



***Revised Annual 2022 Groundwater
Monitoring and LNAPL Removal Report
Terminal 4 Slip 3 Upland Facility
Portland, Oregon
ECSI No. 272***

**Prepared for:
Port of Portland**

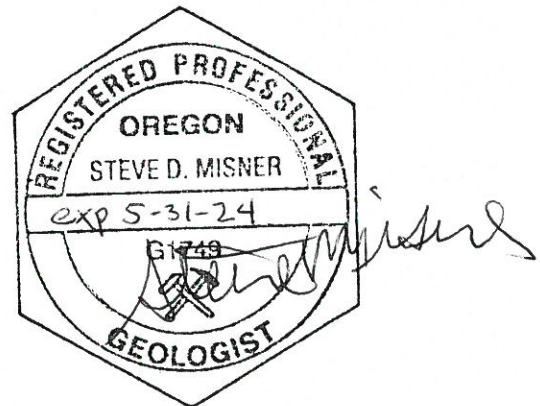
**May 31, 2023
32-22007573**



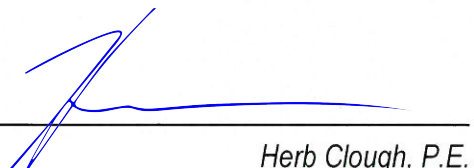
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Table of Contents

1.0 INTRODUCTION	1
1.1 Scope	1
1.2 Report Organization	2
2.0 BACKGROUND	2
2.1 Facility Location and Description	2
2.2 Geology	2
2.3 Hydrogeology	3
2.4 Remedial Action Status	3
3.0 FIELD ACTIVITIES	4
3.1 LNAPL Monitoring Program	4
3.2 Groundwater Monitoring Activities	4
4.0 LNAPL MONITORING RESULTS AND EVALUATION	5
4.1 LNAPL Monitoring and Removal	5
4.2 Evaluation of LNAPL Results	6
5.0 GROUNDWATER MONITORING RESULTS AND EVALUATION	7
5.1 Chemical Analytical Results	7
5.2 Evaluation of Annual Groundwater Results	9
6.0 CONCLUSIONS AND RECOMMENDATIONS	11
6.1 LNAPL Monitoring and Removal	11
6.2 Conclusions of ROD Compliance Annual Results	12
6.3 Additional Considerations	13
6.4 Recommendations for Additional Monitoring	14
7.0 REFERENCES	16

Tables

1	2022 Groundwater and LNAPL Level Monitoring
2	2022 LNAPL Recovery
3	Groundwater Analytical Results, Petroleum Hydrocarbons and PAHs
4	Groundwater Analytical Results, C10-C12 Aliphatic Hydrocarbons and Metals (Total and Dissolved)

Figures

- 1 Facility Location Map
- 2 Site Vicinity Plan
- 3 LNAPL Monitoring/Removal
- 4 Groundwater Elevations (4/25/2022)
- 5 Groundwater Elevations (11/17/2022)
- 6 Groundwater Analytical Results

Appendices

- A Field and Quality Assurance/Quality Control Procedures
- B Data QA/QC Review and Analytical Laboratory Reports
- C Historical Data Tables
- D LNAPL Thickness and Recovery Trend Plots
- E Chemical Concentration Versus Time Plots
- F Four-Year Chemical Concentration Trend Plots

1.0 Introduction

This annual report (Report) describes the results of groundwater monitoring and light non-aqueous phase liquid (LNAPL) monitoring and removal at the Terminal 4 Slip 3 Upland Facility (the Facility; see Figure 1) during 2022. This work was completed in accordance with the *LNAPL Removal, Groundwater Monitoring, and Contingency Plan* (Monitoring Plan; Blasland, Bouck & Lee, Inc [BBL]/Ash Creek/Newfields, 2005b) and the *Site Closure Evaluation and Recommendation – Groundwater* (Ash Creek, 2009). The monitoring activities are part of a required remedial action for the Facility defined in the *Record of Decision* (ROD; Oregon Department of Environmental Quality [DEQ], 2003) and the *Explanation of Significant Difference* (DEQ, 2004a). The Monitoring Plan was prepared pursuant to Attachment C (Scope of Work [SOW]) Item II.I of the *Consent Judgment* (Circuit Court of Oregon, 2004) between the DEQ and the Port of Portland (Port). In addition, the groundwater monitoring program was expanded for 2022 in response to comments provided by DEQ on the *Annual 2021 Groundwater Monitoring and LNAPL Removal Report* (Apex Companies, LLC [Apex], revised April 2022) and the U.S. Environmental Protection Agency (EPA) on the *Sufficiency Assessment Report* (Anchor QEA, Geosyntec, Apex, 2022) for the Portland Harbor Superfund Site.

1.1 Scope

The specific tasks that are described in this Report include:

- Conducted annual groundwater sampling in November/December 2022 per the modified list of monitoring wells presented in the *Second Semi-Annual 2012 Groundwater Monitoring and LNAPL Removal Report* (dated February 11, 2013). Following review of the *Annual 2015 Groundwater Monitoring and LNAPL Removal Report* (dated February 16, 2016), DEQ and the EPA concurred that removal of well BE-3 from the scope for future annual groundwater monitoring events was appropriate (email correspondence dated March 22, 2016). In addition, monitoring well HC-12D was added to the annual sampling program, as this well is screened entirely within the alluvial aquifer. The current monitoring well network sampled on an annual basis consists of BE-1, BE-5, HC-5, and HC-12D. The annual monitoring event also included collection of groundwater levels for estimating hydraulic gradients and groundwater samples for chemical analysis.
- In response to DEQ comments on the *Annual 2021 Groundwater Monitoring and LNAPL Removal Report* and EPA comments on the *Sufficiency Assessment Report*, the Port expanded the monitoring and sampling program for 2022 to include quarterly monitoring and sampling of wells HC-2 and HC-6S and analysis for C10-C12 aliphatic hydrocarbons and total/dissolved metals (arsenic, cadmium, chromium, copper, lead, manganese, mercury, zinc, and vanadium).

The Port submitted the *Revised Annual 2021 Groundwater Monitoring and LNAPL Removal Report* (dated April 13, 2022) that reflects the monitoring program changes described above.

1.2 Report Organization

The report text provides background information on the Facility (Section 2), a summary of field activities and methods (Section 3), the results of the LNAPL removal program (Section 4), and the results of the groundwater monitoring program (Section 5). Supporting information is provided in the tables, figures, and appendices. Appendix A presents the field and quality assurance/quality control (QA/QC) procedures; field notes from the groundwater monitoring event are also included in Appendix A. Appendix B contains the data QA/QC review and analytical laboratory report. Historical data tables are available in Appendix C. LNAPL thickness and removal volume trend plots are included in Appendix D. Appendix E contains chemical concentration versus time plots. Appendix F contains chemical concentration trend plots for data collected in the past four years.

2.0 Background

2.1 Facility Location and Description

The Facility is part of the Port Marine Terminal 4 located at 11040 North Lombard Street in Portland, Oregon (Figure 1). Terminal 4 encompasses about 260 acres along the eastern bank of the Willamette River, near river mile 5. Figure 2 provides a Site vicinity plan showing the boundaries of the Facility in relation to surrounding properties and general site layout. The Facility is generally bounded on the north by Terminal 4 Slip 1 (T4S1), on the west by the Willamette River, on the south by the Toyota Automobile Receiving Area, and on the east by the former Union Pacific Railroad (UPRR) tank farm facility.

The Facility is generally flat at an average elevation of about 35 feet above mean sea level (MSL) relative to the National Geodetic Vertical Datum (NGVD 29). The river water elevation is typically less than 10 feet above MSL and is subject to a mean tidal range of about 2 feet (Hart Crowser, 2000). Immediately east of the Facility, the ground surface rises at about a 15-percent grade to an elevation of about 100 feet.

2.2 Geology

Lithologic logs and geologic cross-sections indicate that the Facility is underlain by approximately 10 to 30 feet of sandy fill. The sandy fill has been described as fine- to medium-grained sand with some coarse sand and fine gravel, and relatively few fines (BBL/Ash Creek/Newfields, 2006; Hart Crowser, 2000). The sandy fill is underlain by alluvium. A laterally continuous layer of silt makes up the top of the alluvium. The silt varies in thickness from approximately 2 to 5 feet or more. This silt layer appears to be hummocky with a general slope towards the river; the silt layer rises sharply to the surface beyond the eastern boundary of the Facility and a “mound” in the silt is present in the northwestern portion of the Facility. Below the silt layer, the alluvium is comprised of layers of silt, sandy silt, silty sand, and sand, which do not appear to be laterally continuous for significant distances.

2.3 Hydrogeology

Depth to shallow groundwater in the central portion of the Facility generally ranges between 12 and 24 feet below ground surface (bgs; BBL/Ash Creek/Newfields, 2006). Potentiometric maps from periodic water level measurements collected indicate a general site-wide gradient towards the river (BBL/Ash Creek/Newfields, 2006). However, gradients are highly variable in the center portion of the Facility, often indicating groundwater flow directions away from the river or to the north or south.

Older wells installed at the Facility (designated by “MW”) are screened within both the sandy fill and the alluvial unit (Century West, 1994). Groundwater levels drop below the sandy fill in many of these wells during the dry season and times when river levels are low (Hart Crowser, 2000). Groundwater levels measured in shallow wells screened only within the sandy fill (e.g., HC-16 and HC-23) are several feet higher than in adjacent MW wells, suggesting the silty layer at the top of the alluvial unit acts to separate two groundwater zones: one above and one below the silt layer. The upper groundwater zone is “perched” on the silt layer.

2.4 Remedial Action Status

The *Consent Judgment* requires remedial action at the Facility consisting of the following elements:

- 1) Excavation of soil hot spots;
- 2) Manual recovery of LNAPL from groundwater wells;
- 3) Excavation of riverbank soils;
- 4) Capping of certain surface soil containing polycyclic aromatic hydrocarbons (PAHs);
- 5) Implementation of a contaminated media management plan (CMMP);
- 6) Source control actions to address pencil pitch in surface soils; and
- 7) Compliance monitoring.

This Report presents the status of ongoing items 2 and 7. Item 1 was completed in 2009. Item 3 was completed in 2004 and is identified as the “BEBRA.” In fall 2008, the Head of Slip 3 cap was installed, a portion of which overlays the BEBRA. The BEBRA fill and Head of Slip 3 cap each contain an organoclay layer that adsorbs petroleum hydrocarbons. Those organoclay layers are downgradient of the BEBRA monitoring wells. Item 4 will be completed in a future action in association with site development. The CMMP (Item 5) was approved by DEQ as an interim document on March 26, 2019, and it will be updated as phases of upland and riverbank work are completed. The document will continue to be called interim until all aspects of the remedy have been completed. A portion of item 6 (Head of Slip 3 source control measure) was completed in 2009. The remainder of Item 6 (riverbank and South Slip Bank source control measures) will be addressed in a future action.

3.0 Field Activities

3.1 LNAPL Monitoring Program

The SOW of the *Consent Judgment* (Circuit Court of Oregon, 2004) requires periodic removal of LNAPL from existing wells. LNAPL monitoring and removal was performed on December 5, 2022. The following describes the results of the LNAPL monitoring and removal program for 2022. A more detailed description of the procedures used is provided in Appendix A.

During the LNAPL monitoring events, LNAPL was removed from wells MW-19 and MW-20 by manually draining the skimmers and reinstalling the skimmers in the wells (after adjusting the cables to account for changes in water table elevation). Additional LNAPL was present in the wells following skimmer removal, which was manually removed using a peristaltic pump or by hand bailing before the skimmer was reinstalled. Additionally, LNAPL was manually removed from wells HC-10 and BE-4 by hand bailing.

The Slip is also inspected for the presence of sheen in the area of the BEBRA during each LNAPL monitoring event. Notes regarding the presence or absence of sheen in the area of the BEBRA are recorded in the field notes (Appendix A).

The purge water and LNAPL mixture from the gauging events is collected in a Department of Transportation (DOT)-approved 55-gallon drum for temporary storage at the facility. The drum and contents are recycled off-site on an as-needed basis.

3.2 Groundwater Monitoring Activities

The following sections describe the gauging and groundwater monitoring events conducted in April, August, and November/December 2022 at the Site. Please refer to Appendix A for a detailed discussion of the field and sampling procedures.

3.2.1 Groundwater Level Measurements

Depths to groundwater and LNAPL (if present) were measured in wells HC-2, HC-5, HC-6S, HC-12D, BE-1, and BE-5 on April 26, August 15, and November 17, 2022. Depths to groundwater and LNAPL (if present) were measured in wells MW-19, MW-20, HC-10, HC-19, HC-21, HC-23, HC-24, and BE-4 during the annual monitoring event in November 2022. Water levels were measured for the purpose of determining groundwater elevations and gradients using an electronic interface probe. Measured depths to groundwater and estimated groundwater elevations are summarized in Table 1. Groundwater elevations are shown on Figure 4 (April 2022) and Figure 5 (November 2022).

3.2.2 Groundwater Sampling

Quarterly Monitoring. The 2022 quarterly groundwater monitoring program consisted of collection of groundwater samples from wells HC-2, HC-5, HC-6S, HC-12D, BE-1, and BE-5. The 2022 quarterly groundwater monitoring events were conducted on April 25 and 26, August 11 and 15, and November 17, 2022. Due to slow recharge in wells BE-1 and BE-5, samples from these wells were collected over several days in December 2022.

Purging. After depths to groundwater were measured, the wells were purged using a peristaltic pump and low-flow purging techniques. Based on observations made during previous sampling events, monitoring wells BE-1 and BE-5 (1-inch diameter casing and screen) dewater and recharge very slowly so the groundwater samples are collected from these wells without purging prior to sample collection.

Sample Collection. After purging was completed and field parameters stabilized (with the exception of wells BE-1 and BE-5), groundwater samples were collected. Groundwater samples were submitted under chain-of-custody (COC) protocols to Apex Laboratories in Tigard, Oregon for chemical analyses. Samples were collected and handled in accordance with the procedures presented in Appendix A.

Waste Disposal. The purge water generated during the annual groundwater monitoring event is combined with the LNAPL DOT-approved 55-gallon drum for temporary storage at the facility. The drum and contents are recycled off-site on an as-needed basis.

4.0 LNAPL Monitoring Results and Evaluation

4.1 LNAPL Monitoring and Removal

Monitoring and removal of LNAPL was conducted as described in Section 3.1. Table 2 summarizes the LNAPL recovery from the December annual event. Figure 3 presents the total LNAPL recovery by well. Trend plots of LNAPL thickness and recovery versus time and cumulative LNAPL recovery are included in Appendix D.

Approximately 0.21 gallons of LNAPL were removed from the wells during the 2022 event. Individual LNAPL recovered from wells were: 0.09 gallons from MW-19, 0.06 gallons from MW-20, 0.06 gallons from HC-10, and <0.01 gallon from BE-4. LNAPL was not observed in wells HC-2, HC-5, HC-6S, HC-12D, HC-19, HC-21, HC-23, HC-24, BE-1, or BE-5 during the 2022 monitoring year. LNAPL has not been observed in the wells installed within the BEBRA area (*i.e.*, wells BE-1, BE-3, and BE-5).

No sheen was observed on the water within Slip 3 during any of the 2022 monitoring year events.

4.2 Evaluation of LNAPL Results

The *Site Closure Evaluation and Recommendation – Groundwater* (Ash Creek, 2009) specified that LNAPL monitoring/removal will continue as long as the total recovery rate is greater than 50 gallons per year. After the total recovery rate falls below 50 gallons per year, individual wells will continue in the LNAPL monitoring/removal program until: (1) the trend in recovery rate is downward; or (2) the recovery rate is less than 5 gallons per year.

The total recovery rate during the 2022 monitoring was less than 50 gallons per year. To evaluate the ancillary requirements of the monitoring/removal program, the recovery rate trend for individual wells was statistically evaluated as described below.

Mann-Kendall. To evaluate the trends in concentrations or LNAPL recovery in monitoring wells, a Mann-Kendall statistical evaluation was completed on each data set (in accordance with Air Force Center for Environmental Excellence [AFCEE] Long-Term Monitoring Optimization guidance; AFCEE, 2006). The Mann-Kendall test is a non-parametric statistical procedure for analyzing trends in evenly spaced data over time for data sets of sufficient size (typically considered to be at least seven sample points). The Mann-Kendall statistic (S) is used to characterize trends in the data. Positive values indicate an increase in concentrations over time, whereas negative values indicate a decrease in concentrations over time. The strength of the trend is proportional to the magnitude of the Mann-Kendall Statistic (*i.e.*, large magnitudes indicate a strong trend). A confidence in the trend is calculated (using the Kendall probability table) and the confidence level is used together with the Mann-Kendall statistic to define the trend based on the following table:

Mann-Kendall Statistic	Confidence in Trend	Defined Concentration Trend
> 0	> 95%	Increasing Trend
> 0	90% - 95%	Probably Increasing Trend
> 0	< 90%	No Trend
≤ 0	< 90% and COV ≥ 1	No Trend
≤ 0	< 90% and COV < 1	Stable
< 0	90% - 95%	Probably Decreasing Trend
< 0	> 95%	Decreasing Trend

S = Mann-Kendall Statistic

COV = Coefficient of Variation (Ratio of the standard deviation to the mean)

A Mann-Kendall statistical evaluation was completed on the annual LNAPL recovery data from wells HC-10, BE-4, MW-19, and MW-20 (as described above). No LNAPL was identified in well HC-5 in 2022 and this well not included in the analysis. The results of the Mann-Kendall analysis for well BE-4 show no statistically

significant trend for LNAPL recovery and stable for well HC-10. The statistical analysis suggests that LNAPL recovery from wells MW-19 and MW-20 is decreasing.

Well	Mann-Kendall Statistic	Confidence in Trend	Coefficient of Variation	Concentration Trend
HC-10	-9	34	0.89	STABLE
BE-4	-1	0	1.99	NO TREND
MW-19	-53	100	1.56	DECREASING
MW-20	-53	100	1.03	DECREASING

The LNAPL recovery trend plots in Appendix D show that there has been a significant reduction in the volume of LNAPL recovered annually since 2010, and the recovery rate during the last 4 years has trended downward. No monitored wells displayed statistically increasing trends in LNAPL recovery.

5.0 Groundwater Monitoring Results and Evaluation

The following sections present the analytical results of the 2022 groundwater monitoring events and provide a statistical evaluation of the ROD compliance data. Data were also assessed for source control purposes.

5.1 Chemical Analytical Results

Groundwater samples were analyzed for the following constituents:

- Diesel- and heavy-oil-(residual)-range petroleum hydrocarbons (TPH-Dx) using Northwest Total Petroleum Hydrocarbons (NWTPH-Dx) with silica gel cleanup (EPA Method 3630M);
- PAHs using EPA Method 8270E
- C10-C12 aliphatic hydrocarbons using EPA 8015M and Northwest Extractable Petroleum Hydrocarbon methods; and
- Total and dissolved metals (As, Cd, Cr, Cu, Pb, Mn, Hg, V and Zn) using EPA Method 6020B.

The groundwater analytical results are summarized in Table 3 (ROD compliance constituents) and Table 4 (C10-C12 aliphatic hydrocarbons and metals). The data quality review and complete laboratory reports are included in Appendix B. The analytical results were screened against the ROD Compliance Criteria, which are provided with the data in Table 3. Results for C10-C12 aliphatic hydrocarbons and metals were screened against Portland Harbor ROD Cleanup Levels (PHROD CULs) and are provided in Table 4. Figure 6 presents the TPH-Dx results for each sampled well. Historical data tables are included in Appendix C. Plots of chemical concentrations versus time for selected ROD compliance chemicals and wells are included in Appendix E. Results for BE-5 are plotted together with BE-2.

BEBRA Wells (BE-1 and BE-5). Monitoring results for the BEBRA wells were consistent with historical ranges for ROD compliance constituents. PAH analytes were not detected or were detected at concentrations below the ROD Compliance Criteria. Diesel-range hydrocarbons in well BE-1 were detected at concentrations of 262 micrograms per liter (µg/L) and 313 µg/L in April and August 2022, which are below the ROD Compliance Criteria (1,000 µg/L) and were not detected in December 2022. Residual-range hydrocarbons were not detected above the laboratory reporting limit during the reporting period. C10-C12 aliphatic hydrocarbons were not detected in samples collected from well BE-1 during the reporting period. Arsenic, chromium, copper, lead, and manganese were detected in one or more samples at concentrations above the PHROD CUL.

PAH analytes in well BE-5 were not detected or detected below ROD Compliance Criteria during the reporting period. Diesel-range and residual-range hydrocarbons were not detected above laboratory reporting limits in well BE-5 during the reporting period. C10-C12 aliphatic hydrocarbons were not detected during the reporting period with the exception of April 2022 when an estimated (J flagged) value of 0.26 µg/L was detected. Arsenic, cadmium, copper, lead, manganese, and zinc were detected in one or more samples at concentrations above the PHROD CUL.

HC-2. No TPH or PAHs were detected in well HC-2 during the reporting period with the exception of anthracene in the sample collected in August 2022 (0.0195 µg/L). C10-C12 aliphatic hydrocarbons were not detected during the reporting period. Cadmium and zinc were detected in one or more samples at concentrations above the PHROD CUL.

HC-5. Monitoring results for well HC-5 were consistent with historical ranges. PAH analytes were not detected during the monitoring period. Diesel-range TPH were detected at concentrations of 2,460 µg/L, 3,310 µg/L, and 9,490 µg/L (for the April, August, and September 2022 monitoring events, respectively), which exceeds the ROD Compliance Criterion (1,000 µg/L). Residual-range TPH were not detected. C10-C12 aliphatic hydrocarbons were detected at concentrations ranging from 0.88 µg/L (J flagged) in April 2022 to 137 µg/L in November 2022. Arsenic, cadmium, copper, manganese, and zinc were detected in one or more samples at concentrations above the PHROD CUL.

HC-6S. A groundwater sample was collected from well HC-6S in April 2022. No samples were collected from this well in August or November as the well was dry. No TPH or PAHs were detected in well HC-6S in April 2022. C10-C12 aliphatic hydrocarbons were not detected in April 2022. Lead, manganese, and zinc were detected in the sample at concentrations below the PHROD CUL in April 2022.

HC-12D. Monitoring results for well HC-12D were consistent with historical ranges. No PAHs were detected in well HC-12D during the reporting period with the exception of acenaphthene at concentrations below the ROD Compliance Criteria. Diesel and residual range hydrocarbons were not detected or were detected at concentrations below the ROD Compliance Criteria. C10-C12 aliphatic hydrocarbons were detected above

the PHROD CUL in the sample collected in April 2022 but were not detected in the August or November samples. However, the laboratory reporting limit is higher than the PHROD CUL. Arsenic, cadmium, copper, lead, manganese, and zinc were detected in one or more samples at concentrations above the PHROD CUL.

5.2 Evaluation of Annual Groundwater Results

The ROD Compliance Criteria concentrations for the Site, presented with the analytical data in Table 3, were developed for the location where groundwater exits the BEBRA organoclay layer into the Willamette River (point of compliance). The BEBRA sentinel wells (BE-1 and BE-5) are monitored to provide an assessment of site conditions adjacent to the point of compliance. Well BE-5 was installed in 2009 to replace BE-2, which was destroyed during construction of the Head of Slip 3 cap. The analytical modeling results for data from BE-2 indicated that the data are likely biased high and suggest that chemical concentrations in BE-2 were likely at or below concentrations that meet compliance levels at the point of compliance (POC; Ash Creek, 2009). The compliance criteria for the BEBRA sentinel wells are as follows:

- 1) Contaminants of concern are below compliance levels for two successive years of monitoring; or
- 2) If detected above compliance levels in Table 3, concentrations of benzo(a)anthracene (BAA) and benzo(a)pyrene (BAP) are each less than 1 µg/L (a conservative sentinel well equivalent compliance level determined from modeling; Ash Creek, 2009) and a downward trend is established for four successive years of sampling.

Statistical analysis was performed on the compliance wells (BE-1 and BE-5) and south slip well (HC-5) for evaluation with the ROD Compliance Criteria. Descriptions of the static methods and results are presented in the subsections below. Graphical representations of analytical data for the past four years are presented in Appendix F.

Additionally, the following data quality issues were identified. For monitoring in 2022, C10-C12 aliphatic hydrocarbons were added to the sampling and analysis plan. Generally, this analyte is analyzed under the Northwest Extractible Petroleum Hydrocarbons (NWEPH) method, but this method is unable to achieve the PHROD CUL. For analysis of C10-C12 aliphatic hydrocarbons, EPA Method 8015 was utilized for the April 2022 groundwater sampling event. This method change from NWEPH was recommended by the analytical laboratory to achieve the PHROD CUL; however, data quality issues were noted after receipt of this data. Results were reported as individual compounds n-decane, n-undecane, and n-dodecane and not as summed carbon ranges that are typical with NWEPH. Alkanes are only a portion of C10-C12 aliphatic hydrocarbons (missing alkenes and alkynes, straight and branched chains) and the reported results were assumed to be biased low. After review of the April data using EPA Method 8015, the decision was made to use the NWEPH method in subsequent sampling events to ensure that all aliphatic hydrocarbons within the C10-C12 range were reported. Reporting limits for the NWEPH method do not meet the PHROD CUL for C10-C12 aliphatic hydrocarbons but, when detected, results reported are more representative of groundwater conditions.

Several laboratories were contacted regarding the detection limit issue. The laboratories were consistent that the 2.6 µg/L PHROD CUL is unachievable without substantial modifications to the NWEPH method.

5.2.1 BEBRA Wells

Concentrations of TPH-Dx in well BE-1 have been below compliance levels since the December 2020 monitoring event. Concentrations of BAA and BAP have not been detected since 2007. TPH-Dx in well BE-1 will be carried through for statistical analysis.

TPH-Dx has not been detected in well BE-5 since December 2019 and has not been detected above compliance levels since May 2019. BAA was not detected above compliance criteria during this reporting period and has not exceeded compliance criteria since December 2020. BAP was not detected during this reporting period and has not been detected above compliance criteria since December 2021. Both BAA and BAP concentrations were below 1 µg/L. Therefore, BAP and BAA concentrations in well BE-5 will be carried through for statistical evaluation.

Mann-Kendall. The statistical analysis of BAA and BAP in well BE-5 was conducted using the historical data from June 2005 (September 2009 for well BE-5) through December 2022. Statistical analysis of TPH-Dx in well BE-1 used the same data timeframes as BAA and BAP mentioned above, with the exception of using results from a resampling event from January 2019 in place of the December 2018 data. The results of the Mann-Kendall analysis for wells BE-1 and BE-5 are summarized in the table below.

Well	Constituent	Number of samples	Number of Detects	Number of ND	Mann-Kendall Statistic	Confidence in Trend	Coefficient of Variation	Concentration Trend
BE-1	TPH-Dx	40	24	15	7	6	1.49	NO TREND
BE-5	BAA	22	9	8	-108	100	1.03	DECREASING
	BAP	22	11	5	-103	100	1.11	DECREASING

Non-detect (ND) = The concentration has been estimated to be one-half the reporting limit for the analyte.

The Mann-Kendall analysis for diesel-range hydrocarbon concentrations for well BE-1 show no statistically significant trend. Concentration trends for BAA and BAP in well BE-5 have changed since the 2021 Groundwater Monitoring Report from probably decreasing to decreasing.

Regression. The ROD Compliance Criteria requires the evaluation of data trends from the last four sampling years. If the data set is abridged to the last four years (December 2019 through December 2022), the Mann-Kendall evaluation cannot be completed due to an insufficient number of data points. Straight-line regressions through this four-year data set (as calculated by the Excel regression function; Appendix F) indicate a negative slope for TPH-Dx in BE-1 (an exponential trend line has been utilized to perform the straight-line regression). However, due to the high variability in TPH-Dx data in BE-1, there is some

uncertainty in the slope of the regression line. Regressions for concentrations of BAA and BAP in BE-5 indicate negative slopes. However, similar to the TPH-Dx data observed in BE-1, there is some uncertainty in the slope of the BAA and BAP regression lines for BE-5 due to the variability in concentrations, specifically the higher concentrations in the samples collected during the annual 2020 monitoring event.

5.2.2 South Slip Compliance Wells

Mann-Kendall. A Mann-Kendall statistical evaluation could not be completed on the data collected from well HC-5 due to the insufficient number of data points and the two-year period in which data was not collected for the well; one of the assumptions of the Mann-Kendall test is evenly spaced data per time, and the data gap between February 2018 and December 2020 violates the condition.

Regression. A straight-line regression for the last four years of the available data set (December 2018 through December 2022) is presented in Appendix F. The graph indicates a flat to decreasing slope in the data (a vertical logarithmic scale was used due to the magnitude of the TPH concentrations observed in well HC-5 during the plotted time period, and an exponential trend line has been utilized to perform the straight-line regression). The observed flat trend is largely due to the higher concentration observed in the groundwater sample collected in 2020 and would otherwise likely be a negative slope. The TPH concentrations in the groundwater samples collected during 2022 are within the range of recent samples other than 2020.

Insufficient data are available to make a statistical evaluation of wells HC-2 and HC-6S.

5.2.3 Additional Assessment

As described in Section 1.1, the Port expanded the monitoring and sampling program for 2022 to include quarterly monitoring and sampling of wells HC-2 and HC-6S and analysis for C10-C12 aliphatic hydrocarbons and total/dissolved metals (As, Cd, Cr, Cu, Pb, Mn, Hg, Zn, and V). The expanded list of analytes may be used in conjunction with forthcoming porewater data that is being collected as part of the in-water design process.

6.0 Conclusions and Recommendations

This section provides conclusions for the 2022 monitoring period and recommendations for additional monitoring.

6.1 LNAPL Monitoring and Removal

LNAPL monitoring and removal was conducted on wells MW-19, MW-20, HC-10, and BE-4 on December 5, 2022. The total 2022 LNAPL removal volume was 0.21 gallons; this volume is below the 50-gallon per year

criterion for the eleventh consecutive year. The total LNAPL recovery from individual wells did not exceed 5 gallons per year. Recovery volumes for wells MW-19, MW-20, and HC-10 were similar and ranged from 0.06 to 0.09 gallons. Statistical evaluation of LNAPL recovery rates from wells in the LNAPL monitoring program did not indicate a significant trend, with the exception of wells MW-19 and MW-20 which continue to show a decreasing trend. Despite several of the wells showing no statistical trend, all monitoring wells in the LNAPL monitoring program meet the specifications in the *Site Closure Evaluation and Recommendations – Groundwater* report (Ash Creek, 2009) to be removed from the monitoring program, i.e.:

- Total recovery rate is less than 50 gallons per year;
- After the total recovery rate falls below 50 gallons per year, individual wells will continue in the LNAPL monitoring/removal program until: (1) the trend in recovery rate is downward; or (2) the recovery rate is less than 5 gallons per year.

Based on the successful fulfillment of these requirements, LNAPL monitoring is no longer required. However, the Port plans on continuing the monitoring program on an annual basis (to be conducted coincident with the Annual Groundwater Monitoring Event).

6.2 Conclusions of ROD Compliance Annual Results

Based on the chemical results and statistical evaluation, a summary of the ROD Compliance Criteria by well is presented below:

- BE-5
 - BAP was detected at a concentration that exceeds compliance levels during the 2019, 2020, and 2021 sampling events but has either not been detected or detected at concentrations less than the compliance criteria during each of the 2022 monitoring events;
 - Concentrations of BAA and BAP were each less than 1 µg/L (or not detected);
 - Mann-Kendall statistical evaluations indicated decreasing concentration trends for BAA and BAP; and
 - Straight-line regressions on the four most recent years of sampling indicated a downward trend for BAA and BAP.
- BE-1
 - Diesel-range TPH was not detected above compliance levels during the 2022 monitoring period but exceeded compliance levels during the December 2020 monitoring event;
 - Mann-Kendall statistical evaluations indicated no concentration trends for TPH; and
 - BAA and BAP were not detected above compliance levels during the 2022 monitoring period and have not exceeded compliance levels since 2007.

-
- HC-5
 - Diesel-range TPH was detected at concentrations above compliance levels during the most recent monitoring events (2021 and 2022);
 - Straight-line regressions on the four most current rounds of sampling indicated a flat slope for TPH; and
 - Concentrations of BAA and BAP were not detected in the samples collected since 2020. However, the laboratory reporting limits were raised due to sample dilution (LNAPL was present in the well in December 2021, so a groundwater sample was not collected).

The *Site Closure Evaluation and Recommendation – Groundwater* (Ash Creek, 2009) specified the groundwater sampling program in the BEBRA area will be terminated when all of the following are achieved:

- 1) LNAPL removal has been terminated;
- 2) Concentrations of chemicals analyzed are below compliance levels at the POC in the BEBRA wells (as discussed in Section 4.4) for a continuous period of at least one year;
- 3) There is no sheen or LNAPL at the POC; and
- 4) Concentration trends in monitoring wells are stable or declining for a continuous period of at least three years.

The items above have been achieved, with the exception of the following:

- The concentrations of TPH-D in HC-5 exceed the ROD Compliance Criteria; and
- TPH-D concentration trends in well HC-5 show no statistical trend according to the regression analysis.

Well HC-5 will require continued monitoring until a declining trend or stable conditions are present. The requirements have been met to terminate the LNAPL Monitoring/Removal program (Item 1). When all four of the conditions are met, the Port will recommend termination of the program, see further discussion of recommendations in Section 6.4.

6.3 Additional Considerations

The results and conclusions for other sampling and analysis are summarized below.

- HC-2
 - No TPH or PAHs were detected during the reporting period in well HC-2 with the exception of anthracene in the sample collected in August 2022; for which no PHROD CUL is established

-
- C10-C12 aliphatic hydrocarbons were not detected during the reporting period; and
 - Arsenic, cadmium and zinc were detected in one or more samples during the reporting period at concentrations above the PHROD CUL.
 - HC-6S
 - No TPH or PAHs were detected during the reporting period in well HC-6S;
 - C10-C12 aliphatic hydrocarbons were not detected during the reporting period; and
 - Lead, manganese, and zinc were detected in the sample at concentrations below the PHROD CUL during the reporting period.
 - HC-12D
 - No PAHs were detected in well HC-12D during the reporting period with the exception of acenaphthene at concentrations below the PHROD CUL;
 - C10-C12 aliphatic hydrocarbons were detected above the PHROD CUL in the sample collected in April 2022 and were not detected in the August or November samples; and
 - Arsenic, cadmium, copper, lead, manganese and zinc were detected in one or more samples at concentrations above the PHROD CUL.

Except for well HC-5, TPH and PAHs are below PHROD CULs. Several metals were detected above PHROD CULs. The detected arsenic, copper, and zinc concentrations are generally consistent with Willamette Valley background concentrations (13 ug/L, 21 ug/L and 280 ug/L, respectively [Washington Department of Ecology, 2022; DEQ, 2004b; United States Geological Survey, 1999]). Other metals are present above the PHROD CULs. Relatively higher concentrations of Cd and Pb in some wells may be the result reducing conditions related to the presence of petroleum hydrocarbons. The metals concentrations will be reassessed when porewater data becomes available.

6.4 Recommendations for Additional Monitoring

Because the ROD Compliance Criteria have not been achieved, the Port recommends that the groundwater sampling continue in 2023 as follows:

- Collect groundwater samples from ROD compliance monitoring wells BE-1, BE-5, HC-5 and HC-12D on an annual basis in 2023 and analyze for TPH-Dx and PAHs. Although well HC-5 (currently the only well that has ROD compliance criteria exceedances) is not the point of compliance, the data from this and other ROD compliance wells may be used along with porewater data to assess if ROD criteria have been met.
- Collect groundwater samples from the ROD compliance wells (BE-1, BE-5, HC-5 and HC-12D) on a semi-annual basis for one year for analysis of C10-C12 aliphatic hydrocarbons and metals (As, Cd, Cr, Cu, Pb, Mn, Hg, Zn and V). Based on the 2022 dataset for well HC-2 and HC-6S, additional

monitoring of this well is not necessary. The need for additional analysis of other parameters will be evaluated after receipt of porewater data.

7.0 References

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Table 1
2022 Groundwater and LNAPL Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID (Casing Elevation)	Date	Initial Measurements (feet)				LNAPL Removal (gallons)		Final LNAPL Thickness (feet)
		Depth to Water	Depth to Product	LNAPL Thickness	Groundwater Elevation *	Discrete Event	Cumulative	
MW-19 (30.73)	5-Dec-2022	16.01	15.95	0.06	14.77	0.09	243.87	0.00
MW-20 (30.73)	5-Dec-2022	19.86	19.83	0.03	10.90	0.06	263.50	0.00
HC-2 (31.78)	25-Apr-2022	27.23	NP	0.00	4.55	0.00	0.00	0.00
	17-Nov-2022	28.60	NP	0.00	3.18	0.00	0.00	0.00
HC-5 (32.10)	25-Apr-2022	18.21	NP	0.00	13.89	0.00	0.60	0.00
	17-Nov-2022	18.57	NP	0.00	13.53	0.00	0.60	0.00
HC-6S (33.03)	25-Apr-2022	18.98	NP	0.00	14.05	0.00	0.00	0.00
	17-Nov-2022	Dry	--	NA	NA	0.00	0.00	0.00
HC-10 (29.30)	17-Nov-2022	17.57	17.53	0.04	11.77	0.07	46.64	0.00
HC-12D (29.32)	25-Apr-2022	15.81	NP	0.00	13.51	0.00	0.00	0.00
	17-Nov-2022	18.20	NP	0.00	11.12	0.00	0.00	0.00
HC-19 (33.05)	17-Nov-2022	18.03	NP	0.00	15.02	0.00	0.00	0.00
HC-21 (31.95)	17-Nov-2022	17.11	NP	0.00	14.84	0.00	0.00	0.00
HC-23 (32.74)	5-Dec-2022	14.75	NP	0.00	17.99	0.00	0.70	0.00
HC-24 (30.04)	17-Nov-2022	12.12	NP	0.00	17.92	0.00	0.00	0.00

Please see notes at end of table.

Table 1
2022 Groundwater and LNAPL Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID (Casing Elevation)	Date	Initial Measurements (feet)				LNAPL Removal (gallons)		Final LNAPL Thickness (feet)
		Depth to Water	Depth to Product	LNAPL Thickness	Groundwater Elevation *	Discrete Event	Cumulative	
BE-1 (19.75)	25-Apr-2022	6.52	NP	0.00	13.23	0.00	0.00	0.00
	17-Nov-2022	6.64	NP	0.00	13.11	0.00	0.00	0.00
BE-3 (17.55)	17-Nov-2022	9.91	NP	0.00	7.64	0.00	0.00	0.00
BE-4 (31.16)	17-Nov-2022	16.60	16.57	0.03	14.59	<0.01	12.76	0.00
BE-5 (21.12)	25-Apr-2022	9.92	NP	0.00	11.20	0.00	0.00	0.00
	17-Nov-2022	10.63	NP	0.00	10.49	0.00	0.00	0.00

Notes:

1. LNAPL = Light non-aqueous phase liquid
2. Passive LNAPL skimmers were installed in wells MW-19 and MW-20 in June 2006; water level measurements were discontinued.
3. NP = No measurable LNAPL at the time of the monitoring event.
4. * Phreatic Elevation = (Casing Elevation - Depth to Water) + S_g * (Product Thickness). S_g = 0.89
5. -- = Not measured or not applicable.
6. NA = Not Applicable. LNAPL removal not required based on initial product thickness measurement.

Table 2
2022 LNAPL Recovery
Terminal 4 Slip 3 Upland Facility
Port of Portland

Wells	MW-15	MW-17	MW-19	MW-20	HC-10	BE-4	HC-5	
Date	LNAPL Removed (gallons)							Total
2005 Total	Data for individual wells not shown							24
2006 Total	Data for individual wells not shown							61
2007 Total	Data for individual wells not shown							100
2008 Total	Data for individual wells not shown							71
2009 Total	2.59	2.34	2.84	2.53	0.15	0.24	--	10.69
2010 Total	4.53	15.48	61.80	41.40	2.38	2.60	--	155.69
2011 Total	0.30	10.55	13.05	16.50	3.25	0.65	--	50.69
2012 Total	1.13	7.80	7.66	23.14	1.50	0.00	--	41.22
2013 Total	2.75	5.30	6.95	9.05	1.75	0.20	--	26.00
2014 Total	1.25	0.20	12.35	8.25	0.20	0.00	--	22.25
2015 Total	n/a	6.50	18.10	15.95	6.15	n/a	--	46.70
2016 Total	n/a	n/a	8.55	7.40	5.55	0.70	--	22.20
2017 Total	n/a	n/a	3.00	12.50	6.45	0.00	--	21.95
2018 Total	n/a	n/a	4.00	8.25	4.15	0.50	0.60	17.50
2019 Total	n/a	n/a	2.10	2.77	2.40	0.00	2.27	9.54
2020 Total	n/a	n/a	0.20	1.31	1.12	0.00	0.00	2.63
2021 Total	n/a	n/a	1.50	1.65	0.42	0.00	0.30	3.87
2022 Total	n/a	n/a	0.09	0.06	0.06	<0.01	N/A	0.21

Notes:

1. The current (2022) LNAPL recovery program includes wells MW-19, MW-20, HC-5, HC-10, and BE-4.
If LNAPL is present at a thickness that is practical for recovery (greater than 0.1 foot), the LNAPL is removed.
2. n/a = not available
3. Wells MW-15 and MW-17 were abandoned in May 2015.

