	**4,920**	**27,000**	*20 U*	*50 U*
	May-18	*0.5 U*	3.8	*0.5 U*	*0.5 U*	**3,540**	*50 U*	*250 U*
	Jun-19	*0.5 U*	8.10	61.8	810	**5,190**	*100 U*	*500 U*
	Jun-20	*10.0 U*	*25 U*	106	**1,241**	**8,130**	*160 U*	*400 U*
	Jul-21	*12.5 U*	15.5	120	**1,357**	**11,300**	*160 U*	*400 U*
	Jun-22	*0.5 U*	2.6	40	502	**3,980**	*160 U*	*400 U*
	Jun-23	*0.5 U*	1.53	45.5	607	**8,900**	*160 U*	*400 U*
FD (MW-8 dup)	Jun-23	*0.5 U*	1.76	65.0	855	**7,800**	*160 U*	*400 U*
	Jun-24	*0.5 U*	16.5	68	873	**7,400**	*160 U*	*400 U*
FD (MW-8 dup)	Jun-24	*0.5 U*	0.5 U	23.0	249.6	**3,160**	*160 U*	*400 U*

Notes:

Based on Washington Department of Ecology Method A cleanup levels in Table 720-1 of the Model Toxics Control Act, Oct 2007.

µg/L - Micrograms per liter

BOLD - Exceeds MTCA Method A Cleanup Level (CUL)

U = Analyte not detected above method reporting limit

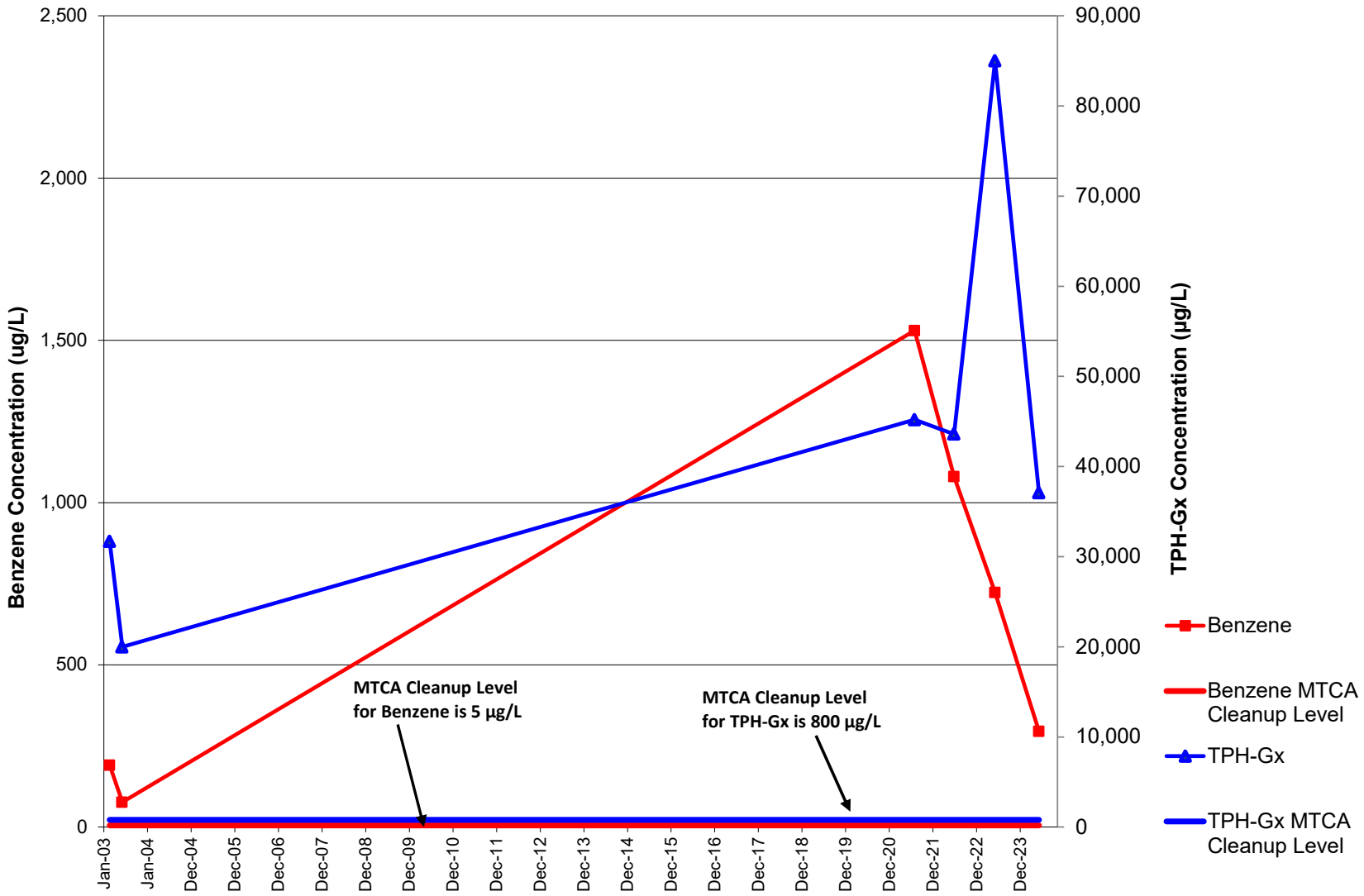
J = Analyte value is estimated

NS = Not Sampled for one of the following reasons: insufficient water in well, presence of liquid hydrocarbons, inaccessibility, date was between sampling events, or well no longer in sampling program.

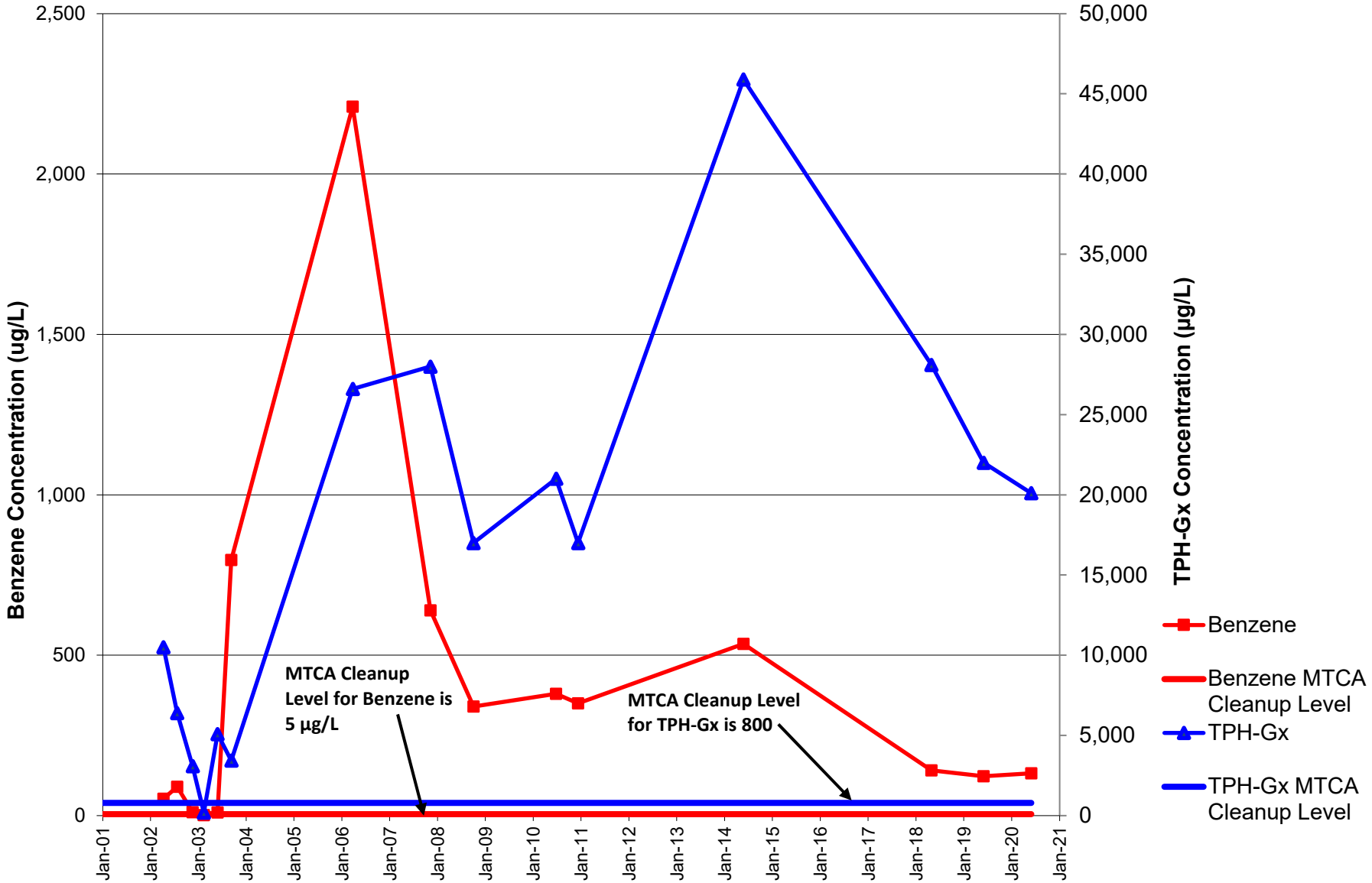
N/A = Not applicable or not available

FD = Field duplicate

APPENDIX E
Historical Time Series Plots of Detected Benzene and/or TPHg Concentrations