Table 3
Groundwater Analytical Results, Petroleum Hydrocarbons and PAHs
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID	Date	TPH (µg/L)		PAHs (µg/L)																			
		Diesel - Range	Residual-Range	Acenaph-thene	Acenaph-thylene	Anthracene	Benzo(a)-anthracene	Benzo(a)-pyrene	Benzo(b)-fluoranthene	Benzo(g,h,i)-perylene	Benzo(k)-fluoranthene	Chrysene	Dibenzo(a,h)-anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	1-Methyl naphthalene	2-Methyl naphthalene	Naphthalene	Phenanthrene	Pyrene	Carbazole	Dibenzofuran
South Slip 3 Area																							
HC-2	4/25/2022	<198	<396	<0.0432	<0.0432	<0.0432	<0.0216	<0.0216	<0.0216	<0.0432	<0.0216	<0.0216	<0.0216	<0.0432	<0.0432	<0.0216	<0.0864	<0.0864	<0.0864	<0.0864	<0.0432	<0.0432	<0.0432
	8/11/2022	<190	<381	<0.0332	<0.0332	0.0195	<0.0166	<0.0166	<0.0166	<0.0332	<0.0166	<0.0166	<0.0166	<0.0332	<0.0332	<0.0166	<0.0664	<0.0664	<0.0664	<0.0664	<0.0332	<0.0332	<0.0332
	11/17/2022	<192	<385	<0.0329	<0.0329	<0.0329	<0.0164	<0.0164	<0.0164	<0.0329	<0.0164	<0.0164	<0.0164	<0.0329	<0.0329	<0.0164	<0.0658	<0.0658	<0.0658	<0.0658	<0.0329	<0.0329	<0.0329
HC-5	4/26/2022	2,460	<385	<1.38	<1.38	<1.38	<0.688	<0.688	<0.688	<1.38	<0.688	<0.688	<0.688	<1.38	<1.38	<0.688	<2.75	<2.75	<2.75	<2.75	<1.38	<1.38	<1.38
	8/11/2022	3,310	<385	<1.33	<1.33	<1.33	<0.664	<0.664	<0.664	<1.33	<0.664	<0.664	<0.664	<1.33	<1.33	<0.664	<2.66	<2.66	<2.66	<2.66	<1.33	<1.33	<1.33
	11/17/2022	9,490	<385	<0.378	<0.378	<0.378	<0.189	<0.189	<0.189	<0.378	<0.189	<0.189	<0.189	<0.378	<0.378	<0.189	<0.755	<0.755	<0.755	<0.755	<0.378	<0.378	<0.378
HC-6S	4/25/2022	<194	<388	<0.0335	<0.0335	<0.0335	<0.0167	<0.0167	<0.0167	<0.0335	<0.0167	<0.0167	<0.0167	<0.0335	<0.0335	<0.0167	<0.0669	<0.0669	<0.0669	<0.0669	<0.0335	<0.0335	<0.0335
BEBRA Area																							
BE-1	4/26/2022	262	<400	<0.0457	<0.0457	<0.0457	<0.0228	<0.0228	<0.0228	<0.0457	<0.0228	<0.0228	<0.0228	<0.0457	<0.0457	<0.0228	<0.0914	<0.0914	<0.0914	<0.0914	<0.0457	<0.0457	<0.0457
	8/15/2022	313	<381	<0.0361	<0.0361	<0.0452	<0.0181	<0.0181	<0.0181	<0.0361	<0.0181	<0.0181	<0.0181	<0.0361	<0.0361	<0.0181	<0.0722	<0.0722	0.122	<0.0722	<0.0361	<0.0361	<0.0361
	12/14/2022	<190	<381	<0.0447	<0.0447	<0.0559	<0.0224	<0.0224	<0.0224	<0.0447	<0.0224	<0.0224	<0.0224	<0.0447	<0.0447	<0.0224	0.103	0.114	0.182	<0.0895	<0.0447	<0.0447	<0.0447
BE-5	4/26/2022	<211	<421	<0.135	<0.135	<0.135	<0.0673	<0.0673	<0.0673	<0.135	<0.0673	<0.0673	<0.0673	<0.135	<0.135	<0.0673	<0.269	<0.269	<0.269	<0.269	<0.135	<0.135	<0.135
	8/15/2022	<192	<385	<0.0326	<0.0326	<0.0326	<0.0163	0.00857	0.0155	<0.0326	<0.0163	<0.0163	<0.0163	<0.0326	<0.0714	0.00979	<0.102	<0.0653	0.182	<0.0816	0.0241	<0.0816	<0.0326
	12/14/2022	<192	<385	<0.0329	<0.0329	<0.0329	<0.0165	<0.0165	<0.0165	<0.0329	<0.0165	<0.0165	<0.0165	<0.0329	<0.0329	<0.0165	<0.0659	<0.0659	0.231	<0.0659	<0.0329	<0.0329	<0.0329
HC-12D	4/25/2022	<196	<392	0.779	<0.399	<0.399	<0.200	<0.200	<0.200	<0.399	<0.200	<0.200	<0.200	<0.399	<0.399	<0.200	<0.799	<0.799	<0.799	<0.799	<0.399	<0.399	<0.399
	4/25/2022 (DUP-1)	<190	<381	0.738	<0.070	<0.128	<0.0187	<0.0187	<0.0187	<0.0374	<0.0187	<0.0187	<0.0187	<0.0374	<0.502	<0.0187	<0.0747	<0.0747	<0.467	<0.175	<0.0374	<0.0700	<0.0374
	8/11/2022	209	<396	0.929	<0.0667	<0.356	<0.0178	<0.0178	<0.0178	<0.0356	<0.0178	<0.0178	<0.0178	<0.0356	<0.578	<0.0178	<0.156	<0.100	<0.656	<0.311	<0.0356	<0.0356	<0.0356
	11/17/2022	<190	<381	0.472	<0.0532	<0.177	<0.0198	<0.0198	<0.0198	<0.0396	<0.0198	<0.0198	<0.0198	<0.0396	<0.459	<0.0198	<0.0792	<0.0792	<0.404	<0.155	<0.0396	<0.160	<0.0396
ROD Compliance Criteria		1,000	1,000	520	NA	NA	0.027	0.014	NA	NA	NA	NA	NA	6.16	3.9	NA	NA	NA	620	6.3	NA	NA	NA
Portland Harbor ROD Cleanup Levels		NA	NA	23	NA	0.73	0.0012	0.00012	0.0012	0.4	0.0013	0.0013	0.00012	6.2	3.9	0.0012	NA	2.1	12	6.3	10	NA	NA

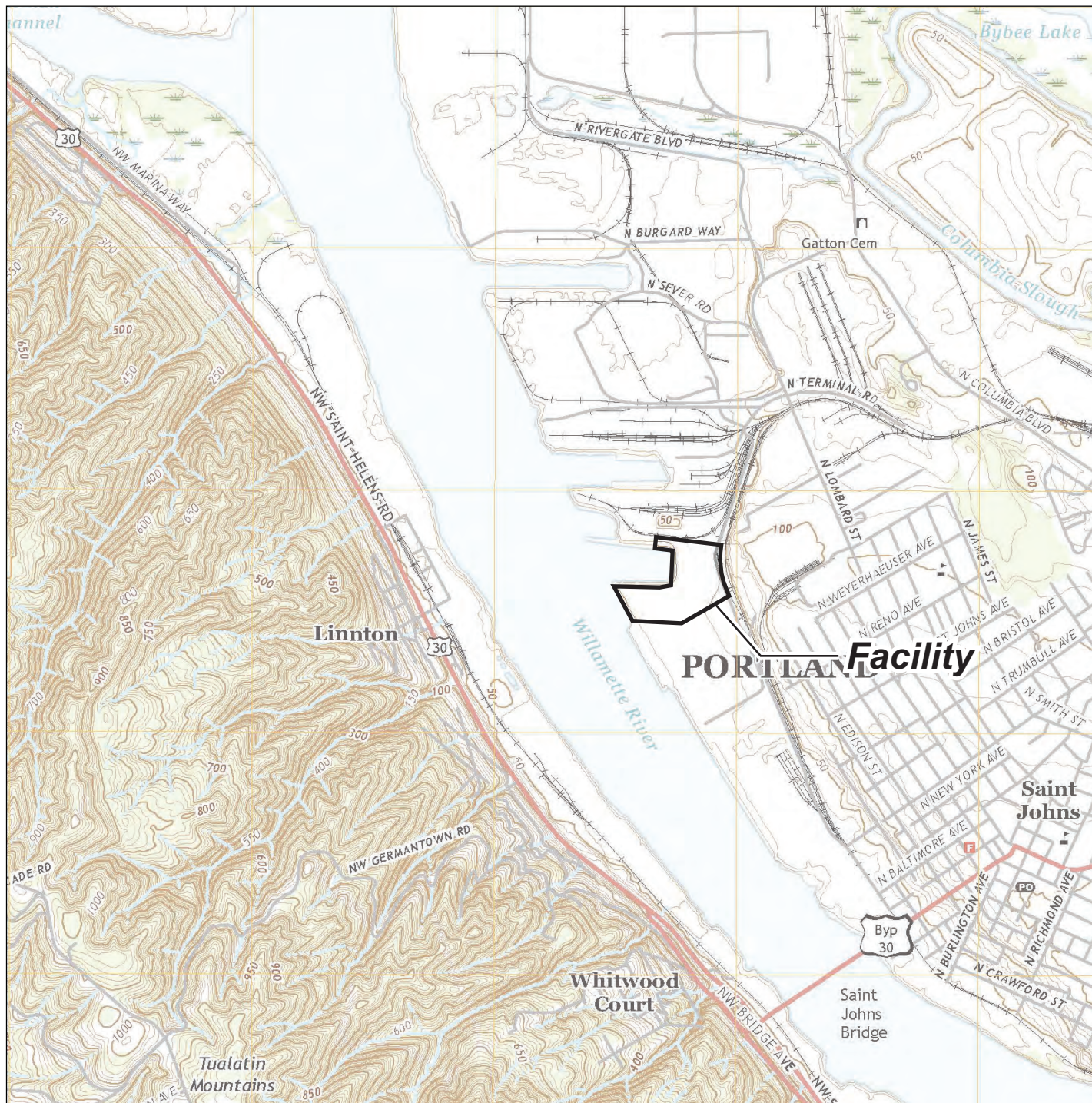
- Notes:
1. NA = No screening level is established.
 2. **Boldface** data represents detected analyte concentrations exceeding compliance criteria; note, this is provided for information purposes only.
 3. ROD compliance criteria is for groundwater discharge at the Slip or river and is not applicable to monitoring well data.
 4. J = Result is an estimated value.
 5. PAHs = Polycyclic aromatic hydrocarbons.
 6. TPH = Total petroleum hydrocarbons.
 7. µg/L = Micrograms per liter.
 8. C10-C12 aliphatic hydrocarbon values are the sum of n-decane, n-undecane, and n-dodecane. Not detected values are summed at one-half the method detection limit (MDL). If C10-C12 aliphatic hydrocarbons were not detected in the sample, then the highest MDL is shown.
 9. < = Constituent not detected above the minimum reporting limit.
 10. -- Value was not available
 11. Monitoring well HC-6S was dry during the August and November 2022 sampling events and no samples were collected.

Table 4
Groundwater Analytical Results – C10-C12 Aliphatic Hydrocarbons and Metals (Total and Dissolved)
Terminal 4 Slip 3 Upland Facility
Port of Portland

Sample ID	Sample Date	C10-C12 Aliphatic Hydrocarbons (µg/L)	Metals (µg/L)																	
			Arsenic		Cadmium		Chromium		Copper		Lead		Manganese		Mercury		Vanadium		Zinc	
			Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved
South Slip 3 Area																				
HC-2	4/25/2022	<0.13	<1.00	<1.00	<0.200	<0.200	<2.00	<2.00	<2.00	<2.00	0.308 J+	<0.200	53.8	48.9	<0.0800	<0.0800	<2.00	<2.00	211 J+	92.2
	8/11/2022	<20.5	<1.00	<1.00	0.216	<0.200	<2.00	<2.00	<2.00	<2.00	<0.200	<0.200	17.6	13.8	<0.0800	<0.0800	<2.00	<2.00	369	273
	11/17/2022	<39.5	1.640	1.570	0.395	0.342	<2.00	<2.00	<2.00	<2.00	<0.200	<0.200	69.8	72	<0.0800	<0.0800	<2.00	<2.00	90.9	93.5
HC-5	4/26/2022	0.88 J	1.58	1.55	<0.200	<0.200	<2.00	<2.00	4.37	<2.00	<0.200	<0.200	771	779	<0.0800	<0.0800	<2.00	<2.00	93.3	82.7
	8/11/2022	129	2.6	1.82	0.171	<0.200	<2.00	<2.00	3.35	2.31	0.339	0.14	1,790	1,780	<0.0800	<0.0800	4.86	1.82	390	187
	11/17/2022	137	2.13	1.93	<0.200	<0.200	<2.00	<2.00	<2.00	<2.00	0.235	<0.200	1,870	1,780	<0.0800	<0.0800	5.58	5.31	699	683
HC-6S	4/25/2022	<0.13	<1.00	<1.00	<0.200	<0.200	<2.00	<2.00	<2.00	<2.00	0.314 J+	<0.200	186	202	<0.0800	<0.0800	<2.00	<2.00	16.7	18.2
BEBRA Area																				
BE-1	4/26/2022	<0.15	6.24	10.9	<0.200	<0.200	<2.00	<2.00	2.00	<2.00	0.425 J+	<0.200	4,150	3,610	<0.0800	<0.0800	<2.00	<2.00	5.61	<4.00
	8/15/2022	<20.7	14.4	12.5	<0.200	<0.200	1.12	<2.00	1.28	3.36	0.715	0.113	4,050	3,560	<0.0800	<0.0800	4.17	<2.00	4.59	2.55
	12/14/2022	<39.6	4.99	6.85	<0.200	<2.00	<2.00	<2.00	<2.00	22.3	1.22	0.733	3,600	3,280	<0.0800	<0.0800	<2.00	<2.00	7.93	11.9
BE-5	4/26/2022	0.26 J	<1.00	<1.00	0.323	0.302	<2.00	<2.00	2.14	3.61	0.465 J+	<0.200	169	146	<0.0800	<0.0800	<2.00	<2.00	68.9	70.9
	8/11/2022	<20.6	7.52	3.06	<0.200	<0.200	<2.00	<2.00	1.41	5.78	0.858	0.175	3,290	3,000	<0.0800	<0.0800	3.2	1.89	6.69	3.75
	12/14/2022	<39.7	<1.00	<1.00	<0.200	0.258	<2.00	<2.00	19.3	3.59	0.567	4.56	16	89	<0.0800	<0.0800	<2.00	2.55	64.4	50.6
HC-12D	4/25/2022	6.6	17.2	17.6	2.38	0.253 J	<2.00	<2.00	<2.00	<2.00	0.557 J+	<0.200	13,100	12,600	<0.0800	<0.0800	<2.00	<2.00	<4.00	<4.00
	4/25/2022 (DUP-1)	4.9	18.0	16.9	3.56	0.347 J	<2.00	<2.00	<2.00	<2.00	0.556	<0.200	12,900	12,400	<0.0800	<0.0800	<2.00	<2.00	<4.00	<4.00
	8/11/2022	<20.6	19.6	19.8	4.94	<0.200	<2.00	<2.00	1.62	2.23	1.46	<0.200	12,700	11,400	<0.0800	<0.0800	2.87	<2.00	7.63	2.68
	11/17/2022	<39.8	18.1	18.3	3.2	3.110	<2.00	<2.00	<2.00	<2.00	1.25	1.230	14,600	14,900	<0.0800	<0.0800	<2.00	<2.00	5.58	8.81
Portland Harbor ROD Cleanup Levels		2.6	0.018		0.094		11		2.74		0.54		430		NA		20		36.5	

- Notes:
- < = Analyte was not detected above the minimum reporting limit.
 - µg/L = Micrograms per liter.
 - J = Result is estimated.
 - J+ = Result is estimated and may be biased high.
 - Boldface** data represents detected analyte concentrations exceeding the Portland Harbor ROD.
 - NA = No screening level is established.
 - ROD = Record of Decision from US Environmental Protection Agency Cleanup Levels for the Portland Harbor Superfund Site, Table 17, Groundwater, January 2017 (updated per Errata #2, January 2020).
 - DUP = Field duplicate.
 - = Analyte was not tested.

I:\Client\Port of Portland\00-PH905\04 T4\03 T4S3 GW\2022 Annual GWMR\32-22007573 01 (Site Location Map).des



Note: Base map prepared from USGS 7.5-minute quadrangle of Linnton, OR, dated 2020 as provided by USGS.gov.



0 2,000 4,000
Approximate Scale in Feet

Facility Location Map

Annual 2022 Groundwater Monitoring Report
Terminal 4 Slip 3 Upland Facility
Portland, Oregon



Apex Companies, LLC
15618 SW 72nd Avenue
Tigard, Oregon 97224

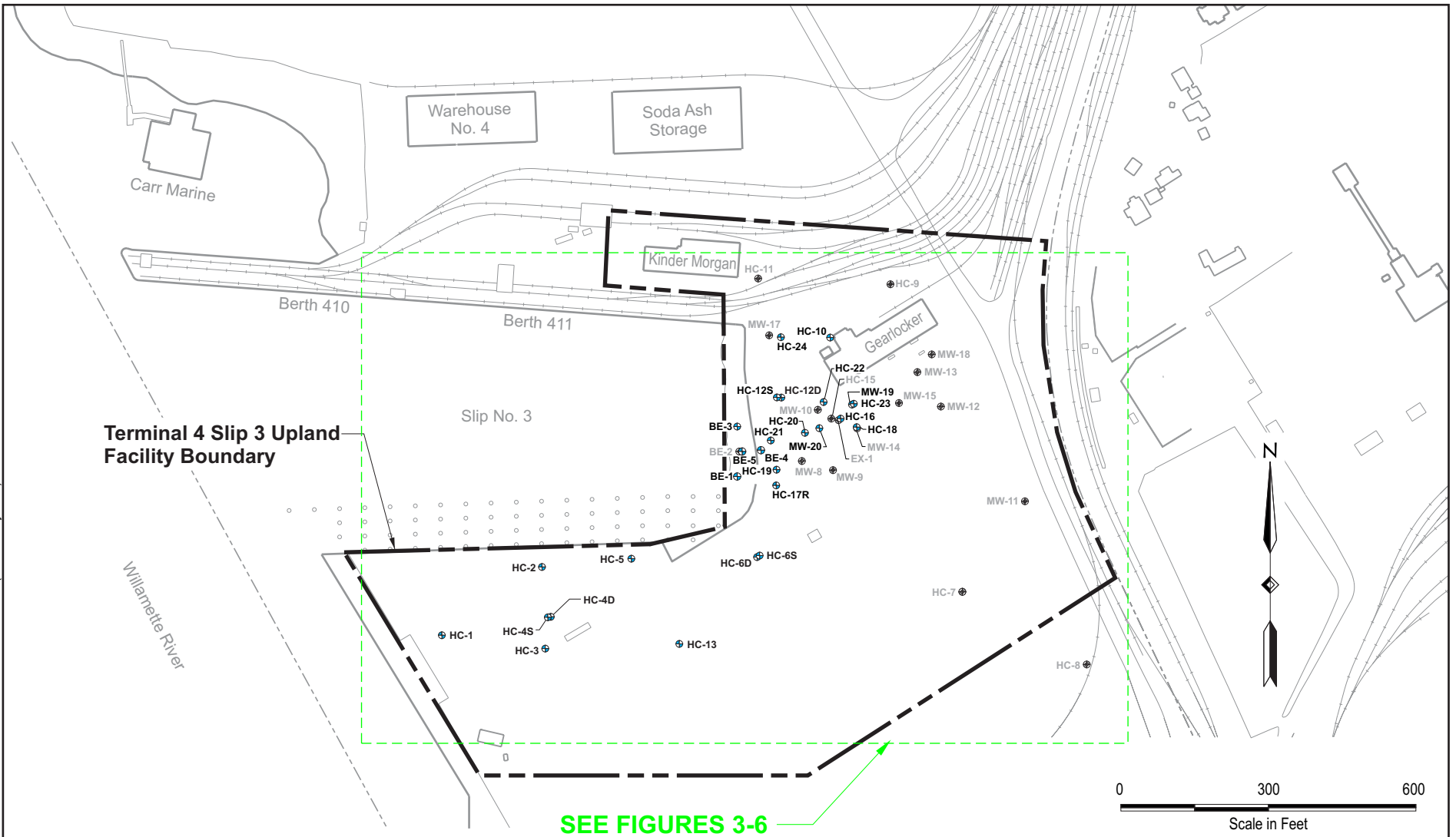
Project Number:
32-22007573

Drawn:
JP

Approved:
SM

May 2023

Figure
1



Legend:

- HC-1 ● Monitoring Well Location
- HC-8 ● Abandoned Monitoring Well Location
- BE-2 ● Destroyed Monitoring Well Location (9/2008)

Site Vicinity Plan

Annual 2022 Groundwater Monitoring Report
Terminal 4 Slip 3 Upland Facility
Portland, Oregon



Apex Companies, LLC
15618 SW 72nd Avenue
Tigard, Oregon 97224

Project Number:
32-22007573

Drawn:
JP

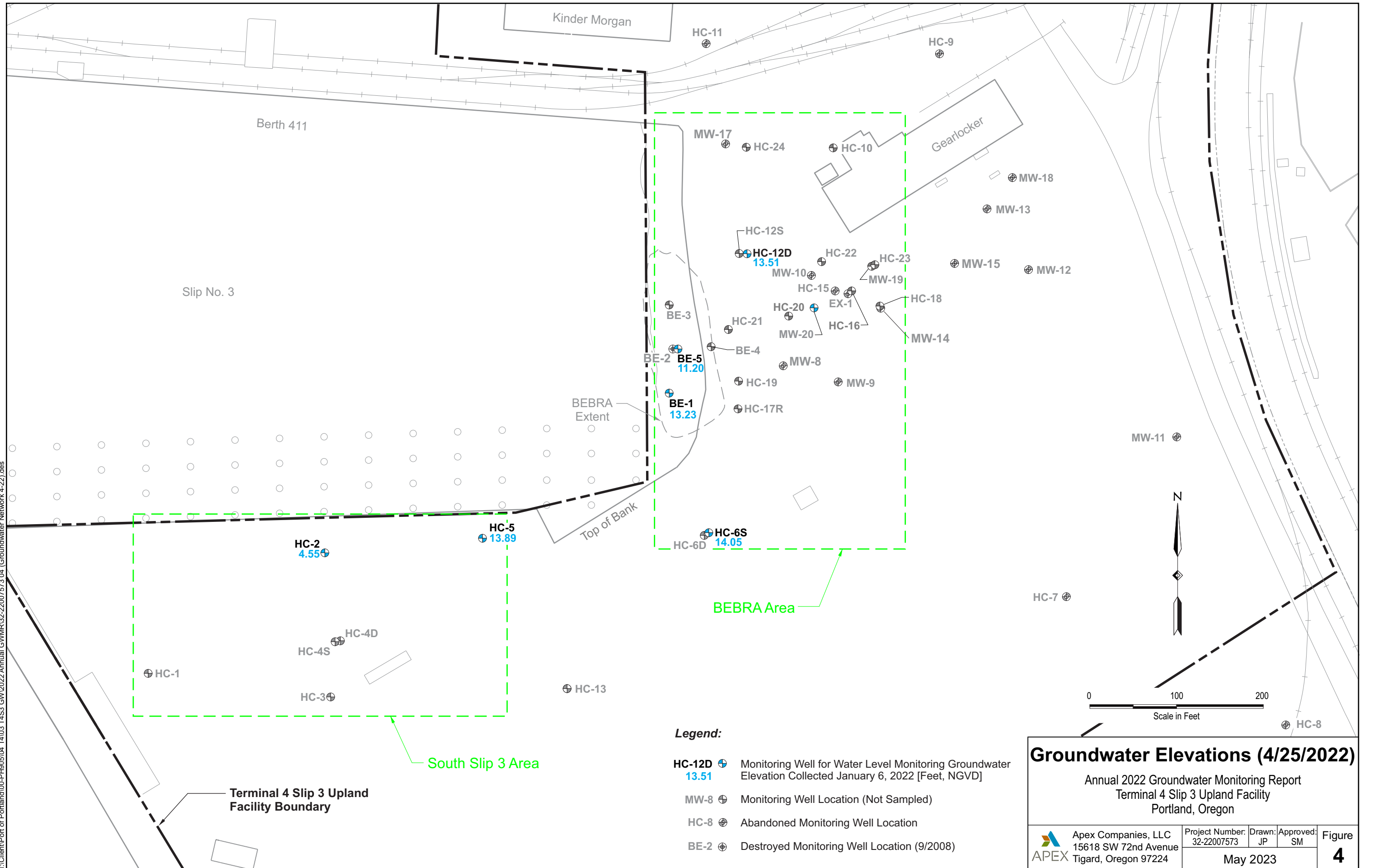
Approved:
SM

May 2023

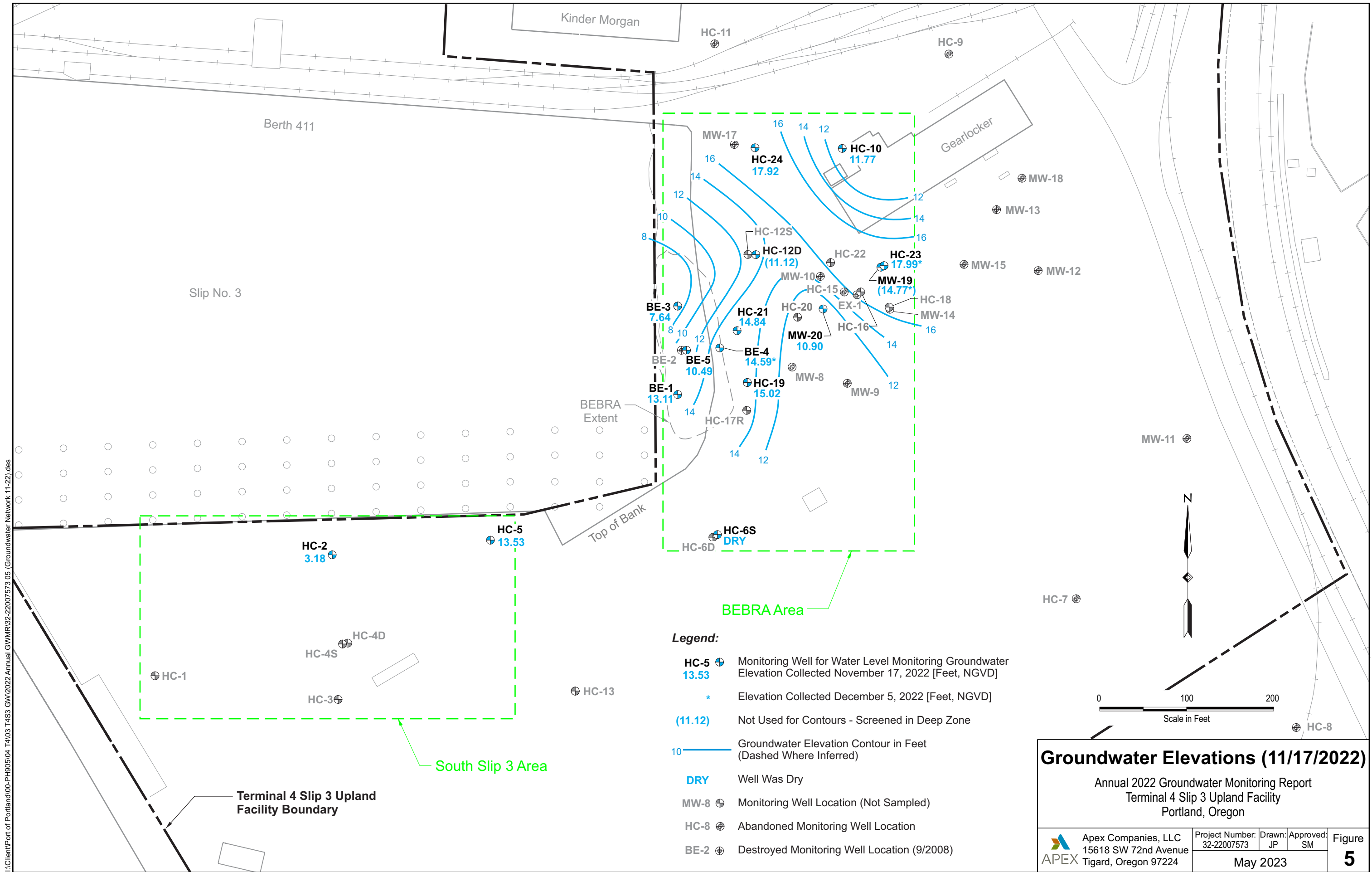
Figure
2



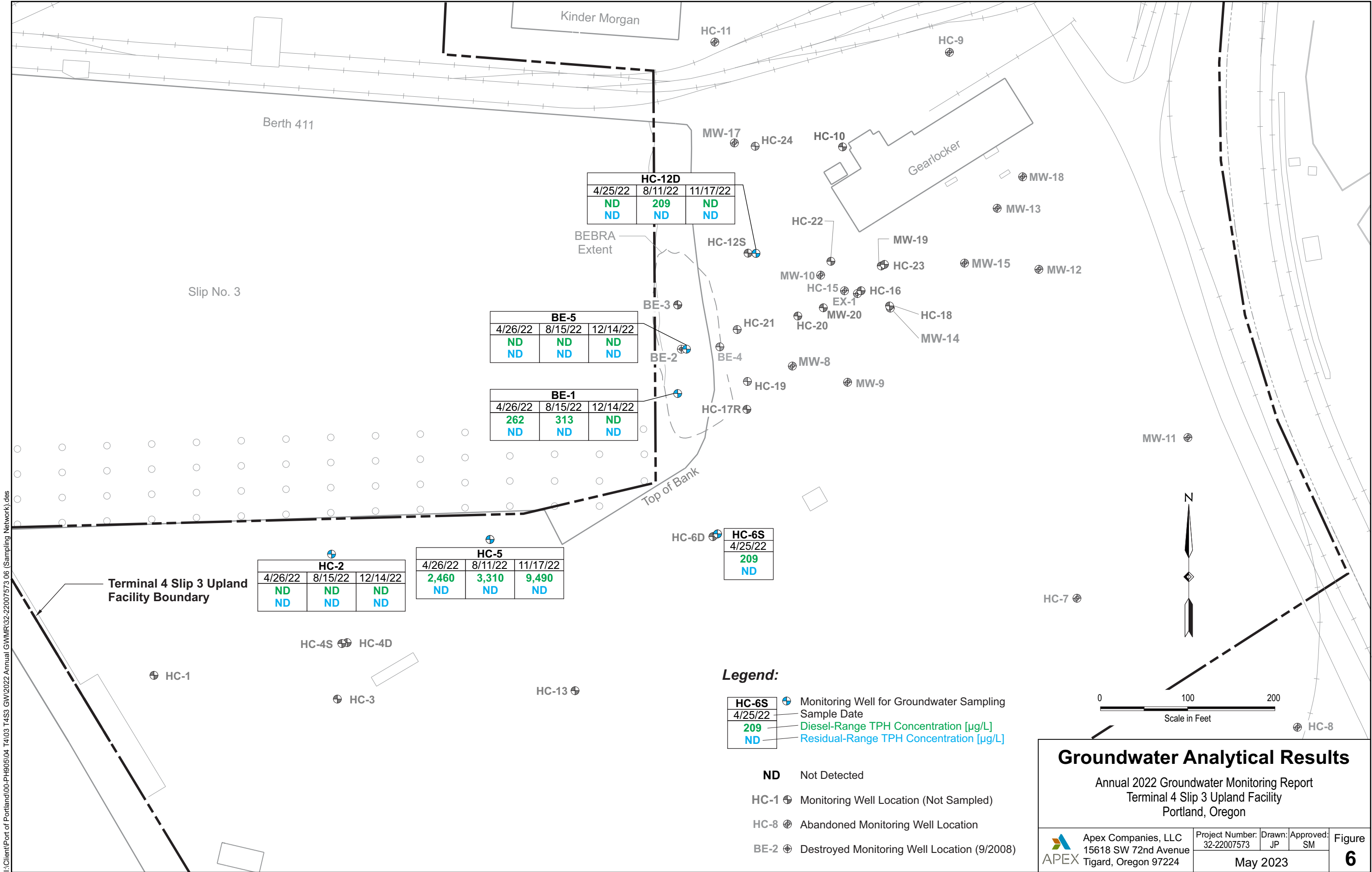
I:\Client\Port of Portland\00-PH90504 T403 T4S3 GW2022 Annual GWMR\32-22007573 04 (Groundwater Network 4-22).des



I:\Client\Port of Portland\00-PH90504 T403 T4S3 GW2022 Annual GWMR\32-22007573 05 (Groundwater Network 11-22).des



I:\Client\Port of Portland\00-PH90504 T403 T4S3 GW2022 Annual GWMR\32-22007573 06 (Sampling Network).des



Appendix A

Field and Quality Assurance/Quality Control Procedures

Introduction

The Port of Portland (Port) is required to conduct groundwater and light non-aqueous phase liquid (LNAPL) monitoring in association with the remedial action at the Terminal 4 Slip 3 Upland Facility (the Facility), as outlined in the *Record of Decision* (ROD; Department of Environmental Quality [DEQ], 2003), *Explanation of Significant Difference* (DEQ, 2004), and *Consent Judgment* (Circuit Court of Oregon, 2004). The specific implementation of the remedial action is described in the *Remedial Design/Remedial Action Work Plan* (RD/RA Work Plan; Hart Crowser, 2004), as amended (Port, 2004). The monitoring program is described in the *LNAPL Removal, Groundwater Monitoring, and Construction Plan* (Monitoring Plan; BBL/Ash Creek/Newfields, 2005) and the *Site Closure Evaluation and Recommendation – Groundwater* (Ash Creek, 2009). This appendix describes the field sampling procedures and quality assurance/quality control (QA/QC) procedures used during the monitoring and LNAPL removal events.

Field and Sampling Procedures

The scope of work (SOW) includes measuring water elevations, performing groundwater monitoring, and removing LNAPL from selected monitoring wells. The field and sampling procedures include the following:

- Measurement of water levels in monitoring wells;
- Collection of groundwater samples from monitoring wells;
- Removal of LNAPL from monitoring wells;
- Sample management (e.g., containers, storage, and shipment);
- Decontamination procedures; and
- Handling of investigation-derived waste (IDW).

Measurement of Water Levels in Monitoring Wells

Water levels in the wells were measured and recorded for the purpose of determining the groundwater gradient and elevations. The wells were first opened and the water levels allowed to equilibrate before the measurements were taken. Measurements were made to the nearest 0.01 foot using an electronic water probe.

Collection of Groundwater Samples from Monitoring Wells

Groundwater monitoring consisted of collecting groundwater samples and measuring groundwater field parameters. Field sampling sheets are included in this appendix.

Appendix A – Field and QA/QC Procedures

After groundwater levels were measured, the selected wells were purged using a peristaltic pump and low-flow purging techniques. Wells with measurable thicknesses of LNAPL were not sampled. Purging of the sampled wells was considered complete when the water quality parameters (pH, temperature, and specific conductance) stabilized within 10 percent of the previous readings. BEBRA wells are not purged due to limited water volume. During purging, the purge water characteristics (e.g., color, turbidity, sheens) and purge volumes were documented. After purging was completed, the wells were sampled. Groundwater samples were collected using a low-flow peristaltic pump and disposable tubing. Purge water was placed in labeled drums pending disposal.

Equipment Cleaning. Clean tubing was used for the peristaltic pump for each collected groundwater sample to prevent cross-contamination. Other groundwater sampling equipment (such as the water level probe) was cleaned prior to use in the first well and after each subsequent well.

LNAPL Monitoring and Removal from Monitoring Wells

Monitoring and removal of LNAPL is conducted on select wells. During each monitoring event, water and product levels were measured in the wells included in the LNAPL program. Each well is monitored for the presence of LNAPL with a product interface probe. Depths to both water and product (if present) were measured and recorded. LNAPL is removed from each monitoring well that is observed to have more than 0.1 foot of accumulated LNAPL. If a removable quantity of LNAPL (>0.1 foot) is observed in any well during the annual monitoring event, then it is added to the list of regularly monitored wells for the next event. The LNAPL was removed with passive skimmers in wells MW-19 and MW-20.

Passive Skimmer Product Removal. After June 9, 2006, passive product skimmers (Keck 4-4L passive recovery canisters) have been used to collect and remove product from wells MW-19 and MW-20. The passive skimmers are maintained so that the water/LNAPL interface is within the 2-foot intake screen of the skimmer. The skimmers are manually removed from the well, drained (through the drain valve), and reinstalled in the well. If residual LNAPL remains in the well after the removal of the skimmer (*i.e.*, the volume of LNAPL in the well was larger than the storage capacity of the skimmer), then the remaining LNAPL is removed as described below. The depth to water is measured in the well and the length of the cable support for each skimmer is adjusted as necessary to reinstall in the wells.

Manual Product Removal. For wells with more than 0.1 foot of measured LNAPL, the product removal process generally involves removing product with a bailer or by using the suction hose of a pump being lowered into the well together with the interface probe (attached to the hose so that the interface point of the probe coincides with the opening of the hose) to allow the operator to judge the depth of the suction hose relative to the oil/water interface and manipulate the depth of the hose so that the floating product is preferentially extracted.

Appendix A – Field and QA/QC Procedures

Sample Management

Pre-cleaned, certified sample containers were provided by the contract analytical laboratory. A sample label was affixed to each sample container and was marked with a unique sample number, date of collection, project number, and sampler's initials. Chain of custody (COC) was maintained and documented at all times. Sample custody seals and packing materials for filled sample containers were provided by the analytical laboratory. The filled, labeled, sealed containers were placed in a cooler on ice and carefully packed to eliminate the possibility of container breakage.

Samples were packaged by the field personnel and transported as low-concentration environmental samples. Shipments were accompanied by the COC form identifying the contents. The original form accompanied the shipment; copies were retained by the sampler for the sampling office records.

Decontamination Procedures

Personnel Decontamination. The Health and Safety Plan (HASP) for the Facility identifies the appropriate level of protection for the type of work and expected field conditions involved in this project. In general, clothing and other protective equipment can be removed from the investigation area. Field personnel should thoroughly wash their hands and faces at the end of each day and before taking any work breaks.

Sampling Equipment Decontamination. To prevent cross-contamination between sampling events, clean, dedicated sampling equipment (e.g., groundwater sampling tubing) was used for each sampling event and was discarded after use. Cleaning of non-disposable items consisted of washing in a detergent (Alconox®) solution, rinsing with tap water, followed by a deionized (DI) water rinse.

Handling of Investigation-Derived Waste

IDW was generated from LNAPL removal and well sampling activities. The IDW generated included LNAPL, purge water, decontamination water, and discarded personal protective supplies. LNAPL, purge water, and decontamination water were placed in DOT-approved drums pending off-site disposal/recycling. Used personal protective equipment (PPE) and trash were collected and disposed of in a waste receptacle.

Appendix A – Field and QA/QC Procedures

References

- Ash Creek, 2009. *Site Closure Evaluation and Recommendation – Groundwater, Terminal 4 Slip 3 Upland Facility*. May 14, 2009.
- BBL/Ash Creek/Newfields, 2005. *LNAPL Removal, Groundwater Monitoring, and Construction Plan*. June 2005.
- Circuit Court of Oregon, Multnomah County, 2004. *Consent Judgment – State of Oregon v. Port of Portland*. October 7, 2004.
- DEQ, 2003. *Record of Decision, Port of Portland Terminal 4 Slip 3 Upland*. April 21, 2003.
- DEQ, 2004. *Explanation of Significant Difference, Port of Portland Terminal 4 Slip 3 Upland Facility*. September 1, 2004.
- Hart Crowser, 2004. *Remedial Design/Remedial Action Work Plan, Terminal 4, Slip 3 Upland Facility*. September 27, 2004.
- Port of Portland, 2004. Letter to DEQ: *Terminal 4 Slip 3 Upland Facility, Response to Comments/Work Plan Addendum, Remedial Design/Remedial Action Work Plan*. October 7, 2004.



3015 SW 1st Ave
Portland, OR 97201
503-924-6357

PROJECT NUMBER 1007-23

FIELD REPORT NUMBER

PAGE 1 OF 1

DATE 4/25/2022

PROJECT Terminal 4 Slip 3 Groundwater Sampling
LOCATION Terminal 4 Slip 3 Upland Facility Portland, Oregon
CLIENT POP
PURPOSE OF OBSERVATIONS GWM
APEX REPRESENTATIVE Robert Schettler
ARRIVAL TIME 1600
DEPARTURE TIME 1840
CONTRACTOR
APEX PROJECT MANAGER Steve Misner

1000 - Arrive at gate and check in.
1015 - Arrive at site and wait for security to unlock gate to river.
1020 - Discover lock on BE-3 had damage from someone trying to cut it. It can not be unlocked. I initially thought this well was supposed to be sampled (not labeled), but later found it was not in this scope. Bring new lock and cutter next time. Continue to open well caps.
1135 - Begin gaging after all locations accessed and allowed to equilibrate.
1230 - Gaging complete. Several wells difficult to access due to overgrown vegetation, steep/muddy slopes, and bolts that have been stripped.
1235 - Set up gear for sampling and begin.
1840 - Sampling for the day is complete - off site.

BY


APEX REPRESENTATIVE

Our firm's professionals are represented on site solely to observe operations of the contractor identified, to form opinions about the adequacy of those operations, and to report those opinions to our client. The presence and activities of our field representative do not relieve any contractor from its obligation to meet contractual requirements. The contractor retains sole responsibility for site safety and the methods, operations, and sequence of construction. Unless signed by the Ash Creek Associates Project Manager, this report is preliminary. A preliminary report is provided solely as evidence that field observation was performed. Observations and/or conclusions and/or recommendations conveyed in the final report may vary from and shall take precedence over those included in a preliminary report.



3015 SW 1st Ave
Portland, OR 97201
503-924-6357

PROJECT NUMBER 1007-23
FIELD REPORT NUMBER
PAGE 1 OF 1
DATE 4/26/2022

PROJECT Terminal 4 Slip 3 Groundwater Sampling
LOCATION Terminal 4 Slip 3 Upland Facility Portland, Oregon
CLIENT POP
PURPOSE OF OBSERVATIONS GWM
APEX REPRESENTATIVE Robert Schettler
ARRIVAL TIME 0830
DEPARTURE TIME 1800
CONTRACTOR
APEX PROJECT MANAGER Steve Misner

0830 - Check in
0840 - Arrive at gate and wait for security to unlock.
0850 - GWM begins.
1020 - Port of Portland representative stops by to see what I am doing. I could not catch his name due to distance / machinery running. He leaves shortly after.
1718 - Sampling is complete. BE-1 and BE-5 both detected. Collection time was very slow due to recharge rate.
1745 - IDW dropped off. Key for IDW now discovered and labeled. IDW is in drum that is ~ 1/2 full.
1800 - Exit site.

BY


APEX REPRESENTATIVE

Our firm's professionals are represented on site solely to observe operations of the contractor identified, to form opinions about the adequacy of those operations, and to report those opinions to our client. The presence and activities of our field representative do not relieve any contractor from its obligation to meet contractual requirements. The contractor retains sole responsibility for site safety and the methods, operations, and sequence of construction. Unless signed by the Ash Creek Associates Project Manager, this report is preliminary. A preliminary report is provided solely as evidence that field observation was performed. Observations and/or conclusions and/or recommendations conveyed in the final report may vary from and shall take precedence over those included in a preliminary report.

APEX

		Job Number:	1007-23
Client:	POP	Date:	4/25/2022
Project:	Terminal 4 Slip, 3 GWM	Sampler:	Robert Schettler
Weather:	Cloudy / Rain	Time In/Out:	

[illegible]

WELL MONITORING DATA SHEET

	Well I.D.	HC-12D	Job Number:	1007-23
	Client:	POP	Date:	4/25/23
	Project:	Terminal 4 Slip 3 GWM	Sampler:	Robert Schettler
	Weather:	Cloudy / rain	Time In/Out:	1446

WELL DATA

Well Depth:		Well Diameter:	2"	Water Height	
Depth to Water:	15.81	Screened Interval:		x Multiplier	
Water Column Length:		Depth to Free Product:		x Casing Volumes	
Purge Volume:		Free Product Thickness:		= Purge Volume	
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:	P. Pump	Pump Intake Depth:		Comments							
Sampling Method:	LF	Tubing Type:									
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
1449			15.17		7.67	16.0	128.5	78.7	38.2		AC
1451			16.20		7.54	16.0	134.6	4.52	21.0		AC
1454			16.20		6.72	15.9	216.5	0.67	-7.4		C
1457			16.20		6.47	15.9	841	0.48	0.7		C
1500			16.20		6.61	15.9	895	0.29	-12.9		C
1503			16.20		6.64	15.8	908	0.29	-18.8		C
1506			16.20		6.65	15.8	714	0.25	-23.4		C

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	HC-12D	Sampling Flow Rate	0.20	Analytical Laboratory:		
Sample Time:	1506	Final Depth to Water:	16.20	Did Well Dewater?	N.	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

Dup - 01 Tester

Well I.D.	H/C - 5	Job Number:	1007-23
Client:	POP	Date:	4/26
Project:	Terminal 4 Slip 3 GWM	Sampler:	Robert Schettler
Weather:	cloudy/rain	Time In/Out:	0800

Well Depth:		Well Diameter:		Water Height	
Depth to Water:	18.22	Screened Interval:		x Multiplier	
Water Column Length:		Depth to Free Product:		x Casing Volumes	
Purge Volume:		Free Product Thickness:		= Purge Volume	
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

Purge Method:	P. Pump	Pump Intake Depth:		Comments
Sampling Method:	LF	Tubing Type:		

[illegible]

SAMPLING DATA

[illegible]

COMMENTS

WELL MONITORING DATA SHEET



Well I.D.	HC-2	Job Number:	1007-23
Client:	POP	Date:	4/25/00
Project:	Terminal 4 Slip 3 GWM	Sampler:	Robert Schettler
Weather:	cloudy / rain	Time In/Out:	1536

WELL DATA

Well Depth:		Well Diameter:		Water Height	
Depth to Water:	27.23	Screened Interval:		x Multiplier	
Water Column Length:		Depth to Free Product:		x Casing Volumes	
Purge Volume:		Free Product Thickness:		= Purge Volume	
Water Height Multipliers (gal)		1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters

PURGING DATA

Purge Method:	P. Pump				Pump Intake Depth:		Comments					
Sampling Method:	L.F.				Tubing Type:							
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color	Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria	
1739		27.28		0.20	5.66	14.8	117.2	0.25	3.4			C
1742		27.31		0.26	5.78	14.8	124.2	0.29	-6.2			C
1745		27.31		0.20	5.74	14.8	126.3	0.29	-8.3			C
1748		27.31		0.20	5.78	14.9	126.8	0.25	-21.1			C

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	HC-2	Sampling Flow Rate	0.20	Analytical Laboratory:		
Sample Time:	1750	Final Depth to Water:	22.31	Did Well Dewater?	no	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

Well I.D.	HLC-65	Job Number:	1007-23
Client:	POP	Date:	4/25
Project:	Terminal 4 Slip 3 GWM	Sampler:	Robert Schettler
Weather:	Cloudy / Rain	Time In/Out:	1608

Well Depth:		Well Diameter:		Water Height	
Depth to Water:	18.98	Screened Interval:		x Multiplier	
Water Column Length:		Depth to Free Product:		x Casing Volumes	
Purge Volume:		Free Product Thickness:		= Purge Volume	
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

[illegible]

SAMPLING DATA

[illegible]

COMMENTS

Well I.D.	BE-1	Job Number:	1007-23
Client:	POP	Date:	9/26
Project:	Terminal 4 Slip 3 GWM	Sampler:	Robert Schettler
Weather:	Cloudy / Rain	Time In/Out:	125

Well Depth:		Well Diameter:	3/4"	Water Height	
Depth to Water:	6.52	Screened Interval:		x Multiplier	
Water Column Length:		Depth to Free Product:		x Casing Volumes	
Purge Volume:		Free Product Thickness:		= Purge Volume	
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

Purge Method:	P. Pump	Pump Intake Depth:		Comments
Sampling Method:	LF	Tubing Type:		

[illegible]

SAMPLING DATA

[illegible]

COMMENTS

[illegible]

Client:

Port of Portland

Date: _____

11/17/2022

Project:

T4 $\leq$ 3

Sampler:

Franklin Sullivan

Weather:

$P. \text{Colony} \sim 50^\circ$

Time In/Out:

[illegible]

Appendix B

Data QA/QC Review and Analytical Laboratory Reports

1.0 Introduction

This appendix documents the results of a quality assurance (QA) review of the analytical data for groundwater samples collected during the 2021 groundwater sampling at Terminal 4 Slip 3 Upland Facility. All analyses were performed by Apex Laboratories of Tigard, Oregon. Apex Laboratories is ORELAP certified (ID OR100062) for PAHs by 8270E and diesel/residual range organics with silica gel cleanup by NWTPH-Dx. A copy of the analytical laboratory report summary is included in this appendix, referenced in Table 1 as follows.

Table 1: Analytical Laboratory Reports

Report	Report Date	Sampling Event
A2D1086	June 24, 2022	April 2022 Groundwater Sampling
A2H0590	September 28, 2022	August 2022 Groundwater Sampling
A2H0645	September 28, 2022	August 2022 Groundwater Sampling
A2K0762	January 19, 2023	November 2022 Groundwater Sampling
A2L0619	January 12, 2023	November 2022 Groundwater Sampling

2.0 Data Validation

The QA review outlines the applicable quality control criteria utilized during the data review process, as well as any deviations from those criteria. Examination and validation of the laboratory summary reports include:

- Analytical preparation and quantitation methods
- Analytical method holding times
- Sample handling
- Chain of custody handling
- Detection and reporting limits
- Method blank detections
- Laboratory control samples and surrogates to assess accuracy
- Laboratory control sample duplicates to assess precision.

The QA review did not include a review of raw data.

Appendix B – Data QA/QC Review

2.1 Data Qualifiers

Any data that is found to have possible bias or error were qualified and flagged. The flags used in the data table are below.

Table 2: Qualifier Flags

J	Result is estimated.
J+	Result is estimated and may be biased high.
J-	Result is estimated and may be biased low.
UJ	The not detected result is estimated. The reporting limit may be inaccurate or imprecise.

3.0 Analytical Methods

Chemical analyses on the collected water samples consisted of the following:

- Diesel and residual range organics with silica gel cleanup by Method NWTPH-Dx;
- Polycyclic aromatic hydrocarbons (PAHs) by U.S. Environmental Protection Agency (EPA) Method 8270E SIM
- C10-C12 Aliphatic Hydrocarbons by EPA Method 8015M (April 2022 groundwater samples)
- C10-C12 Aliphatic Hydrocarbons by Northwest Extractible Petroleum Hydrocarbons (August and November groundwater samples); and
- Metals by EPA Method 6020B

4.0 Quality Assurance Objectives and Review

The general QA objectives for this project were to develop and implement procedures for obtaining and evaluating data of a quality that is suitable for comparison to regulatory compliance criteria. To collect such information, analytical data must have an appropriate degree of accuracy and reproducibility, samples collected must be representative of actual field conditions, and samples must be collected and analyzed using unbroken chain-of-custody (COC) procedures.

Reporting limits and analytical results were compared to action levels for each parameter in the media of concern. Precision, accuracy, representativeness, completeness, and comparability parameters used to indicate data quality are defined below.

Appendix B – Data QA/QC Review

Reporting Limits. Detection and reporting limits are set by the laboratory and are based on instrumentation abilities, sample matrix, and suggested detection limits set by the EPA or the Oregon Department of Environmental Quality (DEQ). Method detection limits (MDLs) were generally consistent with industry standards and were below the relevant *Record of Decision* (ROD) cleanup standards except for benzo(a)pyrene (BAP) and benzo(a)anthracene (BAA) for wells HC-5, BE-1, and HC-12D. Results were reported to MDLs and detections between the MDL and reporting limit (RL) were 'J' flagged as estimated values.

Holding Times. Samples were extracted and analyzed within method holding times.

Sampling Containers and Preservation. Samples were collected in amber glass and plastic containers provided by the laboratory and were immediately chilled with ice. Samples to be analyzed for diesel and residual range organics were preserved with hydrochloric acid (HCl). Samples analyzed for metals were preserved with nitric acid. Samples were received by the laboratory in good condition and below 6 degrees Celsius.

Precision. Precision measures the reproducibility of data under a given set of conditions. Specifically, it is a quantitative measure of the variability of a group of measurements compared to their average values.

Analytical precision is measured through a batch laboratory control sample and laboratory control sample duplicate (LCS and LCSD, respectively). Analytical precision is quantitatively expressed as the relative percent difference (RPD) between the same analytes for the LCS and LCSD. The RPD for all LCS and LCSDs were within control limits.

Sampling precision is measured through field duplicates. The field duplicate results are compared to the initial result to assess variability in the sample matrix and bias due to sampling procedures. A field duplicate was collected during the April 2022 sampling event from well HC-12D. The field duplicate results were within the 30 percent RPD control limit. Field duplicates were inadvertently not collected during the August or November 2022 sampling events.

Accuracy. Accuracy is the measure of error between the reported test results and the true sample concentration. "Perfect" accuracy is 100 percent recovery. True sample concentration is never known due to analytical limitations, variability, and error. Consequently, accuracy is inferred from the recovery data from spiked samples. The laboratory performed sufficient spike samples of a similar matrix (*i.e.*, water) to allow the computation of the accuracy.

The laboratory was assessed for accuracy through the laboratory control sample and the laboratory control sample duplicate. Each LCS/LCSD contained analyte-free water, was spiked with a known concentration of

Appendix B – Data QA/QC Review

analyte, and expressed as a percent recovery. Those recoveries have certain limits as established by the method or laboratory capabilities. LCS and LCSD percent recoveries were within control limits.

Sample extraction/preparation and instrumentation accuracy is evaluated through surrogate recoveries. A surrogate has similar properties to the analytes of interest but is not included on the analyte list. The surrogate is spiked into samples at a known concentration at the beginning of the extraction or preparation process and is analyzed on instrumentation with the sample. A percent recovery is then calculated from the actual concentration of the surrogate and the result from the instrument. Surrogate recoveries were generally within control limits with the following exception.

- For PAH analysis of groundwater collected from BE-1, HC-2, HC-6S, HC-12D and the field duplicate in April 2022, the surrogate acenaphthylene-d8 was recovered below the lower control limit. Verification showed that the true value of the surrogate spike was approximately 70% of expected.

Bias. The laboratory is required to run method blanks per the methods used for analysis. The method blank can determine if there is any contamination within the laboratory preparation or analytical procedure.

Zinc was detected above the method reporting limit for the April 2022 method blank from analytical batch A2D1086-01 (16 micrograms per liter). Groundwater samples collected from BE-1 and HC-12D were not detected for zinc and laboratory contamination is not suspected for these samples. However, zinc was detected in sample HC-2, HC-5, HC-6S and BE-5 at a concentration that is less than ten times the method blank concentration. These results may have been significantly influenced by laboratory contamination and the result may be biased high.

Conclusion. In conclusion, QA objectives were met, and results are acceptable for use.



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

Friday, June 24, 2022

Steve Misner

Apex Companies, LLC

3015 SW First Avenue

Portland, OR 97201

RE: A2D1086 - POP T4 - Slip 3 GW - 1007-23

Thank you for using Apex Laboratories. We greatly appreciate your business and strive to provide the highest quality services to the environmental industry.

Enclosed are the results of analyses for work order A2D1086, which was received by the laboratory on 4/27/2022 at 3:20:00PM.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: DAuvil@apex-labs.com, or by phone at 503-718-2323.

Please note: All samples will be disposed of within 30 days of sample receipt, unless prior arrangements have been made.

Cooler Receipt Information

(See Cooler Receipt Form for details)

Cooler#1	1.2 degC	Cooler#2	2.9 degC
Cooler#3	4.9 degC		

This Final Report is the official version of the data results for this sample submission, unless superseded by a subsequent, labeled amended report.

All other deliverables derived from this data, including Electronic Data Deliverables (EDDs), CLP-like forms, client requested summary sheets, and all other products are considered secondary to this report.



Apex Laboratories

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Darrell Auvil, Client Services Manager

**ANALYTICAL REPORT****Apex Laboratories, LLC**6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062**Apex Companies, LLC**
3015 SW First Avenue
Portland, OR 97201Project: **POP T4 - Slip 3 GW**
Project Number: **1007-23**
Project Manager: **Steve Misner****Report ID:**
A2D1086 - 06 24 22 1013**ANALYTICAL REPORT FOR SAMPLES****SAMPLE INFORMATION**

Client Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BE-1	A2D1086-01	Water	04/26/22 10:50	04/27/22 15:20
BE-5	A2D1086-02	Water	04/26/22 10:20	04/27/22 15:20
HC-2	A2D1086-03	Water	04/25/22 17:50	04/27/22 15:20
HC-5	A2D1086-04	Water	04/26/22 09:12	04/27/22 15:20
HC-6S	A2D1086-05	Water	04/25/22 16:43	04/27/22 15:20
HC-12D	A2D1086-06	Water	04/25/22 15:06	04/27/22 15:20
DUP-1	A2D1086-07	Water	04/25/22 00:00	04/27/22 15:20

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6700 S.W. Sandburg Street
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503-718-2323
ORELAP ID: OR100062Apex Companies, LLC
3015 SW First Avenue
Portland, OR 97201Project: **POP T4 - Slip 3 GW**
Project Number: **1007-23**
Project Manager: **Steve Misner****Report ID:**
A2D1086 - 06 24 22 1013

ANALYTICAL SAMPLE RESULTS

Diesel and/or Oil Hydrocarbons by NWTPH-Dx with Acid/Silica Gel Cleanup

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
BE-1 (A2D1086-01)			Matrix: Water			Batch: 22E0010		
Diesel	0.262	---	0.200	mg/L	1	05/02/22 23:26	NWTPH-Dx/SG	F-11
Oil	ND	---	0.400	mg/L	1	05/02/22 23:26	NWTPH-Dx/SG	
Surrogate: o-Terphenyl (Surr)		Recovery: 95 %		Limits: 50-150 %	1	05/02/22 23:26	NWTPH-Dx/SG	
BE-5 (A2D1086-02)			Matrix: Water			Batch: 22E0010		
Diesel	ND	---	0.211	mg/L	1	05/02/22 23:48	NWTPH-Dx/SG	
Oil	ND	---	0.421	mg/L	1	05/02/22 23:48	NWTPH-Dx/SG	
Surrogate: o-Terphenyl (Surr)		Recovery: 95 %		Limits: 50-150 %	1	05/02/22 23:48	NWTPH-Dx/SG	
HC-2 (A2D1086-03)			Matrix: Water			Batch: 22E0010		
Diesel	ND	---	0.198	mg/L	1	05/03/22 00:09	NWTPH-Dx/SG	
Oil	ND	---	0.396	mg/L	1	05/03/22 00:09	NWTPH-Dx/SG	
Surrogate: o-Terphenyl (Surr)		Recovery: 84 %		Limits: 50-150 %	1	05/03/22 00:09	NWTPH-Dx/SG	
HC-5 (A2D1086-04)			Matrix: Water			Batch: 22E0010		
Diesel	2.46	---	0.192	mg/L	1	05/03/22 00:30	NWTPH-Dx/SG	
Oil	ND	---	0.385	mg/L	1	05/03/22 00:30	NWTPH-Dx/SG	
Surrogate: o-Terphenyl (Surr)		Recovery: 98 %		Limits: 50-150 %	1	05/03/22 00:30	NWTPH-Dx/SG	
HC-6S (A2D1086-05)			Matrix: Water			Batch: 22E0010		
Diesel	ND	---	0.194	mg/L	1	05/03/22 00:52	NWTPH-Dx/SG	
Oil	ND	---	0.388	mg/L	1	05/03/22 00:52	NWTPH-Dx/SG	
Surrogate: o-Terphenyl (Surr)		Recovery: 97 %		Limits: 50-150 %	1	05/03/22 00:52	NWTPH-Dx/SG	
HC-12D (A2D1086-06)			Matrix: Water			Batch: 22E0010		
Diesel	ND	---	0.196	mg/L	1	05/03/22 01:13	NWTPH-Dx/SG	
Oil	ND	---	0.392	mg/L	1	05/03/22 01:13	NWTPH-Dx/SG	
Surrogate: o-Terphenyl (Surr)		Recovery: 100 %		Limits: 50-150 %	1	05/03/22 01:13	NWTPH-Dx/SG	
DUP-1 (A2D1086-07)			Matrix: Water			Batch: 22E0010		
Diesel	ND	---	0.190	mg/L	1	05/03/22 01:34	NWTPH-Dx/SG	
Oil	ND	---	0.381	mg/L	1	05/03/22 01:34	NWTPH-Dx/SG	
Surrogate: o-Terphenyl (Surr)		Recovery: 93 %		Limits: 50-150 %	1	05/03/22 01:34	NWTPH-Dx/SG	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323

ORELAP ID: OR100062

Apex Companies, LLC

3015 SW First Avenue
Portland, OR 97201Project: **POP T4 - Slip 3 GW**Project Number: **1007-23**Project Manager: **Steve Misner**

Report ID:

A2D1086 - 06 24 22 1013

ANALYTICAL SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
BE-1 (A2D1086-01)		Matrix: Water			Batch: 22E0040			
Acenaphthene	ND	---	0.0457	ug/L	1	05/02/22 19:18	EPA 8270E LVI	
Acenaphthylene	ND	---	0.0457	ug/L	1	05/02/22 19:18	EPA 8270E LVI	
Anthracene	ND	---	0.0457	ug/L	1	05/02/22 19:18	EPA 8270E LVI	
Benz(a)anthracene	ND	---	0.0228	ug/L	1	05/02/22 19:18	EPA 8270E LVI	
Benzo(a)pyrene	ND	---	0.0228	ug/L	1	05/02/22 19:18	EPA 8270E LVI	
Benzo(b)fluoranthene	ND	---	0.0228	ug/L	1	05/02/22 19:18	EPA 8270E LVI	
Benzo(k)fluoranthene	ND	---	0.0228	ug/L	1	05/02/22 19:18	EPA 8270E LVI	
Benzo(g,h,i)perylene	ND	---	0.0457	ug/L	1	05/02/22 19:18	EPA 8270E LVI	
Chrysene	ND	---	0.0228	ug/L	1	05/02/22 19:18	EPA 8270E LVI	
Dibenz(a,h)anthracene	ND	---	0.0228	ug/L	1	05/02/22 19:18	EPA 8270E LVI	
Fluoranthene	ND	---	0.0457	ug/L	1	05/02/22 19:18	EPA 8270E LVI	
Fluorene	ND	---	0.0457	ug/L	1	05/02/22 19:18	EPA 8270E LVI	
Indeno(1,2,3-cd)pyrene	ND	---	0.0228	ug/L	1	05/02/22 19:18	EPA 8270E LVI	
1-Methylnaphthalene	ND	---	0.0914	ug/L	1	05/02/22 19:18	EPA 8270E LVI	
2-Methylnaphthalene	ND	---	0.0914	ug/L	1	05/02/22 19:18	EPA 8270E LVI	
Naphthalene	ND	---	0.0914	ug/L	1	05/02/22 19:18	EPA 8270E LVI	
Phenanthrene	ND	---	0.0914	ug/L	1	05/02/22 19:18	EPA 8270E LVI	
Pyrene	ND	---	0.0457	ug/L	1	05/02/22 19:18	EPA 8270E LVI	
Carbazole	ND	---	0.0457	ug/L	1	05/02/22 19:18	EPA 8270E LVI	
Dibenzofuran	ND	---	0.0457	ug/L	1	05/02/22 19:18	EPA 8270E LVI	
Surrogate: Acenaphthylene-d8 (Surr)		Recovery:	72 %	Limits:	78-134 %	1	05/02/22 19:18	EPA 8270E LVI A-01
Benzo(a)pyrene-d12 (Surr)			117 %		80-132 %	1	05/02/22 19:18	EPA 8270E LVI

BE-5 (A2D1086-02RE1)

Matrix: Water

Batch: 22E0083

R-04

Acenaphthene	ND	---	0.135	ug/L	4	05/04/22 00:56	EPA 8270E LVI
Acenaphthylene	ND	---	0.135	ug/L	4	05/04/22 00:56	EPA 8270E LVI
Anthracene	ND	---	0.135	ug/L	4	05/04/22 00:56	EPA 8270E LVI
Benz(a)anthracene	ND	---	0.0673	ug/L	4	05/04/22 00:56	EPA 8270E LVI
Benzo(a)pyrene	ND	---	0.0673	ug/L	4	05/04/22 00:56	EPA 8270E LVI
Benzo(b)fluoranthene	ND	---	0.0673	ug/L	4	05/04/22 00:56	EPA 8270E LVI
Benzo(k)fluoranthene	ND	---	0.0673	ug/L	4	05/04/22 00:56	EPA 8270E LVI
Benzo(g,h,i)perylene	ND	---	0.135	ug/L	4	05/04/22 00:56	EPA 8270E LVI
Chrysene	ND	---	0.0673	ug/L	4	05/04/22 00:56	EPA 8270E LVI

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323

ORELAP ID: OR100062

Apex Companies, LLC

3015 SW First Avenue
Portland, OR 97201Project: POP T4 - Slip 3 GW

Project Number: 1007-23

Project Manager: Steve Misner

Report ID:

A2D1086 - 06 24 22 1013

ANALYTICAL SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
BE-5 (A2D1086-02RE1)		Matrix: Water			Batch: 22E0083		R-04	
Dibenz(a,h)anthracene	ND	---	0.0673	ug/L	4	05/04/22 00:56	EPA 8270E LVI	
Fluoranthene	ND	---	0.135	ug/L	4	05/04/22 00:56	EPA 8270E LVI	
Fluorene	ND	---	0.135	ug/L	4	05/04/22 00:56	EPA 8270E LVI	
Indeno(1,2,3-cd)pyrene	ND	---	0.0673	ug/L	4	05/04/22 00:56	EPA 8270E LVI	
1-Methylnaphthalene	ND	---	0.269	ug/L	4	05/04/22 00:56	EPA 8270E LVI	
2-Methylnaphthalene	ND	---	0.269	ug/L	4	05/04/22 00:56	EPA 8270E LVI	
Naphthalene	ND	---	0.269	ug/L	4	05/04/22 00:56	EPA 8270E LVI	
Phenanthrene	ND	---	0.269	ug/L	4	05/04/22 00:56	EPA 8270E LVI	
Pyrene	ND	---	0.135	ug/L	4	05/04/22 00:56	EPA 8270E LVI	
Carbazole	ND	---	0.135	ug/L	4	05/04/22 00:56	EPA 8270E LVI	
Dibenzofuran	ND	---	0.135	ug/L	4	05/04/22 00:56	EPA 8270E LVI	
Surrogate: Acenaphthylene-d8 (Surr)		Recovery: 23 %		Limits: 78-134 %	4	05/04/22 00:56	EPA 8270E LVI	S-05
Benzo(a)pyrene-d12 (Surr)		122 %		80-132 %	4	05/04/22 00:56	EPA 8270E LVI	S-05
HC-2 (A2D1086-03)		Matrix: Water			Batch: 22E0040			
Acenaphthene	ND	---	0.0432	ug/L	1	05/02/22 19:51	EPA 8270E LVI	
Acenaphthylene	ND	---	0.0432	ug/L	1	05/02/22 19:51	EPA 8270E LVI	
Anthracene	ND	---	0.0432	ug/L	1	05/02/22 19:51	EPA 8270E LVI	
Benz(a)anthracene	ND	---	0.0216	ug/L	1	05/02/22 19:51	EPA 8270E LVI	
Benzo(a)pyrene	ND	---	0.0216	ug/L	1	05/02/22 19:51	EPA 8270E LVI	
Benzo(b)fluoranthene	ND	---	0.0216	ug/L	1	05/02/22 19:51	EPA 8270E LVI	
Benzo(k)fluoranthene	ND	---	0.0216	ug/L	1	05/02/22 19:51	EPA 8270E LVI	
Benzo(g,h,i)perylene	ND	---	0.0432	ug/L	1	05/02/22 19:51	EPA 8270E LVI	
Chrysene	ND	---	0.0216	ug/L	1	05/02/22 19:51	EPA 8270E LVI	
Dibenz(a,h)anthracene	ND	---	0.0216	ug/L	1	05/02/22 19:51	EPA 8270E LVI	
Fluoranthene	ND	---	0.0432	ug/L	1	05/02/22 19:51	EPA 8270E LVI	
Fluorene	ND	---	0.0432	ug/L	1	05/02/22 19:51	EPA 8270E LVI	
Indeno(1,2,3-cd)pyrene	ND	---	0.0216	ug/L	1	05/02/22 19:51	EPA 8270E LVI	
1-Methylnaphthalene	ND	---	0.0864	ug/L	1	05/02/22 19:51	EPA 8270E LVI	
2-Methylnaphthalene	ND	---	0.0864	ug/L	1	05/02/22 19:51	EPA 8270E LVI	
Naphthalene	ND	---	0.0864	ug/L	1	05/02/22 19:51	EPA 8270E LVI	
Phenanthrene	ND	---	0.0864	ug/L	1	05/02/22 19:51	EPA 8270E LVI	
Pyrene	ND	---	0.0432	ug/L	1	05/02/22 19:51	EPA 8270E LVI	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

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503-718-2323

ORELAP ID: OR100062

Apex Companies, LLC

3015 SW First Avenue
Portland, OR 97201Project: POP T4 - Slip 3 GW

Project Number: 1007-23

Project Manager: Steve Misner

Report ID:

A2D1086 - 06 24 22 1013

ANALYTICAL SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
HC-2 (A2D1086-03)		Matrix: Water			Batch: 22E0040			
Carbazole	ND	---	0.0432	ug/L	1	05/02/22 19:51	EPA 8270E LVI	
Dibenzofuran	ND	---	0.0432	ug/L	1	05/02/22 19:51	EPA 8270E LVI	
Surrogate: Acenaphthylene-d8 (Surr)		Recovery:	71 %	Limits:	78-134 %	1	05/02/22 19:51	EPA 8270E LVI A-01
Benzo(a)pyrene-d12 (Surr)			116 %		80-132 %	1	05/02/22 19:51	EPA 8270E LVI
HC-5 (A2D1086-04RE1)		Matrix: Water			Batch: 22E0083			
Acenaphthene	ND	---	1.38	ug/L	40	05/04/22 01:27	EPA 8270E LVI	
Acenaphthylene	ND	---	1.38	ug/L	40	05/04/22 01:27	EPA 8270E LVI	
Anthracene	ND	---	1.38	ug/L	40	05/04/22 01:27	EPA 8270E LVI	
Benz(a)anthracene	ND	---	0.688	ug/L	40	05/04/22 01:27	EPA 8270E LVI	
Benzo(a)pyrene	ND	---	0.688	ug/L	40	05/04/22 01:27	EPA 8270E LVI	
Benzo(b)fluoranthene	ND	---	0.688	ug/L	40	05/04/22 01:27	EPA 8270E LVI	
Benzo(k)fluoranthene	ND	---	0.688	ug/L	40	05/04/22 01:27	EPA 8270E LVI	
Benzo(g,h,i)perylene	ND	---	1.38	ug/L	40	05/04/22 01:27	EPA 8270E LVI	
Chrysene	ND	---	0.688	ug/L	40	05/04/22 01:27	EPA 8270E LVI	
Dibenz(a,h)anthracene	ND	---	0.688	ug/L	40	05/04/22 01:27	EPA 8270E LVI	
Fluoranthene	ND	---	1.38	ug/L	40	05/04/22 01:27	EPA 8270E LVI	
Fluorene	ND	---	1.38	ug/L	40	05/04/22 01:27	EPA 8270E LVI	
Indeno(1,2,3-cd)pyrene	ND	---	0.688	ug/L	40	05/04/22 01:27	EPA 8270E LVI	
1-Methylnaphthalene	ND	---	2.75	ug/L	40	05/04/22 01:27	EPA 8270E LVI	
2-Methylnaphthalene	ND	---	2.75	ug/L	40	05/04/22 01:27	EPA 8270E LVI	
Naphthalene	ND	---	2.75	ug/L	40	05/04/22 01:27	EPA 8270E LVI	
Phenanthrene	ND	---	2.75	ug/L	40	05/04/22 01:27	EPA 8270E LVI	
Pyrene	ND	---	1.38	ug/L	40	05/04/22 01:27	EPA 8270E LVI	
Carbazole	ND	---	1.38	ug/L	40	05/04/22 01:27	EPA 8270E LVI	
Dibenzofuran	ND	---	1.38	ug/L	40	05/04/22 01:27	EPA 8270E LVI	
Surrogate: Acenaphthylene-d8 (Surr)		Recovery:	%	Limits:	78-134 %	40	05/04/22 01:27	EPA 8270E LVI S-01
Benzo(a)pyrene-d12 (Surr)			129 %		80-132 %	40	05/04/22 01:27	EPA 8270E LVI S-05
HC-6S (A2D1086-05)		Matrix: Water			Batch: 22E0040			
Acenaphthene	ND	---	0.0335	ug/L	1	05/02/22 20:23	EPA 8270E LVI	
Acenaphthylene	ND	---	0.0335	ug/L	1	05/02/22 20:23	EPA 8270E LVI	
Anthracene	ND	---	0.0335	ug/L	1	05/02/22 20:23	EPA 8270E LVI	
Benz(a)anthracene	ND	---	0.0167	ug/L	1	05/02/22 20:23	EPA 8270E LVI	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

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ORELAP ID: OR100062Apex Companies, LLC
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Project Number: **1007-23**
Project Manager: **Steve Misner****Report ID:**
A2D1086 - 06 24 22 1013

ANALYTICAL SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
HC-6S (A2D1086-05)		Matrix: Water			Batch: 22E0040			
Benzo(a)pyrene	ND	---	0.0167	ug/L	1	05/02/22 20:23	EPA 8270E LVI	
Benzo(b)fluoranthene	ND	---	0.0167	ug/L	1	05/02/22 20:23	EPA 8270E LVI	
Benzo(k)fluoranthene	ND	---	0.0167	ug/L	1	05/02/22 20:23	EPA 8270E LVI	
Benzo(g,h,i)perylene	ND	---	0.0335	ug/L	1	05/02/22 20:23	EPA 8270E LVI	
Chrysene	ND	---	0.0167	ug/L	1	05/02/22 20:23	EPA 8270E LVI	
Dibenz(a,h)anthracene	ND	---	0.0167	ug/L	1	05/02/22 20:23	EPA 8270E LVI	
Fluoranthene	ND	---	0.0335	ug/L	1	05/02/22 20:23	EPA 8270E LVI	
Fluorene	ND	---	0.0335	ug/L	1	05/02/22 20:23	EPA 8270E LVI	
Indeno(1,2,3-cd)pyrene	ND	---	0.0167	ug/L	1	05/02/22 20:23	EPA 8270E LVI	
1-Methylnaphthalene	ND	---	0.0669	ug/L	1	05/02/22 20:23	EPA 8270E LVI	
2-Methylnaphthalene	ND	---	0.0669	ug/L	1	05/02/22 20:23	EPA 8270E LVI	
Naphthalene	ND	---	0.0669	ug/L	1	05/02/22 20:23	EPA 8270E LVI	
Phenanthrene	ND	---	0.0669	ug/L	1	05/02/22 20:23	EPA 8270E LVI	
Pyrene	ND	---	0.0335	ug/L	1	05/02/22 20:23	EPA 8270E LVI	
Carbazole	ND	---	0.0335	ug/L	1	05/02/22 20:23	EPA 8270E LVI	
Dibenzofuran	ND	---	0.0335	ug/L	1	05/02/22 20:23	EPA 8270E LVI	
Surrogate: Acenaphthylene-d8 (Surr)		Recovery: 69 %		Limits: 78-134 %	1	05/02/22 20:23	EPA 8270E LVI	A-01
Benzo(a)pyrene-d12 (Surr)		117 %		80-132 %	1	05/02/22 20:23	EPA 8270E LVI	
HC-12D (A2D1086-06)		Matrix: Water			Batch: 22E0040			
Acenaphthene	0.779	---	0.399	ug/L	10	05/02/22 18:45	EPA 8270E LVI	B-02
Acenaphthylene	ND	---	0.399	ug/L	10	05/02/22 18:45	EPA 8270E LVI	
Anthracene	ND	---	0.399	ug/L	10	05/02/22 18:45	EPA 8270E LVI	
Benz(a)anthracene	ND	---	0.200	ug/L	10	05/02/22 18:45	EPA 8270E LVI	
Benzo(a)pyrene	ND	---	0.200	ug/L	10	05/02/22 18:45	EPA 8270E LVI	
Benzo(b)fluoranthene	ND	---	0.200	ug/L	10	05/02/22 18:45	EPA 8270E LVI	
Benzo(k)fluoranthene	ND	---	0.200	ug/L	10	05/02/22 18:45	EPA 8270E LVI	
Benzo(g,h,i)perylene	ND	---	0.399	ug/L	10	05/02/22 18:45	EPA 8270E LVI	
Chrysene	ND	---	0.200	ug/L	10	05/02/22 18:45	EPA 8270E LVI	
Dibenz(a,h)anthracene	ND	---	0.200	ug/L	10	05/02/22 18:45	EPA 8270E LVI	
Fluoranthene	ND	---	0.399	ug/L	10	05/02/22 18:45	EPA 8270E LVI	
Fluorene	ND	---	0.399	ug/L	10	05/02/22 18:45	EPA 8270E LVI	
Indeno(1,2,3-cd)pyrene	ND	---	0.200	ug/L	10	05/02/22 18:45	EPA 8270E LVI	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323

ORELAP ID: OR100062

Apex Companies, LLC

3015 SW First Avenue
Portland, OR 97201Project: **POP T4 - Slip 3 GW**Project Number: **1007-23**Project Manager: **Steve Misner**

Report ID:

A2D1086 - 06 24 22 1013

ANALYTICAL SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
HC-12D (A2D1086-06)		Matrix: Water			Batch: 22E0040			
1-Methylnaphthalene	ND	---	0.799	ug/L	10	05/02/22 18:45	EPA 8270E LVI	
2-Methylnaphthalene	ND	---	0.799	ug/L	10	05/02/22 18:45	EPA 8270E LVI	
Naphthalene	ND	---	0.799	ug/L	10	05/02/22 18:45	EPA 8270E LVI	
Phenanthrene	ND	---	0.799	ug/L	10	05/02/22 18:45	EPA 8270E LVI	
Pyrene	ND	---	0.399	ug/L	10	05/02/22 18:45	EPA 8270E LVI	
Carbazole	ND	---	0.399	ug/L	10	05/02/22 18:45	EPA 8270E LVI	
Dibenzofuran	ND	---	0.399	ug/L	10	05/02/22 18:45	EPA 8270E LVI	
Surrogate: Acenaphthylene-d8 (Surr)		Recovery: %		Limits: 78-134 %	10	05/02/22 18:45	EPA 8270E LVI	S-01
Benzo(a)pyrene-d12 (Surr)		123 %		80-132 %	10	05/02/22 18:45	EPA 8270E LVI	S-05
DUP-1 (A2D1086-07)		Matrix: Water			Batch: 22E0040			
Acenaphthene	0.738	---	0.0374	ug/L	1	05/02/22 20:56	EPA 8270E LVI	B-02
Acenaphthylene	ND	---	0.0700	ug/L	1	05/02/22 20:56	EPA 8270E LVI	R-02
Anthracene	ND	---	0.128	ug/L	1	05/02/22 20:56	EPA 8270E LVI	R-02
Benz(a)anthracene	ND	---	0.0187	ug/L	1	05/02/22 20:56	EPA 8270E LVI	
Benzo(a)pyrene	ND	---	0.0187	ug/L	1	05/02/22 20:56	EPA 8270E LVI	
Benzo(b)fluoranthene	ND	---	0.0187	ug/L	1	05/02/22 20:56	EPA 8270E LVI	
Benzo(k)fluoranthene	ND	---	0.0187	ug/L	1	05/02/22 20:56	EPA 8270E LVI	
Benzo(g,h,i)perylene	ND	---	0.0374	ug/L	1	05/02/22 20:56	EPA 8270E LVI	
Chrysene	ND	---	0.0187	ug/L	1	05/02/22 20:56	EPA 8270E LVI	
Dibenz(a,h)anthracene	ND	---	0.0187	ug/L	1	05/02/22 20:56	EPA 8270E LVI	
Fluoranthene	ND	---	0.0374	ug/L	1	05/02/22 20:56	EPA 8270E LVI	
Fluorene	ND	---	0.502	ug/L	1	05/02/22 20:56	EPA 8270E LVI	R-02
Indeno(1,2,3-cd)pyrene	ND	---	0.0187	ug/L	1	05/02/22 20:56	EPA 8270E LVI	
1-Methylnaphthalene	ND	---	0.0747	ug/L	1	05/02/22 20:56	EPA 8270E LVI	
2-Methylnaphthalene	ND	---	0.0747	ug/L	1	05/02/22 20:56	EPA 8270E LVI	
Naphthalene	ND	---	0.467	ug/L	1	05/02/22 20:56	EPA 8270E LVI	R-02
Phenanthrene	ND	---	0.175	ug/L	1	05/02/22 20:56	EPA 8270E LVI	R-02
Pyrene	ND	---	0.0374	ug/L	1	05/02/22 20:56	EPA 8270E LVI	
Carbazole	ND	---	0.0700	ug/L	1	05/02/22 20:56	EPA 8270E LVI	R-02
Dibenzofuran	ND	---	0.0374	ug/L	1	05/02/22 20:56	EPA 8270E LVI	
Surrogate: Acenaphthylene-d8 (Surr)		Recovery: 72 %		Limits: 78-134 %	1	05/02/22 20:56	EPA 8270E LVI	A-01
Benzo(a)pyrene-d12 (Surr)		121 %		80-132 %	1	05/02/22 20:56	EPA 8270E LVI	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

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Tigard, OR 97223
503-718-2323

ORELAP ID: OR100062

Apex Companies, LLC

3015 SW First Avenue
Portland, OR 97201Project: **POP T4 - Slip 3 GW**Project Number: **1007-23**Project Manager: **Steve Misner**

Report ID:

A2D1086 - 06 24 22 1013

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
BE-1 (A2D1086-01) Matrix: Water								
Batch: 22E0330								
Arsenic	6.24	---	1.00	ug/L	1	05/10/22 17:51	EPA 6020B	
Cadmium	ND	---	0.200	ug/L	1	05/10/22 17:51	EPA 6020B	
Chromium	ND	---	2.00	ug/L	1	05/10/22 17:51	EPA 6020B	
Copper	2.00	---	2.00	ug/L	1	05/10/22 17:51	EPA 6020B	
Lead	0.425	---	0.200	ug/L	1	05/10/22 17:51	EPA 6020B	B-02
Mercury	ND	---	0.0800	ug/L	1	05/10/22 17:51	EPA 6020B	
Vanadium	ND	---	2.00	ug/L	1	05/10/22 17:51	EPA 6020B	
BE-1 (A2D1086-01RE1) Matrix: Water								
Batch: 22E0330								
Manganese	4150	---	10.0	ug/L	10	05/11/22 11:53	EPA 6020B	
Batch: 22E0605								
Zinc	5.61	---	4.00	ug/L	1	05/17/22 14:29	EPA 6020B	
BE-5 (A2D1086-02) Matrix: Water								
Batch: 22E0330								
Arsenic	ND	---	1.00	ug/L	1	05/10/22 18:21	EPA 6020B	
Cadmium	0.323	---	0.200	ug/L	1	05/10/22 18:21	EPA 6020B	
Chromium	ND	---	2.00	ug/L	1	05/10/22 18:21	EPA 6020B	
Copper	2.14	---	2.00	ug/L	1	05/10/22 18:21	EPA 6020B	
Lead	0.465	---	0.200	ug/L	1	05/10/22 18:21	EPA 6020B	B-02
Manganese	169	---	1.00	ug/L	1	05/10/22 18:21	EPA 6020B	
Mercury	ND	---	0.0800	ug/L	1	05/10/22 18:21	EPA 6020B	
Vanadium	ND	---	2.00	ug/L	1	05/10/22 18:21	EPA 6020B	
BE-5 (A2D1086-02RE1) Matrix: Water								
Batch: 22E0605								
Zinc	68.9	---	4.00	ug/L	1	05/17/22 14:34	EPA 6020B	
HC-2 (A2D1086-03) Matrix: Water								
Batch: 22E0330								
Arsenic	ND	---	1.00	ug/L	1	05/10/22 18:26	EPA 6020B	
Cadmium	ND	---	0.200	ug/L	1	05/10/22 18:26	EPA 6020B	
Chromium	ND	---	2.00	ug/L	1	05/10/22 18:26	EPA 6020B	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

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503-718-2323

ORELAP ID: OR100062

Apex Companies, LLC

3015 SW First Avenue
Portland, OR 97201Project: POP T4 - Slip 3 GW

Project Number: 1007-23

Project Manager: Steve Misner

Report ID:

A2D1086 - 06 24 22 1013

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes	
HC-2 (A2D1086-03)		Matrix: Water							
Copper	ND	---	2.00	ug/L	1	05/10/22 18:26	EPA 6020B	B-02	
Lead	0.308	---	0.200	ug/L	1	05/10/22 18:26	EPA 6020B		
Manganese	53.8	---	1.00	ug/L	1	05/10/22 18:26	EPA 6020B		
Mercury	ND	---	0.0800	ug/L	1	05/10/22 18:26	EPA 6020B		
Vanadium	ND	---	2.00	ug/L	1	05/10/22 18:26	EPA 6020B		
Zinc	211	---	4.00	ug/L	1	05/10/22 18:26	EPA 6020B		B
HC-5 (A2D1086-04)		Matrix: Water							
Batch: 22E0330									
Arsenic	1.58	---	1.00	ug/L	1	05/10/22 18:31	EPA 6020B		
Cadmium	ND	---	0.200	ug/L	1	05/10/22 18:31	EPA 6020B		
Chromium	ND	---	2.00	ug/L	1	05/10/22 18:31	EPA 6020B		
Copper	4.37	---	2.00	ug/L	1	05/10/22 18:31	EPA 6020B		
Lead	ND	---	0.200	ug/L	1	05/10/22 18:31	EPA 6020B		
Manganese	771	---	1.00	ug/L	1	05/10/22 18:31	EPA 6020B		
Mercury	ND	---	0.0800	ug/L	1	05/10/22 18:31	EPA 6020B		
Vanadium	ND	---	2.00	ug/L	1	05/10/22 18:31	EPA 6020B		
HC-5 (A2D1086-04RE1)		Matrix: Water							
Batch: 22E0605									
Zinc	93.3	---	4.00	ug/L	1	05/17/22 14:50	EPA 6020B		
HC-6S (A2D1086-05)		Matrix: Water							
Batch: 22E0330									
Arsenic	ND	---	1.00	ug/L	1	05/10/22 18:36	EPA 6020B		
Cadmium	ND	---	0.200	ug/L	1	05/10/22 18:36	EPA 6020B		
Chromium	ND	---	2.00	ug/L	1	05/10/22 18:36	EPA 6020B		
Copper	ND	---	2.00	ug/L	1	05/10/22 18:36	EPA 6020B		
Lead	0.314	---	0.200	ug/L	1	05/10/22 18:36	EPA 6020B	B-02	
Manganese	186	---	1.00	ug/L	1	05/10/22 18:36	EPA 6020B		
Mercury	ND	---	0.0800	ug/L	1	05/10/22 18:36	EPA 6020B		
Vanadium	ND	---	2.00	ug/L	1	05/10/22 18:36	EPA 6020B		
HC-6S (A2D1086-05RE1)		Matrix: Water							
Batch: 22E0605									

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Page 10 of 35



ANALYTICAL REPORT

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503-718-2323

ORELAP ID: OR100062

Apex Companies, LLC

3015 SW First Avenue
Portland, OR 97201Project: POP T4 - Slip 3 GW

Project Number: 1007-23

Project Manager: Steve Misner

Report ID:

A2D1086 - 06 24 22 1013

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
HC-6S (A2D1086-05RE1)		Matrix: Water						
Zinc	16.7	---	4.00	ug/L	1	05/17/22 14:55	EPA 6020B	
HC-12D (A2D1086-06)		Matrix: Water						
Batch: 22E0330								
Arsenic	17.2	---	1.00	ug/L	1	05/10/22 18:42	EPA 6020B	
Cadmium	2.38	---	0.200	ug/L	1	05/10/22 18:42	EPA 6020B	
Chromium	ND	---	2.00	ug/L	1	05/10/22 18:42	EPA 6020B	
Copper	ND	---	2.00	ug/L	1	05/10/22 18:42	EPA 6020B	
Lead	0.557	---	0.200	ug/L	1	05/10/22 18:42	EPA 6020B	B-02
Mercury	ND	---	0.0800	ug/L	1	05/10/22 18:42	EPA 6020B	
Vanadium	ND	---	2.00	ug/L	1	05/10/22 18:42	EPA 6020B	
Zinc	ND	---	4.00	ug/L	1	05/10/22 18:42	EPA 6020B	
HC-12D (A2D1086-06RE1)		Matrix: Water						
Batch: 22E0330								
Manganese	13100	---	50.0	ug/L	50	05/11/22 12:09	EPA 6020B	
DUP-1 (A2D1086-07)		Matrix: Water						
Batch: 22E0330								
Arsenic	18.0	---	1.00	ug/L	1	05/10/22 18:47	EPA 6020B	
Cadmium	3.56	---	0.200	ug/L	1	05/10/22 18:47	EPA 6020B	
Chromium	ND	---	2.00	ug/L	1	05/10/22 18:47	EPA 6020B	
Copper	ND	---	2.00	ug/L	1	05/10/22 18:47	EPA 6020B	
Lead	0.556	---	0.200	ug/L	1	05/10/22 18:47	EPA 6020B	B-02
Mercury	ND	---	0.0800	ug/L	1	05/10/22 18:47	EPA 6020B	
Vanadium	ND	---	2.00	ug/L	1	05/10/22 18:47	EPA 6020B	
Zinc	ND	---	4.00	ug/L	1	05/10/22 18:47	EPA 6020B	
DUP-1 (A2D1086-07RE1)		Matrix: Water						
Batch: 22E0330								
Manganese	12900	---	50.0	ug/L	50	05/11/22 12:14	EPA 6020B	

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ANALYTICAL REPORT

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503-718-2323

ORELAP ID: OR100062

Apex Companies, LLC

3015 SW First Avenue
Portland, OR 97201Project: **POP T4 - Slip 3 GW**Project Number: **1007-23**Project Manager: **Steve Misner****Report ID:****A2D1086 - 06 24 22 1013**

ANALYTICAL SAMPLE RESULTS

Dissolved Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
BE-1 (A2D1086-01) Matrix: Water								
Batch: 22D1144								
Arsenic	10.9	---	1.00	ug/L	1	05/01/22 04:02	EPA 6020B (Diss)	
Cadmium	ND	---	0.200	ug/L	1	05/01/22 04:02	EPA 6020B (Diss)	
Chromium	ND	---	2.00	ug/L	1	05/01/22 04:02	EPA 6020B (Diss)	
Copper	ND	---	2.00	ug/L	1	05/01/22 04:02	EPA 6020B (Diss)	
Lead	ND	---	0.200	ug/L	1	05/01/22 04:02	EPA 6020B (Diss)	
Mercury	ND	---	0.0800	ug/L	1	05/01/22 04:02	EPA 6020B (Diss)	
Vanadium	ND	---	2.00	ug/L	1	05/01/22 04:02	EPA 6020B (Diss)	
Zinc	ND	---	4.00	ug/L	1	05/01/22 04:02	EPA 6020B (Diss)	
BE-1 (A2D1086-01RE1) Matrix: Water								
Batch: 22D1144								
Manganese	3610	---	10.0	ug/L	10	05/02/22 12:07	EPA 6020B (Diss)	
BE-5 (A2D1086-02) Matrix: Water								
Batch: 22D1144								
Arsenic	ND	---	1.00	ug/L	1	05/01/22 04:22	EPA 6020B (Diss)	
Cadmium	0.302	---	0.200	ug/L	1	05/01/22 04:22	EPA 6020B (Diss)	
Chromium	ND	---	2.00	ug/L	1	05/01/22 04:22	EPA 6020B (Diss)	
Copper	3.61	---	2.00	ug/L	1	05/01/22 04:22	EPA 6020B (Diss)	
Manganese	146	---	1.00	ug/L	1	05/01/22 04:22	EPA 6020B (Diss)	
Mercury	ND	---	0.0800	ug/L	1	05/01/22 04:22	EPA 6020B (Diss)	
Vanadium	ND	---	2.00	ug/L	1	05/01/22 04:22	EPA 6020B (Diss)	
Zinc	70.9	---	4.00	ug/L	1	05/01/22 04:22	EPA 6020B (Diss)	
BE-5 (A2D1086-02RE1) Matrix: Water								
Batch: 22E0292								
Lead	ND	---	0.200	ug/L	1	05/25/22 04:06	EPA 6020B (Diss)	
HC-2 (A2D1086-03) Matrix: Water								
Batch: 22D1144								
Arsenic	ND	---	1.00	ug/L	1	05/01/22 04:27	EPA 6020B (Diss)	
Cadmium	ND	---	0.200	ug/L	1	05/01/22 04:27	EPA 6020B (Diss)	
Chromium	ND	---	2.00	ug/L	1	05/01/22 04:27	EPA 6020B (Diss)	
Copper	ND	---	2.00	ug/L	1	05/01/22 04:27	EPA 6020B (Diss)	