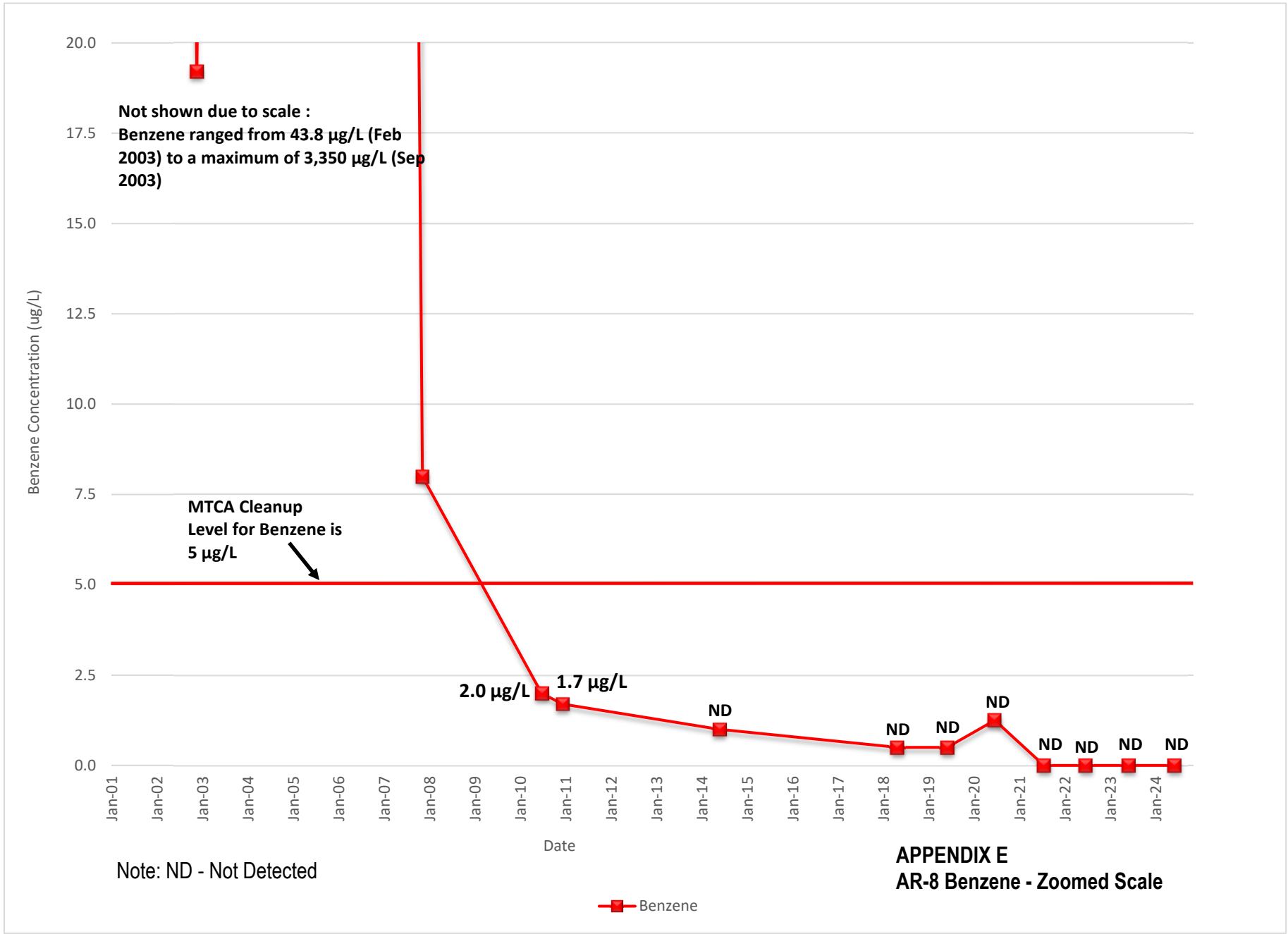


APPENDIX E
AR-1 Benzene and TPH-Gx Concentrations
Tidewater Fuel Leak Site



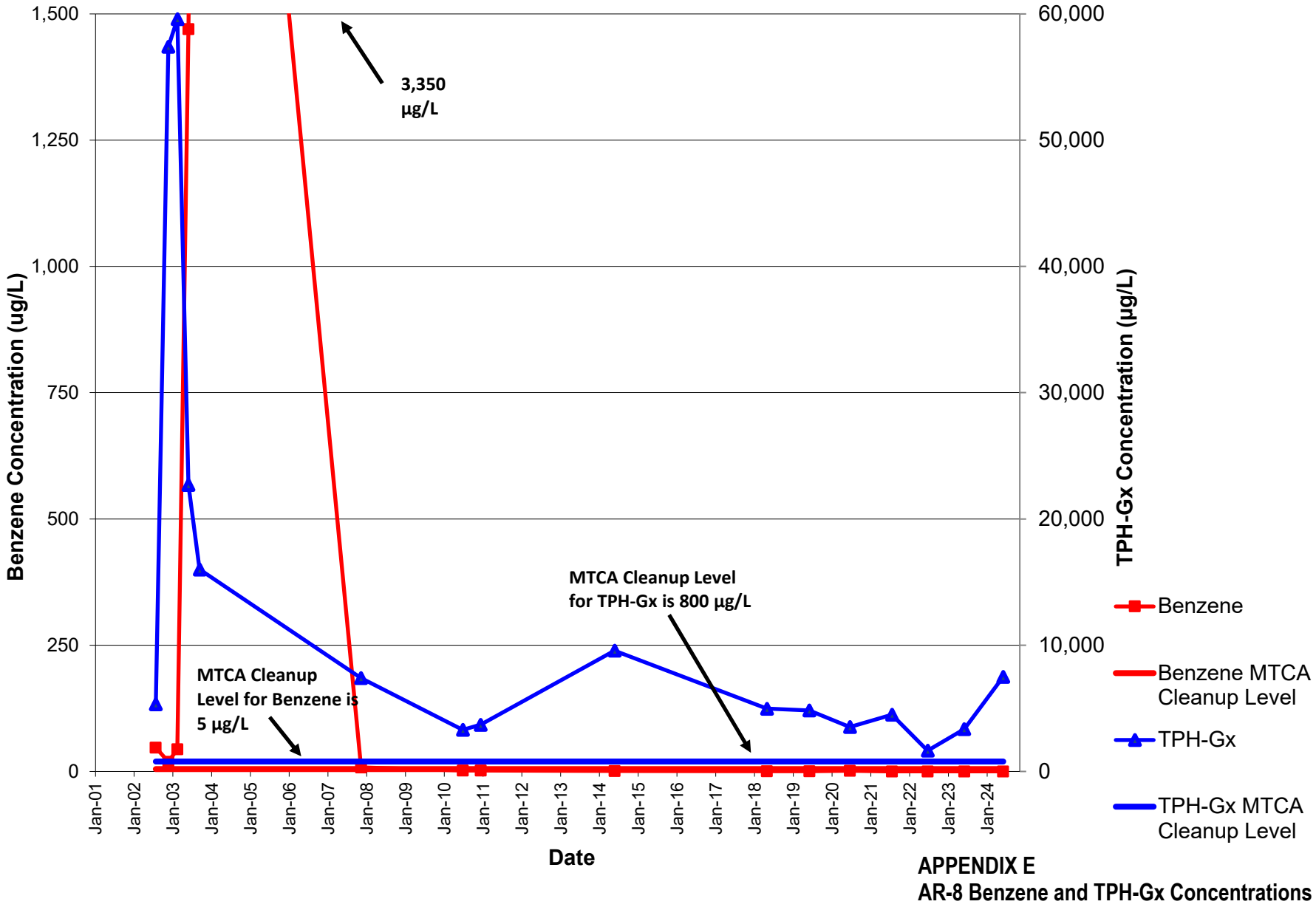
APPENDIX E
AR-4 Benzene and TPH-Gx Concentrations

GeoEngineers



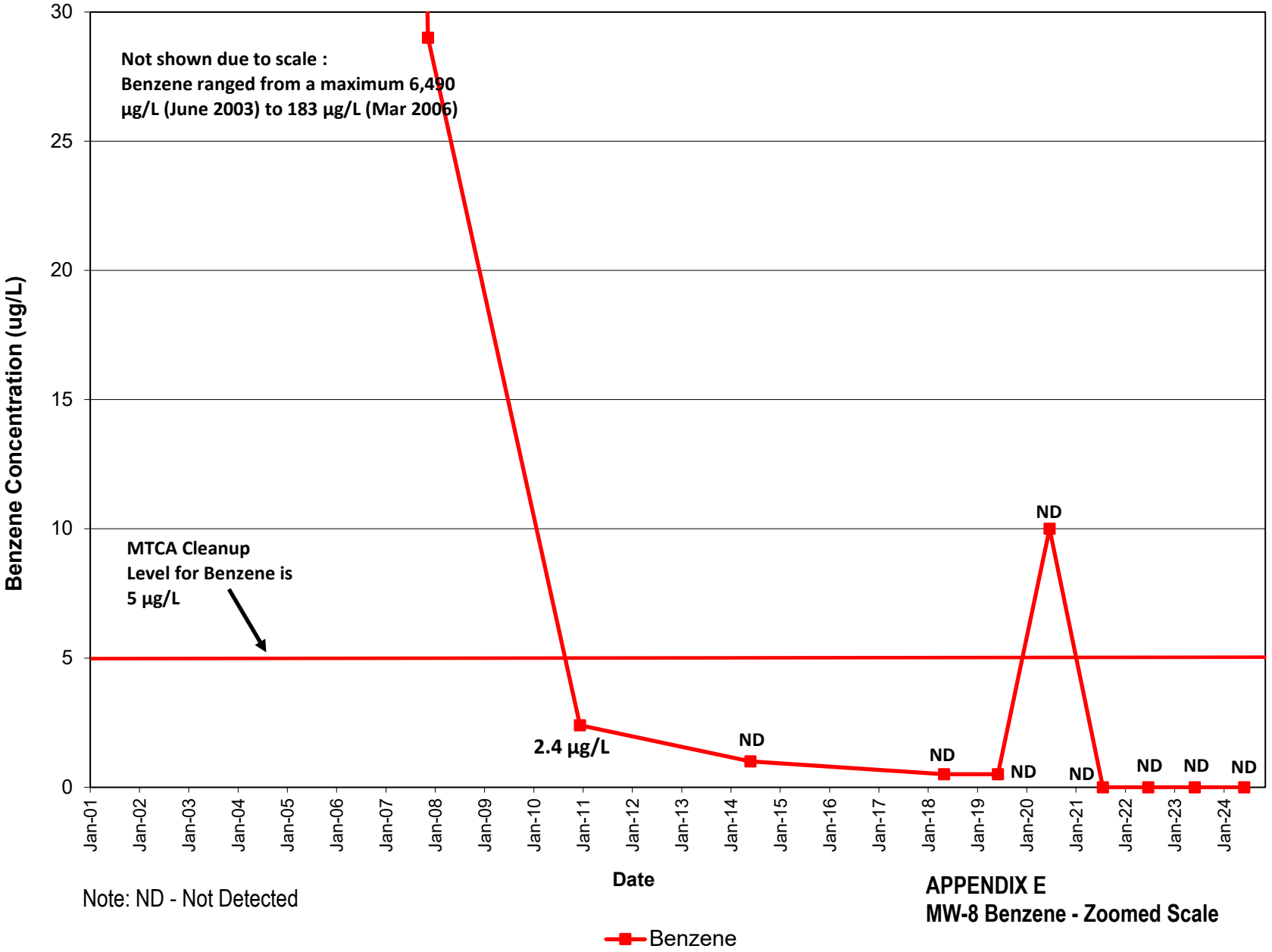
Note: ND - Not Detected

APPENDIX E
AR-8 Benzene - Zoomed Scale



APPENDIX E
AR-8 Benzene and TPH-Gx Concentrations

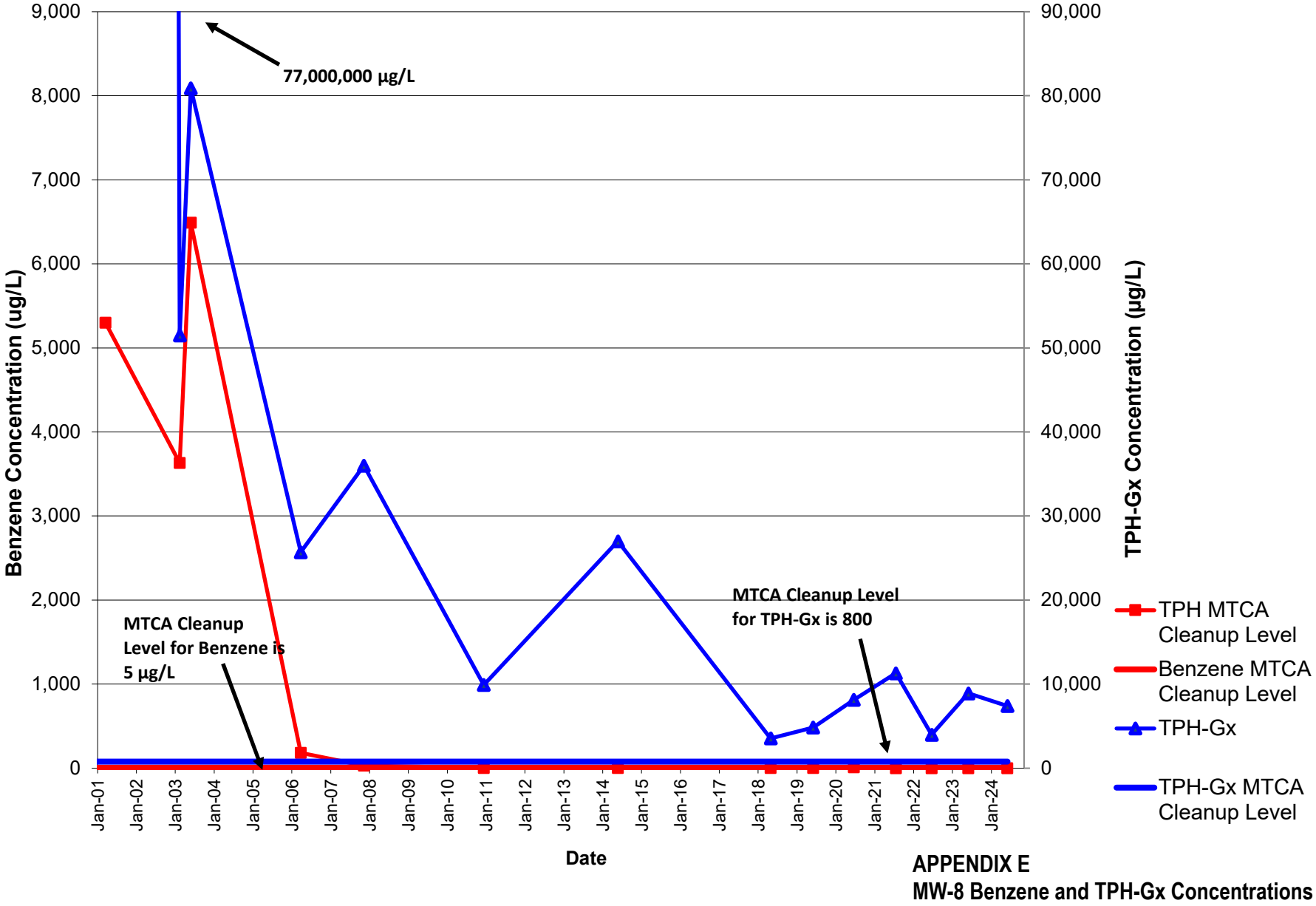
GeoEngineers



Note: ND - Not Detected

APPENDIX E
MW-8 Benzene - Zoomed Scale

GeoEngineers



APPENDIX E
MW-8 Benzene and TPH-Gx Concentrations

GeoEngineers

APPENDIX F

Ecology's Review Report

First Periodic Review
Tidewater Fuel Line Leak

2900 Sacajawea Park Rd Pasco, 99301
Facility Site ID: 2331, Cleanup Site ID: 39378684

Toxics Cleanup Program, Eastern Region

Washington State Department of Ecology
Spokane, Washington

June 2024

Document Information

This document is available on the Department of Ecology's ZZZZ[1]

Related Information

- Facility Site ID: 2331
- Cleanup Site ID: 39378684

Contact Information

Toxics Cleanup Program

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Phone: 509-385-8380

Website: Washington State Department of Ecology[2]

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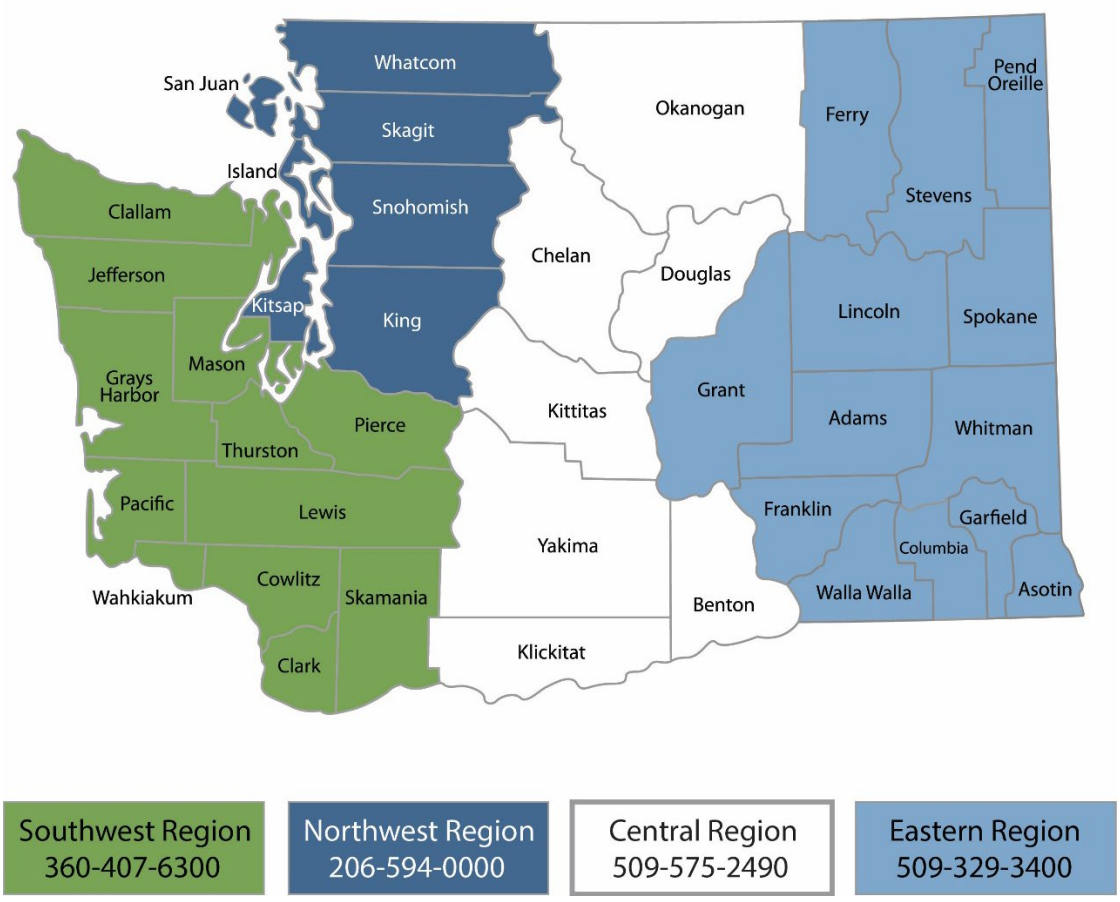
[1] https://ZZZZ
[2] https://ecology.wa.gov/About-us/Who-we-are/Our-Programs/Toxics-Cleanup
[3] https://ecology.wa.gov/About-us/Accountability-transparency/Our-website/Accessibility

Department of Ecology's Regional Offices

Map of Counties Served



Region	Counties served	Mailing Address	Phone
Southwest	Clallam, Clark, Cowlitz, Grays Harbor, Jefferson, Mason, Lewis, Pacific, Pierce, Skamania, Thurston, Wahkiakum	PO Box 47775 Olympia, WA 98504	360-407-6300
Northwest	Island, King, Kitsap, San Juan, Skagit, Snohomish, Whatcom	PO Box 330316 Shoreline, WA 98133	206-594-0000
Central	Benton, Chelan, Douglas, Kittitas, Klickitat, Okanogan, Yakima	1250 W Alder St Union Gap, WA 98903	509-575-2490
Eastern	Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, Whitman	4601 N Monroe Spokane, WA 99205	509-329-3400
Headquarters	Across Washington	PO Box 46700 Olympia, WA 98504	360-407-6000

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Introduction

The Washington State Department of Ecology (Ecology) reviewed post-cleanup site conditions and monitoring data to ensure human health and the environment are being protected at the Tidewater Fuel Line Leak cleanup site (Site). Site cleanup was implemented under the Model Toxics Control Act (MTCA) regulations, Chapter 173-340 Washington Administrative Code (WAC). This is the first periodic review conducted for this Site. Ecology completed the Cleanup Action Plan for the Site in November 2016.

Cleanup activities at this Site were completed under a Consent Decree (CD) filed in Washington State Superior Court for Benton-Franklin County on November 22, 2016 (Ecology, 2016a). Total petroleum hydrocarbons as gasoline (TPH-g) is the primary hazardous indicator substance that remains on the property. Other indicator hazardous substances found at the Site are described below. The MTCA cleanup levels for soil and groundwater are established under WAC 173-340-740[4] and WAC 173-340-720,[5] respectively.

Ecology determined institutional controls in the form of a restrictive covenant would be required as part of the cleanup action for the Site. WAC 173-340-420(2)[6] requires Ecology to conduct a periodic review of certain sites every five years. For this Site, a periodic review is required because the department approved the cleanup actions under a CD.