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Page 12 of 35



ANALYTICAL REPORT

Apex Laboratories, LLC

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503-718-2323
ORELAP ID: OR100062Apex Companies, LLC
3015 SW First Avenue
Portland, OR 97201Project: **POP T4 - Slip 3 GW**
Project Number: **1007-23**
Project Manager: **Steve Misner****Report ID:**
A2D1086 - 06 24 22 1013

ANALYTICAL SAMPLE RESULTS

Dissolved Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
HC-2 (A2D1086-03) Matrix: Water								
Lead	ND	---	0.200	ug/L	1	05/01/22 04:27	EPA 6020B (Diss)	
Manganese	48.9	---	1.00	ug/L	1	05/01/22 04:27	EPA 6020B (Diss)	
Mercury	ND	---	0.0800	ug/L	1	05/01/22 04:27	EPA 6020B (Diss)	
Vanadium	ND	---	2.00	ug/L	1	05/01/22 04:27	EPA 6020B (Diss)	
Zinc	92.2	---	4.00	ug/L	1	05/01/22 04:27	EPA 6020B (Diss)	
HC-5 (A2D1086-04) Matrix: Water								
Batch: 22D1144								
Arsenic	1.55	---	1.00	ug/L	1	05/01/22 04:32	EPA 6020B (Diss)	
Cadmium	ND	---	0.200	ug/L	1	05/01/22 04:32	EPA 6020B (Diss)	
Chromium	ND	---	2.00	ug/L	1	05/01/22 04:32	EPA 6020B (Diss)	
Copper	ND	---	2.00	ug/L	1	05/01/22 04:32	EPA 6020B (Diss)	
Lead	ND	---	0.200	ug/L	1	05/01/22 04:32	EPA 6020B (Diss)	
Manganese	779	---	1.00	ug/L	1	05/01/22 04:32	EPA 6020B (Diss)	
Mercury	ND	---	0.0800	ug/L	1	05/01/22 04:32	EPA 6020B (Diss)	
Vanadium	ND	---	2.00	ug/L	1	05/01/22 04:32	EPA 6020B (Diss)	
Zinc	82.7	---	4.00	ug/L	1	05/01/22 04:32	EPA 6020B (Diss)	
HC-6S (A2D1086-05) Matrix: Water								
Batch: 22D1144								
Arsenic	ND	---	1.00	ug/L	1	05/01/22 04:37	EPA 6020B (Diss)	
Cadmium	ND	---	0.200	ug/L	1	05/01/22 04:37	EPA 6020B (Diss)	
Chromium	ND	---	2.00	ug/L	1	05/01/22 04:37	EPA 6020B (Diss)	
Copper	ND	---	2.00	ug/L	1	05/01/22 04:37	EPA 6020B (Diss)	
Lead	ND	---	0.200	ug/L	1	05/01/22 04:37	EPA 6020B (Diss)	
Manganese	202	---	1.00	ug/L	1	05/01/22 04:37	EPA 6020B (Diss)	
Mercury	ND	---	0.0800	ug/L	1	05/01/22 04:37	EPA 6020B (Diss)	
Vanadium	ND	---	2.00	ug/L	1	05/01/22 04:37	EPA 6020B (Diss)	
Zinc	18.2	---	4.00	ug/L	1	05/01/22 04:37	EPA 6020B (Diss)	
HC-12D (A2D1086-06) Matrix: Water								
Batch: 22D1144								
Arsenic	17.6	---	1.00	ug/L	1	05/01/22 04:42	EPA 6020B (Diss)	
Cadmium	0.253	---	0.200	ug/L	1	05/01/22 04:42	EPA 6020B (Diss)	

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Darrell Auvil, Client Services Manager

Page 13 of 35



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323

ORELAP ID: OR100062

Apex Companies, LLC

3015 SW First Avenue
Portland, OR 97201Project: **POP T4 - Slip 3 GW**Project Number: **1007-23**Project Manager: **Steve Misner**

Report ID:

A2D1086 - 06 24 22 1013

ANALYTICAL SAMPLE RESULTS

Dissolved Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
HC-12D (A2D1086-06)		Matrix: Water						
Chromium	ND	---	2.00	ug/L	1	05/01/22 04:42	EPA 6020B (Diss)	
Copper	ND	---	2.00	ug/L	1	05/01/22 04:42	EPA 6020B (Diss)	
Lead	ND	---	0.200	ug/L	1	05/01/22 04:42	EPA 6020B (Diss)	
Mercury	ND	---	0.0800	ug/L	1	05/01/22 04:42	EPA 6020B (Diss)	
Vanadium	ND	---	2.00	ug/L	1	05/01/22 04:42	EPA 6020B (Diss)	
Zinc	ND	---	4.00	ug/L	1	05/01/22 04:42	EPA 6020B (Diss)	
HC-12D (A2D1086-06RE1)		Matrix: Water						
Batch: 22D1144								
Manganese	12600	---	10.0	ug/L	10	05/02/22 12:12	EPA 6020B (Diss)	
DUP-1 (A2D1086-07)		Matrix: Water						
Batch: 22D1144								
Arsenic	16.9	---	1.00	ug/L	1	05/01/22 04:52	EPA 6020B (Diss)	
Cadmium	0.347	---	0.200	ug/L	1	05/01/22 04:52	EPA 6020B (Diss)	
Chromium	ND	---	2.00	ug/L	1	05/01/22 04:52	EPA 6020B (Diss)	
Copper	ND	---	2.00	ug/L	1	05/01/22 04:52	EPA 6020B (Diss)	
Lead	ND	---	0.200	ug/L	1	05/01/22 04:52	EPA 6020B (Diss)	
Mercury	ND	---	0.0800	ug/L	1	05/01/22 04:52	EPA 6020B (Diss)	
Vanadium	ND	---	2.00	ug/L	1	05/01/22 04:52	EPA 6020B (Diss)	
Zinc	ND	---	4.00	ug/L	1	05/01/22 04:52	EPA 6020B (Diss)	
DUP-1 (A2D1086-07RE1)		Matrix: Water						
Batch: 22D1144								
Manganese	12400	---	10.0	ug/L	10	05/02/22 12:22	EPA 6020B (Diss)	

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ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062Apex Companies, LLC
3015 SW First Avenue
Portland, OR 97201Project: **POP T4 - Slip 3 GW**
Project Number: **1007-23**
Project Manager: **Steve Misner****Report ID:**
A2D1086 - 06 24 22 1013

QUALITY CONTROL (QC) SAMPLE RESULTS

Diesel and/or Oil Hydrocarbons by NWTPH-Dx with Acid/Silica Gel Cleanup

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes	
Batch 22E0010 - EPA 3510C (Fuels/Acid Ext.) w/Silica Gel + Acid							Water						
Blank (22E0010-BLK1)			Prepared: 05/02/22 08:13 Analyzed: 05/02/22 21:39										
<u>NWTPH-Dx/SG</u>													
Diesel	ND	---	0.182	mg/L	1	---	---	---	---	---	---		
Oil	ND	---	0.364	mg/L	1	---	---	---	---	---	---		
Surr: o-Terphenyl (Surr)		Recovery: 97 %		Limits: 50-150 %		Dilution: 1x							
LCS (22E0010-BS1)			Prepared: 05/02/22 08:13 Analyzed: 05/02/22 22:01										
<u>NWTPH-Dx/SG</u>													
Diesel	1.10	---	0.200	mg/L	1	1.25	---	88	36-132%	---	---		
Surr: o-Terphenyl (Surr)		Recovery: 94 %		Limits: 50-150 %		Dilution: 1x							
LCS Dup (22E0010-BSD1)			Prepared: 05/02/22 08:13 Analyzed: 05/02/22 22:22										Q-19
<u>NWTPH-Dx/SG</u>													
Diesel	1.20	---	0.200	mg/L	1	1.25	---	96	36-132%	8	30%		
Surr: o-Terphenyl (Surr)		Recovery: 98 %		Limits: 50-150 %		Dilution: 1x							

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ANALYTICAL REPORT

Apex Laboratories, LLC

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503-718-2323
ORELAP ID: OR100062Apex Companies, LLC
3015 SW First Avenue
Portland, OR 97201Project: **POP T4 - Slip 3 GW**
Project Number: **1007-23**
Project Manager: **Steve Misner****Report ID:**
A2D1086 - 06 24 22 1013

QUALITY CONTROL (QC) SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22E0040 - EPA 3511 (Bottle Extraction)						Water						
Blank (22E0040-BLK1)			Prepared: 05/02/22 13:44		Analyzed: 05/02/22 16:35							
EPA 8270E LVI												
Acenaphthene	ND	---	0.0320	ug/L	1	---	---	---	---	---	---	B-02
Acenaphthylene	ND	---	0.0320	ug/L	1	---	---	---	---	---		
Anthracene	ND	---	0.0320	ug/L	1	---	---	---	---	---		
Benz(a)anthracene	ND	---	0.0160	ug/L	1	---	---	---	---	---		
Benzo(a)pyrene	ND	---	0.0160	ug/L	1	---	---	---	---	---		
Benzo(b)fluoranthene	ND	---	0.0160	ug/L	1	---	---	---	---	---		
Benzo(k)fluoranthene	ND	---	0.0160	ug/L	1	---	---	---	---	---		
Benzo(g,h,i)perylene	ND	---	0.0320	ug/L	1	---	---	---	---	---		
Chrysene	ND	---	0.0160	ug/L	1	---	---	---	---	---		
Dibenz(a,h)anthracene	ND	---	0.0160	ug/L	1	---	---	---	---	---		
Fluoranthene	ND	---	0.0320	ug/L	1	---	---	---	---	---		
Fluorene	ND	---	0.0320	ug/L	1	---	---	---	---	---		
Indeno(1,2,3-cd)pyrene	ND	---	0.0160	ug/L	1	---	---	---	---	---		
1-Methylnaphthalene	ND	---	0.0640	ug/L	1	---	---	---	---	---		
2-Methylnaphthalene	ND	---	0.0640	ug/L	1	---	---	---	---	---		
Naphthalene	ND	---	0.0640	ug/L	1	---	---	---	---	---		
Phenanthrene	ND	---	0.0640	ug/L	1	---	---	---	---	---		
Pyrene	ND	---	0.0320	ug/L	1	---	---	---	---	---		
Carbazole	ND	---	0.0320	ug/L	1	---	---	---	---	---		
Dibenzofuran	ND	---	0.0320	ug/L	1	---	---	---	---	---		
Surr: Acenaphthylene-d8 (Surr)		Recovery: 71 %		Limits: 78-134 %		Dilution: 1x		A-01				
Benzo(a)pyrene-d12 (Surr)		113 %		80-132 %		"						

LCS (22E0040-BS1)

Prepared: 05/02/22 13:44 Analyzed: 05/02/22 17:07

EPA 8270E LVI												
Acenaphthene	1.69	---	0.0320	ug/L	1	1.60	---	105	80-120%	---	---	B-02
Acenaphthylene	1.47	---	0.0320	ug/L	1	1.60	---	92	80-124%	---	---	
Anthracene	1.75	---	0.0320	ug/L	1	1.60	---	110	80-123%	---	---	
Benz(a)anthracene	1.76	---	0.0160	ug/L	1	1.60	---	110	80-122%	---	---	
Benzo(a)pyrene	1.84	---	0.0160	ug/L	1	1.60	---	115	80-129%	---	---	
Benzo(b)fluoranthene	1.71	---	0.0160	ug/L	1	1.60	---	107	80-124%	---	---	
Benzo(k)fluoranthene	1.77	---	0.0160	ug/L	1	1.60	---	110	80-125%	---	---	
Benzo(g,h,i)perylene	1.49	---	0.0320	ug/L	1	1.60	---	93	80-120%	---	---	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062Apex Companies, LLC
3015 SW First Avenue
Portland, OR 97201Project: **POP T4 - Slip 3 GW**
Project Number: **1007-23**
Project Manager: **Steve Misner****Report ID:**
A2D1086 - 06 24 22 1013

QUALITY CONTROL (QC) SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22E0040 - EPA 3511 (Bottle Extraction)						Water						
LCS (22E0040-BS1)			Prepared: 05/02/22 13:44		Analyzed: 05/02/22 17:07							
Chrysene	1.50	---	0.0160	ug/L	1	1.60	---	94	80-120%	---	---	
Dibenz(a,h)anthracene	1.54	---	0.0160	ug/L	1	1.60	---	96	80-120%	---	---	
Fluoranthene	1.55	---	0.0320	ug/L	1	1.60	---	97	80-126%	---	---	
Fluorene	1.86	---	0.0320	ug/L	1	1.60	---	116	77-127%	---	---	
Indeno(1,2,3-cd)pyrene	1.42	---	0.0160	ug/L	1	1.60	---	89	80-121%	---	---	
1-Methylnaphthalene	1.51	---	0.0640	ug/L	1	1.60	---	94	53-148%	---	---	
2-Methylnaphthalene	1.66	---	0.0640	ug/L	1	1.60	---	104	48-150%	---	---	
Naphthalene	1.49	---	0.0640	ug/L	1	1.60	---	93	78-120%	---	---	
Phenanthrene	1.49	---	0.0640	ug/L	1	1.60	---	93	80-120%	---	---	
Pyrene	1.52	---	0.0320	ug/L	1	1.60	---	95	80-125%	---	---	
Carbazole	1.94	---	0.0320	ug/L	1	1.60	---	121	65-141%	---	---	
Dibenzofuran	1.64	---	0.0320	ug/L	1	1.60	---	103	76-121%	---	---	
Surr: Acenaphthylene-d8 (Surr)		Recovery: 73 %		Limits: 78-134 %		Dilution: 1x		A-01				
Benzo(a)pyrene-d12 (Surr)		117 %		80-132 %		"						
LCS Dup (22E0040-BSD1)			Prepared: 05/02/22 13:44		Analyzed: 05/02/22 17:40							Q-19
EPA 8270E LVI												
Acenaphthene	1.67	---	0.0320	ug/L	1	1.60	---	105	80-120%	0.7	30%	B-02
Acenaphthylene	1.43	---	0.0320	ug/L	1	1.60	---	89	80-124%	2	30%	
Anthracene	1.74	---	0.0320	ug/L	1	1.60	---	109	80-123%	0.7	30%	
Benz(a)anthracene	1.74	---	0.0160	ug/L	1	1.60	---	109	80-122%	1	30%	
Benzo(a)pyrene	1.81	---	0.0160	ug/L	1	1.60	---	113	80-129%	1	30%	
Benzo(b)fluoranthene	1.75	---	0.0160	ug/L	1	1.60	---	109	80-124%	2	30%	
Benzo(k)fluoranthene	1.72	---	0.0160	ug/L	1	1.60	---	108	80-125%	3	30%	
Benzo(g,h,i)perylene	1.48	---	0.0320	ug/L	1	1.60	---	92	80-120%	0.8	30%	
Chrysene	1.50	---	0.0160	ug/L	1	1.60	---	94	80-120%	0.1	30%	
Dibenz(a,h)anthracene	1.52	---	0.0160	ug/L	1	1.60	---	95	80-120%	2	30%	
Fluoranthene	1.56	---	0.0320	ug/L	1	1.60	---	97	80-126%	0.4	30%	
Fluorene	1.87	---	0.0320	ug/L	1	1.60	---	117	77-127%	0.4	30%	
Indeno(1,2,3-cd)pyrene	1.41	---	0.0160	ug/L	1	1.60	---	88	80-121%	1	30%	
1-Methylnaphthalene	1.49	---	0.0640	ug/L	1	1.60	---	93	53-148%	1	30%	
2-Methylnaphthalene	1.64	---	0.0640	ug/L	1	1.60	---	103	48-150%	1	30%	
Naphthalene	1.45	---	0.0640	ug/L	1	1.60	---	91	78-120%	3	30%	
Phenanthrene	1.50	---	0.0640	ug/L	1	1.60	---	94	80-120%	0.5	30%	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323

ORELAP ID: OR100062

Apex Companies, LLC

3015 SW First Avenue
Portland, OR 97201Project: POP T4 - Slip 3 GW

Project Number: 1007-23

Project Manager: Steve Misner

Report ID:

A2D1086 - 06 24 22 1013

QUALITY CONTROL (QC) SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22E0040 - EPA 3511 (Bottle Extraction)						Water						
LCS Dup (22E0040-BSD1)			Prepared: 05/02/22 13:44 Analyzed: 05/02/22 17:40						Q-19			
Pyrene	1.52	---	0.0320	ug/L	1	1.60	---	95	80-125%	0.03	30%	
Carbazole	2.00	---	0.0320	ug/L	1	1.60	---	125	65-141%	3	30%	
Dibenzofuran	1.64	---	0.0320	ug/L	1	1.60	---	103	76-121%	0.2	30%	
Surr: Acenaphthylene-d8 (Surr)		Recovery: 73 %		Limits: 78-134 %		Dilution: 1x		A-01				
Benzo(a)pyrene-d12 (Surr)		117 %		80-132 %		"						

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ANALYTICAL REPORT

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503-718-2323
ORELAP ID: OR100062Apex Companies, LLC
3015 SW First Avenue
Portland, OR 97201Project: **POP T4 - Slip 3 GW**
Project Number: **1007-23**
Project Manager: **Steve Misner****Report ID:**
A2D1086 - 06 24 22 1013

QUALITY CONTROL (QC) SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22E0083 - EPA 3511 (Bottle Extraction)						Water						
Blank (22E0083-BLK1)			Prepared: 05/03/22 10:35		Analyzed: 05/03/22 15:13							
EPA 8270E LVI												
Acenaphthene	ND	---	0.0315	ug/L	1	---	---	---	---	---	---	
Acenaphthylene	ND	---	0.0315	ug/L	1	---	---	---	---	---	---	
Anthracene	ND	---	0.0315	ug/L	1	---	---	---	---	---	---	
Benz(a)anthracene	ND	---	0.0157	ug/L	1	---	---	---	---	---	---	
Benzo(a)pyrene	ND	---	0.0157	ug/L	1	---	---	---	---	---	---	
Benzo(b)fluoranthene	ND	---	0.0157	ug/L	1	---	---	---	---	---	---	
Benzo(k)fluoranthene	ND	---	0.0157	ug/L	1	---	---	---	---	---	---	
Benzo(g,h,i)perylene	ND	---	0.0315	ug/L	1	---	---	---	---	---	---	
Chrysene	ND	---	0.0157	ug/L	1	---	---	---	---	---	---	
Dibenz(a,h)anthracene	ND	---	0.0157	ug/L	1	---	---	---	---	---	---	
Fluoranthene	ND	---	0.0315	ug/L	1	---	---	---	---	---	---	
Fluorene	ND	---	0.0315	ug/L	1	---	---	---	---	---	---	
Indeno(1,2,3-cd)pyrene	ND	---	0.0157	ug/L	1	---	---	---	---	---	---	
1-Methylnaphthalene	ND	---	0.0630	ug/L	1	---	---	---	---	---	---	
2-Methylnaphthalene	ND	---	0.0630	ug/L	1	---	---	---	---	---	---	
Naphthalene	ND	---	0.0630	ug/L	1	---	---	---	---	---	---	
Phenanthrene	ND	---	0.0630	ug/L	1	---	---	---	---	---	---	
Pyrene	ND	---	0.0315	ug/L	1	---	---	---	---	---	---	
Carbazole	ND	---	0.0315	ug/L	1	---	---	---	---	---	---	
Dibenzofuran	ND	---	0.0315	ug/L	1	---	---	---	---	---	---	
Surr: Acenaphthylene-d8 (Surr)		Recovery: 73 %		Limits: 78-134 %		Dilution: 1x		A-01				
Benzo(a)pyrene-d12 (Surr)		112 %		80-132 %		"						

LCS (22E0083-BS1)

Prepared: 05/03/22 10:35 Analyzed: 05/03/22 15:46

EPA 8270E LVI												
Acenaphthene	1.62	---	0.0320	ug/L	1	1.60	---	101	80-120%	---	---	
Acenaphthylene	1.42	---	0.0320	ug/L	1	1.60	---	89	80-124%	---	---	
Anthracene	1.69	---	0.0320	ug/L	1	1.60	---	106	80-123%	---	---	
Benz(a)anthracene	1.70	---	0.0160	ug/L	1	1.60	---	106	80-122%	---	---	
Benzo(a)pyrene	1.76	---	0.0160	ug/L	1	1.60	---	110	80-129%	---	---	
Benzo(b)fluoranthene	1.72	---	0.0160	ug/L	1	1.60	---	108	80-124%	---	---	
Benzo(k)fluoranthene	1.69	---	0.0160	ug/L	1	1.60	---	106	80-125%	---	---	
Benzo(g,h,i)perylene	1.57	---	0.0320	ug/L	1	1.60	---	98	80-120%	---	---	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

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503-718-2323

ORELAP ID: OR100062

Apex Companies, LLC

3015 SW First Avenue
Portland, OR 97201Project: **POP T4 - Slip 3 GW**Project Number: **1007-23**Project Manager: **Steve Misner**

Report ID:

A2D1086 - 06 24 22 1013

QUALITY CONTROL (QC) SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22E0083 - EPA 3511 (Bottle Extraction)						Water						
LCS (22E0083-BS1)			Prepared: 05/03/22 10:35		Analyzed: 05/03/22 15:46							
Chrysene	1.48	---	0.0160	ug/L	1	1.60	---	92	80-120%	---	---	
Dibenz(a,h)anthracene	1.51	---	0.0160	ug/L	1	1.60	---	94	80-120%	---	---	
Fluoranthene	1.54	---	0.0320	ug/L	1	1.60	---	96	80-126%	---	---	
Fluorene	1.76	---	0.0320	ug/L	1	1.60	---	110	77-127%	---	---	
Indeno(1,2,3-cd)pyrene	1.48	---	0.0160	ug/L	1	1.60	---	92	80-121%	---	---	
1-Methylnaphthalene	1.57	---	0.0640	ug/L	1	1.60	---	98	53-148%	---	---	
2-Methylnaphthalene	1.67	---	0.0640	ug/L	1	1.60	---	104	48-150%	---	---	
Naphthalene	1.47	---	0.0640	ug/L	1	1.60	---	92	78-120%	---	---	
Phenanthrene	1.47	---	0.0640	ug/L	1	1.60	---	92	80-120%	---	---	
Pyrene	1.51	---	0.0320	ug/L	1	1.60	---	94	80-125%	---	---	
Carbazole	1.77	---	0.0320	ug/L	1	1.60	---	111	65-141%	---	---	
Dibenzofuran	1.57	---	0.0320	ug/L	1	1.60	---	98	76-121%	---	---	
Surr: Acenaphthylene-d8 (Surr)		Recovery: 71 %		Limits: 78-134 %		Dilution: 1x		A-01				
Benzo(a)pyrene-d12 (Surr)		112 %		80-132 %		"						

LCS Dup (22E0083-BS1)			Prepared: 05/03/22 10:35 Analyzed: 05/03/22 16:18								Q-19	
EPA 8270E LVI												
Acenaphthene	1.63	---	0.0320	ug/L	1	1.60	---	102	80-120%	0.7	30%	
Acenaphthylene	1.42	---	0.0320	ug/L	1	1.60	---	89	80-124%	0.3	30%	
Anthracene	1.66	---	0.0320	ug/L	1	1.60	---	104	80-123%	2	30%	
Benz(a)anthracene	1.70	---	0.0160	ug/L	1	1.60	---	106	80-122%	0.2	30%	
Benzo(a)pyrene	1.72	---	0.0160	ug/L	1	1.60	---	108	80-129%	2	30%	
Benzo(b)fluoranthene	1.73	---	0.0160	ug/L	1	1.60	---	108	80-124%	0.6	30%	
Benzo(k)fluoranthene	1.66	---	0.0160	ug/L	1	1.60	---	104	80-125%	2	30%	
Benzo(g,h,i)perylene	1.53	---	0.0320	ug/L	1	1.60	---	96	80-120%	2	30%	
Chrysene	1.46	---	0.0160	ug/L	1	1.60	---	91	80-120%	0.9	30%	
Dibenz(a,h)anthracene	1.49	---	0.0160	ug/L	1	1.60	---	93	80-120%	1	30%	
Fluoranthene	1.52	---	0.0320	ug/L	1	1.60	---	95	80-126%	0.7	30%	
Fluorene	1.76	---	0.0320	ug/L	1	1.60	---	110	77-127%	0.05	30%	
Indeno(1,2,3-cd)pyrene	1.47	---	0.0160	ug/L	1	1.60	---	92	80-121%	0.8	30%	
1-Methylnaphthalene	1.52	---	0.0640	ug/L	1	1.60	---	95	53-148%	4	30%	
2-Methylnaphthalene	1.63	---	0.0640	ug/L	1	1.60	---	102	48-150%	2	30%	
Naphthalene	1.43	---	0.0640	ug/L	1	1.60	---	89	78-120%	3	30%	
Phenanthrene	1.46	---	0.0640	ug/L	1	1.60	---	91	80-120%	0.4	30%	

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ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323

ORELAP ID: OR100062

Apex Companies, LLC

3015 SW First Avenue
Portland, OR 97201Project: POP T4 - Slip 3 GW

Project Number: 1007-23

Project Manager: Steve Misner

Report ID:

A2D1086 - 06 24 22 1013

QUALITY CONTROL (QC) SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22E0083 - EPA 3511 (Bottle Extraction)						Water						
LCS Dup (22E0083-BSD1)			Prepared: 05/03/22 10:35 Analyzed: 05/03/22 16:18						Q-19			
Pyrene	1.49	---	0.0320	ug/L	1	1.60	---	93	80-125%	1	30%	
Carbazole	1.76	---	0.0320	ug/L	1	1.60	---	110	65-141%	1	30%	
Dibenzofuran	1.56	---	0.0320	ug/L	1	1.60	---	98	76-121%	0.7	30%	
Surr: Acenaphthylene-d8 (Surr)		Recovery: 73 %		Limits: 78-134 %		Dilution: 1x		A-01				
Benzo(a)pyrene-d12 (Surr)		114 %		80-132 %		"						

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Portland, OR 97201Project: **POP T4 - Slip 3 GW**
Project Number: **1007-23**
Project Manager: **Steve Misner****Report ID:**
A2D1086 - 06 24 22 1013

QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22E0330 - EPA 3015A						Water						
Blank (22E0330-BLK1)			Prepared: 05/10/22 09:00 Analyzed: 05/10/22 17:36									
EPA 6020B												
Arsenic	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Cadmium	ND	---	0.200	ug/L	1	---	---	---	---	---	---	
Chromium	ND	---	2.00	ug/L	1	---	---	---	---	---	---	
Copper	ND	---	2.00	ug/L	1	---	---	---	---	---	---	
Lead	ND	---	0.200	ug/L	1	---	---	---	---	---	---	B-02
Manganese	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Mercury	ND	---	0.0800	ug/L	1	---	---	---	---	---	---	
Vanadium	ND	---	2.00	ug/L	1	---	---	---	---	---	---	
Zinc	16.3	---	4.00	ug/L	1	---	---	---	---	---	---	B
LCS (22E0330-BS1)												
Prepared: 05/10/22 09:00 Analyzed: 05/10/22 17:41												
EPA 6020B												
Arsenic	53.4	---	1.00	ug/L	1	55.6	---	96	80-120%	---	---	
Cadmium	52.7	---	0.200	ug/L	1	55.6	---	95	80-120%	---	---	
Chromium	50.7	---	2.00	ug/L	1	55.6	---	91	80-120%	---	---	
Copper	54.6	---	2.00	ug/L	1	55.6	---	98	80-120%	---	---	
Lead	52.7	---	0.200	ug/L	1	55.6	---	95	80-120%	---	---	B-02
Manganese	53.4	---	1.00	ug/L	1	55.6	---	96	80-120%	---	---	
Mercury	0.985	---	0.0800	ug/L	1	1.11	---	89	80-120%	---	---	
Vanadium	52.1	---	2.00	ug/L	1	55.6	---	94	80-120%	---	---	
Zinc	54.5	---	4.00	ug/L	1	55.6	---	98	80-120%	---	---	B
Duplicate (22E0330-DUP1)												
Prepared: 05/10/22 09:00 Analyzed: 05/10/22 18:11												
QC Source Sample: BE-1 (A2D1086-01)												
EPA 6020B												
Arsenic	6.42	---	1.00	ug/L	1	---	6.24	---	---	3	20%	
Cadmium	ND	---	0.200	ug/L	1	---	ND	---	---	---	20%	
Chromium	ND	---	2.00	ug/L	1	---	ND	---	---	---	20%	
Copper	ND	---	2.00	ug/L	1	---	2.00	---	---	***	20%	
Lead	0.391	---	0.200	ug/L	1	---	0.425	---	---	8	20%	B-02
Mercury	ND	---	0.0800	ug/L	1	---	ND	---	---	---	20%	
Vanadium	ND	---	2.00	ug/L	1	---	1.28	---	---	***	20%	
Zinc	5.48	---	4.00	ug/L	1	---	5.39	---	---	2	20%	B

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503-718-2323

ORELAP ID: OR100062

Apex Companies, LLC

3015 SW First Avenue
Portland, OR 97201Project: **POP T4 - Slip 3 GW**Project Number: **1007-23**Project Manager: **Steve Misner****Report ID:****A2D1086 - 06 24 22 1013**

QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22E0330 - EPA 3015A						Water						
Duplicate (22E0330-DUP2)												
Prepared: 05/10/22 09:00 Analyzed: 05/11/22 11:58												
QC Source Sample: BE-1 (A2D1086-01RE1)												
EPA 6020B												
Manganese	3600	---	10.0	ug/L	10	---	4150	---	---	14	20%	Q-16
Matrix Spike (22E0330-MS1)												
Prepared: 05/10/22 09:00 Analyzed: 05/10/22 18:16												
QC Source Sample: BE-1 (A2D1086-01)												
EPA 6020B												
Arsenic	60.3	---	1.00	ug/L	1	55.6	6.24	97	75-125%	---	---	B-02
Cadmium	53.3	---	0.200	ug/L	1	55.6	ND	96	75-125%	---	---	
Chromium	49.2	---	2.00	ug/L	1	55.6	ND	89	75-125%	---	---	
Copper	53.6	---	2.00	ug/L	1	55.6	2.00	93	75-125%	---	---	
Lead	53.1	---	0.200	ug/L	1	55.6	0.425	95	75-125%	---	---	
Mercury	1.02	---	0.0800	ug/L	1	1.11	ND	92	75-125%	---	---	B
Vanadium	52.3	---	2.00	ug/L	1	55.6	1.28	92	75-125%	---	---	
Zinc	57.9	---	4.00	ug/L	1	55.6	5.39	95	75-125%	---	---	
Matrix Spike (22E0330-MS3)												
Prepared: 05/10/22 09:00 Analyzed: 05/11/22 12:03												
QC Source Sample: BE-1 (A2D1086-01RE1)												
EPA 6020B												
Manganese	3660	---	10.0	ug/L	10	55.6	4150	-881	75-125%	---	---	Q-03, Q-16

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Portland, OR 97201Project: **POP T4 - Slip 3 GW**
Project Number: **1007-23**
Project Manager: **Steve Misner****Report ID:**
A2D1086 - 06 24 22 1013

QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22E0605 - EPA 3015A						Water						
Blank (22E0605-BLK1)			Prepared: 05/16/22 17:49 Analyzed: 05/17/22 13:47									
EPA 6020B												
Zinc	ND	---	4.00	ug/L	1	---	---	---	---	---	---	
Blank (22E0605-BLK2)			Prepared: 05/16/22 17:49 Analyzed: 05/27/22 14:41									
EPA 6020B												
Zinc	ND	---	4.00	ug/L	1	---	---	---	---	---	---	
Blank (22E0605-BLK3)			Prepared: 05/16/22 17:49 Analyzed: 05/27/22 14:52									
EPA 6020B												
Zinc	ND	---	4.00	ug/L	1	---	---	---	---	---	---	
LCS (22E0605-BS1)			Prepared: 05/16/22 17:49 Analyzed: 05/17/22 13:52									
EPA 6020B												
Zinc	55.2	---	4.00	ug/L	1	55.6	---	99	80-120%	---	---	
LCS (22E0605-BS2)			Prepared: 05/16/22 17:49 Analyzed: 05/27/22 14:47									
EPA 6020B												
Zinc	55.7	---	4.00	ug/L	1	55.6	---	100	80-120%	---	---	
Duplicate (22E0605-DUP1)			Prepared: 05/16/22 17:49 Analyzed: 05/17/22 15:11									
QC Source Sample: Non-SDG (A2E0080-02)												
Zinc	4.24	---	4.00	ug/L	1	---	5.47	---	---	25	20%	Q-05
Matrix Spike (22E0605-MS1)			Prepared: 05/16/22 17:49 Analyzed: 05/17/22 15:16									
QC Source Sample: Non-SDG (A2E0080-02)												
EPA 6020B												
Zinc	57.5	---	4.00	ug/L	1	55.6	5.47	94	75-125%	---	---	

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Portland, OR 97201Project: **POP T4 - Slip 3 GW**
Project Number: **1007-23**
Project Manager: **Steve Misner****Report ID:**
A2D1086 - 06 24 22 1013

QUALITY CONTROL (QC) SAMPLE RESULTS

Dissolved Metals by EPA 6020B (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22D1144 - Matrix Matched Direct Inject						Water						
Blank (22D1144-BLK1)			Prepared: 04/29/22 13:28 Analyzed: 05/01/22 03:26									
EPA 6020B (Diss)												
Arsenic	ND	---	1.00	ug/L	1	---	---	---	---	---	---	B
Cadmium	ND	---	0.200	ug/L	1	---	---	---	---	---	---	
Chromium	ND	---	2.00	ug/L	1	---	---	---	---	---	---	
Copper	ND	---	2.00	ug/L	1	---	---	---	---	---	---	
Lead	0.256	---	0.200	ug/L	1	---	---	---	---	---	---	
Manganese	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Mercury	ND	---	0.0800	ug/L	1	---	---	---	---	---	---	
Vanadium	ND	---	2.00	ug/L	1	---	---	---	---	---	---	
Zinc	ND	---	4.00	ug/L	1	---	---	---	---	---	---	
LCS (22D1144-BS1)			Prepared: 04/29/22 13:28 Analyzed: 05/01/22 03:31									
EPA 6020B (Diss)												
Arsenic	52.8	---	1.00	ug/L	1	55.6	---	95	80-120%	---	---	B
Cadmium	53.0	---	0.200	ug/L	1	55.6	---	95	80-120%	---	---	
Chromium	53.6	---	2.00	ug/L	1	55.6	---	96	80-120%	---	---	
Copper	57.5	---	2.00	ug/L	1	55.6	---	103	80-120%	---	---	
Lead	54.3	---	0.200	ug/L	1	55.6	---	98	80-120%	---	---	
Manganese	53.7	---	1.00	ug/L	1	55.6	---	97	80-120%	---	---	
Mercury	1.04	---	0.0800	ug/L	1	1.11	---	93	80-120%	---	---	
Vanadium	54.5	---	2.00	ug/L	1	55.6	---	98	80-120%	---	---	
Zinc	56.9	---	4.00	ug/L	1	55.6	---	102	80-120%	---	---	
Duplicate (22D1144-DUP1)			Prepared: 04/29/22 13:28 Analyzed: 05/01/22 04:47									
QC Source Sample: HC-12D (A2D1086-06)												
EPA 6020B (Diss)												
Arsenic	18.1	---	1.00	ug/L	1	---	17.6	---	---	3	20%	
Cadmium	0.219	---	0.200	ug/L	1	---	0.253	---	---	14	20%	
Chromium	ND	---	2.00	ug/L	1	---	ND	---	---	---	20%	
Copper	ND	---	2.00	ug/L	1	---	ND	---	---	---	20%	
Lead	ND	---	0.200	ug/L	1	---	ND	---	---	---	20%	
Mercury	ND	---	0.0800	ug/L	1	---	ND	---	---	---	20%	
Vanadium	ND	---	2.00	ug/L	1	---	1.20	---	---	***	20%	
Zinc	ND	---	4.00	ug/L	1	---	ND	---	---	---	20%	

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Project Number: 1007-23

Project Manager: Steve Misner

Report ID:

A2D1086 - 06 24 22 1013

QUALITY CONTROL (QC) SAMPLE RESULTS

Dissolved Metals by EPA 6020B (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22D1144 - Matrix Matched Direct Inject						Water						
Duplicate (22D1144-DUP2)			Prepared: 04/29/22 13:28 Analyzed: 05/02/22 12:17									
QC Source Sample: HC-12D (A2D1086-06RE1)												
EPA 6020B (Diss)												
Manganese	12800	---	10.0	ug/L	10	---	12600	---	---	1	20%	Q-16
Matrix Spike (22D1144-MS1)			Prepared: 04/29/22 13:28 Analyzed: 05/01/22 04:57									
QC Source Sample: DUP-1 (A2D1086-07)												
Arsenic	71.6	---	1.00	ug/L	1	55.6	16.9	98	75-125%	---	---	B
Cadmium	53.9	---	0.200	ug/L	1	55.6	0.347	96	75-125%	---	---	
Chromium	52.7	---	2.00	ug/L	1	55.6	ND	95	75-125%	---	---	
Copper	53.2	---	2.00	ug/L	1	55.6	ND	96	75-125%	---	---	
Lead	53.8	---	0.200	ug/L	1	55.6	ND	97	75-125%	---	---	
Mercury	1.08	---	0.0800	ug/L	1	1.11	ND	97	75-125%	---	---	
Vanadium	56.4	---	2.00	ug/L	1	55.6	1.17	99	75-125%	---	---	
Zinc	54.4	---	4.00	ug/L	1	55.6	ND	98	75-125%	---	---	
Matrix Spike (22D1144-MS2)			Prepared: 04/29/22 13:28 Analyzed: 05/02/22 12:27									
QC Source Sample: DUP-1 (A2D1086-07RE1)												
Manganese	12700	---	10.0	ug/L	10	55.6	12400	443	75-125%	---	---	Q-03, Q-16

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Portland, OR 97201Project: **POP T4 - Slip 3 GW**
Project Number: **1007-23**
Project Manager: **Steve Misner****Report ID:**
A2D1086 - 06 24 22 1013

QUALITY CONTROL (QC) SAMPLE RESULTS

Dissolved Metals by EPA 6020B (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22E0292 - Matrix Matched Direct Inject						Water						
Blank (22E0292-BLK1)			Prepared: 05/09/22 10:23 Analyzed: 05/25/22 03:56									
EPA 6020B (Diss)												
Lead	ND	---	0.200	ug/L	1	---	---	---	---	---	---	
LCS (22E0292-BS1)			Prepared: 05/09/22 10:23 Analyzed: 05/25/22 04:01									
EPA 6020B (Diss)												
Lead	57.4	---	0.200	ug/L	1	55.6	---	103	80-120%	---	---	
Duplicate (22E0292-DUP1)			Prepared: 05/09/22 10:23 Analyzed: 05/25/22 04:11									
QC Source Sample: BE-5 (A2D1086-02RE1)												
EPA 6020B (Diss)												
Lead	ND	---	0.200	ug/L	1	---	0.180	---	---	***	20%	
Matrix Spike (22E0292-MS1)			Prepared: 05/09/22 10:23 Analyzed: 05/25/22 04:16									
QC Source Sample: BE-5 (A2D1086-02RE1)												
EPA 6020B (Diss)												
Lead	54.9	---	0.200	ug/L	1	55.6	0.180	99	75-125%	---	---	

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503-718-2323

ORELAP ID: OR100062

Apex Companies, LLC3015 SW First Avenue
Portland, OR 97201Project: **POP T4 - Slip 3 GW**Project Number: **1007-23**Project Manager: **Steve Misner****Report ID:****A2D1086 - 06 24 22 1013****SAMPLE PREPARATION INFORMATION****Diesel and/or Oil Hydrocarbons by NWTPH-Dx with Acid/Silica Gel Cleanup**

Prep: EPA 3510C (Fuels/Acid Ext.) w/Silica Gel + Acid

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 22E0010							
A2D1086-01	Water	NWTPH-Dx/SG	04/26/22 10:50	05/02/22 08:13	1000mL/5mL	1000mL/5mL	1.00
A2D1086-02	Water	NWTPH-Dx/SG	04/26/22 10:20	05/02/22 08:13	950mL/5mL	1000mL/5mL	1.05
A2D1086-03	Water	NWTPH-Dx/SG	04/25/22 17:50	05/02/22 08:13	1010mL/5mL	1000mL/5mL	0.99
A2D1086-04	Water	NWTPH-Dx/SG	04/26/22 09:12	05/02/22 08:13	1040mL/5mL	1000mL/5mL	0.96
A2D1086-05	Water	NWTPH-Dx/SG	04/25/22 16:43	05/02/22 08:13	1030mL/5mL	1000mL/5mL	0.97
A2D1086-06	Water	NWTPH-Dx/SG	04/25/22 15:06	05/02/22 08:13	1020mL/5mL	1000mL/5mL	0.98
A2D1086-07	Water	NWTPH-Dx/SG	04/25/22 00:00	05/02/22 08:13	1050mL/5mL	1000mL/5mL	0.95

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Prep: EPA 3511 (Bottle Extraction)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 22E0040							
A2D1086-01	Water	EPA 8270E LVI	04/26/22 10:50	05/02/22 13:44	87.55mL/5mL	125mL/5mL	1.43
A2D1086-03	Water	EPA 8270E LVI	04/25/22 17:50	05/02/22 13:44	92.6mL/5mL	125mL/5mL	1.35
A2D1086-05	Water	EPA 8270E LVI	04/25/22 16:43	05/02/22 13:44	119.52mL/5mL	125mL/5mL	1.05
A2D1086-06	Water	EPA 8270E LVI	04/25/22 15:06	05/02/22 13:44	100.13mL/5mL	125mL/5mL	1.25
A2D1086-07	Water	EPA 8270E LVI	04/25/22 00:00	05/02/22 13:44	107.09mL/5mL	125mL/5mL	1.17
Batch: 22E0083							
A2D1086-02RE1	Water	EPA 8270E LVI	04/26/22 10:20	05/03/22 10:35	118.93mL/5mL	125mL/5mL	1.05
A2D1086-04RE1	Water	EPA 8270E LVI	04/26/22 09:12	05/03/22 10:35	116.27mL/5mL	125mL/5mL	1.08

Total Metals by EPA 6020B (ICPMS)

Prep: EPA 3015A

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 22E0330							
A2D1086-01	Water	EPA 6020B	04/26/22 10:50	05/10/22 09:00	45mL/50mL	45mL/50mL	1.00
A2D1086-01RE1	Water	EPA 6020B	04/26/22 10:50	05/10/22 09:00	45mL/50mL	45mL/50mL	1.00
A2D1086-02	Water	EPA 6020B	04/26/22 10:20	05/10/22 09:00	45mL/50mL	45mL/50mL	1.00
A2D1086-03	Water	EPA 6020B	04/25/22 17:50	05/10/22 09:00	45mL/50mL	45mL/50mL	1.00
A2D1086-04	Water	EPA 6020B	04/26/22 09:12	05/10/22 09:00	45mL/50mL	45mL/50mL	1.00
A2D1086-05	Water	EPA 6020B	04/25/22 16:43	05/10/22 09:00	45mL/50mL	45mL/50mL	1.00
A2D1086-06	Water	EPA 6020B	04/25/22 15:06	05/10/22 09:00	45mL/50mL	45mL/50mL	1.00
A2D1086-06RE1	Water	EPA 6020B	04/25/22 15:06	05/10/22 09:00	45mL/50mL	45mL/50mL	1.00
A2D1086-07	Water	EPA 6020B	04/25/22 00:00	05/10/22 09:00	45mL/50mL	45mL/50mL	1.00

Apex Laboratories

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.