When evaluating whether human health and the environment are being protected, Ecology must consider the following factors (WAC 173-340-420(4)):

a) The effectiveness of ongoing or completed cleanup actions, including the effectiveness of engineered controls and institutional controls in limiting exposure to hazardous substances remaining at the site

b) New scientific information for individual hazardous substances or mixtures present at the site

c) New applicable state and federal laws for hazardous substances present at the site

d) Current and projected site and resource uses

e) The availability and practicability of more permanent remedies

f) The availability of improved analytical techniques to evaluate compliance with cleanup levels

Ecology publishes a notice of all periodic reviews in the *Site Register* and provides an opportunity for public comment.

[4] https://app.leg.wa.gov/WAC/default.aspx?cite=173-340-740
[5] https://app.leg.wa.gov/WAC/default.aspx?cite=173-340-720
[6] https://app.leg.wa.gov/wac/default.aspx?cite=173-340-420

Summary of Site Conditions

Site description and history

The Site is located on an easement that crosses the former Chevron Pipeline Company (CPL) Pasco Bulk Terminal (Pasco Terminal) Site located in Pasco, Washington. Tesoro Logistics Operations LLC (Tesoro) purchased the CPL Pasco Terminal site from Chevron in 2015. The Pasco Terminal is located southwest of the intersection of U.S. Highway 12 and Sacajawea Park Road, east of the City of Pasco in Franklin County, Washington (Figure 1) and is situated on the north bank of the Snake River (Lake Wallula).

The Pasco Terminal is an active facility that has been in operation since September 1950. It is used for bulk storage of refined fuel products, which are delivered through pipelines and by barge. Pipelines transfer the product between the terminal and barge facility. Petroleum products (currently diesel, gasoline, and jet fuel) and ethanol are stored in 18 aboveground storage tanks.

Tidewater (and its predecessors) own and operate pipelines that transfer products between the Pasco Terminal and the adjacent Tidewater Terminal, located approximately ¾-mile upstream on the Snake River of the Pasco Terminal. The Pasco Terminal Site and Tidewater site is shown on Figure 1.

Petroleum products have been released at various times from tanks, pipelines, and other facilities within the formerly owned CPL Pasco Terminal. CPL and Tidewater conducted soil and groundwater investigations and performed remedial activities to address these historical releases, including at the Site. These activities are described in the Remedial Investigation/Feasibility (RI/FS) Report, dated September 29, 2011 (URS, 2011). In July 2000, a leak in a Tidewater pipeline resulted in the release of an estimated 41,000 gallons of gasoline at the Site. The release occurred in the northwest portion of the Pasco Bulk Fuel Terminal, the Tidewater Site. Interim cleanup of this spill took place between 2000 and 2006 and is described below.

At the time of the RI/FS (URS 2011), the site encompassed both the CPL Pasco Terminal and the Tidewater Pipeline Fuel Leak Site. In July 2015, Ecology made the decision to separate the site into two Sites: the area associated with the Tidewater Fuel Pipeline Leak Site and the Tesoro (former CPL) release site (Ecology, 2016b). Therefore, this periodic review only addresses activities related to the Tidewater Site located within the Tesoro Pasco Terminal that is hereafter referred to as the “Site”.

Physical Setting

The Site is located in Section 35, Township 9 North, Range 30 East, Willamette Meridian. Topographic map coverage of the Site and vicinity is provided by the Pasco Quadrangle, U.S. Geological Survey, 7.5-minute series dated 1992. The upland portion of the Site is about 420 feet above sea level using the National Geodetic Vertical Datum (NGVD) of 1929.

The 33-acre former CPL Pasco Bulk Fuel Terminal is situated along the north bank of the Snake River (Lake Wallula) and is bordered by unimproved land on three sides (Figure 1). The Site is situated along an easement which crosses the Pasco Bulk Fuel Terminal and encompasses about three acres. (Figure 2) Land use in the vicinity is limited with most of it being agricultural. The general land slope is relatively flat with a sharp decline from the tank storage area to the Snake River located 1,100 feet south of the Site (Figure 1). Ground surface at the Site is mostly compacted sand and gravel.

Regional and Site Geology

The Site is situated within the Pasco Basin. The basin is underlain by three major stratigraphic units, which are in ascending order: the Columbia River Basalt Group; the Ringold Formation; and the Hanford Formation. The thick sequence of flood basalts was deposited during the Miocene Era resulting in a total thickness of over 15,000 feet (Drost, et. al, 1997). The basalt formations found in the area include the Saddle Mountains Basalt that overlies the Wanapum Basalt which in turn overlies the Grande Ronde. Overlaying the basalt is the Ringold Formation. The Ringold, deposited during the Pliocene, consists of four units recognized by textural class, and consist of the following soil types listed in ascending order:

- Basal units consisting of sand and gravel;
- Lower unit comprised of silt and clay;
- Middle unit composed of sand, gravel, and silt; and
- Upper unit consisting of sand and silt.

Pleistocene glacial flood deposits sit atop the Ringold Formation (Ecology 2016b). The Pleistocene age Hanford Formation is composed of two units: the lower Pasco Gravels; and the overlying Touchet Beds. The Pasco gravels are comprised of sand or sand and gravel while the Touchet Beds consist of silt and sand.

The upper Site soil profile consists of brown to gray, fine to coarse-grained sand with some gravel (Ecology 2016b). The gravel portion appears to increase with depth. The gravel is dense, mostly fine to coarse with some sand and trace amounts of silt. The gravel lithology is mostly basalt and is typically sub-angular to sub-rounded.

Regional Hydrogeology

The Pasco Basin is a subset of the regional Columbia Plateau aquifer system. The Columbia Plateau Regional Aquifer System (CPRAS) covers over 50,000 square miles of eastern Oregon and Washington and western Idaho (Kahle, et. al, 2011). The basalts may be as thick as 16,000 feet in the Site area (Drost , et al. 1990). The Columbia River Basalt Group (CRBG) are the primary aquifers in the region. However, the alluvial aquifers are important in some areas of the Columbia Plateau, including in the Site area since they are readily accessible and are capable of high yields. The groundwater flow direction in the alluvial and basalt aquifers is typically toward the rivers.

The alluvial aquifers known collectively as the Pasco Gravels in the Site area range in thickness from 50 to 200 feet (Whitehead, 1994). In the Site area, yields as high as 3,500 gallons per minute (gpm) have been reported in wells completed in the Pasco Gravels.

Site Hydrogeology

Groundwater levels have been monitored at the Pasco Bulk Fuel Terminal since the first monitoring wells were installed in 1983. Based upon Site groundwater elevations, groundwater beneath the Site generally flows to the southeast toward the Snake River. The aquifer at the Site is unconfined and is usually encountered about 80 feet below ground surface (bgs). Groundwater levels can fluctuate between 2 to 5.5 feet over a season as observed during more than 37 years of monitoring.

Site investigations

Tidewater Emergency Site Interim Action 2000-2006

In July 2000, a leak in a Tidewater pipeline resulted in the release of an estimated 41,000 gallons of gasoline at the Site. The release occurred in the northwest portion of the Pasco Bulk Fuel Terminal and is referred to as the Tidewater area (Figure 2). An emergency response effort was undertaken to characterize the release and begin remedial efforts to minimize impacts of the release. During the emergency response phase, Ecology's Spill Response Program provided oversight to the efforts conducted to address the release. The efforts were directed at identifying the extent of contamination and beginning free product recovery. By September 2000, the emergency response phase of the project was concluded when Tidewater demonstrated the free product plume was contained.

Prior to September 2000, Tidewater installed twelve monitoring wells in the release area to characterize the extent of free product. Four vapor extraction wells were installed within the soil contaminant area to assist in defining the free product plume. Total fluids recovery pumps were placed in several monitoring wells. About 8,000 gallons of liquid phase free product were recovered and sent off-site for reprocessing and eventual re-use. Along with the monitoring wells, an SVE system was installed during the emergency phase to assist in product recovery. Vapor phase recovery removed between 25,000 to 27,000 gallons of petroleum hydrocarbons which were destroyed on-site with thermal or catalytic oxidation. In February and March 2001, additional investigation work was completed at the Site to support the design and installation of an air sparging system.

Eight additional monitoring wells along with seventeen sparge points were completed in and adjacent to the free product pool. The air sparging in combination with the SVE system was designed to reduce the free product pool and enhance biodegradation in the upper saturated zone. Bioventing was included as part of the interim cleanup action. Wells MW-2, MW-3, and MW-4 wellheads were fitted with vent caps and filters to provide passive atmosphere into the subsurface. These were originally initiated under active vapor extraction operations to limit the lateral extent of the vapor extraction/negative pressure influence from extending outside the Tidewater release area and potentially pulling vapors from other release areas outside the Site.

By February 2003, the free product pool had diminished to the point where only sheen was visible in some monitoring wells. Tidewater monitoring wells were sampled from February 2003 through December 2003. The sampling results indicated the remedial actions successfully addressed the free product plume while stabilizing the dissolved phase plume. Supplemental sampling completed in March 2006 confirmed the results of the 2003 sampling events and indicated that the dissolved phase plume had decreased in size as well as in concentration.

CPL and Site-Wide Activities 2007-2016

Between 2007 and 2011 CPLP and Tidewater conducted remedial investigation (RI) and conducted a feasibility study (FS). The final RI/FS report combining the results from RI investigation and the FS work was finalized in 2012 (URS, 2011) As part of the RI/FS in 2007 and 2008, CPL completed two sampling events that included the sampling of CPL's wells and a limited number of Tidewater monitoring wells.

Free product was not observed in any of the CPL or Tidewater monitoring wells during the sampling. Sheen was observed on purge water collected from five of the Tidewater wells sampled in 2007. In 2010, a joint field investigation was conducted by URS (representing CPL) and CH2M HILL (representing Tidewater) Tidewater's and referred to in the Site Cleanup Action Plan (Ecology 2016b). The investigation included well maintenance and rehabilitation, a civil survey of monitoring wells, and groundwater sampling. The civil survey placed site wells on the same vertical datum, which allowed for preparing groundwater elevation contour, flow direction, and gradient maps.

A site-wide groundwater sampling event was completed in June 2010. Nine CPL wells and eleven Tidewater wells were sampled for this event.. Another site-wide groundwater sampling event was performed in December 2010. The groundwater sampling results from both events indicate petroleum hydrocarbon concentrations have decreased or remain stable at the Site. After the completion of the RI/FS report in 2012, CPL sold its portion of the Pasco Terminal to Tesoro Logistics Operations LLC (Tesoro) in 2013.

Separation of the Site from the Pasco Terminal site in 2016

At the time when the RI/FS investigation and reporting took place, the Site encompassed the Pasco Terminal and the Tidewater Pipeline. In order to best facilitate site cleanup, in July 2015 Ecology made the decision to separate the Site into two separate sites. The Site discussed in this document is the area associated with the Tidewater pipeline release and related groundwater plume with a cleanup site identification number 2331. The other site is that the area associated with the Tesoro (former CPL) releases and related groundwater plumes on the Tesoro property with a cleanup site identification number 4867.

Site cleanup action

In the November 2016 CAP (Ecology, 2016b) Ecology selected Alternative 1: Institutional Controls and Monitored Natural Attenuation (MNA) as the preferred cleanup action that would be protective of human health and the environment at the Site. While the groundwater is not currently used as such at the Site, the highest beneficial use of groundwater is as a drinking water source.

Site Cleanup Action Implementation, MNA Methodology

Recorded field parameters includes dissolved oxygen (DO), oxygen reduction potential (ORP), pH, temperature, and specific conductance. In addition to using the field parameters to determine when representative samples can be collected, DO and ORP is also recorded (Table 1) to confirm continued biodegradation of dissolved phase petroleum hydrocarbons.
Groundwater samples are collected and analyzed annually for the Site indicator hazardous substances (IHS): benzene, toluene, ethylbenzene, total xylenes, gasoline-, diesel-, and heavy oil-range petroleum hydrocarbons (Table 2).
Sampling and analysis of the key parameters of natural attenuation: alkalinity, ferrous iron, manganese, sulfate, and nitrate are performed in the following wells:AR-1 (since 2021), AR-4 (until 2020), AR-8, MW-4, MW-6, and MW-8. Tidewater prepared the Site compliance monitoring plan (CMP) in 2017 (CH2M, 2017) and the first annual groundwater monitoring event in accordance with the CAP took place in 2018.
Groundwater monitoring events since the implementation of the CAP in 2017 show that contamination remains within the Site and does not extend beyond the areas of the cleanup action.

Reasonable Restoration Timeframe defined in the CAP

In the Site CAP a ten-year restoration time frame was estimated, based on the contamination attenuation observed at the time the CAP was prepared.

Cleanup standards

Cleanup standards include cleanup levels, the location where these cleanup levels must be met (point of compliance), and any other regulatory requirements that apply to the Site.

Cleanup levels

The CD identified MTCA Method A cleanup levels as applicable to the Site in accordance with WAC 173-340-704.[7] The cleanup levels for the Site IHS were developed considering the existing Site conditions, known exposure pathways, anticipated receptors for the current Site activities, nearby land uses, and current and potential future beneficial uses of groundwater. The primary beneficial use of the groundwater beneath the Site is as a drinking water source. Site indicator

[7] https://app.leg.wa.gov/WAC/default.aspx?cite=173-340-704

substances and cleanup levels are provided in Table 2. The process used to develop the cleanup levels is described in the CAP (Ecology 2016b).

Points of compliance

The CD defines the Site as the area affected by the IHS above MTCA Method A cleanup levels. The point of compliance established for soil is based on protection of groundwater per WAC 173-340-900[8] and is defined as throughout the lateral extent of the Site from the surface extending vertically below the water table.

The groundwater point of compliance was established as throughout the Site from the uppermost level of the saturated zone to the lowest depth that could possibly be affected by the Site.

Restrictive Covenant

Ecology determined that institutional controls would be required as part of the cleanup action to document the remaining contamination, protect the cleanup action, and protect human health and the environment. However, due to the industrial use of the Site and the planned long-term use of the Site, a formal restrictive covenant has not been recorded for the Site at the Franklin County court system.

The CAP and the CMP determined that:

1. No groundwater may be taken from the parcel, except for purposes related to the Remedial Action, such as groundwater monitoring.
2. The PLP will monitor the groundwater and confirm natural attenuation is reducing contamination. Monitoring will continue until data show that cleanup levels have been met in groundwater for a minimum of four consecutive sampling events within designated monitoring networks. The residual contamination that is the subject of this Covenant consists of petroleum hydrocarbons and polynuclear aromatic hydrocarbons and is located in the area shown in Exhibit "A". Remediation or removal of these contaminants must be addressed before the owner or successor owner alters or modifies the property in any manner that causes the residual contamination to be exposed or accessible.

Operations and maintenance

There are no operating remediation systems at the Site. The current system of Site monitoring wells is inspected for potential damage or problems during the annual groundwater sampling events and repaired as needed.

On July 21, 2021, upon discovery of damage in well AR-4, representatives of GeoEngineers and Tidewater observed video camera deployment into wells AR-1 and AR-4 by Environmental West

[8] https://apps.leg.wa.gov/WAC/default.aspx?cite=173-340-900

Exploration of Spokane, Washington. The results of the inspection and subsequent repairs are reported in the 2021 Annual Report (GeoEngineers, 2021). Well AR-1 was installed at the source location for spill that occurred in 2000. The study showed that the well AR-1 casing was intact and generally straight throughout. The screened interval inside AR-1 was redeveloped in accordance with the procedures described in GeoEngineers (2021). The sampling pump lost in the base of AR-4 during the 2020 monitoring event could not be retrieved. Ecology approved the use of AR-1 for compliance monitoring in place of the damaged AR-4. Steel monuments were installed over wells AR-4 and AR-8 during the July 2021 monitoring event; remaining protective well covers at the Site were considered to still be sufficiently protective of remaining wells at this time (GeoEngineers, 2021).

Performance monitoring

Performance monitoring is conducted to demonstrate when the cleanup action has attained cleanup standards. In accordance with the final CMP (CH2M, 2017), performance monitoring comprises groundwater monitoring, including monitoring of geochemical parameters that are indicators of natural attenuation of petroleum hydrocarbons and biological activity in particular. As discussed above, wells MW-2, MW-3, and MW-4 wellheads were fitted with vent caps and filters before 2006 as part of the historic Site interim action to provide passive atmosphere into the subsurface. These well heads have been maintained as part of a passive bioventing system and is proposed to continue under the compliance monitoring.

Groundwater monitoring

The six on-Site groundwater monitoring wells (AR-1, AR-8, AR-11, MW-4, MW-6, and MW-8) that are currently part of the natural attenuation parameter monitoring program area are also part of the groundwater analytical monitoring program. AR-1 replaced damaged well AR-4 in 2021 as a compliance well, as discussed above. Additionally, groundwater elevations are measured annually in a total of eleven on-Site wells including the six analytical groundwater monitoring wells. Table 1 provides groundwater monitoring well information such as well head elevation, depth to groundwater, groundwater elevation and 2023 field monitoring results from these eleven wells. Figure 2 shows the current monitoring wells that are sampled and analyzed as well as the wells where groundwater levels are recorded during the annual sampling event. Groundwater compliance monitoring has been conducted annually since 2018 to ensure no off-Site migration of hazardous materials.

Free-phase petroleum product monitoring

A check for free product is performed as part of the annual monitoring in the eleven wells in part of the current monitoring program.

Site Maintenance Work during the Review Period

In 2021, well AR-4 was replaced with well AR-1 due to irreparable damage to well AR-4 as discussed above. Groundwater contaminant concentrations and key natural attenuation parameters from the last monitoring event in 2023 are presented in Table 3. Additionally in

2021, a monument well cover was installed to protect well AR-8 from potential on-Site vehicles and equipment.

Periodic Review

Effectiveness of completed cleanup actions

During the Site visit conducted on May 20, 2024, Ecology found no indications the integrity of the remedial action has been compromised. There were no indications of undocumented Site excavation or disturbance activities, and no visual indications of possible disturbance of the asphalt surface. However, several wells are unprotected from vehicles and power equipment. A number of wells with flush-mounted covers do not have gaskets or are missing bolts holding the cover in place. Two wells: MW-01 and AR-02 could not be found and are currently missing. Some of the wells that are part of the interim action remedial system such as MW-05, MW-07, and MW-08 are exposed to the environment without covers. Table 4 presents recommended actions for the well heads observed by Ecology during the site visit. A photo log is in Appendix D.

Direct contact

Cleanup actions at the Site are intended to eliminate human exposure to groundwater at the Site. The exposure pathways to contaminated groundwater and free product (ingestion, direct contact) have been removed by limiting and controlling access to the Site, the interim emergency cleanup actions, and the restriction on groundwater use from the Site in the Cleanup Action Plan.

Institutional controls

The Covenant for the Site is not in place. This Covenant would prohibit groundwater use from any well in the property, prohibit activities that would result in the release of contaminants contained as part of the cleanup without Ecology's approval, and prohibit other uses. A Covenant would maintain the integrity of the Site surface.

Monitoring results

Groundwater gradients and groundwater flow 2018-2023

Groundwater is found at the Site approximately 80 ft below the ground surface. Between 2018 and 2023, the groundwater elevation ranged between 243.00 and 244.61 feet above mean sea level (NVGD29). The groundwater gradient for the site is flat with less than 0.001 foot/feet (ft/ft) variation between upgradient and downgradient wells. These groundwater elevations are consistent with historical measurements. Groundwater elevations measured during the June 2023 monitoring event were approximately 0.065 feet higher than were measured in June

2022. Groundwater elevations from the last groundwater monitoring event in 2023 are presented in Figure 3. Since 2010 groundwater elevations have declined 0.7 feet on average. The groundwater flow direction to the south was inferred based on historical groundwater elevations and groundwater plume geometry. Historical groundwater elevations are presented in Appendix A.

Groundwater monitoring

Petroleum hydrocarbons were not detected in wells AR-11, MW-4, or MW-6 above laboratory reporting limits since the inception of the Site compliance monitoring program in 2018. Wells AR-1, AR-4, AR-8, and MW-8 have all contained concentrations of IHS above the Site CULs since the Site CMP was implemented in 2016. Gasoline-range TPH concentrations exceeding the Site CUL have been detected in wells AR-1, AR-4, AR-8, and MW-8 since the compliance monitoring program was implemented in 2018. Benzene, toluene, and total xylenes concentrations exceeding the Site CULs were detected in wells AR-1 and AR-4 since 2018 with one detection of ethylbenzene in 2021 exceeding the Site CUL in well AR-1. Historical groundwater monitoring data is presented in Appendix B. Field parameter data presented in Table 1 from the last sampling event at the Site in 2023 show that wells with historic and existing petroleum hydrocarbon detections also have negative oxidation-reduction potential (ORP) values that indicate reducing conditions. Similarly, lower dissolved oxygen (DO) detections are also noted in these wells, also indicating anaerobic conditions. Well AR-1, sampled in place of AR-4 and located within the center of the petroleum hydrocarbon plume directly downgradient for the release area, has the highest contaminant level exceeding Site CULs. Figure 4 shows the latest groundwater analytical data from the last annual groundwater sampling event conducted in June 2023,

Time series plots for benzene and TPH-g are provided in Appendix C from wells AR-1, AR-4, AR-8, and MW-8. These plots show stable to increasing concentrations of TPH-g in wells AR-1 and AR-4. The TPH-g trends in wells AR-8 and MW-8 are showing a gradual decrease. Benzene concentration well above the Site CUL in wells AR-1 and AR-4 show a stable or a slightly decreasing trend. Well AR-1, located within the center of the petroleum hydrocarbon plume directly downgradient for the release area, had the highest TPH-g and BTEX concentrations at the site. TPH-g, benzene, toluene, and xylenes consistently exceed Site CULs. Hydrocarbons detected in the diesel range in well AR-1 and AR-4 during the last five years of groundwater monitoring were attributed to weathered gasoline, which is consistent with the 2000 release of unleaded gasoline.