Darrell Auvil, Client Services Manager

Page 28 of 35



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323

ORELAP ID: OR100062

Apex Companies, LLC

3015 SW First Avenue
Portland, OR 97201Project: **POP T4 - Slip 3 GW**Project Number: **1007-23**Project Manager: **Steve Misner**

Report ID:

A2D1086 - 06 24 22 1013

SAMPLE PREPARATION INFORMATION

Total Metals by EPA 6020B (ICPMS)

Prep: EPA 3015A

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
A2D1086-07RE1	Water	EPA 6020B	04/25/22 00:00	05/10/22 09:00	45mL/50mL	45mL/50mL	1.00
Batch: 22E0605							
A2D1086-01RE1	Water	EPA 6020B	04/26/22 10:50	05/16/22 17:49	45mL/50mL	45mL/50mL	1.00
A2D1086-02RE1	Water	EPA 6020B	04/26/22 10:20	05/16/22 17:49	45mL/50mL	45mL/50mL	1.00
A2D1086-04RE1	Water	EPA 6020B	04/26/22 09:12	05/16/22 17:49	45mL/50mL	45mL/50mL	1.00
A2D1086-05RE1	Water	EPA 6020B	04/25/22 16:43	05/16/22 17:49	45mL/50mL	45mL/50mL	1.00

Dissolved Metals by EPA 6020B (ICPMS)

Prep: Matrix Matched Direct Inject

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 22D1144							
A2D1086-01	Water	EPA 6020B (Diss)	04/26/22 10:50	04/29/22 13:28	45mL/50mL	45mL/50mL	1.00
A2D1086-01RE1	Water	EPA 6020B (Diss)	04/26/22 10:50	04/29/22 13:28	45mL/50mL	45mL/50mL	1.00
A2D1086-02	Water	EPA 6020B (Diss)	04/26/22 10:20	04/29/22 13:28	45mL/50mL	45mL/50mL	1.00
A2D1086-03	Water	EPA 6020B (Diss)	04/25/22 17:50	04/29/22 13:28	45mL/50mL	45mL/50mL	1.00
A2D1086-04	Water	EPA 6020B (Diss)	04/26/22 09:12	04/29/22 13:28	45mL/50mL	45mL/50mL	1.00
A2D1086-05	Water	EPA 6020B (Diss)	04/25/22 16:43	04/29/22 13:28	45mL/50mL	45mL/50mL	1.00
A2D1086-06	Water	EPA 6020B (Diss)	04/25/22 15:06	04/29/22 13:28	45mL/50mL	45mL/50mL	1.00
A2D1086-06RE1	Water	EPA 6020B (Diss)	04/25/22 15:06	04/29/22 13:28	45mL/50mL	45mL/50mL	1.00
A2D1086-07	Water	EPA 6020B (Diss)	04/25/22 00:00	04/29/22 13:28	45mL/50mL	45mL/50mL	1.00
A2D1086-07RE1	Water	EPA 6020B (Diss)	04/25/22 00:00	04/29/22 13:28	45mL/50mL	45mL/50mL	1.00
Batch: 22E0292							
A2D1086-02RE1	Water	EPA 6020B (Diss)	04/26/22 10:20	05/09/22 10:23	22.5mL/25mL	45mL/50mL	1.00

Apex Laboratories

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

Apex Companies, LLC
3015 SW First Avenue
Portland, OR 97201

Project: **POP T4 - Slip 3 GW**
Project Number: **1007-23**
Project Manager: **Steve Misner**

Report ID:
A2D1086 - 06 24 22 1013

QUALIFIER DEFINITIONS

Client Sample and Quality Control (QC) Sample Qualifier Definitions:

Apex Laboratories

- A-01** Due to a discrepancy between the standards used for calibration and extraction of samples, surrogate recovery is below acceptance limits. Verification showed that the true value of the surrogate spike was approximately 70% of expected.
- B** Analyte detected in an associated blank at a level above the MRL. (See Notes and Conventions below.)
- B-02** Analyte detected in an associated blank at a level between one-half the MRL and the MRL. (See Notes and Conventions below.)
- F-11** The hydrocarbon pattern indicates possible weathered diesel, mineral oil, or a contribution from a related component.
- Q-03** Spike recovery and/or RPD is outside control limits due to the high concentration of analyte present in the sample.
- Q-05** Analyses are not controlled on RPD values from sample and duplicate concentrations that are below 5 times the reporting level.
- Q-16** Reanalysis of an original Batch QC sample.
- Q-19** Blank Spike Duplicate (BSD) sample analyzed in place of Matrix Spike/Duplicate samples due to limited sample amount available for analysis.
- R-02** The Reporting Limit for this analyte has been raised to account for interference from coeluting organic compounds present in the sample.
- R-04** Reporting levels elevated due to preparation and/or analytical dilution necessary for analysis.
- S-01** Surrogate recovery for this sample is not available due to sample dilution required from high analyte concentration and/or matrix interference.
- S-05** Surrogate recovery is estimated due to sample dilution required for high analyte concentration and/or matrix interference.

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6700 S.W. Sandburg Street
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ORELAP ID: OR100062

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3015 SW First Avenue
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Project: **POP T4 - Slip 3 GW**
Project Number: **1007-23**
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Report ID:
A2D1086 - 06 24 22 1013

REPORTING NOTES AND CONVENTIONS:

Abbreviations:

DET Analyte DETECTED at or above the detection or reporting limit.
ND Analyte NOT DETECTED at or above the detection or reporting limit.
NR Result Not Reported
RPD Relative Percent Difference. RPDs for Matrix Spikes and Matrix Spike Duplicates are based on concentration, not recovery.

Detection Limits: Limit of Detection (LOD)

Limits of Detection (LODs) are normally set at a level of one half the validated Limit of Quantitation (LOQ).
If no value is listed ('-----'), then the data has not been evaluated below the Reporting Limit.

Reporting Limits: Limit of Quantitation (LOQ)

Validated Limits of Quantitation (LOQs) are reported as the Reporting Limits for all analyses where the LOQ, MRL, PQL or CRL are requested. The LOQ represents a level at or above the low point of the calibration curve, that has been validated according to Apex Laboratories' comprehensive LOQ policies and procedures.

Reporting Conventions:

Basis: Results for soil samples are generally reported on a 100% dry weight basis.
The Result Basis is listed following the units as "dry", "wet", or " " (blank) designation.

"dry" Sample results and Reporting Limits are reported on a dry weight basis. (i.e. "ug/kg dry")
See Percent Solids section for details of dry weight analysis.

"wet" Sample results and Reporting Limits for this analysis are normally dry weight corrected, but have not been modified in this case.

" " Results without 'wet' or 'dry' designation are not normally dry weight corrected. These results are considered 'As Received'.

QC Source:

In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) may be analyzed to demonstrate accuracy and precision of the extraction batch.

Non-Client Batch QC Samples (Duplicates and Matrix Spike/Duplicates) may not be included in this report. Please request a Full QC report if this data is required.

Miscellaneous Notes:

" --- " QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.

" *** " Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).

Blanks:

Standard practice is to evaluate the results from Blank QC Samples down to a level equal to ½ the Reporting Limit (RL).
-For Blank hits falling between ½ the RL and the RL (J flagged hits), the associated sample and QC data will receive a 'B-02' qualifier.
-For Blank hits above the RL, the associated sample and QC data will receive a 'B' qualifier, per Apex Laboratories' Blank Policy.
For further details, please request a copy of this document.

Apex Laboratories

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ANALYTICAL REPORT

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6700 S.W. Sandburg Street
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503-718-2323
ORELAP ID: OR100062

Apex Companies, LLC
3015 SW First Avenue
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Project: **POP T4 - Slip 3 GW**
Project Number: **1007-23**
Project Manager: **Steve Misner**

Report ID:
A2D1086 - 06 24 22 1013

REPORTING NOTES AND CONVENTIONS (Cont.):

Blanks (Cont.):

Sample results flagged with a 'B' or 'B-02' qualifier are potentially biased high if the sample results are less than ten times the level found in the blank for inorganic analyses, or less than five times the level found in the blank for organic analyses.

'B' and 'B-02' qualifications are only applied to sample results detected above the Reporting Level.

Preparation Notes:

Mixed Matrix Samples:

Water Samples:

Water samples containing significant amounts of sediment are decanted or separated prior to extraction, and only the water portion analyzed, unless otherwise directed by the client.

Soil and Sediment Samples:

Soil and Sediment samples containing significant amounts of water are decanted prior to extraction, and only the solid portion analyzed, unless otherwise directed by the client.

Sampling and Preservation Notes:

Certain regulatory programs, such as National Pollutant Discharge Elimination System (NPDES), require that activities such as sample filtration (for dissolved metals, orthophosphate, hexavalent chromium, etc.) and testing of short hold analytes (pH, Dissolved Oxygen, etc.) be performed in the field (on-site) within a short time window. In addition, sample matrix spikes are required for some analyses, and sufficient volume must be provided, and billable site specific QC requested, if this is required. All regulatory permits should be reviewed to ensure that these requirements are being met.

Data users should be aware of which regulations pertain to the samples they submit for testing. If related sample collection activities are not approved for a particular regulatory program, results should be considered estimates. Apex Laboratories will qualify these analytes according to the most stringent requirements, however results for samples that are for non-regulatory purposes may be acceptable.

Samples that have been filtered and preserved at Apex Laboratories per client request are listed in the preparation section of the report with the date and time of filtration listed.

Apex Laboratories maintains detailed records on sample receipt, including client label verification, cooler temperature, sample preservation, hold time compliance and field filtration. Data is qualified as necessary, and the lack of qualification indicates compliance with required parameters.

Apex Laboratories

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

Apex Companies, LLC
3015 SW First Avenue
Portland, OR 97201

Project: **POP T4 - Slip 3 GW**
Project Number: **1007-23**
Project Manager: **Steve Misner**

Report ID:
A2D1086 - 06 24 22 1013

LABORATORY ACCREDITATION INFORMATION

ORELAP Certification ID: OR100062 (Primary Accreditation) -

EPA ID: OR01039

All methods and analytes reported from work performed at Apex Laboratories are included on Apex Laboratories' ORELAP Scope of Certification, with the exception of any analyte(s) listed below:

Apex Laboratories

Matrix	Analysis	TNI_ID	Analyte	TNI_ID	Accreditation
All reported analytes are included in Apex Laboratories' current ORELAP scope.					

Secondary Accreditations

Apex Laboratories also maintains reciprocal accreditation with non-TNI states (Washington DOE), as well as other state specific accreditations not listed here.

Subcontract Laboratory Accreditations

Subcontracted data falls outside of Apex Laboratories' Scope of Accreditation.
Please see the Subcontract Laboratory report for full details, or contact your Project Manager for more information.

Field Testing Parameters

Results for Field Tested data are provided by the client or sampler, and fall outside of Apex Laboratories' Scope of Accreditation.

Apex Laboratories

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Apex Companies, LLC

3015 SW First Avenue

Portland, OR 97201

Project: **POP T4 - Slip 3 GW**Project Number: **1007-23**Project Manager: **Steve Misner****Report ID:****A2D1086 - 06 24 22 1013**

A2D1086

Telephone Number: 503.924.4704
Fax No.: 503.943.6357

Analytical Lab: Apex Labs

Report To: Steve Misner@apexco.com

Page: 1 of 1

CHAIN OF CUSTODY RECORD

Client Name: Apex Companies, LLC
Address: 3015 SW First Ave
City/State/Zip: Portland, OR 97201

Project Manager: Steve Misner

Project Name: Terminal 4 Slip 3 Groundwater Sampling

Project Number: 1007-23

Sampler Name: Robert Schettler



Sample ID / Description	Date Sampled	Time Sampled	No. of Containers Shipped	Grab	Composite	Field Filtered for Diss. Metals	Preservative										Matrix	Analyze For:	RUSH TAT (Pre-Schedule)	Standard TAT	Fax Results	Send QC with report
							Ice	HNO ₃ (Red Label)	HCl (Blue Label)	NaOH (Orange Label)	H ₂ SO ₄ Plastic (Yellow Label)	H ₂ SO ₄ Glass (Yellow Label)	None (Black Label)	Other (Specify)	Groundwater	Drinking Water						
BE-1	4/26	1050	5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
BE-5	4/26	1020	5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
HC-2	4/25	1750	5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
HC-5	4/26	0912	5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
HC-6S	4/25	1643	5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
HC-12D	4/25	1506	5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
Dup-1	4/25	--	5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			

Special Instructions:				Method of Shipment:				Laboratory Comments:												
Relinquished by: Name/Company	Date	Time	Received by: Name/Company	Date	Time	Relinquished by: Name/Company	Date	Time	Received by: Name/Company	Date	Time	Relinquished by: Name/Company	Date	Time	Received by: Name/Company	Date	Time	Relinquished by: Name/Company	Date	Time
Robert Schettler - Apex	4/26/22	1700	Steve Misner	4/26/22	1900	Steve Misner	4/26/22	1900	Steve Misner	4/26/22	1900	Steve Misner	4/26/22	1900	Steve Misner	4/26/22	1900	Steve Misner	4/26/22	1900
Robert Schettler - Apex	4/27/22	1520	Steve Misner	4/27/22	1520	Steve Misner	4/27/22	1520	Steve Misner	4/27/22	1520	Steve Misner	4/27/22	1520	Steve Misner	4/27/22	1520	Steve Misner	4/27/22	1520
Steve Misner																				
Relinquished by: Name/Company	Date	Time	Received by: Name/Company	Date	Time	Relinquished by: Name/Company	Date	Time	Received by: Name/Company	Date	Time	Relinquished by: Name/Company	Date	Time	Received by: Name/Company	Date	Time	Relinquished by: Name/Company	Date	Time

Apex Laboratories

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Darrell Auvel, Client Services Manager

Report is complete only if it includes ALS-Kelso Laboratory Data.

Page 34 of 64 02/02/2023

Page 34 of 35



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Apex Companies, LLC

3015 SW First Avenue

Portland, OR 97201

Project: POP T4 - Slip 3 GWProject Number: 1007-23Project Manager: Steve Misner

Report ID:

A2D1086 - 06 24 22 1013

APEX LABS COOLER RECEIPT FORM

Client: Apex Companies Element WO#: A2 D1086Project/Project #: Terminal 4 slip 3 Groundwater Sampling / 1007-23

Delivery Info:

Date/time received: 4/27/22 @ 1520 By: MSDelivered by: Apex ☒ Client ☒ ESS ☐ FedEx ☐ UPS ☐ Swift ☐ Senvoy ☐ SDS ☐ Other ☐Cooler Inspection Date/time inspected: 4/27/22 @ 1520 By: MSChain of Custody included? Yes ☒ No ☐ Custody seals? Yes ☐ No ☒Signed/dated by client? Yes ☒ No ☐Signed/dated by Apex? Yes ☒ No ☐

	Cooler #1	Cooler #2	Cooler #3	Cooler #4	Cooler #5	Cooler #6	Cooler #7
Temperature (°C)	<u>1.2</u>	<u>2.9</u>	<u>4.9</u>				
Received on ice? (Y/N)	<u>Y</u>	<u>Y</u>	<u>Y</u>				
Temp. blanks? (Y/N)	<u>Y</u>	<u>Y</u>	<u>Y</u>				
Ice type: (Gel/Real/Other)	<u>Real</u>	<u>Real</u>	<u>Real</u>				
Condition:	<u>Good</u>	<u>Good</u>	<u>Good</u>				

Cooler out of temp? (Y/N) ☒ Possible reason why:Green dots applied to out of temperature samples? Yes ☒ No ☐Out of temperature samples form initiated? Yes ☒ No ☐Sample Inspection: Date/time inspected: 4/28/22 @ 1200 By: JSAll samples intact? Yes ☒ No ☐ Comments:Bottle labels/COCs agree? Yes ☒ No ☐ Comments:COC/container discrepancies form initiated? Yes ☐ No ☒Containers/volumes received appropriate for analysis? Yes ☒ No ☐ Comments:Do VOA vials have visible headspace? Yes ☐ No ☒ NA ☐

Comments:

Water samples: pH checked: Yes ☒ No ☐ NA ☐ pH appropriate? Yes ☒ No ☐ NA ☐

Comments:

Additional information:

Labeled by:

JS

Witness:

BS

Cooler Inspected by:

MS HAS

Apex Laboratories

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Darrell Auvin

Darrell Auvin, Client Services Manager

Report is complete only if it includes ALS-Kelso Laboratory Data. Page 35 of 64 02/02/2023

Page 35 of 35



May 16, 2022

Service Request No:K2204561

Darrell Auvil
Apex Laboratories
6700 SW Sandburg St.
Tigard, OR 97223

Laboratory Results for: A2D1086

Dear Darrell,

Enclosed are the results of the sample(s) submitted to our laboratory April 29, 2022
For your reference, these analyses have been assigned our service request number **K2204561**.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3350. You may also contact me via email at Kelley.Lovejoy@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

for Kelley Lovejoy
Project Manager

ADDRESS 1317 S. 13th Avenue, Kelso, WA 98626
PHONE +1 360 577 7222 | FAX +1 360 636 1068
ALS Group USA, Corp.
dba ALS Environmental



Narrative Documents

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Client: Apex Laboratories
Project: A2D1086
Sample Matrix: Water

Service Request: K2204561
Date Received: 04/29/2022

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier II level requested by the client.

Sample Receipt:

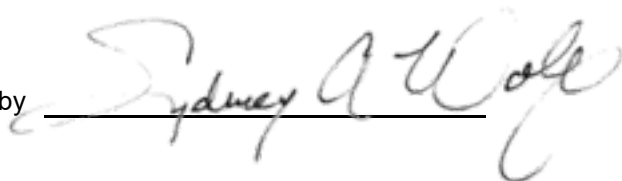
Seven water samples were received for analysis at ALS Environmental on 04/29/2022. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

Semivola GC:

Method 8015C, 05/11/2022: The upper control criterion was exceeded for surrogate Triacontane-d62 in Continuing Calibration Verification (CCV) KQ2207673-02. The field samples analyzed in this sequence with detections for target analytes were re-analyzed for this surrogate. Since the apparent problem indicated a potential high bias, the data quality was not affected. No further corrective action was required.

Method 8015C, 05/12/2022: The upper control criterion was exceeded for surrogate Triacontane-d62 in Continuing Calibration Verification (CCV) KQ2207807-02. Samples were run multiple times with similar results. Since the apparent problem indicated a potential high bias, the data quality was not affected. No further corrective action was required.

Approved by



Date

05/16/2022

SAMPLE DETECTION SUMMARY

This form includes only detections above the reporting levels. For a full listing of sample results, continue to the Sample Results section of this Report.

CLIENT ID: BE-5			Lab ID: K2204561-002			
Analyte	Results	Flag	MDL	MRL	Units	Method
n-Undecane	0.14	J	0.084	2.1	ug/L	8015C
CLIENT ID: HC-5			Lab ID: K2204561-004			
Analyte	Results	Flag	MDL	MRL	Units	Method
n-Undecane	0.38	J	0.084	2.1	ug/L	8015C
n-Dodecane	0.44	J	0.13	2.1	ug/L	8015C
CLIENT ID: HC-12D			Lab ID: K2204561-006			
Analyte	Results	Flag	MDL	MRL	Units	Method
n-Decane	0.35	J	0.11	2.1	ug/L	8015C
n-Undecane	0.81	J	0.084	2.1	ug/L	8015C
n-Dodecane	5.4		0.13	2.1	ug/L	8015C
CLIENT ID: DUP-1			Lab ID: K2204561-007			
Analyte	Results	Flag	MDL	MRL	Units	Method
n-Decane	0.30	J	0.11	2.1	ug/L	8015C
n-Undecane	0.60	J	0.084	2.1	ug/L	8015C
n-Dodecane	4.0		0.13	2.1	ug/L	8015C



Sample Receipt Information

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Client: Apex Laboratories
Project: A2D1086

Service Request:K2204561

SAMPLE CROSS-REFERENCE

<u>SAMPLE #</u>	<u>CLIENT SAMPLE ID</u>	<u>DATE</u>	<u>TIME</u>
K2204561-001	BE-1	4/26/2022	1050
K2204561-002	BE-5	4/26/2022	1020
K2204561-003	HC-2	4/25/2022	1750
K2204561-004	HC-5	4/26/2022	0912
K2204561-005	HC-6S	4/25/2022	1643
K2204561-006	HC-12D	4/25/2022	1506
K2204561-007	DUP-1	4/25/2022	0000

SUBCONTRACT ORDER

Apex Laboratories

AB4125/22 A2D1086

112204561

SENDING LABORATORY:

Apex Laboratories
6700 S.W. Sandburg Street
Tigard, OR 97223
Phone: (503) 718-2323
Fax: (503) 336-0745
Project Manager: Darrell Auvil

RECEIVING LABORATORY:

ALS Group USA - Kelso
1317 S 13th Avenue
Kelso, WA 98626
Phone: (360) 577-7222
Fax: (360) 636-1068

Sample Name: BE-1

Sampled: 04/26/22 10:50

(A2D1086-01)

Analysis	Due	Expires	Comments
Subcontract Outside	05/10/22 17:00	10/23/22 10:50	8015 c10-c12 aliphatic
Containers Supplied:			
(G)Other-HCl			
(H)Other-HCl			

Sample Name: BE-5

Sampled: 04/26/22 10:20

(A2D1086-02)

Analysis	Due	Expires	Comments
Subcontract Outside	05/10/22 17:00	10/23/22 10:20	8015 c10-c12 aliphatic
Containers Supplied:			
(G)Other-HCl			
(H)Other-HCl			

Sample Name: HC-2

Sampled: 04/25/22 17:50

(A2D1086-03)

Analysis	Due	Expires	Comments
Subcontract Outside	05/10/22 17:00	10/22/22 17:50	8015 c10-c12 aliphatic
Containers Supplied:			
(G)Other-HCl			
(H)Other-HCl			

Sample Name: HC-5

Sampled: 04/26/22 09:12

(A2D1086-04)

Analysis	Due	Expires	Comments
Subcontract Outside	05/10/22 17:00	10/23/22 09:12	8015 c10-c12 aliphatic
Containers Supplied:			
(G)Other-HCl			
(H)Other-HCl			

Standard TAT 1125

Released By [Signature] Date 4/29/22 1125 Received By [Signature] Date 4/29/22 1125

Released By [Signature] Date 4/29/22 1240 Received By [Signature] Date 4/29/22 1240

SUBCONTRACT ORDER

Apex Laboratories

AS 4/28/22 A2D1086

K2204561

Sample Name: HC-6S

Sampled: 04/25/22 16:43

(A2D1086-05)

Analysis	Due	Expires	Comments
Subcontract Outside Containers Supplied: (G)Other-HCl (H)Other-HCl	05/10/22 17:00	10/22/22 16:43	8015 c10-c12 aliphatic

Sample Name: HC-12D

Sampled: 04/25/22 15:06

(A2D1086-06)

Analysis	Due	Expires	Comments
Subcontract Outside Containers Supplied: (G)Other-HCl (H)Other-HCl	05/10/22 17:00	10/22/22 15:06	8015 c10-c12 aliphatic

Sample Name: DUP-1

Sampled: 04/25/22 00:00

(A2D1086-07)

Analysis	Due	Expires	Comments
Subcontract Outside Containers Supplied: (G)Other-HCl (H)Other-HCl	05/10/22 17:00	10/22/22 00:00	8015 c10-c12 aliphatic

Standard TAT

Released By	Date	Received By	Date
<i>[Signature]</i>	4/29/22 1125	<i>[Signature]</i>	4/29/22 1125
Released By	Date	Received By	Date
<i>[Signature]</i>	ALS 4/29/22 1240	<i>[Signature]</i>	ALS 4/29/22 1240

PM

Cooler Receipt and Preservation Form

Client Apex Service Request K22 04561
 Received: 4/29/22 Opened: 4/29/22 By: JK Unloaded: 4/29/22 By: JK

1. Samples were received via? USPS Fed Ex UPS DHL PDX Courier Hand Delivered
 2. Samples were received in: (circle) Cooler Box Envelope Other NA
 3. Were custody seals on coolers? NA Y N If yes, how many and where? _____
 If present, were custody seals intact? Y N If present, were they signed and dated? Y N

Temp Blank	Sample Temp	IR Gun	Cooler #/COC ID / NA	Out of temp indicate with "X"	PM Notified if out of temp	Tracking Number NA	Filled
	<u>5.7</u>	<u>IR 02</u>					

4. Was a Temperature Blank present in cooler? NA Y N If yes, notate the temperature in the appropriate column above:
 If no, take the temperature of a representative sample bottle contained within the cooler; notate in the column "Sample Temp":

5. Were samples received within the method specified temperature ranges? NA Y N
 If no, were they received on ice and same day as collected? If not, notate the cooler # below and notify the PM. NA Y N

If applicable, tissue samples were received: Frozen Partially Thawed Thawed

6. Packing material: Inserts Baggies Bubble Wrap Gel Packs Wet Ice Dry Ice Sleeves

7. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
 8. Were samples received in good condition (unbroken) NA Y N
 9. Were all sample labels complete (ic, analysis, preservation, etc.)? NA Y N
 10. Did all sample labels and tags agree with custody papers? NA Y N
 11. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
 12. Were the pH-preserved bottles (see SMO GEN SOP) received at the appropriate pH? Indicate in the table below NA Y N
 13. Were VOA vials received without headspace? Indicate in the table below NA Y N
 14. Was C12/Res negative? NA Y N
 15. Were 100ml sterile microbiology bottles filled exactly to the 100ml mark? NA Y N Under filled Overfilled

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count	Bottle Type	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, Resolutions: _____

1/13/22

Page ____ of ____



Miscellaneous Forms

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Inorganic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.
- H The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

- # The control limit criteria is not applicable.
- J The result is an estimated value.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.
- Q See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimated value.
- J The result is an estimated value.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

- F The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjllabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdwlabservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.

Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/analyte is offered by that state.

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

ALS Group USA, Corp.
dba ALS Environmental

Analyst Summary report

Client: Apex Laboratories
Project: A2D1086/

Service Request: K2204561

Sample Name: BE-1
Lab Code: K2204561-001
Sample Matrix: Water

Date Collected: 04/26/22
Date Received: 04/29/22

Analysis Method
8015C

Extracted/Digested By
BRICKMAN

Analyzed By
TPOTTSCHMIDT

Sample Name: BE-5
Lab Code: K2204561-002
Sample Matrix: Water

Date Collected: 04/26/22
Date Received: 04/29/22

Analysis Method
8015C

Extracted/Digested By
BRICKMAN

Analyzed By
TPOTTSCHMIDT

Sample Name: HC-2
Lab Code: K2204561-003
Sample Matrix: Water

Date Collected: 04/25/22
Date Received: 04/29/22

Analysis Method
8015C

Extracted/Digested By
BRICKMAN

Analyzed By
TPOTTSCHMIDT

Sample Name: HC-5
Lab Code: K2204561-004
Sample Matrix: Water

Date Collected: 04/26/22
Date Received: 04/29/22

Analysis Method
8015C

Extracted/Digested By
BRICKMAN

Analyzed By
TPOTTSCHMIDT

Sample Name: HC-6S
Lab Code: K2204561-005
Sample Matrix: Water

Date Collected: 04/25/22
Date Received: 04/29/22

Analysis Method
8015C

Extracted/Digested By
BRICKMAN

Analyzed By
TPOTTSCHMIDT

ALS Group USA, Corp.

dba ALS Environmental

Analyst Summary report

Client: Apex Laboratories
Project: A2D1086/

Service Request: K2204561

Sample Name: HC-6S
Lab Code: K2204561-005.R01
Sample Matrix: Water

Date Collected: 04/25/22**Date Received:** 04/29/22

Analysis Method
8015C

Extracted/Digested By
BRICKMAN

Analyzed By
TPOTTSCHMIDT

Sample Name: HC-12D
Lab Code: K2204561-006
Sample Matrix: Water

Date Collected: 04/25/22**Date Received:** 04/29/22

Analysis Method
8015C

Extracted/Digested By
BRICKMAN

Analyzed By
TPOTTSCHMIDT

Sample Name: HC-12D
Lab Code: K2204561-006.R01
Sample Matrix: Water

Date Collected: 04/25/22**Date Received:** 04/29/22

Analysis Method
8015C

Extracted/Digested By
BRICKMAN

Analyzed By
TPOTTSCHMIDT

Sample Name: DUP-1
Lab Code: K2204561-007
Sample Matrix: Water

Date Collected: 04/25/22**Date Received:** 04/29/22

Analysis Method
8015C

Extracted/Digested By
BRICKMAN

Analyzed By
TPOTTSCHMIDT

Sample Name: DUP-1
Lab Code: K2204561-007.R01
Sample Matrix: Water

Date Collected: 04/25/22**Date Received:** 04/29/22

Analysis Method
8015C

Extracted/Digested By
BRICKMAN

Analyzed By
TPOTTSCHMIDT



Sample Results

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

RIGHT SOLUTIONS | RIGHT PARTNER



Semivolatile Organic Compounds by GC

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

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ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Apex Laboratories
Project: A2D1086
Sample Matrix: Water

Service Request: K2204561
Date Collected: 04/26/22 10:50
Date Received: 04/29/22 12:40

Sample Name: BE-1
Lab Code: K2204561-001

Units: ug/L
Basis: NA

Petroleum Hydrocarbons by GC/FID

Analysis Method: 8015C
Prep Method: EPA 3510C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
n-Decane	ND U	2.5	0.13	1	05/11/22 17:48	5/9/22	
n-Undecane	ND U	2.5	0.10	1	05/11/22 17:48	5/9/22	
n-Dodecane	ND U	2.5	0.15	1	05/11/22 17:48	5/9/22	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Dodecane-d26	43	40 - 150	05/11/22 17:48	
Triacontane-d62	80	40 - 150	05/11/22 17:48	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Apex Laboratories
Project: A2D1086
Sample Matrix: Water

Service Request: K2204561
Date Collected: 04/26/22 10:20
Date Received: 04/29/22 12:40

Sample Name: BE-5
Lab Code: K2204561-002

Units: ug/L
Basis: NA

Petroleum Hydrocarbons by GC/FID

Analysis Method: 8015C
Prep Method: EPA 3510C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
n-Decane	ND U	2.1	0.11	1	05/11/22 18:10	5/9/22	
n-Undecane	0.14 J	2.1	0.084	1	05/11/22 18:10	5/9/22	
n-Dodecane	ND U	2.1	0.13	1	05/11/22 18:10	5/9/22	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Dodecane-d26	44	40 - 150	05/11/22 18:10	
Triacontane-d62	76	40 - 150	05/11/22 18:10	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Apex Laboratories
Project: A2D1086
Sample Matrix: Water

Service Request: K2204561
Date Collected: 04/25/22 17:50
Date Received: 04/29/22 12:40

Sample Name: HC-2
Lab Code: K2204561-003

Units: ug/L
Basis: NA

Petroleum Hydrocarbons by GC/FID

Analysis Method: 8015C
Prep Method: EPA 3510C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
n-Decane	ND U	2.1	0.11	1	05/11/22 18:31	5/9/22	
n-Undecane	ND U	2.1	0.084	1	05/11/22 18:31	5/9/22	
n-Dodecane	ND U	2.1	0.13	1	05/11/22 18:31	5/9/22	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Dodecane-d26	42	40 - 150	05/11/22 18:31	
Triacontane-d62	82	40 - 150	05/11/22 18:31	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Apex Laboratories
Project: A2D1086
Sample Matrix: Water

Service Request: K2204561
Date Collected: 04/26/22 09:12
Date Received: 04/29/22 12:40

Sample Name: HC-5
Lab Code: K2204561-004

Units: ug/L
Basis: NA

Petroleum Hydrocarbons by GC/FID

Analysis Method: 8015C
Prep Method: EPA 3510C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
n-Decane	ND U	2.1	0.11	1	05/11/22 19:58	5/9/22	
n-Undecane	0.38 J	2.1	0.084	1	05/11/22 19:58	5/9/22	
n-Dodecane	0.44 J	2.1	0.13	1	05/11/22 19:58	5/9/22	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Dodecane-d26	50	40 - 150	05/11/22 19:58	
Triacontane-d62	70	40 - 150	05/11/22 19:58	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Apex Laboratories
Project: A2D1086
Sample Matrix: Water

Service Request: K2204561
Date Collected: 04/25/22 16:43
Date Received: 04/29/22 12:40

Sample Name: HC-6S
Lab Code: K2204561-005

Units: ug/L
Basis: NA

Petroleum Hydrocarbons by GC/FID

Analysis Method: 8015C
Prep Method: EPA 3510C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
n-Decane	ND U	2.1	0.11	1	05/11/22 18:53	5/9/22	
n-Undecane	ND U	2.1	0.084	1	05/11/22 18:53	5/9/22	
n-Dodecane	ND U	2.1	0.13	1	05/11/22 18:53	5/9/22	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Dodecane-d26	40	40 - 150	05/12/22 12:53	
Triacontane-d62	78	40 - 150	05/11/22 18:53	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Apex Laboratories
Project: A2D1086
Sample Matrix: Water

Service Request: K2204561
Date Collected: 04/25/22 15:06
Date Received: 04/29/22 12:40

Sample Name: HC-12D
Lab Code: K2204561-006

Units: ug/L
Basis: NA

Petroleum Hydrocarbons by GC/FID

Analysis Method: 8015C
Prep Method: EPA 3510C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
n-Decane	0.35 J	2.1	0.11	1	05/11/22 19:15	5/9/22	
n-Undecane	0.81 J	2.1	0.084	1	05/11/22 19:15	5/9/22	
n-Dodecane	5.4	2.1	0.13	1	05/11/22 19:15	5/9/22	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Dodecane-d26	47	40 - 150	05/11/22 19:15	
Triacontane-d62	88	40 - 150	05/12/22 13:14	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Apex Laboratories
Project: A2D1086
Sample Matrix: Water

Service Request: K2204561
Date Collected: 04/25/22 00:00
Date Received: 04/29/22 12:40

Sample Name: DUP-1
Lab Code: K2204561-007

Units: ug/L
Basis: NA

Petroleum Hydrocarbons by GC/FID

Analysis Method: 8015C
Prep Method: EPA 3510C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
n-Decane	0.30 J	2.1	0.11	1	05/11/22 19:36	5/9/22	
n-Undecane	0.60 J	2.1	0.084	1	05/11/22 19:36	5/9/22	
n-Dodecane	4.0	2.1	0.13	1	05/11/22 19:36	5/9/22	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Dodecane-d26	40	40 - 150	05/11/22 19:36	
Triacontane-d62	74	40 - 150	05/12/22 13:36	



QC Summary Forms

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com



Semivolatile Organic Compounds by GC

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: Apex Laboratories
Project: A2D1086
Sample Matrix: Water

Service Request: K2204561

SURROGATE RECOVERY SUMMARY
Petroleum Hydrocarbons by GC/FID

Analysis Method: 8015C
Extraction Method: EPA 3510C

Sample Name	Lab Code	Dodecane-d26	Triacontane-d62
		40-150	40-150
BE-1	K2204561-001	43	80
BE-5	K2204561-002	44	76
HC-2	K2204561-003	42	82
HC-5	K2204561-004	50	70
HC-6S	K2204561-005	40	78
HC-12D	K2204561-006	47	88
DUP-1	K2204561-007	40	74
Method Blank	KQ2207415-03	54	82
Lab Control Sample	KQ2207415-01	77	95
Duplicate Lab Control Sample	KQ2207415-02	57	79

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Apex Laboratories
Project: A2D1086
Sample Matrix: Water

Service Request: K2204561
Date Collected: NA
Date Received: NA

Sample Name: Method Blank
Lab Code: KQ2207415-03

Units: ug/L
Basis: NA

Petroleum Hydrocarbons by GC/FID

Analysis Method: 8015C
Prep Method: EPA 3510C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
n-Decane	ND U	2.0	0.099	1	05/11/22 17:26	5/9/22	
n-Undecane	ND U	2.0	0.080	1	05/11/22 17:26	5/9/22	
n-Dodecane	ND U	2.0	0.12	1	05/11/22 17:26	5/9/22	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Dodecane-d26	54	40 - 150	05/11/22 17:26	
Triacontane-d62	82	40 - 150	05/11/22 17:26	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: Apex Laboratories
Project: A2D1086
Sample Matrix: Water

Service Request: K2204561
Date Analyzed: 05/11/22
Date Extracted: 05/09/22

Duplicate Lab Control Sample Summary
Petroleum Hydrocarbons by GC/FID

Analysis Method: 8015C
Prep Method: EPA 3510C

Units: ug/L
Basis: NA
Analysis Lot: 763608

Lab Control Sample
KQ2207415-01

Duplicate Lab Control Sample
KQ2207415-02

Analyte Name	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec	% Rec Limits	RPD	RPD Limit
n-Decane	29.3	40.0	73	22.6	40.0	56	50-150	26	30
n-Dodecane	31.2	40.0	78	25.5	40.0	64	50-150	20	30
n-Undecane	30.7	40.0	77	24.7	40.0	62	50-150	22	30



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

Wednesday, September 28, 2022

Steve Misner
Apex Companies, LLC
3015 SW First Avenue
Portland, OR 97201

RE: A2H0590 - POP T4 - Slip 3 GW - 7573-00

Thank you for using Apex Laboratories. We greatly appreciate your business and strive to provide the highest quality services to the environmental industry.

Enclosed are the results of analyses for work order A2H0590, which was received by the laboratory on 8/16/2022 at 1:55:00PM.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: DAuvil@apex-labs.com, or by phone at 503-718-2323.

Please note: All samples will be disposed of within 30 days of sample receipt, unless prior arrangements have been made.

Cooler Receipt Information

(See Cooler Receipt Form for details)

Cooler #1	6.0 degC	Cooler #2	5.8 degC

This Final Report is the official version of the data results for this sample submission, unless superseded by a subsequent, labeled amended report.

All other deliverables derived from this data, including Electronic Data Deliverables (EDDs), CLP-like forms, client requested summary sheets, and all other products are considered secondary to this report.



Apex Laboratories

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Darrell Auvil, Client Services Manager

**ANALYTICAL REPORT****Apex Laboratories, LLC**6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062**Apex Companies, LLC**3015 SW First Avenue
Portland, OR 97201Project: **POP T4 - Slip 3 GW**

Project Number: 7573-00

Project Manager: Steve Misner

Report ID:

A2H0590 - 09 28 22 1301

ANALYTICAL REPORT FOR SAMPLES**SAMPLE INFORMATION**

Client Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BE-1	A2H0590-01	Water	08/15/22 13:34	08/16/22 13:55
BE-5	A2H0590-02	Water	08/15/22 17:02	08/16/22 13:55
HC-2	A2H0590-03	Water	08/11/22 13:25	08/16/22 13:55
HC-5	A2H0590-04	Water	08/11/22 14:40	08/16/22 13:55
HC-12D	A2H0590-05	Water	08/11/22 16:15	08/16/22 13:55

Apex Laboratories

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Apex Companies, LLC

3015 SW First Avenue

Portland, OR 97201

Project: POP T4 - Slip 3 GW

Project Number: 7573-00

Project Manager: Steve Misner

Report ID:

A2H0590 - 09 28 22 1301

ANALYTICAL SAMPLE RESULTS

Diesel and/or Oil Hydrocarbons by NWTPH-Dx with Acid/Silica Gel Cleanup

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
BE-1 (A2H0590-01)				Matrix: Water		Batch: 22H0885		
Diesel	0.313	0.0952	0.190	mg/L	1	08/25/22 22:48	NWTPH-Dx/SG	F-11
Oil	ND	0.190	0.381	mg/L	1	08/25/22 22:48	NWTPH-Dx/SG	
Surrogate: o-Terphenyl (Surr)		Recovery: 99 %		Limits: 50-150 %	1	08/25/22 22:48	NWTPH-Dx/SG	
BE-5 (A2H0590-02)				Matrix: Water		Batch: 22H0885		
Diesel	ND	0.0962	0.192	mg/L	1	08/25/22 23:08	NWTPH-Dx/SG	
Oil	ND	0.192	0.385	mg/L	1	08/25/22 23:08	NWTPH-Dx/SG	
Surrogate: o-Terphenyl (Surr)		Recovery: 100 %		Limits: 50-150 %	1	08/25/22 23:08	NWTPH-Dx/SG	
HC-2 (A2H0590-03)				Matrix: Water		Batch: 22H0885		
Diesel	ND	0.0952	0.190	mg/L	1	08/25/22 23:29	NWTPH-Dx/SG	
Oil	ND	0.190	0.381	mg/L	1	08/25/22 23:29	NWTPH-Dx/SG	
Surrogate: o-Terphenyl (Surr)		Recovery: 88 %		Limits: 50-150 %	1	08/25/22 23:29	NWTPH-Dx/SG	
HC-5 (A2H0590-04)				Matrix: Water		Batch: 22H0885		
Diesel	3.31	0.0962	0.192	mg/L	1	08/25/22 23:49	NWTPH-Dx/SG	
Oil	ND	0.192	0.385	mg/L	1	08/25/22 23:49	NWTPH-Dx/SG	
Surrogate: o-Terphenyl (Surr)		Recovery: 99 %		Limits: 50-150 %	1	08/25/22 23:49	NWTPH-Dx/SG	
HC-12D (A2H0590-05)				Matrix: Water		Batch: 22H0885		
Diesel	0.209	0.0990	0.198	mg/L	1	08/26/22 00:09	NWTPH-Dx/SG	F-13
Oil	ND	0.198	0.396	mg/L	1	08/26/22 00:09	NWTPH-Dx/SG	
Surrogate: o-Terphenyl (Surr)		Recovery: 101 %		Limits: 50-150 %	1	08/26/22 00:09	NWTPH-Dx/SG	

Apex Laboratories

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Apex Companies, LLC

3015 SW First Avenue

Portland, OR 97201

Project: **POP T4 - Slip 3 GW**

Project Number: 7573-00

Project Manager: Steve Misner

Report ID:

A2H0590 - 09 28 22 1301

ANALYTICAL SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
BE-1 (A2H0590-01)		Matrix: Water			Batch: 22H0649			
Acenaphthene	ND	0.0361	0.0361	ug/L	1	08/18/22 12:37	EPA 8270E LVI	R-02
Acenaphthylene	ND	0.0181	0.0361	ug/L	1	08/18/22 12:37	EPA 8270E LVI	
Anthracene	ND	0.0452	0.0452	ug/L	1	08/18/22 12:37	EPA 8270E LVI	
Benz(a)anthracene	ND	0.00903	0.0181	ug/L	1	08/18/22 12:37	EPA 8270E LVI	
Benzo(a)pyrene	ND	0.00903	0.0181	ug/L	1	08/18/22 12:37	EPA 8270E LVI	
Benzo(b)fluoranthene	ND	0.00903	0.0181	ug/L	1	08/18/22 12:37	EPA 8270E LVI	
Benzo(k)fluoranthene	ND	0.00903	0.0181	ug/L	1	08/18/22 12:37	EPA 8270E LVI	
Benzo(g,h,i)perylene	ND	0.0181	0.0361	ug/L	1	08/18/22 12:37	EPA 8270E LVI	
Chrysene	ND	0.00903	0.0181	ug/L	1	08/18/22 12:37	EPA 8270E LVI	
Dibenz(a,h)anthracene	ND	0.00903	0.0181	ug/L	1	08/18/22 12:37	EPA 8270E LVI	
Fluoranthene	ND	0.0181	0.0361	ug/L	1	08/18/22 12:37	EPA 8270E LVI	
Fluorene	ND	0.0361	0.0361	ug/L	1	08/18/22 12:37	EPA 8270E LVI	
Indeno(1,2,3-cd)pyrene	ND	0.00903	0.0181	ug/L	1	08/18/22 12:37	EPA 8270E LVI	
1-Methylnaphthalene	ND	0.0722	0.0722	ug/L	1	08/18/22 12:37	EPA 8270E LVI	
2-Methylnaphthalene	ND	0.0361	0.0722	ug/L	1	08/18/22 12:37	EPA 8270E LVI	
Naphthalene	0.122	0.0361	0.0722	ug/L	1	08/18/22 12:37	EPA 8270E LVI	
Phenanthrene	ND	0.0361	0.0722	ug/L	1	08/18/22 12:37	EPA 8270E LVI	
Pyrene	ND	0.0181	0.0361	ug/L	1	08/18/22 12:37	EPA 8270E LVI	
Carbazole	ND	0.0361	0.0361	ug/L	1	08/18/22 12:37	EPA 8270E LVI	
Dibenzofuran	ND	0.0181	0.0361	ug/L	1	08/18/22 12:37	EPA 8270E LVI	
Surrogate: Acenaphthylene-d8 (Surr)		Recovery: 98 %		Limits: 78-134 %	1	08/18/22 12:37	EPA 8270E LVI	
Benzo(a)pyrene-d12 (Surr)		114 %		80-132 %	1	08/18/22 12:37	EPA 8270E LVI	

HC-2 (A2H0590-03)

Matrix: Water

Batch: 22H0649

Acenaphthene	ND	0.0166	0.0332	ug/L	1	08/18/22 13:09	EPA 8270E LVI	J
Acenaphthylene	ND	0.0166	0.0332	ug/L	1	08/18/22 13:09	EPA 8270E LVI	
Anthracene	0.0195	0.0166	0.0332	ug/L	1	08/18/22 13:09	EPA 8270E LVI	
Benz(a)anthracene	ND	0.00830	0.0166	ug/L	1	08/18/22 13:09	EPA 8270E LVI	
Benzo(a)pyrene	ND	0.00830	0.0166	ug/L	1	08/18/22 13:09	EPA 8270E LVI	
Benzo(b)fluoranthene	ND	0.00830	0.0166	ug/L	1	08/18/22 13:09	EPA 8270E LVI	
Benzo(k)fluoranthene	ND	0.00830	0.0166	ug/L	1	08/18/22 13:09	EPA 8270E LVI	
Benzo(g,h,i)perylene	ND	0.0166	0.0332	ug/L	1	08/18/22 13:09	EPA 8270E LVI	
Chrysene	ND	0.00830	0.0166	ug/L	1	08/18/22 13:09	EPA 8270E LVI	

Apex Laboratories

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Apex Companies, LLC

3015 SW First Avenue

Portland, OR 97201

Project: POP T4 - Slip 3 GW

Project Number: 7573-00

Project Manager: Steve Misner

Report ID:

A2H0590 - 09 28 22 1301

ANALYTICAL SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
HC-2 (A2H0590-03)		Matrix: Water			Batch: 22H0649			
Dibenz(a,h)anthracene	ND	0.00830	0.0166	ug/L	1	08/18/22 13:09	EPA 8270E LVI	
Fluoranthene	ND	0.0166	0.0332	ug/L	1	08/18/22 13:09	EPA 8270E LVI	
Fluorene	ND	0.0166	0.0332	ug/L	1	08/18/22 13:09	EPA 8270E LVI	
Indeno(1,2,3-cd)pyrene	ND	0.00830	0.0166	ug/L	1	08/18/22 13:09	EPA 8270E LVI	
1-Methylnaphthalene	ND	0.0332	0.0664	ug/L	1	08/18/22 13:09	EPA 8270E LVI	
2-Methylnaphthalene	ND	0.0332	0.0664	ug/L	1	08/18/22 13:09	EPA 8270E LVI	
Naphthalene	ND	0.0664	0.0664	ug/L	1	08/18/22 13:09	EPA 8270E LVI	
Phenanthrene	ND	0.0332	0.0664	ug/L	1	08/18/22 13:09	EPA 8270E LVI	
Pyrene	ND	0.0166	0.0332	ug/L	1	08/18/22 13:09	EPA 8270E LVI	
Carbazole	ND	0.0166	0.0332	ug/L	1	08/18/22 13:09	EPA 8270E LVI	
Dibenzofuran	ND	0.0166	0.0332	ug/L	1	08/18/22 13:09	EPA 8270E LVI	
Surrogate: Acenaphthylene-d8 (Surr)		Recovery: 98 %		Limits: 78-134 %	1	08/18/22 13:09	EPA 8270E LVI	
Benzo(a)pyrene-d12 (Surr)		112 %		80-132 %	1	08/18/22 13:09	EPA 8270E LVI	
HC-5 (A2H0590-04)		Matrix: Water			Batch: 22H0649			R-04
Acenaphthene	ND	1.33	1.33	ug/L	40	08/18/22 12:04	EPA 8270E LVI	
Acenaphthylene	ND	0.664	1.33	ug/L	40	08/18/22 12:04	EPA 8270E LVI	
Anthracene	ND	0.664	1.33	ug/L	40	08/18/22 12:04	EPA 8270E LVI	
Benz(a)anthracene	ND	0.332	0.664	ug/L	40	08/18/22 12:04	EPA 8270E LVI	
Benzo(a)pyrene	ND	0.332	0.664	ug/L	40	08/18/22 12:04	EPA 8270E LVI	
Benzo(b)fluoranthene	ND	0.332	0.664	ug/L	40	08/18/22 12:04	EPA 8270E LVI	
Benzo(k)fluoranthene	ND	0.332	0.664	ug/L	40	08/18/22 12:04	EPA 8270E LVI	
Benzo(g,h,i)perylene	ND	0.664	1.33	ug/L	40	08/18/22 12:04	EPA 8270E LVI	
Chrysene	ND	0.332	0.664	ug/L	40	08/18/22 12:04	EPA 8270E LVI	
Dibenz(a,h)anthracene	ND	0.332	0.664	ug/L	40	08/18/22 12:04	EPA 8270E LVI	
Fluoranthene	ND	0.664	1.33	ug/L	40	08/18/22 12:04	EPA 8270E LVI	
Fluorene	ND	0.664	1.33	ug/L	40	08/18/22 12:04	EPA 8270E LVI	
Indeno(1,2,3-cd)pyrene	ND	0.332	0.664	ug/L	40	08/18/22 12:04	EPA 8270E LVI	
1-Methylnaphthalene	ND	1.33	2.66	ug/L	40	08/18/22 12:04	EPA 8270E LVI	
2-Methylnaphthalene	ND	1.33	2.66	ug/L	40	08/18/22 12:04	EPA 8270E LVI	
Naphthalene	ND	1.33	2.66	ug/L	40	08/18/22 12:04	EPA 8270E LVI	
Phenanthrene	ND	1.33	2.66	ug/L	40	08/18/22 12:04	EPA 8270E LVI	
Pyrene	ND	0.664	1.33	ug/L	40	08/18/22 12:04	EPA 8270E LVI	

Apex Laboratories

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062Apex Companies, LLC
3015 SW First Avenue
Portland, OR 97201Project: **POP T4 - Slip 3 GW**
Project Number: **7573-00**
Project Manager: **Steve Misner****Report ID:**
A2H0590 - 09 28 22 1301

ANALYTICAL SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
HC-5 (A2H0590-04)				Matrix: Water		Batch: 22H0649		R-04
Carbazole	ND	0.664	1.33	ug/L	40	08/18/22 12:04	EPA 8270E LVI	
Dibenzofuran	ND	0.664	1.33	ug/L	40	08/18/22 12:04	EPA 8270E LVI	
Surrogate: Acenaphthylene-d8 (Surr)		Recovery: 47 %		Limits: 78-134 %	40	08/18/22 12:04	EPA 8270E LVI	S-05
Benzo(a)pyrene-d12 (Surr)		112 %		80-132 %	40	08/18/22 12:04	EPA 8270E LVI	S-05
HC-12D (A2H0590-05)				Matrix: Water		Batch: 22H0649		
Acenaphthene	0.929	0.0178	0.0356	ug/L	1	08/18/22 13:42	EPA 8270E LVI	
Acenaphthylene	ND	0.0667	0.0667	ug/L	1	08/18/22 13:42	EPA 8270E LVI	R-02
Anthracene	ND	0.356	0.356	ug/L	1	08/18/22 13:42	EPA 8270E LVI	R-02
Benz(a)anthracene	ND	0.00890	0.0178	ug/L	1	08/18/22 13:42	EPA 8270E LVI	
Benzo(a)pyrene	ND	0.00890	0.0178	ug/L	1	08/18/22 13:42	EPA 8270E LVI	
Benzo(b)fluoranthene	ND	0.00890	0.0178	ug/L	1	08/18/22 13:42	EPA 8270E LVI	
Benzo(k)fluoranthene	ND	0.00890	0.0178	ug/L	1	08/18/22 13:42	EPA 8270E LVI	
Benzo(g,h,i)perylene	ND	0.0178	0.0356	ug/L	1	08/18/22 13:42	EPA 8270E LVI	
Chrysene	ND	0.00890	0.0178	ug/L	1	08/18/22 13:42	EPA 8270E LVI	
Dibenz(a,h)anthracene	ND	0.00890	0.0178	ug/L	1	08/18/22 13:42	EPA 8270E LVI	
Fluoranthene	ND	0.0178	0.0356	ug/L	1	08/18/22 13:42	EPA 8270E LVI	
Fluorene	ND	0.578	0.578	ug/L	1	08/18/22 13:42	EPA 8270E LVI	R-02
Indeno(1,2,3-cd)pyrene	ND	0.00890	0.0178	ug/L	1	08/18/22 13:42	EPA 8270E LVI	
1-Methylnaphthalene	ND	0.156	0.156	ug/L	1	08/18/22 13:42	EPA 8270E LVI	R-02
2-Methylnaphthalene	ND	0.100	0.100	ug/L	1	08/18/22 13:42	EPA 8270E LVI	R-02
Naphthalene	ND	0.656	0.656	ug/L	1	08/18/22 13:42	EPA 8270E LVI	R-02
Phenanthrene	ND	0.311	0.311	ug/L	1	08/18/22 13:42	EPA 8270E LVI	R-02
Pyrene	ND	0.0178	0.0356	ug/L	1	08/18/22 13:42	EPA 8270E LVI	
Carbazole	ND	0.0178	0.0356	ug/L	1	08/18/22 13:42	EPA 8270E LVI	
Dibenzofuran	ND	0.0178	0.0356	ug/L	1	08/18/22 13:42	EPA 8270E LVI	
Surrogate: Acenaphthylene-d8 (Surr)		Recovery: 96 %		Limits: 78-134 %	1	08/18/22 13:42	EPA 8270E LVI	
Benzo(a)pyrene-d12 (Surr)		117 %		80-132 %	1	08/18/22 13:42	EPA 8270E LVI	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Apex Companies, LLC

3015 SW First Avenue

Portland, OR 97201

Project: POP T4 - Slip 3 GW

Project Number: 7573-00

Project Manager: Steve Misner

Report ID:

A2H0590 - 09 28 22 1301

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
BE-1 (A2H0590-01)		Matrix: Water						
Batch: 22H0665								
Arsenic	14.4	0.500	1.00	ug/L	1	08/19/22 08:20	EPA 6020B	
Cadmium	ND	0.100	0.200	ug/L	1	08/19/22 08:20	EPA 6020B	
Chromium	1.12	1.00	2.00	ug/L	1	08/19/22 08:20	EPA 6020B	J
Copper	1.28	1.00	2.00	ug/L	1	08/19/22 08:20	EPA 6020B	J
Lead	0.715	0.110	0.200	ug/L	1	08/19/22 08:20	EPA 6020B	
Manganese	4050	0.500	1.00	ug/L	1	08/19/22 08:20	EPA 6020B	
Mercury	ND	0.0400	0.0800	ug/L	1	08/19/22 08:20	EPA 6020B	
Vanadium	4.17	1.00	2.00	ug/L	1	08/19/22 08:20	EPA 6020B	
Zinc	4.59	2.00	4.00	ug/L	1	08/19/22 08:20	EPA 6020B	
HC-2 (A2H0590-03)		Matrix: Water						
Batch: 22H0665								
Arsenic	ND	0.500	1.00	ug/L	1	08/19/22 08:24	EPA 6020B	
Cadmium	0.216	0.100	0.200	ug/L	1	08/19/22 08:24	EPA 6020B	
Chromium	ND	1.00	2.00	ug/L	1	08/19/22 08:24	EPA 6020B	
Copper	ND	1.00	2.00	ug/L	1	08/19/22 08:24	EPA 6020B	
Lead	ND	0.110	0.200	ug/L	1	08/19/22 08:24	EPA 6020B	
Manganese	17.6	0.500	1.00	ug/L	1	08/19/22 08:24	EPA 6020B	
Mercury	ND	0.0400	0.0800	ug/L	1	08/19/22 08:24	EPA 6020B	
Vanadium	ND	1.00	2.00	ug/L	1	08/19/22 08:24	EPA 6020B	
Zinc	369	2.00	4.00	ug/L	1	08/19/22 08:24	EPA 6020B	
HC-5 (A2H0590-04)		Matrix: Water						
Batch: 22H0665								
Arsenic	2.60	0.500	1.00	ug/L	1	08/19/22 08:29	EPA 6020B	
Cadmium	0.171	0.100	0.200	ug/L	1	08/19/22 08:29	EPA 6020B	J
Chromium	ND	1.00	2.00	ug/L	1	08/19/22 08:29	EPA 6020B	
Copper	3.35	1.00	2.00	ug/L	1	08/19/22 08:29	EPA 6020B	
Lead	0.339	0.110	0.200	ug/L	1	08/19/22 08:29	EPA 6020B	
Manganese	1790	0.500	1.00	ug/L	1	08/19/22 08:29	EPA 6020B	
Mercury	ND	0.0400	0.0800	ug/L	1	08/19/22 08:29	EPA 6020B	
Vanadium	4.86	1.00	2.00	ug/L	1	08/19/22 08:29	EPA 6020B	
Zinc	390	2.00	4.00	ug/L	1	08/19/22 08:29	EPA 6020B	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

Apex Companies, LLC

3015 SW First Avenue
Portland, OR 97201Project: **POP T4 - Slip 3 GW**

Project Number: 7573-00

Project Manager: Steve Misner

Report ID:

A2H0590 - 09 28 22 1301

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
HC-12D (A2H0590-05)		Matrix: Water						
Batch: 22H0665								
Arsenic	19.6	0.500	1.00	ug/L	1	08/19/22 08:34	EPA 6020B	J
Cadmium	4.94	0.100	0.200	ug/L	1	08/19/22 08:34	EPA 6020B	
Chromium	ND	1.00	2.00	ug/L	1	08/19/22 08:34	EPA 6020B	
Copper	1.62	1.00	2.00	ug/L	1	08/19/22 08:34	EPA 6020B	
Lead	1.46	0.110	0.200	ug/L	1	08/19/22 08:34	EPA 6020B	
Manganese	12700	0.500	1.00	ug/L	1	08/19/22 08:34	EPA 6020B	
Mercury	ND	0.0400	0.0800	ug/L	1	08/19/22 08:34	EPA 6020B	
Vanadium	2.87	1.00	2.00	ug/L	1	08/19/22 08:34	EPA 6020B	
Zinc	7.63	2.00	4.00	ug/L	1	08/19/22 08:34	EPA 6020B	

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3015 SW First Avenue

Portland, OR 97201

Project: POP T4 - Slip 3 GW

Project Number: 7573-00

Project Manager: Steve Misner

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A2H0590 - 09 28 22 1301

ANALYTICAL SAMPLE RESULTS

Dissolved Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
BE-1 (A2H0590-01) Matrix: Water								
Batch: 22H0857								
Arsenic	12.5	0.500	1.00	ug/L	1	08/25/22 01:01	EPA 6020B (Diss)	
Cadmium	ND	0.100	0.200	ug/L	1	08/25/22 01:01	EPA 6020B (Diss)	
Chromium	ND	1.00	2.00	ug/L	1	08/25/22 01:01	EPA 6020B (Diss)	
Copper	3.36	1.00	2.00	ug/L	1	08/25/22 01:01	EPA 6020B (Diss)	
Lead	0.113	0.100	0.200	ug/L	1	08/25/22 01:01	EPA 6020B (Diss)	J
Mercury	ND	0.0400	0.0800	ug/L	1	08/25/22 01:01	EPA 6020B (Diss)	
Vanadium	ND	1.00	2.00	ug/L	1	08/25/22 01:01	EPA 6020B (Diss)	
Zinc	2.55	2.00	4.00	ug/L	1	08/25/22 01:01	EPA 6020B (Diss)	J
BE-1 (A2H0590-01RE1) Matrix: Water								
Batch: 22H0857								
Manganese	3560	5.00	10.0	ug/L	10	08/25/22 15:14	EPA 6020B (Diss)	
HC-2 (A2H0590-03) Matrix: Water								
Batch: 22H0857								
Arsenic	ND	0.500	1.00	ug/L	1	08/25/22 01:25	EPA 6020B (Diss)	
Cadmium	ND	0.100	0.200	ug/L	1	08/25/22 01:25	EPA 6020B (Diss)	
Chromium	ND	1.00	2.00	ug/L	1	08/25/22 01:25	EPA 6020B (Diss)	
Copper	ND	1.00	2.00	ug/L	1	08/25/22 01:25	EPA 6020B (Diss)	
Lead	ND	0.100	0.200	ug/L	1	08/25/22 01:25	EPA 6020B (Diss)	
Manganese	13.8	0.500	1.00	ug/L	1	08/25/22 01:25	EPA 6020B (Diss)	
Mercury	ND	0.0400	0.0800	ug/L	1	08/25/22 01:25	EPA 6020B (Diss)	
Vanadium	ND	1.00	2.00	ug/L	1	08/25/22 01:25	EPA 6020B (Diss)	
Zinc	273	2.00	4.00	ug/L	1	08/25/22 01:25	EPA 6020B (Diss)	
HC-5 (A2H0590-04) Matrix: Water								
Batch: 22H0857								
Arsenic	1.82	0.500	1.00	ug/L	1	08/25/22 01:29	EPA 6020B (Diss)	
Cadmium	ND	0.100	0.200	ug/L	1	08/25/22 01:29	EPA 6020B (Diss)	
Chromium	ND	1.00	2.00	ug/L	1	08/25/22 01:29	EPA 6020B (Diss)	
Copper	2.31	1.00	2.00	ug/L	1	08/25/22 01:29	EPA 6020B (Diss)	
Lead	0.140	0.100	0.200	ug/L	1	08/25/22 01:29	EPA 6020B (Diss)	J
Manganese	1780	0.500	1.00	ug/L	1	08/25/22 01:29	EPA 6020B (Diss)	

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ANALYTICAL REPORT

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503-718-2323

ORELAP ID: OR100062

Apex Companies, LLC

3015 SW First Avenue

Portland, OR 97201

Project: POP T4 - Slip 3 GW

Project Number: 7573-00

Project Manager: Steve Misner

Report ID:

A2H0590 - 09 28 22 1301

ANALYTICAL SAMPLE RESULTS

Dissolved Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
HC-5 (A2H0590-04)		Matrix: Water						
Mercury	ND	0.0400	0.0800	ug/L	1	08/25/22 01:29	EPA 6020B (Diss)	
Vanadium	1.82	1.00	2.00	ug/L	1	08/25/22 01:29	EPA 6020B (Diss)	J
Zinc	187	2.00	4.00	ug/L	1	08/25/22 01:29	EPA 6020B (Diss)	
HC-12D (A2H0590-05)		Matrix: Water						
Batch: 22H0857								
Arsenic	19.8	0.500	1.00	ug/L	1	08/25/22 01:34	EPA 6020B (Diss)	
Cadmium	ND	0.100	0.200	ug/L	1	08/25/22 01:34	EPA 6020B (Diss)	
Chromium	ND	1.00	2.00	ug/L	1	08/25/22 01:34	EPA 6020B (Diss)	
Copper	2.23	1.00	2.00	ug/L	1	08/25/22 01:34	EPA 6020B (Diss)	
Lead	ND	0.100	0.200	ug/L	1	08/25/22 01:34	EPA 6020B (Diss)	
Mercury	ND	0.0400	0.0800	ug/L	1	08/25/22 01:34	EPA 6020B (Diss)	
Vanadium	ND	1.00	2.00	ug/L	1	08/25/22 01:34	EPA 6020B (Diss)	
Zinc	2.68	2.00	4.00	ug/L	1	08/25/22 01:34	EPA 6020B (Diss)	J
HC-12D (A2H0590-05RE1)		Matrix: Water						
Batch: 22H0857								
Manganese	11400	25.0	50.0	ug/L	50	08/25/22 15:50	EPA 6020B (Diss)	

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ANALYTICAL REPORT

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6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062Apex Companies, LLC
3015 SW First Avenue
Portland, OR 97201Project: **POP T4 - Slip 3 GW**
Project Number: **7573-00**
Project Manager: **Steve Misner****Report ID:**
A2H0590 - 09 28 22 1301

QUALITY CONTROL (QC) SAMPLE RESULTS

Diesel and/or Oil Hydrocarbons by NWTPH-Dx with Acid/Silica Gel Cleanup

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22H0885 - EPA 3510C (Fuels/Acid Ext.) w/Silica Gel + Acid						Water						
Blank (22H0885-BLK1)			Prepared: 08/25/22 07:01 Analyzed: 08/25/22 21:47									
<u>NWTPH-Dx/SG</u>												
Diesel	ND	0.0909	0.182	mg/L	1	---	---	---	---	---	---	
Oil	ND	0.182	0.364	mg/L	1	---	---	---	---	---	---	
Surr: o-Terphenyl (Surr)		Recovery: 97 %		Limits: 50-150 %		Dilution: 1x						
LCS (22H0885-BS1)			Prepared: 08/25/22 07:01 Analyzed: 08/25/22 22:07									
<u>NWTPH-Dx/SG</u>												
Diesel	1.07	0.100	0.200	mg/L	1	1.25	---	86	36-132%	---	---	
Surr: o-Terphenyl (Surr)		Recovery: 103 %		Limits: 50-150 %		Dilution: 1x						
LCS Dup (22H0885-BSD1)			Prepared: 08/25/22 07:01 Analyzed: 08/25/22 22:27									
<u>NWTPH-Dx/SG</u>												
Diesel	1.06	0.100	0.200	mg/L	1	1.25	---	85	36-132%	1	30%	
Surr: o-Terphenyl (Surr)		Recovery: 106 %		Limits: 50-150 %		Dilution: 1x						

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ANALYTICAL REPORT

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6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Apex Companies, LLC

3015 SW First Avenue

Portland, OR 97201

Project: POP T4 - Slip 3 GW

Project Number: 7573-00

Project Manager: Steve Misner

Report ID:

A2H0590 - 09 28 22 1301

QUALITY CONTROL (QC) SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22H0649 - EPA 3511 (Bottle Extraction)						Water						
Blank (22H0649-BLK1)			Prepared: 08/18/22 07:12		Analyzed: 08/18/22 10:27							
EPA 8270E LVI												
Acenaphthene	ND	0.0160	0.0320	ug/L	1	---	---	---	---	---	---	
Acenaphthylene	ND	0.0160	0.0320	ug/L	1	---	---	---	---	---	---	
Anthracene	ND	0.0160	0.0320	ug/L	1	---	---	---	---	---	---	
Benz(a)anthracene	ND	0.00800	0.0160	ug/L	1	---	---	---	---	---	---	
Benzo(a)pyrene	ND	0.00800	0.0160	ug/L	1	---	---	---	---	---	---	
Benzo(b)fluoranthene	ND	0.00800	0.0160	ug/L	1	---	---	---	---	---	---	
Benzo(k)fluoranthene	ND	0.00800	0.0160	ug/L	1	---	---	---	---	---	---	
Benzo(g,h,i)perylene	ND	0.0160	0.0320	ug/L	1	---	---	---	---	---	---	
Chrysene	ND	0.00800	0.0160	ug/L	1	---	---	---	---	---	---	
Dibenz(a,h)anthracene	ND	0.00800	0.0160	ug/L	1	---	---	---	---	---	---	
Fluoranthene	ND	0.0160	0.0320	ug/L	1	---	---	---	---	---	---	
Fluorene	ND	0.0160	0.0320	ug/L	1	---	---	---	---	---	---	
Indeno(1,2,3-cd)pyrene	ND	0.00800	0.0160	ug/L	1	---	---	---	---	---	---	
1-Methylnaphthalene	ND	0.0320	0.0640	ug/L	1	---	---	---	---	---	---	
2-Methylnaphthalene	ND	0.0320	0.0640	ug/L	1	---	---	---	---	---	---	
Naphthalene	ND	0.0320	0.0640	ug/L	1	---	---	---	---	---	---	
Phenanthrene	ND	0.0320	0.0640	ug/L	1	---	---	---	---	---	---	
Pyrene	ND	0.0160	0.0320	ug/L	1	---	---	---	---	---	---	
Carbazole	ND	0.0160	0.0320	ug/L	1	---	---	---	---	---	---	
Dibenzofuran	ND	0.0160	0.0320	ug/L	1	---	---	---	---	---	---	
Surr: Acenaphthylene-d8 (Surr)		Recovery: 97 %		Limits: 78-134 %		Dilution: 1x						
Benzo(a)pyrene-d12 (Surr)		110 %		80-132 %		"						

LCS (22H0649-BS1)

Prepared: 08/18/22 07:12 Analyzed: 08/18/22 10:59

EPA 8270E LVI												
Acenaphthene	1.70	0.0160	0.0320	ug/L	1	1.60	---	106	80-120%	---	---	
Acenaphthylene	1.79	0.0160	0.0320	ug/L	1	1.60	---	112	80-124%	---	---	
Anthracene	1.63	0.0160	0.0320	ug/L	1	1.60	---	102	80-123%	---	---	
Benz(a)anthracene	1.65	0.00800	0.0160	ug/L	1	1.60	---	103	80-122%	---	---	
Benzo(a)pyrene	1.70	0.00800	0.0160	ug/L	1	1.60	---	106	80-129%	---	---	
Benzo(b)fluoranthene	1.62	0.00800	0.0160	ug/L	1	1.60	---	102	80-124%	---	---	
Benzo(k)fluoranthene	1.60	0.00800	0.0160	ug/L	1	1.60	---	100	80-125%	---	---	
Benzo(g,h,i)perylene	1.57	0.0160	0.0320	ug/L	1	1.60	---	98	80-120%	---	---	

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503-718-2323

ORELAP ID: OR100062

Apex Companies, LLC

3015 SW First Avenue

Portland, OR 97201

Project: **POP T4 - Slip 3 GW**

Project Number: 7573-00

Project Manager: Steve Misner

Report ID:

A2H0590 - 09 28 22 1301

QUALITY CONTROL (QC) SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22H0649 - EPA 3511 (Bottle Extraction)						Water						
LCS (22H0649-BS1)						Prepared: 08/18/22 07:12 Analyzed: 08/18/22 10:59						
Chrysene	1.58	0.00800	0.0160	ug/L	1	1.60	---	98	80-120%	---	---	
Dibenz(a,h)anthracene	1.58	0.00800	0.0160	ug/L	1	1.60	---	99	80-120%	---	---	
Fluoranthene	1.75	0.0160	0.0320	ug/L	1	1.60	---	110	80-126%	---	---	
Fluorene	1.74	0.0160	0.0320	ug/L	1	1.60	---	109	77-127%	---	---	
Indeno(1,2,3-cd)pyrene	1.51	0.00800	0.0160	ug/L	1	1.60	---	95	80-121%	---	---	
1-Methylnaphthalene	1.92	0.0320	0.0640	ug/L	1	1.60	---	120	53-148%	---	---	
2-Methylnaphthalene	1.85	0.0320	0.0640	ug/L	1	1.60	---	116	48-150%	---	---	
Naphthalene	1.76	0.0320	0.0640	ug/L	1	1.60	---	110	78-120%	---	---	
Phenanthrene	1.58	0.0320	0.0640	ug/L	1	1.60	---	99	80-120%	---	---	
Pyrene	1.77	0.0160	0.0320	ug/L	1	1.60	---	111	80-125%	---	---	
Carbazole	1.54	0.0160	0.0320	ug/L	1	1.60	---	96	65-141%	---	---	
Dibenzofuran	1.73	0.0160	0.0320	ug/L	1	1.60	---	108	76-121%	---	---	
Surr: Acenaphthylene-d8 (Surr)		Recovery: 100 %		Limits: 78-134 %		Dilution: 1x						
Benzo(a)pyrene-d12 (Surr)		110 %		80-132 %		"						

LCS Dup (22H0649-BSD1)				Prepared: 08/18/22 07:12 Analyzed: 08/18/22 11:32								Q-19
EPA 8270E LVI												
Acenaphthene	1.71	0.0160	0.0320	ug/L	1	1.60	---	107	80-120%	0.6	30%	
Acenaphthylene	1.79	0.0160	0.0320	ug/L	1	1.60	---	112	80-124%	0.07	30%	
Anthracene	1.64	0.0160	0.0320	ug/L	1	1.60	---	103	80-123%	1	30%	
Benz(a)anthracene	1.69	0.00800	0.0160	ug/L	1	1.60	---	106	80-122%	3	30%	
Benzo(a)pyrene	1.70	0.00800	0.0160	ug/L	1	1.60	---	106	80-129%	0.05	30%	
Benzo(b)fluoranthene	1.63	0.00800	0.0160	ug/L	1	1.60	---	102	80-124%	0.5	30%	
Benzo(k)fluoranthene	1.59	0.00800	0.0160	ug/L	1	1.60	---	100	80-125%	0.6	30%	
Benzo(g,h,i)perylene	1.62	0.0160	0.0320	ug/L	1	1.60	---	101	80-120%	3	30%	
Chrysene	1.60	0.00800	0.0160	ug/L	1	1.60	---	100	80-120%	1	30%	
Dibenz(a,h)anthracene	1.59	0.00800	0.0160	ug/L	1	1.60	---	99	80-120%	0.6	30%	
Fluoranthene	1.78	0.0160	0.0320	ug/L	1	1.60	---	111	80-126%	1	30%	
Fluorene	1.73	0.0160	0.0320	ug/L	1	1.60	---	108	77-127%	0.6	30%	
Indeno(1,2,3-cd)pyrene	1.56	0.00800	0.0160	ug/L	1	1.60	---	98	80-121%	3	30%	
1-Methylnaphthalene	1.97	0.0320	0.0640	ug/L	1	1.60	---	123	53-148%	3	30%	
2-Methylnaphthalene	1.88	0.0320	0.0640	ug/L	1	1.60	---	117	48-150%	1	30%	
Naphthalene	1.80	0.0320	0.0640	ug/L	1	1.60	---	112	78-120%	2	30%	
Phenanthrene	1.61	0.0320	0.0640	ug/L	1	1.60	---	100	80-120%	1	30%	

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Project Manager: Steve Misner

Report ID:

A2H0590 - 09 28 22 1301

QUALITY CONTROL (QC) SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22H0649 - EPA 3511 (Bottle Extraction)						Water						
LCS Dup (22H0649-BSD1)			Prepared: 08/18/22 07:12 Analyzed: 08/18/22 11:32								Q-19	
Pyrene	1.80	0.0160	0.0320	ug/L	1	1.60	---	113	80-125%	2	30%	
Carbazole	1.51	0.0160	0.0320	ug/L	1	1.60	---	94	65-141%	2	30%	
Dibenzofuran	1.71	0.0160	0.0320	ug/L	1	1.60	---	107	76-121%	1	30%	
Surr: Acenaphthylene-d8 (Surr)		Recovery: 98 %		Limits: 78-134 %		Dilution: 1x						
Benzo(a)pyrene-d12 (Surr)		108 %		80-132 %		"						

Apex Laboratories

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Apex Companies, LLC

3015 SW First Avenue

Portland, OR 97201

Project: **POP T4 - Slip 3 GW**

Project Number: 7573-00

Project Manager: Steve Misner

Report ID:

A2H0590 - 09 28 22 1301

QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22H0665 - EPA 3015A						Water						
Blank (22H0665-BLK1)			Prepared: 08/18/22 12:42 Analyzed: 08/19/22 06:59									
EPA 6020B												
Arsenic	ND	0.500	1.00	ug/L	1	---	---	---	---	---	---	
Cadmium	ND	0.100	0.200	ug/L	1	---	---	---	---	---	---	
Chromium	ND	1.00	2.00	ug/L	1	---	---	---	---	---	---	
Copper	ND	1.00	2.00	ug/L	1	---	---	---	---	---	---	
Lead	ND	0.110	0.200	ug/L	1	---	---	---	---	---	---	
Manganese	ND	0.500	1.00	ug/L	1	---	---	---	---	---	---	
Mercury	ND	0.0400	0.0800	ug/L	1	---	---	---	---	---	---	
Vanadium	ND	1.00	2.00	ug/L	1	---	---	---	---	---	---	
Zinc	ND	2.00	4.00	ug/L	1	---	---	---	---	---	---	
LCS (22H0665-BS1)			Prepared: 08/18/22 12:42 Analyzed: 08/19/22 07:13									
EPA 6020B												
Arsenic	52.5	0.500	1.00	ug/L	1	55.6	---	95	80-120%	---	---	
Cadmium	53.7	0.100	0.200	ug/L	1	55.6	---	97	80-120%	---	---	
Chromium	53.6	1.00	2.00	ug/L	1	55.6	---	96	80-120%	---	---	
Copper	56.4	1.00	2.00	ug/L	1	55.6	---	101	80-120%	---	---	
Lead	51.9	0.110	0.200	ug/L	1	55.6	---	93	80-120%	---	---	
Manganese	54.4	0.500	1.00	ug/L	1	55.6	---	98	80-120%	---	---	
Mercury	1.09	0.0400	0.0800	ug/L	1	1.11	---	98	80-120%	---	---	
Vanadium	54.0	1.00	2.00	ug/L	1	55.6	---	97	80-120%	---	---	
Zinc	56.3	2.00	4.00	ug/L	1	55.6	---	101	80-120%	---	---	
Duplicate (22H0665-DUP1)			Prepared: 08/18/22 12:42 Analyzed: 08/19/22 07:23									
QC Source Sample: Non-SDG (A2H0458-01)												
Arsenic	1.65	0.500	1.00	ug/L	1	---	1.62	---	---	2	20%	
Cadmium	ND	0.100	0.200	ug/L	1	---	ND	---	---	---	20%	
Chromium	1.15	1.00	2.00	ug/L	1	---	1.45	---	---	23	20%	
Copper	1.14	1.00	2.00	ug/L	1	---	ND	---	---	---	20%	
Lead	ND	0.110	0.200	ug/L	1	---	ND	---	---	---	20%	
Manganese	9.51	0.500	1.00	ug/L	1	---	9.56	---	---	0.6	20%	
Mercury	ND	0.0400	0.0800	ug/L	1	---	ND	---	---	---	20%	
Vanadium	ND	1.00	2.00	ug/L	1	---	ND	---	---	---	20%	
Zinc	3.29	2.00	4.00	ug/L	1	---	ND	---	---	---	20%	

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ANALYTICAL REPORT

Apex Laboratories, LLC

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503-718-2323

ORELAP ID: OR100062

Apex Companies, LLC

3015 SW First Avenue

Portland, OR 97201

Project: POP T4 - Slip 3 GW

Project Number: 7573-00

Project Manager: Steve Misner

Report ID:

A2H0590 - 09 28 22 1301

QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22H0665 - EPA 3015A						Water						
Matrix Spike (22H0665-MS1)						Prepared: 08/18/22 12:42 Analyzed: 08/19/22 07:27						
QC Source Sample: Non-SDG (A2H0458-01)												
EPA 6020B												
Arsenic	55.5	0.500	1.00	ug/L	1	55.6	1.62	97	75-125%	---	---	
Cadmium	55.2	0.100	0.200	ug/L	1	55.6	ND	99	75-125%	---	---	
Chromium	55.0	1.00	2.00	ug/L	1	55.6	1.45	96	75-125%	---	---	
Copper	54.2	1.00	2.00	ug/L	1	55.6	ND	98	75-125%	---	---	
Lead	48.1	0.110	0.200	ug/L	1	55.6	ND	87	75-125%	---	---	
Manganese	64.5	0.500	1.00	ug/L	1	55.6	9.56	99	75-125%	---	---	
Mercury	1.06	0.0400	0.0800	ug/L	1	1.11	ND	96	75-125%	---	---	
Vanadium	56.7	1.00	2.00	ug/L	1	55.6	ND	102	75-125%	---	---	
Zinc	55.8	2.00	4.00	ug/L	1	55.6	ND	100	75-125%	---	---	

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Project: **POP T4 - Slip 3 GW**

Project Number: 7573-00

Project Manager: Steve Misner

Report ID:

A2H0590 - 09 28 22 1301

QUALITY CONTROL (QC) SAMPLE RESULTS

Dissolved Metals by EPA 6020B (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22H0857 - EPA 3015A - Dissolved						Water						
Blank (22H0857-BLK1)			Prepared: 08/24/22 11:29 Analyzed: 08/25/22 00:51									
EPA 6020B (Diss)												
Arsenic	ND	0.500	1.00	ug/L	1	---	---	---	---	---	---	
Cadmium	ND	0.100	0.200	ug/L	1	---	---	---	---	---	---	
Chromium	ND	1.00	2.00	ug/L	1	---	---	---	---	---	---	
Copper	ND	1.00	2.00	ug/L	1	---	---	---	---	---	---	
Lead	ND	0.100	0.200	ug/L	1	---	---	---	---	---	---	
Manganese	ND	0.500	1.00	ug/L	1	---	---	---	---	---	---	
Mercury	ND	0.0400	0.0800	ug/L	1	---	---	---	---	---	---	
Vanadium	ND	1.00	2.00	ug/L	1	---	---	---	---	---	---	
Zinc	ND	2.00	4.00	ug/L	1	---	---	---	---	---	---	
LCS (22H0857-BS1)			Prepared: 08/24/22 11:29 Analyzed: 08/25/22 00:56									
EPA 6020B (Diss)												
Arsenic	52.3	0.500	1.00	ug/L	1	55.6	---	94	80-120%	---	---	
Cadmium	54.8	0.100	0.200	ug/L	1	55.6	---	99	80-120%	---	---	
Chromium	53.7	1.00	2.00	ug/L	1	55.6	---	97	80-120%	---	---	
Copper	57.4	1.00	2.00	ug/L	1	55.6	---	103	80-120%	---	---	
Lead	56.8	0.100	0.200	ug/L	1	55.6	---	102	80-120%	---	---	
Manganese	54.6	0.500	1.00	ug/L	1	55.6	---	98	80-120%	---	---	
Mercury	1.11	0.0400	0.0800	ug/L	1	1.11	---	100	80-120%	---	---	
Vanadium	53.8	1.00	2.00	ug/L	1	55.6	---	97	80-120%	---	---	
Zinc	54.9	2.00	4.00	ug/L	1	55.6	---	99	80-120%	---	---	
Duplicate (22H0857-DUP1)			Prepared: 08/24/22 11:29 Analyzed: 08/25/22 01:15									
QC Source Sample: BE-1 (A2H0590-01)												
EPA 6020B (Diss)												
Arsenic	12.7	0.500	1.00	ug/L	1	---	12.5	---	---	1	20%	
Cadmium	ND	0.100	0.200	ug/L	1	---	ND	---	---	---	20%	
Chromium	ND	1.00	2.00	ug/L	1	---	ND	---	---	---	20%	
Copper	3.32	1.00	2.00	ug/L	1	---	3.36	---	---	1	20%	
Lead	0.136	0.100	0.200	ug/L	1	---	0.113	---	---	18	20%	
Mercury	ND	0.0400	0.0800	ug/L	1	---	ND	---	---	---	20%	
Vanadium	ND	1.00	2.00	ug/L	1	---	ND	---	---	---	20%	
Zinc	2.46	2.00	4.00	ug/L	1	---	2.55	---	---	3	20%	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

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503-718-2323

ORELAP ID: OR100062

Apex Companies, LLC

3015 SW First Avenue

Portland, OR 97201

Project: POP T4 - Slip 3 GW

Project Number: 7573-00

Project Manager: Steve Misner

Report ID:

A2H0590 - 09 28 22 1301

QUALITY CONTROL (QC) SAMPLE RESULTS

Dissolved Metals by EPA 6020B (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22H0857 - EPA 3015A - Dissolved						Water						
Duplicate (22H0857-DUP2)			Prepared: 08/24/22 11:29 Analyzed: 08/25/22 15:19									
<u>QC Source Sample: BE-1 (A2H0590-01RE1)</u>												
<u>EPA 6020B (Diss)</u>												
Manganese	3690	5.00	10.0	ug/L	10	---	3560	---	---	4	20%	Q-16
Matrix Spike (22H0857-MS1)			Prepared: 08/24/22 11:29 Analyzed: 08/25/22 01:20									
<u>QC Source Sample: BE-1 (A2H0590-01)</u>												
<u>EPA 6020B (Diss)</u>												
Arsenic	67.8	0.500	1.00	ug/L	1	55.6	12.5	100	75-125%	---	---	
Cadmium	57.3	0.100	0.200	ug/L	1	55.6	ND	103	75-125%	---	---	
Chromium	55.1	1.00	2.00	ug/L	1	55.6	ND	99	75-125%	---	---	
Copper	60.0	1.00	2.00	ug/L	1	55.6	3.36	102	75-125%	---	---	
Lead	57.2	0.100	0.200	ug/L	1	55.6	0.113	103	75-125%	---	---	
Mercury	1.12	0.0400	0.0800	ug/L	1	1.11	ND	101	75-125%	---	---	
Vanadium	55.8	1.00	2.00	ug/L	1	55.6	ND	100	75-125%	---	---	
Zinc	58.2	2.00	4.00	ug/L	1	55.6	2.55	100	75-125%	---	---	
Matrix Spike (22H0857-MS2)			Prepared: 08/24/22 11:29 Analyzed: 08/25/22 15:24									
<u>QC Source Sample: BE-1 (A2H0590-01RE1)</u>												
<u>EPA 6020B (Diss)</u>												
Manganese	3600	5.00	10.0	ug/L	10	55.6	3560	61	75-125%	---	---	Q-03, Q-16

Apex Laboratories

Darrell Auvil, Client Services Manager

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**ANALYTICAL REPORT****Apex Laboratories, LLC**

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Apex Companies, LLC

3015 SW First Avenue

Portland, OR 97201

Project: **POP T4 - Slip 3 GW**Project Number: **7573-00**Project Manager: **Steve Misner****Report ID:****A2H0590 - 09 28 22 1301****SAMPLE PREPARATION INFORMATION****Diesel and/or Oil Hydrocarbons by NWTPH-Dx with Acid/Silica Gel Cleanup**

Prep: EPA 3510C (Fuels/Acid Ext.) w/Silica Gel + Acid

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 22H0885							
A2H0590-01	Water	NWTPH-Dx/SG	08/15/22 13:34	08/25/22 07:01	1050mL/5mL	1000mL/5mL	0.95
A2H0590-02	Water	NWTPH-Dx/SG	08/15/22 17:02	08/25/22 07:01	1040mL/5mL	1000mL/5mL	0.96
A2H0590-03	Water	NWTPH-Dx/SG	08/11/22 13:25	08/25/22 07:01	1050mL/5mL	1000mL/5mL	0.95
A2H0590-04	Water	NWTPH-Dx/SG	08/11/22 14:40	08/25/22 07:01	1040mL/5mL	1000mL/5mL	0.96
A2H0590-05	Water	NWTPH-Dx/SG	08/11/22 16:15	08/25/22 07:01	1010mL/5mL	1000mL/5mL	0.99

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Prep: EPA 3511 (Bottle Extraction)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 22H0649							
A2H0590-01	Water	EPA 8270E LVI	08/15/22 13:34	08/18/22 07:13	110.74mL/5mL	125mL/5mL	1.13
A2H0590-03	Water	EPA 8270E LVI	08/11/22 13:25	08/18/22 07:13	120.43mL/5mL	125mL/5mL	1.04
A2H0590-04	Water	EPA 8270E LVI	08/11/22 14:40	08/18/22 07:13	120.41mL/5mL	125mL/5mL	1.04
A2H0590-05	Water	EPA 8270E LVI	08/11/22 16:15	08/18/22 07:13	112.38mL/5mL	125mL/5mL	1.11

Total Metals by EPA 6020B (ICPMS)

Prep: EPA 3015A

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 22H0665							
A2H0590-01	Water	EPA 6020B	08/15/22 13:34	08/18/22 12:42	45mL/50mL	45mL/50mL	1.00
A2H0590-03	Water	EPA 6020B	08/11/22 13:25	08/18/22 12:42	45mL/50mL	45mL/50mL	1.00
A2H0590-04	Water	EPA 6020B	08/11/22 14:40	08/18/22 12:42	45mL/50mL	45mL/50mL	1.00
A2H0590-05	Water	EPA 6020B	08/11/22 16:15	08/18/22 12:42	45mL/50mL	45mL/50mL	1.00

Dissolved Metals by EPA 6020B (ICPMS)

Prep: EPA 3015A - Dissolved

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 22H0857							
A2H0590-01	Water	EPA 6020B (Diss)	08/15/22 13:34	08/24/22 11:29	45mL/50mL	45mL/50mL	1.00
A2H0590-01RE1	Water	EPA 6020B (Diss)	08/15/22 13:34	08/24/22 11:29	45mL/50mL	45mL/50mL	1.00
A2H0590-03	Water	EPA 6020B (Diss)	08/11/22 13:25	08/24/22 11:29	45mL/50mL	45mL/50mL	1.00
A2H0590-04	Water	EPA 6020B (Diss)	08/11/22 14:40	08/24/22 11:29	45mL/50mL	45mL/50mL	1.00
A2H0590-05	Water	EPA 6020B (Diss)	08/11/22 16:15	08/24/22 11:29	45mL/50mL	45mL/50mL	1.00

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Darrell Auvil, Client Services Manager

**ANALYTICAL REPORT****Apex Laboratories, LLC**6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062**Apex Companies, LLC**3015 SW First Avenue
Portland, OR 97201Project: **POP T4 - Slip 3 GW**

Project Number: 7573-00

Project Manager: Steve Misner

Report ID:

A2H0590 - 09 28 22 1301

SAMPLE PREPARATION INFORMATION**Dissolved Metals by EPA 6020B (ICPMS)**Prep: EPA 3015A - Dissolved

					Sample	Default	RL Prep
Lab Number	Matrix	Method	Sampled	Prepared	Initial/Final	Initial/Final	Factor
A2H0590-05RE1	Water	EPA 6020B (Diss)	08/11/22 16:15	08/24/22 11:29	45mL/50mL	45mL/50mL	1.00

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QUALIFIER DEFINITIONS

Client Sample and Quality Control (QC) Sample Qualifier Definitions:

Apex Laboratories

- F-11** The hydrocarbon pattern indicates possible weathered diesel, mineral oil, or a contribution from a related component.
- F-13** The chromatographic pattern does not resemble the fuel standard used for quantitation
- J** Estimated Result. Result detected below the lowest point of the calibration curve, but above the specified MDL.
- Q-03** Spike recovery and/or RPD is outside control limits due to the high concentration of analyte present in the sample.
- Q-16** Reanalysis of an original Batch QC sample.
- Q-19** Blank Spike Duplicate (BSD) sample analyzed in place of Matrix Spike/Duplicate samples due to limited sample amount available for analysis.
- R-02** The Reporting Limit for this analyte has been raised to account for interference from coeluting organic compounds present in the sample.
- R-04** Reporting levels elevated due to preparation and/or analytical dilution necessary for analysis.
- S-05** Surrogate recovery is estimated due to sample dilution required for high analyte concentration and/or matrix interference.