Free product monitoring results

No free product has been detected in any of these wells since 2010 (well AR-1). Last time sheen was observed in any of the wells was in 2014 in well AR-1.

Monitored Natural Attenuation and an Estimate of Site Restoration Timeframes

In 2023 GeoEngineers evaluated the natural attenuation rate of residual petroleum contamination at the site. GeoEngineers used BIOSCREEN Natural Attenuation software for quantitative estimates of restoration timeframes. Further description of the evaluation can be found in the 2023 annual groundwater monitoring report (GeoEngineers, 2023). Individual BTEX

compounds were modeled in BIOSCREEN to evaluate predicted biodegradation at the site. BTEX constituent cleanup levels are predicted to be achieved between 14 to 50 years. Benzene is estimated to achieve cleanup levels within 35 years, while total xylenes are estimated to achieve cleanup leaves within 14 years. Toluene was found to be the slowest to achieve cleanup levels in multiple modeling scenarios at 50 years. Table 5 shows the predicted years before cleanup levels are achieved for each BTEX constituent. A copy of the BIOSCREEN input and output for each BTEX compound is provided in GeoEngineers (2023).

Summary

The results of the latest annual groundwater monitoring event (GeoEngineers 2023) confirms the original conclusions presented in the September 2011 Remedial Investigation/Feasibility Study Report (URS, 2011) as follows:

- The hydraulic gradient at the site is relatively flat with limited fluctuations.
- The petroleum hydrocarbon source in the vadose zone has been addressed through the interim actions implemented between 2000-2006 .
- Residual dissolved-phase petroleum hydrocarbons remain on property and within the central portion of the former free product plume at the Site. These areas include monitoring wells AR-1, AR-4, AR-8, and MW-8.
- The lateral extent of the dissolved-phase plume has been stable since active remedial actions were discontinued.
- Measured concentrations of field parameters and analytical results of natural attenuation constituents suggest that biodegradation processes continue at the site. The presence of biodegradation processes at the Site may be supported by observed gradual decreases of TPH-g in wells AR-8 and MW-8 located at the periphery of the contaminant plume
- Restoration timeframe is limited by the flat hydraulic gradient and inability to replenish electron acceptors in the source area. However, the flat hydraulic gradient appears to keep the plume from expanding.
- Since implementation of the CMP in 2018, the extent of the plume has not changed notably.

New scientific information for individual hazardous substances or mixtures present at the Site

There is no new relevant scientific information for the hazardous substances remaining at the Site.

New applicable state and federal laws for hazardous substances present at the Site

This cleanup is governed by Chapter 173-340 WAC (1996 ed.) that was amended in 2001 and 2024. TPH cleanup levels have not changed since 2001 and are valid.

Current and projected Site and resource uses

The Site is used for industrial purposes. There have been no changes in current or projected future Site or resource uses. The current Site use is not likely to have a negative impact on the protectiveness of the cleanup action.

Availability and practicability of more permanent remedies

The remedy implemented included containing hazardous substances, and it continues to be protective of human health and the environment. However more permanent remedies are available to be able to reduce the Site restoration timeframe.

Availability of improved analytical techniques to evaluate compliance with cleanup levels

The analytical methods used at the time of the cleanup action were capable of detection below the selected MTCA cleanup levels. The presence of improved analytical techniques would not affect decisions or recommendations made for the Site.

Conclusions

- The cleanup actions completed at the Site appear to be protective of human health and the off-Site environment.
- The interim cleanup action s conducted between 2001 and 2006 reduced contaminants from unsaturated soils.
- Groundwater cleanup levels have not been met at the Site; however, the cleanup action complies with cleanup standards under WAC 173-340-740(6)(f). The flat groundwater gradient, combined with natural degradation of contaminants, currently precludes off-property migration of contaminants .
- A formal Covenant for the property has not been put in place to fully protect human health and the environment from the release of the Site contaminants and protect the integrity of the cleanup action. This is a requirement set forth in the Site CAP.
- The current estimate of the restoration timeframe is approximately 50 years for all BTEX contaminants. This restoration timeframe does not include TPH as gasoline. The new estimate of the restoration timeframe for BTEX is longer than the original ten-year estimate in the CAP.
- While 50 years is not a reasonable restoration timeframe, Ecology would like to see additional data before determining whether additional cleanup actions are necessary to reduce this timeframe

Recommendations

- In order to fully protect human health and the environment from the release of the Site contaminants and protect the integrity of the cleanup action, a formal Covenant for the Site property must be put in place and recorded with Franklin County.
- Beyond recording a Site Restrictive Environmental Covenant, the requirements of the proposed Covenant in the CAP are being followed. No additional cleanup actions are required by the property owner at this time. However, with the longer restoration timeframe as originally estimated, special attention must be placed on the wells at the Site perimeter to ensure that contamination does not migrate off-property when evaluating the annual groundwater monitoring results. The property owner is responsible for continuing to inspect the Site to ensure the integrity of the cleanup action is maintained, including the well head covers, groundwater monitoring wells, and wellhead vent caps.

Next review

Ecology will schedule the next review for the Site five years from the date of this periodic review. If additional cleanup actions or institutional controls are required, the next periodic review will be scheduled five years after those activities are completed.

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Tables

Table 1, 2023 Site Groundwater Monitoring Well Information (GeoEngineers, 2023)

Well	Date Monitored [1]	Reference Point Elevation (ft)	Depth to Water (ft btc)	Groundwater Elevation (ft)	Temp (°C)	pH	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (mV)	Ferrous Iron (mg/L)	Conductivity (mS/cm)	Turbidity (NTU)	Comments
AR-1	6/29/2023	423.88 [3]	79.98	343.90	20.4	7.72	0.15	-589.7	1.74	1.191	14.0	--
AR-8	6/27/2023	423.02	79.13	343.89	21.2	7.80	0.38	-492.2	0.46	0.919	19.0	--
AR-11	6/27/2023	422.62	78.74	343.88	20.9	8.16	8.15	-252.6	0.10	0.932	8.6	--
MW-4	6/28/2023	422.29	78.42	343.87	18.3	7.94	7.53	-193.3	0.15	0.947	2.3	--
MW-6	6/28/2023	422.50	78.62	343.88	18.0	8.15	8.12	-229.4	0.00	0.917	3.1	Also collected MS/MSD Lab QC Sample
MW-8	6/28/2023	427.15	83.30	343.85	18.9	7.94	5.66	-321.8	0.09	0.840	2.7	Also collected Field Duplicate and Equipment Rinsate Samples
Water Levels Only												
AR-4	6/27/2023	426.51 [2]	82.62	343.89	--	--	--	--	--	--	--	--
AR-7	6/27/2023	425.44	81.55	343.89	--	--	--	--	--	--	--	--
AR-12	6/27/2023	425.50	Dry	--	--	--	--	--	--	--	--	--
MW-5	6/27/2023	425.02	81.17	343.85	--	--	--	--	--	--	--	--
MW-7	6/27/2023	427.25	83.40	343.85	--	--	--	--	--	--	--	--

Notes:
1 - All water level measurements were conducted on June 27, 2023. Groundwater samples were collected on June 27, 28, and 29, 2023.
2 - Reference point elevation was resurveyed on July 27, 2021.
3 - Reference point elevation was resurveyed on June 1, 2022.
" -- " = Not applicable, not available, and/or not measured.
Reference point elevation is top of PVC casing; all elevations are in feet above mean sea level (NAVD88).
Field parameter readings represent final stabilized readings obtained during low-flow purge immediately prior to collection of water-quality sample.

ft = feet
ft btc = feet below top of casing
°C = degrees celsius
mg/L = milligrams per liter
mV = millivolts
mS/cm = millisiemens per centimeter
NTU = Nephelometric Turbidity Units

Table 2, Indicator Hazardous Substances (IHS) Site cleanup Levels,

Contaminant	Frequency of Detection	Maximum Concentration, ug/L	MTCA Cleanup Level, ug/L	Basis	Screening Results
Benzene	**40%**	**6,750**	**5**	**Method A**	**Indicator**
Diesel	**30%**	**1,165,000**	**500**	**Method A**	**Indicator**
Ethylbenzene	**43%**	**1,500**	**700**	**Method A**	**Indicator**
Gasoline	**54%**	**77,000,000**	**800**	**Method A**	**Indicator**
Heavy Oil	**18%**	**5,900**	**500**	**Method A**	**Indicator**
Toluene	**46%**	**17,000**	**1000**	**Method A**	**Indicator**
Xylene	**48%**	**12,590**	**1000**	**Method A**	**Indicator**
MTBE	0	0	20	Method A	<5% detection
Ethanol	NA	NA	NA	NA	NA

from CAP (Ecology 2016b)

Table 3, 2023 Groundwater Monitoring Well Analytical Data (GeoEngineers, 2023

Well Sample ID Sample Date				AR-11 AR-11-2306 6/27/2023	MW-4 MW-4-2306 6/28/2023	MW-6 MW-6-2306 6/28/2023	MW-8 MW-8-2306 6/28/2023	FD (MW-8) MW-8-FD-2306 6/28/2023	AR-8 AR8-2306 6/27/2023	AR-1 AR1-2306 6/29/2023	Equipment Blank MW-8-ER-2306 6/28/2023
Field Parameters	**Method**	**Units**	**MTCA CUL [1]**								
pH	Field Probe	units	--	8.16	7.94	8.15	7.94	--	7.80	7.72	--
Temperature	Field Probe	°C	--	20.9	18.3	18.0	18.9	--	21.2	20.4	--
Conductivity	Field Probe	mS/cm	--	0.932	0.947	0.917	0.840	--	0.919	1.191	--
Dissolved Oxygen	Field Probe	mg/L	--	8.15	7.53	8.12	5.66	--	0.38	0.15	--
Oxygen Reduction Potential	Field Probe	mV	--	-252.6	-193.3	-229.4	-321.8	--	-492.2	-589.7	--
Turbidity	Field Probe	NTU	--	8.6	2.3	3.1	2.7	--	19.01	14.0	--
Ferrous Iron	Field Screen	mg/L	--	0.10	0.15	0.00	0.09	--	0.46	1.74	--
Petroleum Hydrocarbons											
Benzene	EPA 624.1	µg/L	5	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	**723**	<0.500
Toluene	EPA 624.1	µg/L	1,000	<0.500	<0.500	<0.500	**1.53**	**1.76**	<0.500	**3,800**	<0.500
Ethylbenzene	EPA 624.1	µg/L	700	<0.500	<0.500	<0.500	**45.5**	**65.0**	**48.0**	**434**	<0.500
Total Xylenes	EPA 624.1	µg/L	1,000	<0.500	<0.500	<0.500	**607**	**855**	**55.6**	**6,740**	<0.500
TPH-Gasoline Range	NWTPH-Gx	µg/L	800	<200	<200	<200	**8,900**	**7,800**	**3,360**	**85,000**	<200
TPH-Diesel Range	NWTPH-Dx	µg/L	500	<160	<160	<160	<160	<160	<160	**6,010 [2]**	<160
TPH-Heavy Range	NWTPH-Dx	µg/L	500	<400	<400	<400	<400	<400	<400	<400	<400
MNA Parameters											
Manganese	EPA 200.8	mg/L	--	0.00487	<0.00100	<0.00100	0.283	0.272	1.05	2.21	--
Sulfate	EPA 300.0	mg/L	--	8.56	173	147	113.0	113.0	53.4	54.1	--
Nitrate	EPA 300.0	mg/L	--	0.550	30.8	29.8	22.4	22.6	2.29	1.29	--
Methane	RSK-175 MOD	µg/L	--	<0.65	<0.65	<0.65	<0.65	<0.65	6.69	67.9	--
Ferrous Iron	SM-3500	mg/L	--	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	--

Notes:

[1] From the November 2016 Cleanup Action Plan Table 1.

[2] Diesel range detection does not appear to be target compound. Analyst indicates detection appears to be weathered gasoline.

MNA field parameter readings represent final stabilized readings obtained during low-flow purge immediately prior to collection of water-quality sample.

BOLD = Detection

Grey shading = Exceeds MTCA Cleanup Level

Non-detect values reported as "<" laboratory method detection limit.

" -- " = Not applicable, not available, and/or not measured.

MTCA CUL = Model Toxics Control Act Cleanup Level

°C = degrees celsius

µg/L = micrograms per liter

mg/L = milligrams per liter

mV = millivolts

mS/cm = millisiemens per centimeter

NTU = Nephelometric Turbidity Units

Table 4, Wellhead Conditions and Recommended Repair and Maintenance Work

Well ID	Well Head Type	Well Head Condition	Recommended Action	Comments
AR-01	Flush with ground	No bolts	add bolts or replace with new cover	
AR-01	Biovent	No protection	Add vented protective cover	Paint yellow
AR-02	N/A	Well missing	Locate well	Abandon* well if damaged
AR-03	PVC stickup	No protection	Add protective cover	Add bollards, paint yellow
AR-04	Steel monument cover	Good		Add bollards, paint yellow
AR-05	Biovent	No protection	Add vented protective cover	Add bollards, paint yellow
AR-06	PVC stickup	No protection	Add protective cover	Add bollards, paint yellow
AR-07	PVC stickup	No protection	Add protective cover	Add bollards, paint yellow
AR-08	Flush with ground	OK		Keep an eye on bolt conditions
AR-09	Biovent, flush with ground	No bioventing action, sealed cover	Replace with vented protective cover	Add bollards, paint yellow if above ground
AR-10	Flush with ground	No gasket	Add new gasket	
AR-11	Flush with ground	No bolts	add bolts or replace with new cover	
AR-12	PVC stickup	No protection, well is dry	Convert into biovent well or abandon* well	Paint any aboveground cover yellow
MW-01	N/A	Well missing	Locate well	Abandon* well if damaged
MW-02	Flush with ground	No gasket	Add new gasket	
MW-03	Flush with ground	Water in wellhead, no gasket	Clean out well, add new gasket	
MW-04	Flush with ground	Old worn gasket	Replace gasket	
MW-05	Steel stickup 2" steel pipe inside 4" steel pipe	Open top, hornet nest inside pipe	Cover top to keep out critters and debris	Add bollards, paint yellow
MW-06	Flush with ground	No gasket	Add new gasket	
MW-07	Steel stickup 2" steel pipe inside 4" steel pipe	Open top	Cover top to keep out critters and debris	Add bollards, paint yellow
MW-08	Steel stickup 2" steel pipe inside 4" steel pipe	Open top	Cover top to keep out critters and debris	Add bollards, paint yellow

General comment: Keep an eye on well head bolts

*Abandon wells in accordance with applicable State and local regulations.

Table 5, Predicted Time Until Cleanup Level Achievement Using BIOSCREEN Instantaneous Reaction Model (from GeoEngineers, 2023)

Compound	Cleanup Level	Units	Predicted Years Until Cleanup Level Achieved
Benzene	0.005	milligrams per liter	35
Toluene	1		50
Ethylbenzene	0.700		Ethylbenzene is currently under CUL
Total Xylenes	1		14

Figures



Figure 1, Site Location (GeoEngineers, 2023)

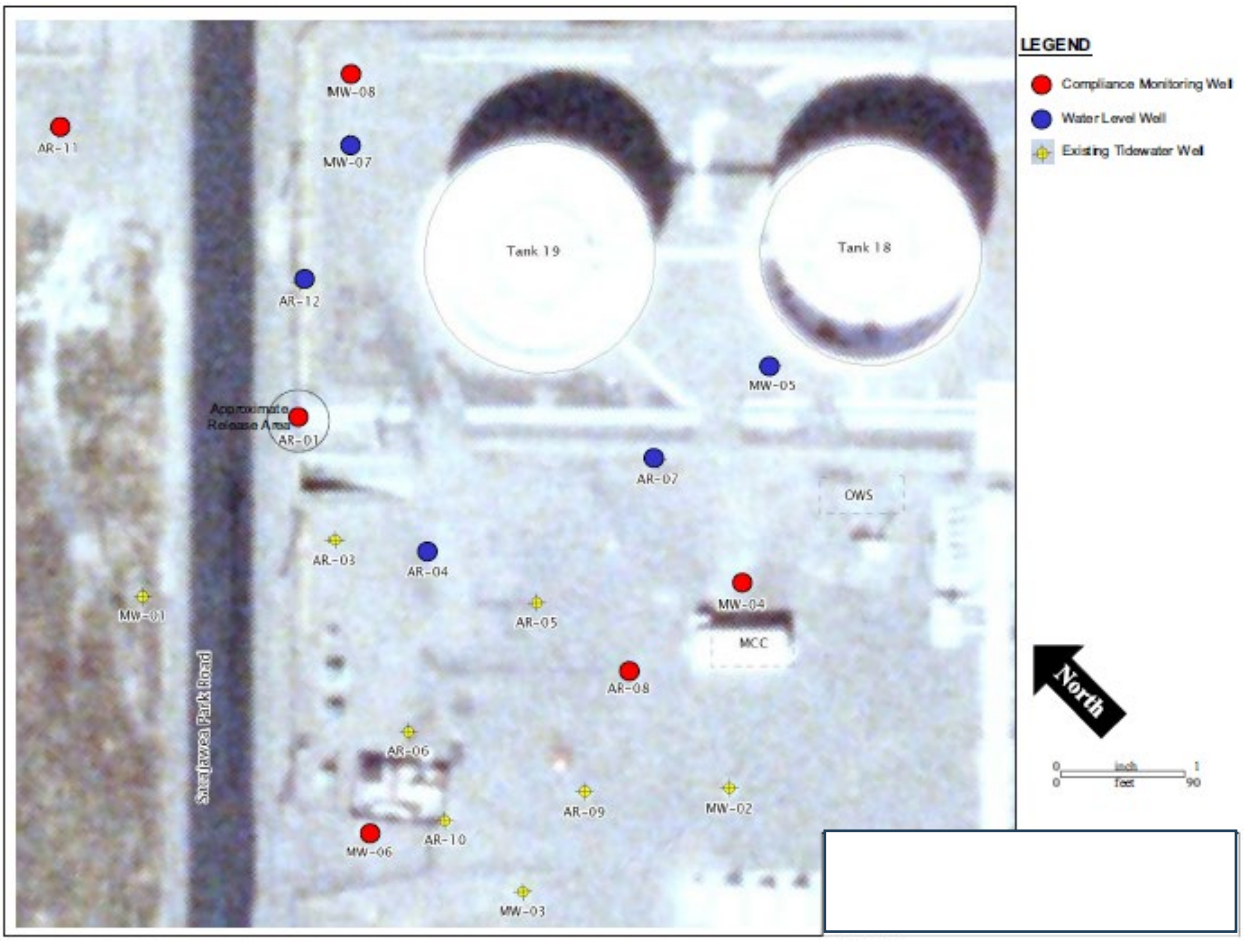

Figure 2, Site Layout (GeoEngineers, 2023)