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Project: **POP T4 - Slip 3 GW**
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A2H0590 - 09 28 22 1301

REPORTING NOTES AND CONVENTIONS:

Abbreviations:

DET Analyte DETECTED at or above the detection or reporting limit.
ND Analyte NOT DETECTED at or above the detection or reporting limit.
NR Result Not Reported
RPD Relative Percent Difference. RPDs for Matrix Spikes and Matrix Spike Duplicates are based on concentration, not recovery.

Detection Limits: Limit of Detection (LOD)

Limits of Detection (LODs) are normally set at a level of one half the validated Limit of Quantitation (LOQ).
If no value is listed ('-----'), then the data has not been evaluated below the Reporting Limit.

Reporting Limits: Limit of Quantitation (LOQ)

Validated Limits of Quantitation (LOQs) are reported as the Reporting Limits for all analyses where the LOQ, MRL, PQL or CRL are requested. The LOQ represents a level at or above the low point of the calibration curve, that has been validated according to Apex Laboratories' comprehensive LOQ policies and procedures.

Reporting Conventions:

Basis: Results for soil samples are generally reported on a 100% dry weight basis.
The Result Basis is listed following the units as "dry", "wet", or " " (blank) designation.

"dry" Sample results and Reporting Limits are reported on a dry weight basis. (i.e. "ug/kg dry")
See Percent Solids section for details of dry weight analysis.
"wet" Sample results and Reporting Limits for this analysis are normally dry weight corrected, but have not been modified in this case.
" " Results without 'wet' or 'dry' designation are not normally dry weight corrected. These results are considered 'As Received'.

QC Source:

In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) may be analyzed to demonstrate accuracy and precision of the extraction batch.

Non-Client Batch QC Samples (Duplicates and Matrix Spike/Duplicates) may not be included in this report. Please request a Full QC report if this data is required.

Miscellaneous Notes:

" --- " QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.

" *** " Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).

Blanks:

Standard practice is to evaluate the results from Blank QC Samples down to a level equal to ½ the Reporting Limit (RL).
-For Blank hits falling between ½ the RL and the RL (J flagged hits), the associated sample and QC data will receive a 'B-02' qualifier.
-For Blank hits above the RL, the associated sample and QC data will receive a 'B' qualifier, per Apex Laboratories' Blank Policy.
For further details, please request a copy of this document.

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REPORTING NOTES AND CONVENTIONS (Cont.):

Blanks (Cont.):

Sample results flagged with a 'B' or 'B-02' qualifier are potentially biased high if the sample results are less than ten times the level found in the blank for inorganic analyses, or less than five times the level found in the blank for organic analyses.

'B' and 'B-02' qualifications are only applied to sample results detected above the Reporting Level.

Preparation Notes:

Mixed Matrix Samples:

Water Samples:

Water samples containing significant amounts of sediment are decanted or separated prior to extraction, and only the water portion analyzed, unless otherwise directed by the client.

Soil and Sediment Samples:

Soil and Sediment samples containing significant amounts of water are decanted prior to extraction, and only the solid portion analyzed, unless otherwise directed by the client.

Sampling and Preservation Notes:

Certain regulatory programs, such as National Pollutant Discharge Elimination System (NPDES), require that activities such as sample filtration (for dissolved metals, orthophosphate, hexavalent chromium, etc.) and testing of short hold analytes (pH, Dissolved Oxygen, etc.) be performed in the field (on-site) within a short time window. In addition, sample matrix spikes are required for some analyses, and sufficient volume must be provided, and billable site specific QC requested, if this is required. All regulatory permits should be reviewed to ensure that these requirements are being met.

Data users should be aware of which regulations pertain to the samples they submit for testing. If related sample collection activities are not approved for a particular regulatory program, results should be considered estimates. Apex Laboratories will qualify these analytes according to the most stringent requirements, however results for samples that are for non-regulatory purposes may be acceptable.

Samples that have been filtered and preserved at Apex Laboratories per client request are listed in the preparation section of the report with the date and time of filtration listed.

Apex Laboratories maintains detailed records on sample receipt, including client label verification, cooler temperature, sample preservation, hold time compliance and field filtration. Data is qualified as necessary, and the lack of qualification indicates compliance with required parameters.

Apex Laboratories

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.

Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

Apex Companies, LLC

3015 SW First Avenue
Portland, OR 97201

Project: **POP T4 - Slip 3 GW**

Project Number: 7573-00

Project Manager: Steve Misner

Report ID:

A2H0590 - 09 28 22 1301

LABORATORY ACCREDITATION INFORMATION

ORELAP Certification ID: OR100062 (Primary Accreditation) -

EPA ID: OR01039

All methods and analytes reported from work performed at Apex Laboratories are included on Apex Laboratories' ORELAP Scope of Certification, with the exception of any analyte(s) listed below:

Apex Laboratories

Matrix	Analysis	TNI_ID	Analyte	TNI_ID	Accreditation
<u>All reported analytes are included in Apex Laboratories' current ORELAP scope.</u>					

Secondary Accreditations

Apex Laboratories also maintains reciprocal accreditation with non-TNI states (Washington DOE), as well as other state specific accreditations not listed here.

Subcontract Laboratory Accreditations

Subcontracted data falls outside of Apex Laboratories' Scope of Accreditation.

Please see the Subcontract Laboratory report for full details, or contact your Project Manager for more information.

Field Testing Parameters

Results for Field Tested data are provided by the client or sampler, and fall outside of Apex Laboratories' Scope of Accreditation.

Apex Laboratories

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Apex Companies, LLC

3015 SW First Avenue

Portland, OR 97201

Project: POP T4 - Slip 3 GW

Project Number: 7573-00

Project Manager: Steve Misner

Report ID:

A2H0590 - 09 28 22 1301

Apex Cos.

APEX LABS COOLER RECEIPT FORM

Client: Steve Misner 08/18 Element WO#: A2H0590Project/Project #: Terminal 4 Slip 3 Groundwater Sampling #7573-00

Delivery Info:

Date/time received: 8/16/22 @ 1355 By: ACKDelivered by: Apex Client ☒ ESS FedEx ☐ UPS ☐ Swift ☐ Senvoy ☐ SDS ☐ Other ☐Cooler Inspection Date/time inspected: 8/16/22 @ 1358 By: ACKChain of Custody included? Yes ☒ No ☐ Custody seals? Yes ☐ No ☒Signed/dated by client? Yes ☒ No ☐Signed/dated by Apex? Yes ☒ No ☐

	Cooler #1	Cooler #2	Cooler #3	Cooler #4	Cooler #5	Cooler #6	Cooler #7
Temperature (°C)	<u>0.0</u>	<u>5.8</u>					
Received on ice? (Y/N)	<u>Y</u>	<u>Y</u>					
Temp. blanks? (Y/N)	<u>Y</u>	<u>Y</u>					
Ice type: (Gel/Real/Other)	<u>Real</u>	<u>Real</u>					
Condition:	<u>Melty</u>	<u>Melty</u>					

Cooler out of temp? (Y/N) No Possible reason why:Green dots applied to out of temperature samples? Yes ☒ No ☐Out of temperature samples form initiated? Yes ☒ No ☐Sample Inspection: Date/time inspected: 8/16/22 @ 19:11 By: ZAMAll samples intact? Yes ☒ No ☐ Comments:Bottle labels/COCs agree? Yes ☒ No ☐ Comments:COC/container discrepancies form initiated? Yes ☐ No ☒Containers/volumes received appropriate for analysis? Yes ☒ No ☐ Comments:Do VOA vials have visible headspace? Yes ☐ No ☐ NA ☒

Comments:

Water samples: pH checked: Yes ☒ No ☐ NA ☐ pH appropriate? Yes ☒ No ☐ NA ☐

Comments:

Additional information:

Labeled by:

ZAM

Witness:

ACK

Cooler Inspected by:

ACK

Apex Laboratories

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Darrell Auvil, Client Services Manager



3600 Fremont Ave. N.
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

Apex Laboratories
Darrell Auvil
6700 SW Sandburg St
Tigard, OR 97223

RE: A2H0590
Work Order Number: 2208289

September 02, 2022

Attention Darrell Auvil:

Fremont Analytical, Inc. received 5 sample(s) on 8/19/2022 for the analyses presented in the following report.

Extractable Petroleum Hydrocarbons by NWEPH

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Brianna Barnes
Project Manager

CC:
Sub Data

*DoD-ELAP Accreditation #79636 by PJLA, ISO/IEC 17025:2017 and QSM 5.3 for Environmental Testing
ORELAP Certification: WA 100009 (NELAP Recognized) for Environmental Testing
Washington State Department of Ecology Accredited for Environmental Testing, Lab ID C910*

Revision v1

www.fremontanalytical.com

CLIENT: Apex Laboratories
Project: A2H0590
Work Order: 2208289

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
2208289-001	BE-1	08/15/2022 1:34 PM	08/19/2022 9:27 AM
2208289-002	BE-5	08/15/2022 5:02 PM	08/19/2022 9:27 AM
2208289-003	HC-2	08/11/2022 1:25 PM	08/19/2022 9:27 AM
2208289-004	HC-5	08/11/2022 2:40 PM	08/19/2022 9:27 AM
2208289-005	HC-12D	08/11/2022 4:15 PM	08/19/2022 9:27 AM

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

CLIENT: Apex Laboratories**Project:** A2H0590

I. SAMPLE RECEIPT:

Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:

Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:

Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

9/15/22: Revision 1 reports samples to the Method Detection Limits per client request.

Qualifiers:

- * - Associated LCS is outside of control limits
- B - Analyte detected in the associated Method Blank
- D - Dilution was required
- E - Value above quantitation range
- H - Holding times for preparation or analysis exceeded
- I - Analyte with an internal standard that does not meet established acceptance criteria
- J - Analyte detected below Reporting Limit
- N - Tentatively Identified Compound (TIC)
- Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria
- S - Spike recovery outside accepted recovery limits
- ND - Not detected at the Method Detection Limit
- R - High relative percent difference observed

Acronyms:

- %Rec - Percent Recovery
- CCB - Continued Calibration Blank
- CCV - Continued Calibration Verification
- DF - Dilution Factor
- DUP - Sample Duplicate
- HEM - Hexane Extractable Material
- ICV - Initial Calibration Verification
- LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
- MCL - Maximum Contaminant Level
- MB or MBLANK - Method Blank
- MDL - Method Detection Limit
- MS/MSD - Matrix Spike / Matrix Spike Duplicate
- PDS - Post Digestion Spike
- Ref Val - Reference Value
- REP - Sample Replicate
- RL - Reporting Limit
- RPD - Relative Percent Difference
- SD - Serial Dilution
- SGT - Silica Gel Treatment
- SPK - Spike
- Surr - Surrogate



Analytical Report

Work Order: 2208289
Date Reported: 9/2/2022

Client: Apex Laboratories
Project: A2H0590
Lab ID: 2208289-001
Client Sample ID: BE-1

Collection Date: 8/15/2022 1:34:00 PM

Matrix: Water

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
<u>Extractable Petroleum Hydrocarbons by NWEPH</u>				Batch ID: 37533		Analyst: SK	
Aliphatic Hydrocarbon (C10-C12)	ND	40.1	20.7		µg/L	1	09/01/22 11:49:49
Surr: 1-Chlorooctadecane	43.7	50 - 150		S	%Rec	1	09/01/22 11:49:49

NOTES:

S - Outlying surrogate recovery(ies) observed.

Client: Apex Laboratories
Project: A2H0590
Lab ID: 2208289-002
Client Sample ID: BE-5

Collection Date: 8/15/2022 5:02:00 PM

Matrix: Water

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
<u>Extractable Petroleum Hydrocarbons by NWEPH</u>				Batch ID: 37533		Analyst: SK	
Aliphatic Hydrocarbon (C10-C12)	ND	39.9	20.6		µg/L	1	09/01/22 12:11:32
Surr: 1-Chlorooctadecane	55.0	50 - 150			%Rec	1	09/01/22 12:11:32

Client: Apex Laboratories
Project: A2H0590
Lab ID: 2208289-003
Client Sample ID: HC-2

Collection Date: 8/11/2022 1:25:00 PM

Matrix: Water

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
<u>Extractable Petroleum Hydrocarbons by NWEPH</u>				Batch ID: 37533		Analyst: SK	
Aliphatic Hydrocarbon (C10-C12)	ND	39.8	20.5		µg/L	1	09/01/22 12:33:08
Surr: 1-Chlorooctadecane	52.8	50 - 150			%Rec	1	09/01/22 12:33:08



Analytical Report

Work Order: 2208289
Date Reported: 9/2/2022

Client: Apex Laboratories
Project: A2H0590
Lab ID: 2208289-004
Client Sample ID: HC-5

Collection Date: 8/11/2022 2:40:00 PM

Matrix: Water

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
<u>Extractable Petroleum Hydrocarbons by NWEPH</u>				Batch ID: 37533		Analyst: SK	
Aliphatic Hydrocarbon (C10-C12)	129	40.0	20.7		µg/L	1	09/01/22 13:38:03
Surr: 1-Chlorooctadecane	41.0	50 - 150		S	%Rec	1	09/01/22 13:38:03

NOTES:

S - Outlying surrogate recovery(ies) observed.

Client: Apex Laboratories
Project: A2H0590
Lab ID: 2208289-005
Client Sample ID: HC-12D

Collection Date: 8/11/2022 4:15:00 PM

Matrix: Water

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
<u>Extractable Petroleum Hydrocarbons by NWEPH</u>				Batch ID: 37533		Analyst: SK	
Aliphatic Hydrocarbon (C10-C12)	ND	39.9	20.6		µg/L	1	09/02/22 13:44:34
Surr: 1-Chlorooctadecane	52.6	50 - 150			%Rec	1	09/02/22 13:44:34

Work Order: 2208289
CLIENT: Apex Laboratories
Project: A2H0590

QC SUMMARY REPORT

Extractable Petroleum Hydrocarbons by NWEPH

Sample ID: MB-37533	SampType: MBLK	Units: µg/L			Prep Date: 8/23/2022			RunNo: 78007			
Client ID: MBLKW	Batch ID: 37533				Analysis Date: 9/1/2022			SeqNo: 1602965			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Aliphatic Hydrocarbon (C10-C12)	ND	39.9		0	0						
Surr: 1-Chlorooctadecane	235		399.3		58.9	50	150				

Sample ID: 2208289-003AMS		SampType: MS			Units: µg/L		Prep Date: 8/23/2022			RunNo: 78007		
Client ID: HC-2		Batch ID: 37533			Analysis Date: 9/1/2022			SeqNo: 1602970				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Aliphatic Hydrocarbon (C10-C12)	350	39.8	497.9	0	70.3	70	130				
Surr: 1-Chlorooctadecane	303		398.3		76.0	50	150				

Sample ID: 2208289-003AMSD		SampType: MSD			Units: µg/L		Prep Date: 8/23/2022			RunNo: 78007		
Client ID: HC-2		Batch ID: 37533			Analysis Date: 9/1/2022			SeqNo: 1602971				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Aliphatic Hydrocarbon (C10-C12)	312	39.8	497.3	0	62.7	70	130	350.2	11.6	30	S
Surr: 1-Chlorooctadecane	262		397.8		65.8	50	150		0		

NOTES:

S - Outlying spike recovery(ies) observed. A duplicate analysis was performed and recovered within range.

Sample ID: LCS-37533		SampType: LCS			Units: µg/L		Prep Date: 8/23/2022			RunNo: 78007		
Client ID: LCSW		Batch ID: 37533			Analysis Date: 9/2/2022					SeqNo: 1603079		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Aliphatic Hydrocarbon (C10-C12)	355	40.0	500.5	0	70.9	70	130				
Surr: 1-Chlorooctadecane	319		400.4		79.6	50	150				

Client Name: APEX
 Logged by: Gabrielle Coeuille

Work Order Number: 2208289
 Date Received: 8/19/2022 9:27:00 AM

Chain of Custody

1. Is Chain of Custody complete? Yes ☒ No ☐ Not Present ☐
 2. How was the sample delivered? UPS

Log In

3. Coolers are present? Yes ☒ No ☐ NA ☐
 4. Shipping container/cooler in good condition? Yes ☒ No ☐
 5. Custody Seals present on shipping container/cooler?
 (Refer to comments for Custody Seals not intact) Yes ☐ No ☐ Not Present ☒
 6. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
 7. Were all items received at a temperature of >2°C to 6°C * Yes ☒ No ☐ NA ☐
 8. Sample(s) in proper container(s)? Yes ☒ No ☐
 9. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
 10. Are samples properly preserved? Yes ☒ No ☐
 11. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
 12. Is there headspace in the VOA vials? Yes ☐ No ☐ NA ☒
 13. Did all samples containers arrive in good condition(unbroken)? Yes ☒ No ☐
 14. Does paperwork match bottle labels? Yes ☒ No ☐
 15. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
 16. Is it clear what analyses were requested? Yes ☒ No ☐
 17. Were all holding times able to be met? Yes ☒ No ☐

Special Handling (if applicable)

18. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☒

Person Notified: Date:
 By Whom: Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person
 Regarding:
 Client Instructions:

19. Additional remarks:

Item Information

Item #	Temp °C
Sample 1	3.8

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

SUBCONTRACT ORDER

Apex Laboratories

A2H0590

SENDING LABORATORY:

Apex Laboratories
6700 S.W. Sandburg Street
Tigard, OR 97223
Phone: (503) 718-2323
Fax: (503) 336-0745
Project Manager: Darrell Auvil

RECEIVING LABORATORY:

Fremont Analytical
3600 Fremont Avenue N.
Seattle, WA 98103
Phone : (206) 352-3790
Fax: (206) 352-7178

Sample Name: BE-1

Water

Sampled: 08/15/22 13:34

(A2H0590-01)

Analysis	Due	Expires	Comments
NWTPH-EPH (Sub)	09/02/22 17:00	08/29/22 13:34	c10-c12 aliphatic ONLY
Containers Supplied: (F)1 L Amber Glass - HCL			

Sample Name: BE-5

Water

Sampled: 08/15/22 17:02

(A2H0590-02)

Analysis	Due	Expires	Comments
NWTPH-EPH (Sub)	09/02/22 17:00	08/29/22 17:02	c10-c12 aliphatic ONLY
Containers Supplied: (B)1 L Amber Glass - HCL			

Sample Name: HC-2

Water

Sampled: 08/11/22 13:25

(A2H0590-03)

Analysis	Due	Expires	Comments
NWTPH-EPH (Sub)	09/02/22 17:00	08/25/22 13:25	c10-c12 aliphatic ONLY
Containers Supplied: (G)1 L Amber Glass - HCL (H)1 L Amber Glass - HCL			

Sample Name: HC-5

Water

Sampled: 08/11/22 14:40

(A2H0590-04)

Analysis	Due	Expires	Comments
NWTPH-EPH (Sub)	09/02/22 17:00	08/25/22 14:40	c10-c12 aliphatic ONLY
Containers Supplied: (G)1 L Amber Glass - HCL (H)1 L Amber Glass - HCL			

Standard TAT

Released By

UPS (Shipper)

Date

Received By

Date

Released By

Date

Received By

Date

UPS (Shipper)

SUBCONTRACT ORDER

ET

Apex Laboratories

AB 8/18/22 A2H0590

2208289

Sample Name: HC-12D

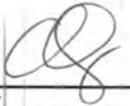
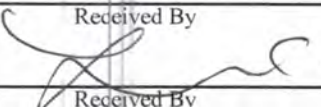
Water

Sampled: 08/11/22 16:15

(A2H0590-05)

Analysis	Due	Expires	Comments
NWTPH-EPH (Sub)	09/02/22 17:00	08/25/22 16:15	c10-c12 aliphatic ONLY
Containers Supplied:			
(G)1 L Amber Glass - HCL			
(H)1 L Amber Glass - HCL			

Standard TAT

Released By	Date	Received By	Date
	8/18/22	UPS (Shipper)	
Released By	Date	Received By	Date
UPS (Shipper)			8/19/22 09:17



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

Wednesday, September 28, 2022

Steve Misner
Apex Companies, LLC
3015 SW First Avenue
Portland, OR 97201

RE: A2H0645 - POP T4 - Slip 3 GW - 7573-00

Thank you for using Apex Laboratories. We greatly appreciate your business and strive to provide the highest quality services to the environmental industry.

Enclosed are the results of analyses for work order A2H0645, which was received by the laboratory on 8/18/2022 at 3:40:00PM.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: DAuvil@apex-labs.com, or by phone at 503-718-2323.

Please note: All samples will be disposed of within 30 days of sample receipt, unless prior arrangements have been made.

Cooler Receipt Information

(See Cooler Receipt Form for details)

Cooler #1	2.6 degC

This Final Report is the official version of the data results for this sample submission, unless superseded by a subsequent, labeled amended report.

All other deliverables derived from this data, including Electronic Data Deliverables (EDDs), CLP-like forms, client requested summary sheets, and all other products are considered secondary to this report.



Apex Laboratories

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

Apex Companies, LLC

3015 SW First Avenue
Portland, OR 97201

Project: POP T4 - Slip 3 GW

Project Number: 7573-00

Project Manager: Steve Misner

Report ID:

A2H0645 - 09 28 22 1312

ANALYTICAL REPORT FOR SAMPLES

SAMPLE INFORMATION

Client Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BE-5	A2H0645-01	Water	08/18/22 14:32	08/18/22 15:40

Apex Laboratories

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062Apex Companies, LLC
3015 SW First Avenue
Portland, OR 97201Project: **POP T4 - Slip 3 GW**
Project Number: **7573-00**
Project Manager: **Steve Misner****Report ID:**
A2H0645 - 09 28 22 1312

ANALYTICAL SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
BE-5 (A2H0645-01)				Matrix: Water		Batch: 22H0828		
Acenaphthene	ND	0.0163	0.0326	ug/L	1	08/24/22 12:59	EPA 8270E LVI	
Acenaphthylene	ND	0.0163	0.0326	ug/L	1	08/24/22 12:59	EPA 8270E LVI	
Anthracene	ND	0.0326	0.0326	ug/L	1	08/24/22 12:59	EPA 8270E LVI	
Benz(a)anthracene	ND	0.0163	0.0163	ug/L	1	08/24/22 12:59	EPA 8270E LVI	
Benzo(a)pyrene	0.00857	0.00816	0.0163	ug/L	1	08/24/22 12:59	EPA 8270E LVI	J
Benzo(b)fluoranthene	0.0155	0.00816	0.0163	ug/L	1	08/24/22 12:59	EPA 8270E LVI	J
Benzo(k)fluoranthene	ND	0.00816	0.0163	ug/L	1	08/24/22 12:59	EPA 8270E LVI	
Benzo(g,h,i)perylene	ND	0.0163	0.0326	ug/L	1	08/24/22 12:59	EPA 8270E LVI	
Chrysene	ND	0.0163	0.0163	ug/L	1	08/24/22 12:59	EPA 8270E LVI	
Dibenz(a,h)anthracene	ND	0.00816	0.0163	ug/L	1	08/24/22 12:59	EPA 8270E LVI	
Fluoranthene	ND	0.0163	0.0326	ug/L	1	08/24/22 12:59	EPA 8270E LVI	
Fluorene	ND	0.0714	0.0714	ug/L	1	08/24/22 12:59	EPA 8270E LVI	R-02
Indeno(1,2,3-cd)pyrene	0.00979	0.00816	0.0163	ug/L	1	08/24/22 12:59	EPA 8270E LVI	J
1-Methylnaphthalene	ND	0.102	0.102	ug/L	1	08/24/22 12:59	EPA 8270E LVI	R-02
2-Methylnaphthalene	ND	0.0326	0.0653	ug/L	1	08/24/22 12:59	EPA 8270E LVI	
Naphthalene	0.182	0.0326	0.0653	ug/L	1	08/24/22 12:59	EPA 8270E LVI	
Phenanthrene	ND	0.0816	0.0816	ug/L	1	08/24/22 12:59	EPA 8270E LVI	R-02
Pyrene	0.0241	0.0163	0.0326	ug/L	1	08/24/22 12:59	EPA 8270E LVI	J
Carbazole	ND	0.0816	0.0816	ug/L	1	08/24/22 12:59	EPA 8270E LVI	R-02
Dibenzofuran	ND	0.0163	0.0326	ug/L	1	08/24/22 12:59	EPA 8270E LVI	
Surrogate: Acenaphthylene-d8 (Surr)		Recovery: 98 %		Limits: 78-134 %	1	08/24/22 12:59	EPA 8270E LVI	
Benzo(a)pyrene-d12 (Surr)		115 %		80-132 %	1	08/24/22 12:59	EPA 8270E LVI	

Apex Laboratories

Darrell Auvil, Client Services Manager

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ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Apex Companies, LLC

3015 SW First Avenue

Portland, OR 97201

Project: **POP T4 - Slip 3 GW**

Project Number: 7573-00

Project Manager: Steve Misner

Report ID:

A2H0645 - 09 28 22 1312

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
BE-5 (A2H0645-01)		Matrix: Water						
Batch: 22H0902								
Arsenic	7.52	0.500	1.00	ug/L	1	08/26/22 00:04	EPA 6020B	J
Cadmium	ND	0.100	0.200	ug/L	1	08/26/22 00:04	EPA 6020B	
Chromium	ND	1.00	2.00	ug/L	1	08/26/22 00:04	EPA 6020B	
Copper	1.41	1.00	2.00	ug/L	1	08/26/22 00:04	EPA 6020B	
Lead	0.858	0.110	0.200	ug/L	1	08/26/22 00:04	EPA 6020B	
Mercury	ND	0.0400	0.0800	ug/L	1	08/26/22 00:04	EPA 6020B	
Vanadium	3.20	1.00	2.00	ug/L	1	08/26/22 00:04	EPA 6020B	
Zinc	6.69	2.00	4.00	ug/L	1	08/26/22 00:04	EPA 6020B	
BE-5 (A2H0645-01RE1)		Matrix: Water						
Batch: 22H0902								
Manganese	3290	5.00	10.0	ug/L	10	08/26/22 17:05	EPA 6020B	

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Report ID:

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ANALYTICAL SAMPLE RESULTS

Dissolved Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
BE-5 (A2H0645-01)		Matrix: Water						
Batch: 22H0857								
Arsenic	3.06	0.500	1.00	ug/L	1	08/25/22 01:39	EPA 6020B (Diss)	
Cadmium	ND	0.100	0.200	ug/L	1	08/25/22 01:39	EPA 6020B (Diss)	
Chromium	ND	1.00	2.00	ug/L	1	08/25/22 01:39	EPA 6020B (Diss)	
Copper	5.78	1.00	2.00	ug/L	1	08/25/22 01:39	EPA 6020B (Diss)	
Lead	0.175	0.100	0.200	ug/L	1	08/25/22 01:39	EPA 6020B (Diss)	J
Mercury	ND	0.0400	0.0800	ug/L	1	08/25/22 01:39	EPA 6020B (Diss)	
Vanadium	1.89	1.00	2.00	ug/L	1	08/25/22 01:39	EPA 6020B (Diss)	J
Zinc	3.75	2.00	4.00	ug/L	1	08/25/22 01:39	EPA 6020B (Diss)	J
BE-5 (A2H0645-01RE1)		Matrix: Water						
Batch: 22H0857								
Manganese	3000	5.00	10.0	ug/L	10	08/25/22 15:55	EPA 6020B (Diss)	

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Portland, OR 97201

Project: **POP T4 - Slip 3 GW**

Project Number: 7573-00

Project Manager: Steve Misner

Report ID:

A2H0645 - 09 28 22 1312

QUALITY CONTROL (QC) SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22H0828 - EPA 3511 (Bottle Extraction)						Water						
Blank (22H0828-BLK1)			Prepared: 08/24/22 07:19		Analyzed: 08/24/22 11:22							
EPA 8270E LVI												
Acenaphthene	ND	0.0160	0.0320	ug/L	1	---	---	---	---	---	---	
Acenaphthylene	ND	0.0160	0.0320	ug/L	1	---	---	---	---	---	---	
Anthracene	ND	0.0160	0.0320	ug/L	1	---	---	---	---	---	---	
Benz(a)anthracene	ND	0.00800	0.0160	ug/L	1	---	---	---	---	---	---	
Benzo(a)pyrene	ND	0.00800	0.0160	ug/L	1	---	---	---	---	---	---	
Benzo(b)fluoranthene	ND	0.00800	0.0160	ug/L	1	---	---	---	---	---	---	
Benzo(k)fluoranthene	ND	0.00800	0.0160	ug/L	1	---	---	---	---	---	---	
Benzo(g,h,i)perylene	ND	0.0160	0.0320	ug/L	1	---	---	---	---	---	---	
Chrysene	ND	0.00800	0.0160	ug/L	1	---	---	---	---	---	---	
Dibenz(a,h)anthracene	ND	0.00800	0.0160	ug/L	1	---	---	---	---	---	---	
Fluoranthene	ND	0.0160	0.0320	ug/L	1	---	---	---	---	---	---	
Fluorene	ND	0.0160	0.0320	ug/L	1	---	---	---	---	---	---	
Indeno(1,2,3-cd)pyrene	ND	0.00800	0.0160	ug/L	1	---	---	---	---	---	---	
1-Methylnaphthalene	ND	0.0320	0.0640	ug/L	1	---	---	---	---	---	---	
2-Methylnaphthalene	ND	0.0320	0.0640	ug/L	1	---	---	---	---	---	---	
Naphthalene	ND	0.0320	0.0640	ug/L	1	---	---	---	---	---	---	
Phenanthrene	ND	0.0320	0.0640	ug/L	1	---	---	---	---	---	---	
Pyrene	ND	0.0160	0.0320	ug/L	1	---	---	---	---	---	---	
Carbazole	ND	0.0160	0.0320	ug/L	1	---	---	---	---	---	---	
Dibenzofuran	ND	0.0160	0.0320	ug/L	1	---	---	---	---	---	---	
Surr: Acenaphthylene-d8 (Surr)		Recovery: 96 %		Limits: 78-134 %		Dilution: 1x						
Benzo(a)pyrene-d12 (Surr)		108 %		80-132 %		"						

LCS (22H0828-BS1)

Prepared: 08/24/22 07:19 Analyzed: 08/24/22 11:54

EPA 8270E LVI												
Acenaphthene	1.67	0.0160	0.0320	ug/L	1	1.60	---	105	80-120%	---	---	
Acenaphthylene	1.75	0.0160	0.0320	ug/L	1	1.60	---	109	80-124%	---	---	
Anthracene	1.64	0.0160	0.0320	ug/L	1	1.60	---	103	80-123%	---	---	
Benz(a)anthracene	1.66	0.00800	0.0160	ug/L	1	1.60	---	104	80-122%	---	---	
Benzo(a)pyrene	1.69	0.00800	0.0160	ug/L	1	1.60	---	105	80-129%	---	---	
Benzo(b)fluoranthene	1.65	0.00800	0.0160	ug/L	1	1.60	---	103	80-124%	---	---	
Benzo(k)fluoranthene	1.60	0.00800	0.0160	ug/L	1	1.60	---	100	80-125%	---	---	
Benzo(g,h,i)perylene	1.62	0.0160	0.0320	ug/L	1	1.60	---	101	80-120%	---	---	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Apex Companies, LLC

3015 SW First Avenue

Portland, OR 97201

Project: **POP T4 - Slip 3 GW**

Project Number: 7573-00

Project Manager: Steve Misner

Report ID:

A2H0645 - 09 28 22 1312

QUALITY CONTROL (QC) SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22H0828 - EPA 3511 (Bottle Extraction)						Water						
LCS (22H0828-BS1)			Prepared: 08/24/22 07:19		Analyzed: 08/24/22 11:54							
Chrysene	1.58	0.00800	0.0160	ug/L	1	1.60	---	99	80-120%	---	---	
Dibenz(a,h)anthracene	1.56	0.00800	0.0160	ug/L	1	1.60	---	98	80-120%	---	---	
Fluoranthene	1.79	0.0160	0.0320	ug/L	1	1.60	---	112	80-126%	---	---	
Fluorene	1.78	0.0160	0.0320	ug/L	1	1.60	---	111	77-127%	---	---	
Indeno(1,2,3-cd)pyrene	1.52	0.00800	0.0160	ug/L	1	1.60	---	95	80-121%	---	---	
1-Methylnaphthalene	1.85	0.0320	0.0640	ug/L	1	1.60	---	116	53-148%	---	---	
2-Methylnaphthalene	1.81	0.0320	0.0640	ug/L	1	1.60	---	113	48-150%	---	---	
Naphthalene	1.78	0.0320	0.0640	ug/L	1	1.60	---	111	78-120%	---	---	
Phenanthrene	1.56	0.0320	0.0640	ug/L	1	1.60	---	97	80-120%	---	---	
Pyrene	1.76	0.0160	0.0320	ug/L	1	1.60	---	110	80-125%	---	---	
Carbazole	1.59	0.0160	0.0320	ug/L	1	1.60	---	100	65-141%	---	---	
Dibenzofuran	1.72	0.0160	0.0320	ug/L	1	1.60	---	107	76-121%	---	---	
Surr: Acenaphthylene-d8 (Surr)		Recovery: 97 %		Limits: 78-134 %		Dilution: 1x						
Benzo(a)pyrene-d12 (Surr)		110 %		80-132 %		"						

LCS Dup (22H0828-BSD1)			Prepared: 08/24/22 07:19 Analyzed: 08/24/22 12:27								Q-19	
EPA 8270E LVI												
Acenaphthene	1.67	0.0160	0.0320	ug/L	1	1.60	---	104	80-120%	0.5	30%	
Acenaphthylene	1.76	0.0160	0.0320	ug/L	1	1.60	---	110	80-124%	0.7	30%	
Anthracene	1.66	0.0160	0.0320	ug/L	1	1.60	---	104	80-123%	0.9	30%	
Benz(a)anthracene	1.68	0.00800	0.0160	ug/L	1	1.60	---	105	80-122%	1	30%	
Benzo(a)pyrene	1.72	0.00800	0.0160	ug/L	1	1.60	---	108	80-129%	2	30%	
Benzo(b)fluoranthene	1.64	0.00800	0.0160	ug/L	1	1.60	---	103	80-124%	0.3	30%	
Benzo(k)fluoranthene	1.67	0.00800	0.0160	ug/L	1	1.60	---	104	80-125%	4	30%	
Benzo(g,h,i)perylene	1.71	0.0160	0.0320	ug/L	1	1.60	---	107	80-120%	5	30%	
Chrysene	1.59	0.00800	0.0160	ug/L	1	1.60	---	99	80-120%	0.7	30%	
Dibenz(a,h)anthracene	1.61	0.00800	0.0160	ug/L	1	1.60	---	101	80-120%	3	30%	
Fluoranthene	1.76	0.0160	0.0320	ug/L	1	1.60	---	110	80-126%	1	30%	
Fluorene	1.75	0.0160	0.0320	ug/L	1	1.60	---	110	77-127%	2	30%	
Indeno(1,2,3-cd)pyrene	1.59	0.00800	0.0160	ug/L	1	1.60	---	99	80-121%	4	30%	
1-Methylnaphthalene	1.89	0.0320	0.0640	ug/L	1	1.60	---	118	53-148%	2	30%	
2-Methylnaphthalene	1.83	0.0320	0.0640	ug/L	1	1.60	---	114	48-150%	1	30%	
Naphthalene	1.69	0.0320	0.0640	ug/L	1	1.60	---	106	78-120%	5	30%	
Phenanthrene	1.58	0.0320	0.0640	ug/L	1	1.60	---	99	80-120%	1	30%	

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Darrell Auvil, Client Services Manager

**ANALYTICAL REPORT****Apex Laboratories, LLC**

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Apex Companies, LLC

3015 SW First Avenue

Portland, OR 97201

Project: **POP T4 - Slip 3 GW**Project Number: **7573-00**Project Manager: **Steve Misner****Report ID:****A2H0645 - 09 28 22 1312****QUALITY CONTROL (QC) SAMPLE RESULTS****Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)**

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22H0828 - EPA 3511 (Bottle Extraction)						Water						
LCS Dup (22H0828-BSD1)			Prepared: 08/24/22 07:19 Analyzed: 08/24/22 12:27								Q-19	
Pyrene	1.77	0.0160	0.0320	ug/L	1	1.60	---	110	80-125%	0.7	30%	
Carbazole	1.54	0.0160	0.0320	ug/L	1	1.60	---	96	65-141%	3	30%	
Dibenzofuran	1.67	0.0160	0.0320	ug/L	1	1.60	---	104	76-121%	3	30%	
Surr: Acenaphthylene-d8 (Surr)		Recovery: 96 %		Limits: 78-134 %		Dilution: 1x						
Benzo(a)pyrene-d12 (Surr)		110 %		80-132 %		"						

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ANALYTICAL REPORT

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3015 SW First Avenue

Portland, OR 97201

Project: POP T4 - Slip 3 GW

Project Number: 7573-00

Project Manager: Steve Misner

Report ID:

A2H0645 - 09 28 22 1312

QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22H0902 - EPA 3015A						Water						
Blank (22H0902-BLK1)			Prepared: 08/25/22 10:56 Analyzed: 08/25/22 23:59									
EPA 6020B												
Arsenic	ND	0.500	1.00	ug/L	1	---	---	---	---	---	---	
Cadmium	ND	0.100	0.200	ug/L	1	---	---	---	---	---	---	
Chromium	ND	1.00	2.00	ug/L	1	---	---	---	---	---	---	
Copper	ND	1.00	2.00	ug/L	1	---	---	---	---	---	---	
Lead	ND	0.110	0.200	ug/L	1	---	---	---	---	---	---	
Manganese	ND	0.500	1.00	ug/L	1	---	---	---	---	---	---	
Mercury	ND	0.0400	0.0800	ug/L	1	---	---	---	---	---	---	
Vanadium	ND	1.00	2.00	ug/L	1	---	---	---	---	---	---	
Zinc	ND	2.00	4.00	ug/L	1	---	---	---	---	---	---	
LCS (22H0902-BS1)			Prepared: 08/25/22 10:56 Analyzed: 08/25/22 22:42									
EPA 6020B												
Arsenic	50.3	0.500	1.00	ug/L	1	55.6	---	91	80-120%	---	---	
Cadmium	53.7	0.100	0.200	ug/L	1	55.6	---	97	80-120%	---	---	
Chromium	49.9	1.00	2.00	ug/L	1	55.6	---	90	80-120%	---	---	
Copper	54.0	1.00	2.00	ug/L	1	55.6	---	97	80-120%	---	---	
Lead	51.9	0.110	0.200	ug/L	1	55.6	---	93	80-120%	---	---	
Manganese	50.8	0.500	1.00	ug/L	1	55.6	---	91	80-120%	---	---	
Mercury	1.09	0.0400	0.0800	ug/L	1	1.11	---	98	80-120%	---	---	
Vanadium	52.9	1.00	2.00	ug/L	1	55.6	---	95	80-120%	---	---	
Zinc	53.9	2.00	4.00	ug/L	1	55.6	---	97	80-120%	---	---	
Duplicate (22H0902-DUP1)			Prepared: 08/25/22 10:56 Analyzed: 08/26/22 00:09									
QC Source Sample: BE-5 (A2H0645-01)												
EPA 6020B												
Arsenic	7.20	0.500	1.00	ug/L	1	---	7.52	---	---	4	20%	
Cadmium	ND	0.100	0.200	ug/L	1	---	ND	---	---	---	20%	
Chromium	ND	1.00	2.00	ug/L	1	---	ND	---	---	---	20%	
Copper	1.55	1.00	2.00	ug/L	1	---	1.41	---	---	9	20%	
Lead	0.876	0.110	0.200	ug/L	1	---	0.858	---	---	2	20%	
Mercury	ND	0.0400	0.0800	ug/L	1	---	ND	---	---	---	20%	
Vanadium	3.13	1.00	2.00	ug/L	1	---	3.20	---	---	2	20%	
Zinc	7.32	2.00	4.00	ug/L	1	---	6.69	---	---	9	20%	

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503-718-2323

ORELAP ID: OR100062

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3015 SW First Avenue

Portland, OR 97201

Project: POP T4 - Slip 3 GW

Project Number: 7573-00

Project Manager: Steve Misner

Report ID:

A2H0645 - 09 28 22 1312

QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22H0902 - EPA 3015A						Water						
Duplicate (22H0902-DUP2)			Prepared: 08/25/22 10:56 Analyzed: 08/26/22 17:10									
QC Source Sample: BE-5 (A2H0645-01RE1)												
EPA 6020B												
Manganese	3380	5.00	10.0	ug/L	10	---	3290	---	---	3	20%	Q-16
Matrix Spike (22H0902-MS1)			Prepared: 08/25/22 10:56 Analyzed: 08/26/22 00:15									
QC Source Sample: BE-5 (A2H0645-01)												
EPA 6020B												
Arsenic	59.4	0.500	1.00	ug/L	1	55.6	7.52	93	75-125%	---	---	
Cadmium	54.5	0.100	0.200	ug/L	1	55.6	ND	98	75-125%	---	---	
Chromium	50.3	1.00	2.00	ug/L	1	55.6	ND	91	75-125%	---	---	
Copper	52.3	1.00	2.00	ug/L	1	55.6	1.41	92	75-125%	---	---	
Lead	52.6	0.110	0.200	ug/L	1	55.6	0.858	93	75-125%	---	---	
Mercury	1.13	0.0400	0.0800	ug/L	1	1.11	ND	102	75-125%	---	---	
Vanadium	57.2	1.00	2.00	ug/L	1	55.6	3.20	97	75-125%	---	---	
Zinc	59.2	2.00	4.00	ug/L	1	55.6	6.69	95	75-125%	---	---	
Matrix Spike (22H0902-MS2)			Prepared: 08/25/22 10:56 Analyzed: 08/26/22 17:15									
QC Source Sample: BE-5 (A2H0645-01RE1)												
EPA 6020B												
Manganese	3380	5.00	10.0	ug/L	10	55.6	3290	166	75-125%	---	---	Q-03, Q-16

Apex Laboratories

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Portland, OR 97201

Project: **POP T4 - Slip 3 GW**

Project Number: 7573-00

Project Manager: Steve Misner

Report ID:

A2H0645 - 09 28 22 1312

QUALITY CONTROL (QC) SAMPLE RESULTS

Dissolved Metals by EPA 6020B (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22H0857 - EPA 3015A - Dissolved						Water						
Blank (22H0857-BLK1)			Prepared: 08/24/22 11:29		Analyzed: 08/25/22 00:51							
EPA 6020B (Diss)												
Arsenic	ND	0.500	1.00	ug/L	1	---	---	---	---	---	---	
Cadmium	ND	0.100	0.200	ug/L	1	---	---	---	---	---	---	
Chromium	ND	1.00	2.00	ug/L	1	---	---	---	---	---	---	
Copper	ND	1.00	2.00	ug/L	1	---	---	---	---	---	---	
Lead	ND	0.100	0.200	ug/L	1	---	---	---	---	---	---	
Manganese	ND	0.500	1.00	ug/L	1	---	---	---	---	---	---	
Mercury	ND	0.0400	0.0800	ug/L	1	---	---	---	---	---	---	
Vanadium	ND	1.00	2.00	ug/L	1	---	---	---	---	---	---	
Zinc	ND	2.00	4.00	ug/L	1	---	---	---	---	---	---	
LCS (22H0857-BS1)			Prepared: 08/24/22 11:29		Analyzed: 08/25/22 00:56							
EPA 6020B (Diss)												
Arsenic	52.3	0.500	1.00	ug/L	1	55.6	---	94	80-120%	---	---	
Cadmium	54.8	0.100	0.200	ug/L	1	55.6	---	99	80-120%	---	---	
Chromium	53.7	1.00	2.00	ug/L	1	55.6	---	97	80-120%	---	---	
Copper	57.4	1.00	2.00	ug/L	1	55.6	---	103	80-120%	---	---	
Lead	56.8	0.100	0.200	ug/L	1	55.6	---	102	80-120%	---	---	
Manganese	54.6	0.500	1.00	ug/L	1	55.6	---	98	80-120%	---	---	
Mercury	1.11	0.0400	0.0800	ug/L	1	1.11	---	100	80-120%	---	---	
Vanadium	53.8	1.00	2.00	ug/L	1	55.6	---	97	80-120%	---	---	
Zinc	54.9	2.00	4.00	ug/L	1	55.6	---	99	80-120%	---	---	
Duplicate (22H0857-DUP1)			Prepared: 08/24/22 11:29		Analyzed: 08/25/22 01:15							
QC Source Sample: Non-SDG (A2H0590-01)												
Arsenic	12.7	0.500	1.00	ug/L	1	---	12.5	---	---	1	20%	
Cadmium	ND	0.100	0.200	ug/L	1	---	ND	---	---	---	20%	
Chromium	ND	1.00	2.00	ug/L	1	---	ND	---	---	---	20%	
Copper	3.32	1.00	2.00	ug/L	1	---	3.36	---	---	1	20%	
Lead	0.136	0.100	0.200	ug/L	1	---	0.113	---	---	18	20%	
Mercury	ND	0.0400	0.0800	ug/L	1	---	ND	---	---	---	20%	
Vanadium	ND	1.00	2.00	ug/L	1	---	ND	---	---	---	20%	
Zinc	2.46	2.00	4.00	ug/L	1	---	2.55	---	---	3	20%	

Apex Laboratories

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Apex Companies, LLC

3015 SW First Avenue

Portland, OR 97201

Project: **POP T4 - Slip 3 GW**

Project Number: 7573-00

Project Manager: Steve Misner

Report ID:

A2H0645 - 09 28 22 1312

QUALITY CONTROL (QC) SAMPLE RESULTS

Dissolved Metals by EPA 6020B (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22H0857 - EPA 3015A - Dissolved						Water						
Duplicate (22H0857-DUP2)			Prepared: 08/24/22 11:29 Analyzed: 08/25/22 15:19									
QC Source Sample: Non-SDG (A2H0590-01RE1)												
Manganese	3690	5.00	10.0	ug/L	10	---	3560	---	---	4	20%	Q-16
Matrix Spike (22H0857-MS1)			Prepared: 08/24/22 11:29 Analyzed: 08/25/22 01:20									
QC Source Sample: Non-SDG (A2H0590-01)												
EPA 6020B (Diss)												
Arsenic	67.8	0.500	1.00	ug/L	1	55.6	12.5	100	75-125%	---	---	
Cadmium	57.3	0.100	0.200	ug/L	1	55.6	ND	103	75-125%	---	---	
Chromium	55.1	1.00	2.00	ug/L	1	55.6	ND	99	75-125%	---	---	
Copper	60.0	1.00	2.00	ug/L	1	55.6	3.36	102	75-125%	---	---	
Lead	57.2	0.100	0.200	ug/L	1	55.6	0.113	103	75-125%	---	---	
Mercury	1.12	0.0400	0.0800	ug/L	1	1.11	ND	101	75-125%	---	---	
Vanadium	55.8	1.00	2.00	ug/L	1	55.6	ND	100	75-125%	---	---	
Zinc	58.2	2.00	4.00	ug/L	1	55.6	2.55	100	75-125%	---	---	
Matrix Spike (22H0857-MS2)			Prepared: 08/24/22 11:29 Analyzed: 08/25/22 15:24									
QC Source Sample: Non-SDG (A2H0590-01RE1)												
EPA 6020B (Diss)												
Manganese	3600	5.00	10.0	ug/L	10	55.6	3560	61	75-125%	---	---	Q-03, Q-16

Apex Laboratories

Darrell Auvil, Client Services Manager

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503-718-2323

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Apex Companies, LLC

3015 SW First Avenue

Portland, OR 97201

Project: **POP T4 - Slip 3 GW**Project Number: **7573-00**Project Manager: **Steve Misner****Report ID:****A2H0645 - 09 28 22 1312****SAMPLE PREPARATION INFORMATION****Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)****Prep: EPA 3511 (Bottle Extraction)**

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 22H0828							
A2H0645-01	Water	EPA 8270E LVI	08/18/22 14:32	08/24/22 07:19	122.56mL/5mL	125mL/5mL	1.02

Total Metals by EPA 6020B (ICPMS)**Prep: EPA 3015A**

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 22H0902							
A2H0645-01	Water	EPA 6020B	08/18/22 14:32	08/25/22 10:56	45mL/50mL	45mL/50mL	1.00
A2H0645-01RE1	Water	EPA 6020B	08/18/22 14:32	08/25/22 10:56	45mL/50mL	45mL/50mL	1.00

Dissolved Metals by EPA 6020B (ICPMS)**Prep: EPA 3015A - Dissolved**

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 22H0857							
A2H0645-01	Water	EPA 6020B (Diss)	08/18/22 14:32	08/24/22 11:29	45mL/50mL	45mL/50mL	1.00
A2H0645-01RE1	Water	EPA 6020B (Diss)	08/18/22 14:32	08/24/22 11:29	45mL/50mL	45mL/50mL	1.00

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Project Number: 7573-00

Project Manager: Steve Misner

Report ID:

A2H0645 - 09 28 22 1312

QUALIFIER DEFINITIONS

Client Sample and Quality Control (QC) Sample Qualifier Definitions:

Apex Laboratories

- J** Estimated Result. Result detected below the lowest point of the calibration curve, but above the specified MDL.
- Q-03** Spike recovery and/or RPD is outside control limits due to the high concentration of analyte present in the sample.
- Q-16** Reanalysis of an original Batch QC sample.
- Q-19** Blank Spike Duplicate (BSD) sample analyzed in place of Matrix Spike/Duplicate samples due to limited sample amount available for analysis.
- R-02** The Reporting Limit for this analyte has been raised to account for interference from coeluting organic compounds present in the sample.