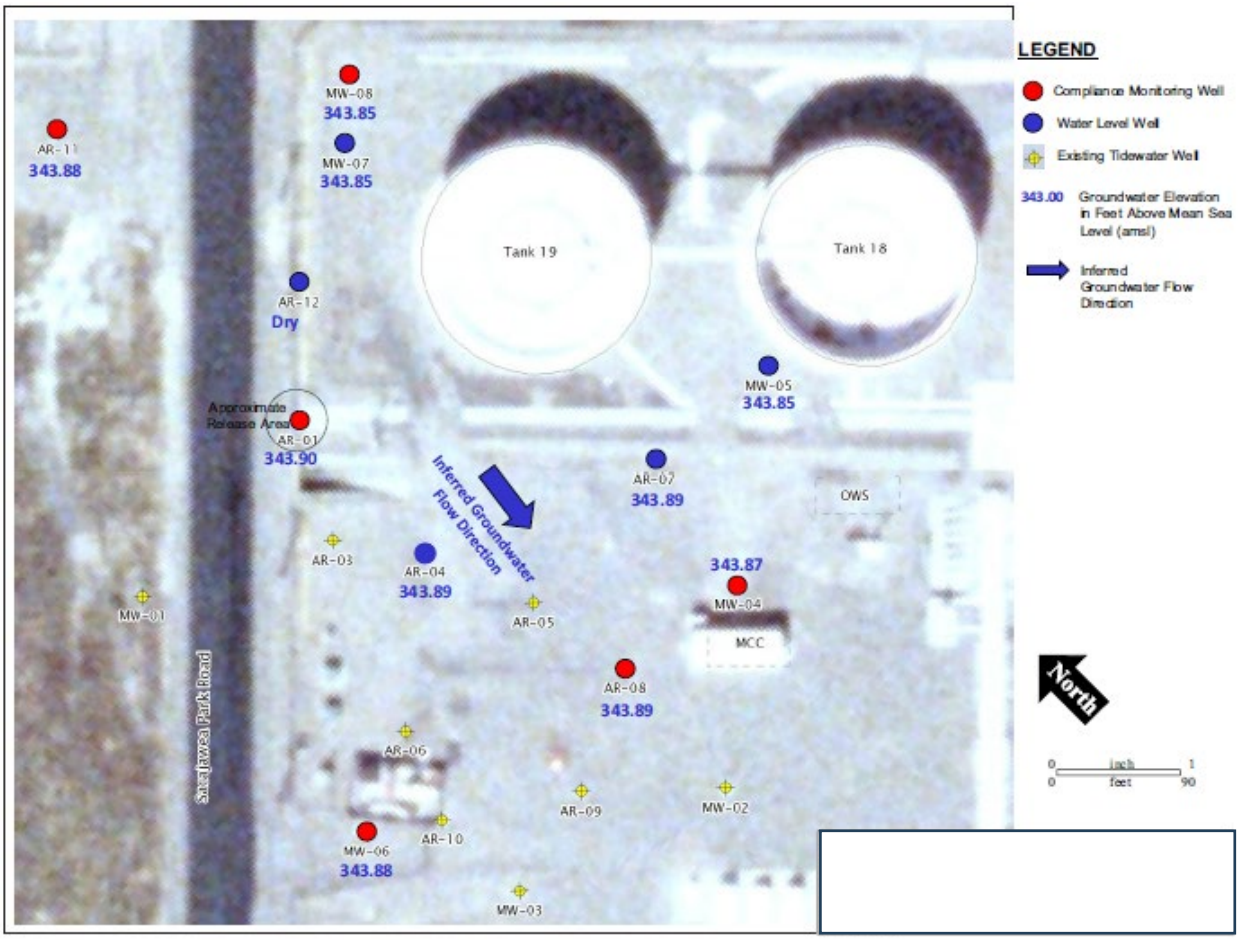

Figure 3, June 2023 Groundwater Elevations, and Inferred Groundwater Flow Direction. (GeoEngineers, 2023)

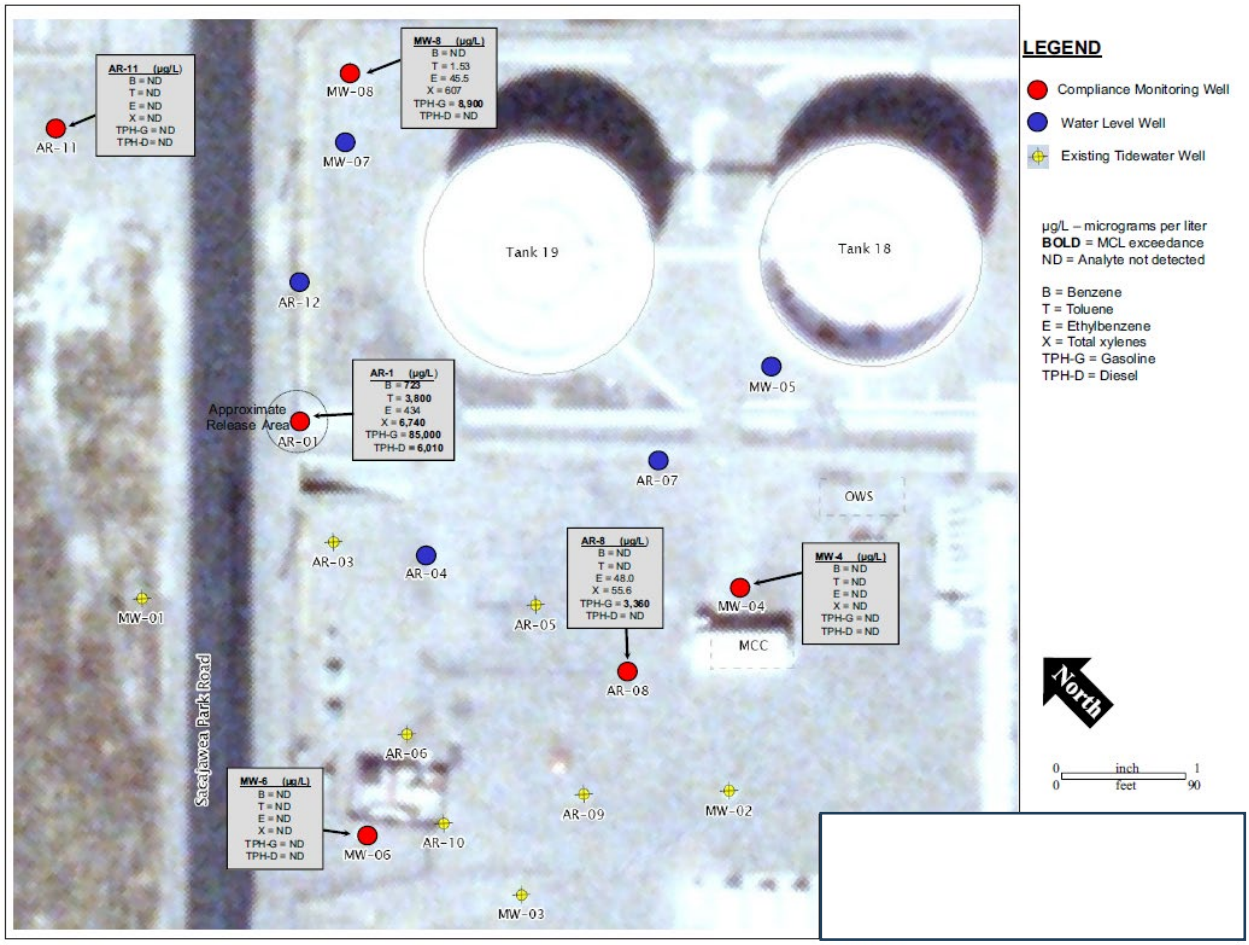

Figure 4, June 2023 Groundwater Analytical Data (GeoEngineers, 2023)

Appendix A,
Historical Groundwater Elevations and Product Thickness

Appendix B,
Historical Groundwater Analytical Data

Appendix C,
Historical Groundwater Analytical Data Time Series Plots

Appendix D,
Site Visit Photos

APPENDIX G

Report Limitations and Guidelines for Use

APPENDIX G
REPORT LIMITATIONS AND GUIDELINES FOR USE[1]

This appendix provides information to help you manage your risks with respect to the use of this report.

Environmental Services are Performed for Specific Purposes, Persons and Projects

This report has been prepared for use by Tidewater Terminal Company. This report is not intended for use by others, and the information contained herein is not applicable to other sites.

GeoEngineers structures our services to meet the specific needs of our clients. For example, an environmental site assessment study conducted for a property owner may not fulfill the needs of a prospective purchaser of the same property. Because each environmental study is unique, each environmental report is unique, prepared solely for the specific client and project site. No one except Ecology should rely on this environmental report without first conferring with GeoEngineers. This report should not be applied for any purpose or project except the one originally contemplated.

This Environmental Report is Based on a Unique Set of Project-Specific Factors

This report has been prepared for the Tidewater Fuel Leak Site in Pasco, Washington. GeoEngineers considered a number of unique, project-specific factors when establishing the scope of services for this project and report. Unless GeoEngineers specifically indicates otherwise, do not rely on this report if it was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

If important changes are made after the date of this report, GeoEngineers should be given the opportunity to review our interpretations and recommendations and provide written modifications or confirmation, as appropriate.

Reliance Conditions for Third Parties

If a lending agency or other parties intend to place legal reliance on the product of our services, we require that those parties indicate in writing their acknowledgement that the scope of services provided, and the general conditions under which the services were rendered including the limitation of professional liability, are understood and accepted by them. This is to provide our firm with reasonable protection against open-ended liability claims by third parties with whom there would otherwise be no contractual limits to their actions.

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[1] Developed based on material provided by ASFE, Professional Firms Practicing in the Geosciences; www.asfe.org.

Environmental Regulations are Always Evolving

Some substances may be present in the site vicinity in quantities or under conditions that may have led, or may lead, to contamination of the subject site, but are not included in current local, state or federal regulatory definitions of hazardous substances or do not otherwise present current potential liability. GeoEngineers cannot be responsible if the standards for appropriate inquiry, or regulatory definitions of hazardous substance, change or if more stringent environmental standards are developed in the future.

Uncertainty May Remain Even After this Phase II ESA is Completed

No ESA can wholly eliminate uncertainty regarding the potential for contamination in connection with a property. Our interpretation of subsurface conditions in this study is based on field observations and chemical analytical data from widely-spaced sampling locations. It is always possible that contamination exists in areas that were not explored, sampled or analyzed.

Subsurface Conditions Can Change

This environmental report is based on conditions that existed at the time the study was performed. The findings and conclusions of this report may be affected by the passage of time, by manmade events such as construction on or adjacent to the site, by new releases of hazardous substances, or by natural events such as floods, earthquakes, slope instability or groundwater fluctuations. Always contact GeoEngineers before applying this report to determine if it is still applicable.

Most Environmental Findings are Professional Opinions

Our interpretations of subsurface conditions are based on field observations and chemical analytical data from widely spaced sampling locations at the site. Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. GeoEngineers reviewed field and laboratory data and then applied our professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ – sometimes significantly – from those indicated in this report. Our report, conclusions and interpretations should not be construed as a warranty of the subsurface conditions.

Do Not Redraw the Field Forms

Environmental scientists prepare field forms based upon their collected field data. To prevent errors or omissions, the forms included in an environmental report should never be redrawn for inclusion in other design drawings. Only photographic or electronic reproduction is acceptable, but recognize that separating forms from the report can elevate risk.

Read These Provisions Closely

Some clients, design professionals and contractors may not recognize that the geoscience practices (geotechnical engineering, geology and environmental science) are far less exact than other engineering and natural science disciplines. This lack of understanding can create unrealistic expectations that could lead to disappointments, claims and disputes. GeoEngineers includes these explanatory “limitations” provisions in our reports to help reduce such risks. Please confer with GeoEngineers if you are unclear how these “Report Limitations and Guidelines for Use” apply to your project or site. Geotechnical, Geologic and GeoEnvironmental Reports Should Not Be Interchanged.

The equipment, techniques and personnel used to perform an environmental study differ significantly from those used to perform a geotechnical or geologic study and vice versa. For that reason, a geotechnical engineering or geologic report does not usually relate any environmental findings, conclusions or recommendations, e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. Similarly, environmental reports are not used to address geotechnical or geologic concerns regarding a specific project.

GeoEngineers