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Project: **POP T4 - Slip 3 GW**
Project Number: **7573-00**
Project Manager: **Steve Misner**

Report ID:
A2H0645 - 09 28 22 1312

REPORTING NOTES AND CONVENTIONS:

Abbreviations:

DET Analyte DETECTED at or above the detection or reporting limit.
ND Analyte NOT DETECTED at or above the detection or reporting limit.
NR Result Not Reported
RPD Relative Percent Difference. RPDs for Matrix Spikes and Matrix Spike Duplicates are based on concentration, not recovery.

Detection Limits: Limit of Detection (LOD)

Limits of Detection (LODs) are normally set at a level of one half the validated Limit of Quantitation (LOQ).
If no value is listed ('-----'), then the data has not been evaluated below the Reporting Limit.

Reporting Limits: Limit of Quantitation (LOQ)

Validated Limits of Quantitation (LOQs) are reported as the Reporting Limits for all analyses where the LOQ, MRL, PQL or CRL are requested. The LOQ represents a level at or above the low point of the calibration curve, that has been validated according to Apex Laboratories' comprehensive LOQ policies and procedures.

Reporting Conventions:

Basis: Results for soil samples are generally reported on a 100% dry weight basis.
The Result Basis is listed following the units as "dry", "wet", or " " (blank) designation.

"dry" Sample results and Reporting Limits are reported on a dry weight basis. (i.e. "ug/kg dry")
See Percent Solids section for details of dry weight analysis.
"wet" Sample results and Reporting Limits for this analysis are normally dry weight corrected, but have not been modified in this case.
" " Results without 'wet' or 'dry' designation are not normally dry weight corrected. These results are considered 'As Received'.

QC Source:

In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) may be analyzed to demonstrate accuracy and precision of the extraction batch.

Non-Client Batch QC Samples (Duplicates and Matrix Spike/Duplicates) may not be included in this report. Please request a Full QC report if this data is required.

Miscellaneous Notes:

" --- " QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.

" *** " Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).

Blanks:

Standard practice is to evaluate the results from Blank QC Samples down to a level equal to ½ the Reporting Limit (RL).
-For Blank hits falling between ½ the RL and the RL (J flagged hits), the associated sample and QC data will receive a 'B-02' qualifier.
-For Blank hits above the RL, the associated sample and QC data will receive a 'B' qualifier, per Apex Laboratories' Blank Policy.
For further details, please request a copy of this document.

Apex Laboratories

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A2H0645 - 09 28 22 1312

REPORTING NOTES AND CONVENTIONS (Cont.):

Blanks (Cont.):

Sample results flagged with a 'B' or 'B-02' qualifier are potentially biased high if the sample results are less than ten times the level found in the blank for inorganic analyses, or less than five times the level found in the blank for organic analyses.

'B' and 'B-02' qualifications are only applied to sample results detected above the Reporting Level.

Preparation Notes:

Mixed Matrix Samples:

Water Samples:

Water samples containing significant amounts of sediment are decanted or separated prior to extraction, and only the water portion analyzed, unless otherwise directed by the client.

Soil and Sediment Samples:

Soil and Sediment samples containing significant amounts of water are decanted prior to extraction, and only the solid portion analyzed, unless otherwise directed by the client.

Sampling and Preservation Notes:

Certain regulatory programs, such as National Pollutant Discharge Elimination System (NPDES), require that activities such as sample filtration (for dissolved metals, orthophosphate, hexavalent chromium, etc.) and testing of short hold analytes (pH, Dissolved Oxygen, etc.) be performed in the field (on-site) within a short time window. In addition, sample matrix spikes are required for some analyses, and sufficient volume must be provided, and billable site specific QC requested, if this is required. All regulatory permits should be reviewed to ensure that these requirements are being met.

Data users should be aware of which regulations pertain to the samples they submit for testing. If related sample collection activities are not approved for a particular regulatory program, results should be considered estimates. Apex Laboratories will qualify these analytes according to the most stringent requirements, however results for samples that are for non-regulatory purposes may be acceptable.

Samples that have been filtered and preserved at Apex Laboratories per client request are listed in the preparation section of the report with the date and time of filtration listed.

Apex Laboratories maintains detailed records on sample receipt, including client label verification, cooler temperature, sample preservation, hold time compliance and field filtration. Data is qualified as necessary, and the lack of qualification indicates compliance with required parameters.

Apex Laboratories

Darrell Auvil, Client Services Manager

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Project: **POP T4 - Slip 3 GW**
Project Number: 7573-00
Project Manager: Steve Misner

Report ID:
A2H0645 - 09 28 22 1312

LABORATORY ACCREDITATION INFORMATION

ORELAP Certification ID: OR100062 (Primary Accreditation) -
EPA ID: OR01039

All methods and analytes reported from work performed at Apex Laboratories are included on Apex Laboratories' ORELAP Scope of Certification, with the exception of any analyte(s) listed below:

Apex Laboratories

Matrix	Analysis	TNI_ID	Analyte	TNI_ID	Accreditation
<u>All reported analytes are included in Apex Laboratories' current ORELAP scope.</u>					

Secondary Accreditations

Apex Laboratories also maintains reciprocal accreditation with non-TNI states (Washington DOE), as well as other state specific accreditations not listed here.

Subcontract Laboratory Accreditations

Subcontracted data falls outside of Apex Laboratories' Scope of Accreditation.
Please see the Subcontract Laboratory report for full details, or contact your Project Manager for more information.

Field Testing Parameters

Results for Field Tested data are provided by the client or sampler, and fall outside of Apex Laboratories' Scope of Accreditation.

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

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Project: POP T4 - Slip 3 GW

Project Number: 7573-00

Project Manager: Steve Misner

Report ID:

A2H0645 - 09 28 22 1312

APEX LABS COOLER RECEIPT FORM

Client: Apex Companies Element WO#: A2 H0645Project/Project #: Terminal 4 Slip 3 Groundwater Sampling

Delivery Info:

Date/time received: 8/18/22 @ 1540 By: MSDelivered by: Apex ☒ Client ☒ ESS ☐ FedEx ☐ UPS ☐ Swift ☐ Senvoy ☐ SDS ☐ Other ☐Cooler Inspection Date/time inspected: 8/18/22 @ 1540 By: MSChain of Custody included? Yes ☒ No ☐ Custody seals? Yes ☐ No ☒Signed/dated by client? Yes ☒ No ☐Signed/dated by Apex? Yes ☒ No ☐

	Cooler #1	Cooler #2	Cooler #3	Cooler #4	Cooler #5	Cooler #6	Cooler #7
Temperature (°C)	<u>2.6</u>						
Received on ice? (Y/N)	<u>Y</u>						
Temp. blanks? (Y/N)	<u>Y</u>						
Ice type: (Gel/Real/Other)	<u>Real</u>						
Condition:	<u>Good</u>						

Cooler out of temp? (Y/N) ☒ Possible reason why: _____Green dots applied to out of temperature samples? Yes ☒ No ☐Out of temperature samples form initiated? Yes ☒ No ☐Sample Inspection: Date/time inspected: 8/19/22 @ 0739 By: MSAll samples intact? Yes ☒ No ☐ Comments: _____Bottle labels/COCs agree? Yes ☒ No ☐ Comments: _____COC/container discrepancies form initiated? Yes ☐ No ☒Containers/volumes received appropriate for analysis? Yes ☒ No ☐ Comments: _____Do VOA vials have visible headspace? Yes ☐ No ☐ NA ☒

Comments: _____

Water samples: pH checked: Yes ☒ No ☐ NA ☐ pH appropriate? Yes ☒ No ☐ NA ☐

Comments: _____

Additional information: _____

Labeled by: MS Witness: AMC Cooler Inspected by: MS

Apex Laboratories

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Darrell Auvil, Client Services Manager

Page 19 of 19



ANALYTICAL REPORT

AMENDED REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

Thursday, January 19, 2023

Steve Misner
Apex Companies, LLC
15618 SW 72nd Ave
Tigard, OR 97224

RE: A2K0762 - POP T4 - Slip 3 GW - 7573-00

Thank you for using Apex Laboratories. We greatly appreciate your business and strive to provide the highest quality services to the environmental industry.

Enclosed are the results of analyses for work order A2K0762, which was received by the laboratory on 11/21/2022 at 1:37:00PM.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: DAuvil@apex-labs.com, or by phone at 503-718-2323.

Please note: All samples will be disposed of within 30 days of sample receipt, unless prior arrangements have been made.

Cooler Receipt Information

(See Cooler Receipt Form for details)

Cooler #1	3.1 degC

This Final Report is the official version of the data results for this sample submission, unless superseded by a subsequent, labeled amended report.

All other deliverables derived from this data, including Electronic Data Deliverables (EDDs), CLP-like forms, client requested summary sheets, and all other products are considered secondary to this report.



Apex Laboratories

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Darrell Auvil, Client Services Manager

**ANALYTICAL REPORT****AMENDED REPORT****Apex Laboratories, LLC**

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Apex Companies, LLC

15618 SW 72nd Ave

Tigard, OR 97224

Project: **POP T4 - Slip 3 GW**

Project Number: 7573-00

Project Manager: Steve Misner

Report ID:

A2K0762 - 01 19 23 1118

ANALYTICAL REPORT FOR SAMPLES**SAMPLE INFORMATION**

Client Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
HC-2	A2K0762-01	Water	11/17/22 14:20	11/21/22 13:37
HC-2 Metals	A2K0762-02	Water	11/17/22 14:20	11/21/22 13:37
HC-5	A2K0762-03	Water	11/17/22 11:30	11/21/22 13:37
HC-5 Metals	A2K0762-04	Water	11/17/22 11:30	11/21/22 13:37
HC-12D	A2K0762-05	Water	11/17/22 13:40	11/21/22 13:37
HC-12D Metals	A2K0762-06	Water	11/17/22 13:40	11/21/22 13:37

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Darrell Auvil, Client Services Manager

**ANALYTICAL REPORT****AMENDED REPORT****Apex Laboratories, LLC**

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A2K0762 - 01 19 23 1118

ANALYTICAL CASE NARRATIVE**A2K0762****Apex Laboratories**

Amended Report Revision 1:

This report supersedes all previous reports.

NWTPH-Dx Data Correction: Samples "HC-2" (A2K0762-01) and "HC-5" (A2K0762-03) reported incorrectly:

The originally reported NWTPH Diesel results for these two samples were labeled incorrectly.

The results for "HC-2" were originally reported as "HC-5", and the results for "HC-5" were originally reported as "HC-2"

The NWTPH-Dx results are now correct for these two samples, with "HC-5" having a detection for Diesel, and "HC-2" being non-detect.

Mark Zehr
Organics Manager
1/18/2023

Apex Laboratories

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Darrell Auvin, Client Services Manager



ANALYTICAL REPORT

AMENDED REPORT

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ANALYTICAL SAMPLE RESULTS

Diesel and/or Oil Hydrocarbons by NWTPH-Dx with Acid/Silica Gel Cleanup

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
HC-2 (A2K0762-01)			Matrix: Water			Batch: 22K0866		X
Diesel	ND	---	0.192	mg/L	1	11/23/22 20:55	NWTPH-Dx/SG	AMEND
Oil	ND	---	0.385	mg/L	1	11/23/22 20:55	NWTPH-Dx/SG	
Surrogate: o-Terphenyl (Surr)		Recovery: 88 %		Limits: 50-150 %	1	11/23/22 20:55	NWTPH-Dx/SG	
HC-5 (A2K0762-03)			Matrix: Water			Batch: 22K0866		X
Diesel	9.49	---	0.192	mg/L	1	11/23/22 20:32	NWTPH-Dx/SG	AMEND, F-11
Oil	ND	---	0.385	mg/L	1	11/23/22 20:32	NWTPH-Dx/SG	
Surrogate: o-Terphenyl (Surr)		Recovery: 98 %		Limits: 50-150 %	1	11/23/22 20:32	NWTPH-Dx/SG	
HC-12D (A2K0762-05)			Matrix: Water			Batch: 22K0866		
Diesel	ND	---	0.190	mg/L	1	11/23/22 21:18	NWTPH-Dx/SG	
Oil	ND	---	0.381	mg/L	1	11/23/22 21:18	NWTPH-Dx/SG	
Surrogate: o-Terphenyl (Surr)		Recovery: 76 %		Limits: 50-150 %	1	11/23/22 21:18	NWTPH-Dx/SG	

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Darrell Auvil, Client Services Manager

Report is complete only if it includes Fremont Analytical Laboratories Data.

Page 4 of 31 01/19/2023

Page 4 of 23



ANALYTICAL REPORT

AMENDED REPORT

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Project: POP T4 - Slip 3 GW

Project Number: 7573-00

Project Manager: Steve Misner

Report ID:

A2K0762 - 01 19 23 1118

ANALYTICAL SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
HC-2 (A2K0762-01RE1)		Matrix: Water			Batch: 22K0826			
Acenaphthene	ND	---	0.0329	ug/L	1	11/22/22 15:25	EPA 8270E LVI	
Acenaphthylene	ND	---	0.0329	ug/L	1	11/22/22 15:25	EPA 8270E LVI	
Anthracene	ND	---	0.0329	ug/L	1	11/22/22 15:25	EPA 8270E LVI	
Benz(a)anthracene	ND	---	0.0164	ug/L	1	11/22/22 15:25	EPA 8270E LVI	
Benzo(a)pyrene	ND	---	0.0164	ug/L	1	11/22/22 15:25	EPA 8270E LVI	
Benzo(b)fluoranthene	ND	---	0.0164	ug/L	1	11/22/22 15:25	EPA 8270E LVI	
Benzo(k)fluoranthene	ND	---	0.0164	ug/L	1	11/22/22 15:25	EPA 8270E LVI	
Benzo(g,h,i)perylene	ND	---	0.0329	ug/L	1	11/22/22 15:25	EPA 8270E LVI	
Chrysene	ND	---	0.0164	ug/L	1	11/22/22 15:25	EPA 8270E LVI	
Dibenz(a,h)anthracene	ND	---	0.0164	ug/L	1	11/22/22 15:25	EPA 8270E LVI	
Fluoranthene	ND	---	0.0329	ug/L	1	11/22/22 15:25	EPA 8270E LVI	
Fluorene	ND	---	0.0329	ug/L	1	11/22/22 15:25	EPA 8270E LVI	
Indeno(1,2,3-cd)pyrene	ND	---	0.0164	ug/L	1	11/22/22 15:25	EPA 8270E LVI	
1-Methylnaphthalene	ND	---	0.0658	ug/L	1	11/22/22 15:25	EPA 8270E LVI	
2-Methylnaphthalene	ND	---	0.0658	ug/L	1	11/22/22 15:25	EPA 8270E LVI	
Naphthalene	ND	---	0.0658	ug/L	1	11/22/22 15:25	EPA 8270E LVI	
Phenanthrene	ND	---	0.0658	ug/L	1	11/22/22 15:25	EPA 8270E LVI	
Pyrene	ND	---	0.0329	ug/L	1	11/22/22 15:25	EPA 8270E LVI	
Carbazole	ND	---	0.0329	ug/L	1	11/22/22 15:25	EPA 8270E LVI	
Dibenzofuran	ND	---	0.0329	ug/L	1	11/22/22 15:25	EPA 8270E LVI	
Surrogate: Acenaphthylene-d8 (Surr)		Recovery:	101 %	Limits:	78-134 %	1	11/22/22 15:25	EPA 8270E LVI
Benzo(a)pyrene-d12 (Surr)			109 %		80-132 %	1	11/22/22 15:25	EPA 8270E LVI

HC-5 (A2K0762-03)

Matrix: Water

Batch: 22K0826

R-04

Acenaphthene	ND	---	0.378	ug/L	10	11/22/22 14:20	EPA 8270E LVI
Acenaphthylene	ND	---	0.378	ug/L	10	11/22/22 14:20	EPA 8270E LVI
Anthracene	ND	---	0.378	ug/L	10	11/22/22 14:20	EPA 8270E LVI
Benz(a)anthracene	ND	---	0.189	ug/L	10	11/22/22 14:20	EPA 8270E LVI
Benzo(a)pyrene	ND	---	0.189	ug/L	10	11/22/22 14:20	EPA 8270E LVI
Benzo(b)fluoranthene	ND	---	0.189	ug/L	10	11/22/22 14:20	EPA 8270E LVI
Benzo(k)fluoranthene	ND	---	0.189	ug/L	10	11/22/22 14:20	EPA 8270E LVI
Benzo(g,h,i)perylene	ND	---	0.378	ug/L	10	11/22/22 14:20	EPA 8270E LVI
Chrysene	ND	---	0.189	ug/L	10	11/22/22 14:20	EPA 8270E LVI

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

AMENDED REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Apex Companies, LLC

15618 SW 72nd Ave

Tigard, OR 97224

Project: POP T4 - Slip 3 GW

Project Number: 7573-00

Project Manager: Steve Misner

Report ID:

A2K0762 - 01 19 23 1118

ANALYTICAL SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
HC-5 (A2K0762-03)		Matrix: Water			Batch: 22K0826		R-04	
Dibenz(a,h)anthracene	ND	---	0.189	ug/L	10	11/22/22 14:20	EPA 8270E LVI	
Fluoranthene	ND	---	0.378	ug/L	10	11/22/22 14:20	EPA 8270E LVI	
Fluorene	ND	---	0.378	ug/L	10	11/22/22 14:20	EPA 8270E LVI	
Indeno(1,2,3-cd)pyrene	ND	---	0.189	ug/L	10	11/22/22 14:20	EPA 8270E LVI	
1-Methylnaphthalene	ND	---	0.755	ug/L	10	11/22/22 14:20	EPA 8270E LVI	
2-Methylnaphthalene	ND	---	0.755	ug/L	10	11/22/22 14:20	EPA 8270E LVI	
Naphthalene	ND	---	0.755	ug/L	10	11/22/22 14:20	EPA 8270E LVI	
Phenanthrene	ND	---	0.755	ug/L	10	11/22/22 14:20	EPA 8270E LVI	
Pyrene	ND	---	0.378	ug/L	10	11/22/22 14:20	EPA 8270E LVI	
Carbazole	ND	---	0.378	ug/L	10	11/22/22 14:20	EPA 8270E LVI	
Dibenzofuran	ND	---	0.378	ug/L	10	11/22/22 14:20	EPA 8270E LVI	
Surrogate: Acenaphthylene-d8 (Surr)		Recovery:	133 %	Limits:	78-134 %	10	11/22/22 14:20	EPA 8270E LVI S-05
Benzo(a)pyrene-d12 (Surr)			121 %		80-132 %	10	11/22/22 14:20	EPA 8270E LVI S-05
HC-12D (A2K0762-05)		Matrix: Water			Batch: 22K0826			
Acenaphthene	0.472	---	0.0396	ug/L	1	11/22/22 14:53	EPA 8270E LVI	
Acenaphthylene	ND	---	0.0532	ug/L	1	11/22/22 14:53	EPA 8270E LVI	R-02
Anthracene	ND	---	0.177	ug/L	1	11/22/22 14:53	EPA 8270E LVI	R-02
Benz(a)anthracene	ND	---	0.0198	ug/L	1	11/22/22 14:53	EPA 8270E LVI	
Benzo(a)pyrene	ND	---	0.0198	ug/L	1	11/22/22 14:53	EPA 8270E LVI	
Benzo(b)fluoranthene	ND	---	0.0198	ug/L	1	11/22/22 14:53	EPA 8270E LVI	
Benzo(k)fluoranthene	ND	---	0.0198	ug/L	1	11/22/22 14:53	EPA 8270E LVI	
Benzo(g,h,i)perylene	ND	---	0.0396	ug/L	1	11/22/22 14:53	EPA 8270E LVI	
Chrysene	ND	---	0.0198	ug/L	1	11/22/22 14:53	EPA 8270E LVI	
Dibenz(a,h)anthracene	ND	---	0.0198	ug/L	1	11/22/22 14:53	EPA 8270E LVI	
Fluoranthene	ND	---	0.0396	ug/L	1	11/22/22 14:53	EPA 8270E LVI	
Fluorene	ND	---	0.459	ug/L	1	11/22/22 14:53	EPA 8270E LVI	R-02
Indeno(1,2,3-cd)pyrene	ND	---	0.0198	ug/L	1	11/22/22 14:53	EPA 8270E LVI	
1-Methylnaphthalene	ND	---	0.0792	ug/L	1	11/22/22 14:53	EPA 8270E LVI	
2-Methylnaphthalene	ND	---	0.0792	ug/L	1	11/22/22 14:53	EPA 8270E LVI	
Naphthalene	ND	---	0.404	ug/L	1	11/22/22 14:53	EPA 8270E LVI	R-02
Phenanthrene	ND	---	0.155	ug/L	1	11/22/22 14:53	EPA 8270E LVI	R-02
Pyrene	ND	---	0.0396	ug/L	1	11/22/22 14:53	EPA 8270E LVI	

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ANALYTICAL REPORT

AMENDED REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Apex Companies, LLC

15618 SW 72nd Ave

Tigard, OR 97224

Project: **POP T4 - Slip 3 GW**

Project Number: 7573-00

Project Manager: Steve Misner

Report ID:

A2K0762 - 01 19 23 1118

ANALYTICAL SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
HC-12D (A2K0762-05)		Matrix: Water			Batch: 22K0826			
Carbazole	ND	---	0.160	ug/L	1	11/22/22 14:53	EPA 8270E LVI	R-02
Dibenzofuran	ND	---	0.0396	ug/L	1	11/22/22 14:53	EPA 8270E LVI	
Surrogate: Acenaphthylene-d8 (Surr)		Recovery: 100 %		Limits: 78-134 %	1	11/22/22 14:53	EPA 8270E LVI	S-05
Benzo(a)pyrene-d12 (Surr)		111 %		80-132 %	1	11/22/22 14:53	EPA 8270E LVI	S-05

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Project Manager: Steve Misner

Report ID:

A2K0762 - 01 19 23 1118

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
HC-2 (A2K0762-01) Matrix: Water								
Batch: 22K0956								
Arsenic	1.64	---	1.00	ug/L	1	11/29/22 17:11	EPA 6020B	
Cadmium	0.395	---	0.200	ug/L	1	11/29/22 17:11	EPA 6020B	
Chromium	ND	---	2.00	ug/L	1	11/29/22 17:11	EPA 6020B	
Copper	ND	---	2.00	ug/L	1	11/29/22 17:11	EPA 6020B	
Lead	ND	---	0.200	ug/L	1	11/29/22 17:11	EPA 6020B	
Manganese	69.8	---	1.00	ug/L	1	11/29/22 17:11	EPA 6020B	
Mercury	ND	---	0.0800	ug/L	1	11/29/22 17:11	EPA 6020B	Q-42
Vanadium	ND	---	2.00	ug/L	1	11/29/22 17:11	EPA 6020B	
Zinc	90.9	---	4.00	ug/L	1	11/29/22 17:11	EPA 6020B	
HC-2 Metals (A2K0762-02) Matrix: Water								
Batch: 22K0956								
Arsenic	1.57	---	1.00	ug/L	1	11/29/22 17:26	EPA 6020B	
Cadmium	0.342	---	0.200	ug/L	1	11/29/22 17:26	EPA 6020B	
Chromium	ND	---	2.00	ug/L	1	11/29/22 17:26	EPA 6020B	
Copper	ND	---	2.00	ug/L	1	11/29/22 17:26	EPA 6020B	
Lead	ND	---	0.200	ug/L	1	11/29/22 17:26	EPA 6020B	
Manganese	72.0	---	1.00	ug/L	1	11/29/22 17:26	EPA 6020B	
Mercury	ND	---	0.0800	ug/L	1	11/29/22 17:26	EPA 6020B	
Vanadium	ND	---	2.00	ug/L	1	11/29/22 17:26	EPA 6020B	
Zinc	93.5	---	4.00	ug/L	1	11/29/22 17:26	EPA 6020B	
HC-5 (A2K0762-03) Matrix: Water								
Batch: 22K0956								
Arsenic	2.13	---	1.00	ug/L	1	11/29/22 17:32	EPA 6020B	
Cadmium	ND	---	0.200	ug/L	1	11/29/22 17:32	EPA 6020B	
Chromium	ND	---	2.00	ug/L	1	11/29/22 17:32	EPA 6020B	
Copper	ND	---	2.00	ug/L	1	11/29/22 17:32	EPA 6020B	
Lead	0.235	---	0.200	ug/L	1	11/29/22 17:32	EPA 6020B	
Manganese	1870	---	1.00	ug/L	1	11/29/22 17:32	EPA 6020B	
Mercury	ND	---	0.0800	ug/L	1	11/29/22 17:32	EPA 6020B	
Vanadium	5.58	---	2.00	ug/L	1	11/29/22 17:32	EPA 6020B	
Zinc	699	---	4.00	ug/L	1	11/29/22 17:32	EPA 6020B	

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Page 8 of 31 01/19/2023

Page 8 of 23



ANALYTICAL REPORT

AMENDED REPORT

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503-718-2323

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15618 SW 72nd Ave

Tigard, OR 97224

Project: **POP T4 - Slip 3 GW**

Project Number: 7573-00

Project Manager: Steve Misner

Report ID:

A2K0762 - 01 19 23 1118

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
HC-5 Metals (A2K0762-04) Matrix: Water								
Batch: 22K0956								
Arsenic	1.93	---	1.00	ug/L	1	11/29/22 17:37	EPA 6020B	
Cadmium	ND	---	0.200	ug/L	1	11/29/22 17:37	EPA 6020B	
Chromium	ND	---	2.00	ug/L	1	11/29/22 17:37	EPA 6020B	
Copper	ND	---	2.00	ug/L	1	11/29/22 17:37	EPA 6020B	
Lead	ND	---	0.200	ug/L	1	11/29/22 17:37	EPA 6020B	
Manganese	1780	---	1.00	ug/L	1	11/29/22 17:37	EPA 6020B	
Mercury	ND	---	0.0800	ug/L	1	11/29/22 17:37	EPA 6020B	
Vanadium	5.31	---	2.00	ug/L	1	11/29/22 17:37	EPA 6020B	
Zinc	683	---	4.00	ug/L	1	11/29/22 17:37	EPA 6020B	
HC-12D (A2K0762-05) Matrix: Water								
Batch: 22K0956								
Arsenic	18.1	---	1.00	ug/L	1	11/29/22 17:42	EPA 6020B	
Cadmium	3.20	---	0.200	ug/L	1	11/29/22 17:42	EPA 6020B	
Chromium	ND	---	2.00	ug/L	1	11/29/22 17:42	EPA 6020B	
Copper	ND	---	2.00	ug/L	1	11/29/22 17:42	EPA 6020B	
Lead	1.25	---	0.200	ug/L	1	11/29/22 17:42	EPA 6020B	
Mercury	ND	---	0.0800	ug/L	1	11/29/22 17:42	EPA 6020B	
Vanadium	ND	---	2.00	ug/L	1	11/29/22 17:42	EPA 6020B	
Zinc	5.58	---	4.00	ug/L	1	11/29/22 17:42	EPA 6020B	
HC-12D (A2K0762-05RE1) Matrix: Water								
Batch: 22K0956								
Manganese	14600	---	100	ug/L	100	11/30/22 17:34	EPA 6020B	
HC-12D Metals (A2K0762-06) Matrix: Water								
Batch: 22K0956								
Arsenic	18.3	---	1.00	ug/L	1	11/29/22 17:47	EPA 6020B	
Cadmium	3.11	---	0.200	ug/L	1	11/29/22 17:47	EPA 6020B	
Chromium	ND	---	2.00	ug/L	1	11/29/22 17:47	EPA 6020B	
Copper	ND	---	2.00	ug/L	1	11/29/22 17:47	EPA 6020B	
Lead	1.23	---	0.200	ug/L	1	11/29/22 17:47	EPA 6020B	
Mercury	ND	---	0.0800	ug/L	1	11/29/22 17:47	EPA 6020B	

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ANALYTICAL REPORT

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503-718-2323

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Apex Companies, LLC

15618 SW 72nd Ave

Tigard, OR 97224

Project: **POP T4 - Slip 3 GW**

Project Number: 7573-00

Project Manager: Steve Misner

Report ID:

A2K0762 - 01 19 23 1118

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
HC-12D Metals (A2K0762-06)			Matrix: Water					
Vanadium	ND	---	2.00	ug/L	1	11/29/22 17:47	EPA 6020B	
Zinc	8.81	---	4.00	ug/L	1	11/29/22 17:47	EPA 6020B	
HC-12D Metals (A2K0762-06RE1)			Matrix: Water					
Batch: 22K0956								
Manganese	14900	---	100	ug/L	100	11/30/22 17:39	EPA 6020B	

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QUALITY CONTROL (QC) SAMPLE RESULTS

Diesel and/or Oil Hydrocarbons by NWTPH-Dx with Acid/Silica Gel Cleanup

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22K0866 - EPA 3510C (Fuels/Acid Ext.) w/Silica Gel + Acid						Water						
Blank (22K0866-BLK1)			Prepared: 11/23/22 06:37 Analyzed: 11/23/22 19:23									
NWTPH-Dx/SG												
Diesel	ND	---	0.182	mg/L	1	---	---	---	---	---	---	
Oil	ND	---	0.364	mg/L	1	---	---	---	---	---	---	
Surr: o-Terphenyl (Surr)		Recovery: 79 %		Limits: 50-150 %		Dilution: 1x						
LCS (22K0866-BS1)			Prepared: 11/23/22 06:37 Analyzed: 11/23/22 19:46									
NWTPH-Dx/SG												
Diesel	1.01	---	0.200	mg/L	1	1.25	---	81	36-132%	---	---	
Surr: o-Terphenyl (Surr)		Recovery: 87 %		Limits: 50-150 %		Dilution: 1x						
LCS Dup (22K0866-BSD1)			Prepared: 11/23/22 06:37 Analyzed: 11/23/22 20:09									
NWTPH-Dx/SG												
Diesel	0.970	---	0.200	mg/L	1	1.25	---	78	36-132%	4	30%	
Surr: o-Terphenyl (Surr)		Recovery: 88 %		Limits: 50-150 %		Dilution: 1x						
Batch 23A0580 - EPA 3510C (Fuels/Acid Ext.) w/Silica Gel + Acid						Water						
Blank (23A0580-BLK1)			Prepared: 01/17/23 12:21 Analyzed: 01/17/23 20:33									
NWTPH-Dx/SG												
Diesel	ND	---	0.200	mg/L	1	---	---	---	---	---	---	
Oil	ND	---	0.400	mg/L	1	---	---	---	---	---	---	
Surr: o-Terphenyl (Surr)		Recovery: 95 %		Limits: 50-150 %		Dilution: 1x						
LCS (23A0580-BS1)			Prepared: 01/17/23 12:21 Analyzed: 01/17/23 20:53									
NWTPH-Dx/SG												
Diesel	1.05	---	0.200	mg/L	1	1.25	---	84	36-132%	---	---	
Surr: o-Terphenyl (Surr)		Recovery: 96 %		Limits: 50-150 %		Dilution: 1x						
LCS Dup (23A0580-BSD1)			Prepared: 01/17/23 12:21 Analyzed: 01/17/23 21:13									
NWTPH-Dx/SG												
Diesel	1.04	---	0.200	mg/L	1	1.25	---	83	36-132%	0.7	30%	
Surr: o-Terphenyl (Surr)		Recovery: 95 %		Limits: 50-150 %		Dilution: 1x						

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Page 11 of 31

01/19/2023

Page 11 of 23



ANALYTICAL REPORT

AMENDED REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Apex Companies, LLC

15618 SW 72nd Ave

Tigard, OR 97224

Project: **POP T4 - Slip 3 GW**

Project Number: 7573-00

Project Manager: Steve Misner

Report ID:

A2K0762 - 01 19 23 1118

QUALITY CONTROL (QC) SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22K0826 - EPA 3511 (Bottle Extraction)						Water						
Blank (22K0826-BLK1)			Prepared: 11/22/22 08:09		Analyzed: 11/22/22 12:10							
EPA 8270E LVI												
Acenaphthene	ND	---	0.0320	ug/L	1	---	---	---	---	---	---	
Acenaphthylene	ND	---	0.0320	ug/L	1	---	---	---	---	---	---	
Anthracene	ND	---	0.0320	ug/L	1	---	---	---	---	---	---	
Benz(a)anthracene	ND	---	0.0160	ug/L	1	---	---	---	---	---	---	
Benzo(a)pyrene	ND	---	0.0160	ug/L	1	---	---	---	---	---	---	
Benzo(b)fluoranthene	ND	---	0.0160	ug/L	1	---	---	---	---	---	---	
Benzo(k)fluoranthene	ND	---	0.0160	ug/L	1	---	---	---	---	---	---	
Benzo(g,h,i)perylene	ND	---	0.0320	ug/L	1	---	---	---	---	---	---	
Chrysene	ND	---	0.0160	ug/L	1	---	---	---	---	---	---	
Dibenz(a,h)anthracene	ND	---	0.0160	ug/L	1	---	---	---	---	---	---	
Fluoranthene	ND	---	0.0320	ug/L	1	---	---	---	---	---	---	
Fluorene	ND	---	0.0320	ug/L	1	---	---	---	---	---	---	
Indeno(1,2,3-cd)pyrene	ND	---	0.0160	ug/L	1	---	---	---	---	---	---	
1-Methylnaphthalene	ND	---	0.0640	ug/L	1	---	---	---	---	---	---	
2-Methylnaphthalene	ND	---	0.0640	ug/L	1	---	---	---	---	---	---	
Naphthalene	ND	---	0.0640	ug/L	1	---	---	---	---	---	---	
Phenanthrene	ND	---	0.0640	ug/L	1	---	---	---	---	---	---	
Pyrene	ND	---	0.0320	ug/L	1	---	---	---	---	---	---	
Carbazole	ND	---	0.0320	ug/L	1	---	---	---	---	---	---	
Dibenzofuran	ND	---	0.0320	ug/L	1	---	---	---	---	---	---	
Surr: Acenaphthylene-d8 (Surr)		Recovery: 122 %		Limits: 78-134 %		Dilution: 1x						
Benzo(a)pyrene-d12 (Surr)		107 %		80-132 %		"						

LCS (22K0826-BS1)

Prepared: 11/22/22 08:09 Analyzed: 11/22/22 12:42

EPA 8270E LV1												
Acenaphthene	1.49	---	0.0320	ug/L	1	1.60	---	93	80-120%	---	---	
Acenaphthylene	1.80	---	0.0320	ug/L	1	1.60	---	113	80-124%	---	---	
Anthracene	1.58	---	0.0320	ug/L	1	1.60	---	99	80-123%	---	---	
Benz(a)anthracene	1.65	---	0.0160	ug/L	1	1.60	---	103	80-122%	---	---	
Benzo(a)pyrene	1.67	---	0.0160	ug/L	1	1.60	---	104	80-129%	---	---	
Benzo(b)fluoranthene	1.57	---	0.0160	ug/L	1	1.60	---	98	80-124%	---	---	
Benzo(k)fluoranthene	1.64	---	0.0160	ug/L	1	1.60	---	102	80-125%	---	---	
Benzo(g,h,i)perylene	1.53	---	0.0320	ug/L	1	1.60	---	96	80-120%	---	---	

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Page 12 of 31

01/19/2023

Page 12 of 23



ANALYTICAL REPORT

AMENDED REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Apex Companies, LLC

15618 SW 72nd Ave

Tigard, OR 97224

Project: **POP T4 - Slip 3 GW**

Project Number: 7573-00

Project Manager: Steve Misner

Report ID:

A2K0762 - 01 19 23 1118

QUALITY CONTROL (QC) SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22K0826 - EPA 3511 (Bottle Extraction)						Water						
LCS (22K0826-BS1)			Prepared: 11/22/22 08:09		Analyzed: 11/22/22 12:42							
Chrysene	1.53	---	0.0160	ug/L	1	1.60	---	96	80-120%	---	---	
Dibenz(a,h)anthracene	1.48	---	0.0160	ug/L	1	1.60	---	93	80-120%	---	---	
Fluoranthene	1.66	---	0.0320	ug/L	1	1.60	---	104	80-126%	---	---	
Fluorene	1.56	---	0.0320	ug/L	1	1.60	---	98	77-127%	---	---	
Indeno(1,2,3-cd)pyrene	1.43	---	0.0160	ug/L	1	1.60	---	90	80-121%	---	---	
1-Methylnaphthalene	1.39	---	0.0640	ug/L	1	1.60	---	87	53-148%	---	---	
2-Methylnaphthalene	1.31	---	0.0640	ug/L	1	1.60	---	82	48-150%	---	---	
Naphthalene	1.52	---	0.0640	ug/L	1	1.60	---	95	78-120%	---	---	
Phenanthrene	1.49	---	0.0640	ug/L	1	1.60	---	93	80-120%	---	---	
Pyrene	1.67	---	0.0320	ug/L	1	1.60	---	104	80-125%	---	---	
Carbazole	1.80	---	0.0320	ug/L	1	1.60	---	112	65-141%	---	---	
Dibenzofuran	1.70	---	0.0320	ug/L	1	1.60	---	106	76-121%	---	---	
Surr: Acenaphthylene-d8 (Surr)		Recovery: 114 %		Limits: 78-134 %		Dilution: 1x						
Benzo(a)pyrene-d12 (Surr)		108 %		80-132 %		"						

LCS Dup (22K0826-BSD1)			Prepared: 11/22/22 08:09 Analyzed: 11/22/22 13:15								Q-19	
EPA 8270E LVI												
Acenaphthene	1.49	---	0.0320	ug/L	1	1.60	---	93	80-120%	0.3	30%	
Acenaphthylene	1.84	---	0.0320	ug/L	1	1.60	---	115	80-124%	2	30%	
Anthracene	1.63	---	0.0320	ug/L	1	1.60	---	102	80-123%	3	30%	
Benz(a)anthracene	1.64	---	0.0160	ug/L	1	1.60	---	103	80-122%	0.4	30%	
Benzo(a)pyrene	1.69	---	0.0160	ug/L	1	1.60	---	105	80-129%	1	30%	
Benzo(b)fluoranthene	1.60	---	0.0160	ug/L	1	1.60	---	100	80-124%	2	30%	
Benzo(k)fluoranthene	1.63	---	0.0160	ug/L	1	1.60	---	102	80-125%	0.5	30%	
Benzo(g,h,i)perylene	1.53	---	0.0320	ug/L	1	1.60	---	96	80-120%	0.1	30%	
Chrysene	1.52	---	0.0160	ug/L	1	1.60	---	95	80-120%	0.8	30%	
Dibenz(a,h)anthracene	1.48	---	0.0160	ug/L	1	1.60	---	93	80-120%	0.03	30%	
Fluoranthene	1.68	---	0.0320	ug/L	1	1.60	---	105	80-126%	1	30%	
Fluorene	1.55	---	0.0320	ug/L	1	1.60	---	97	77-127%	0.6	30%	
Indeno(1,2,3-cd)pyrene	1.45	---	0.0160	ug/L	1	1.60	---	90	80-121%	0.9	30%	
1-Methylnaphthalene	1.48	---	0.0640	ug/L	1	1.60	---	93	53-148%	6	30%	
2-Methylnaphthalene	1.40	---	0.0640	ug/L	1	1.60	---	87	48-150%	7	30%	
Naphthalene	1.55	---	0.0640	ug/L	1	1.60	---	97	78-120%	2	30%	
Phenanthrene	1.49	---	0.0640	ug/L	1	1.60	---	93	80-120%	0.1	30%	

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Page 13 of 31

01/19/2023

Page 13 of 23



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AMENDED REPORT

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6700 S.W. Sandburg Street

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503-718-2323

ORELAP ID: OR100062

Apex Companies, LLC

15618 SW 72nd Ave

Tigard, OR 97224

Project: POP T4 - Slip 3 GW

Project Number: 7573-00

Project Manager: Steve Misner

Report ID:

A2K0762 - 01 19 23 1118

QUALITY CONTROL (QC) SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22K0826 - EPA 3511 (Bottle Extraction)						Water						
LCS Dup (22K0826-BSD1)			Prepared: 11/22/22 08:09 Analyzed: 11/22/22 13:15								Q-19	
Pyrene	1.69	---	0.0320	ug/L	1	1.60	---	106	80-125%	1	30%	
Carbazole	1.80	---	0.0320	ug/L	1	1.60	---	112	65-141%	0.04	30%	
Dibenzofuran	1.71	---	0.0320	ug/L	1	1.60	---	107	76-121%	0.09	30%	
Surr: Acenaphthylene-d8 (Surr)		Recovery: 115 %		Limits: 78-134 %		Dilution: 1x						
Benzo(a)pyrene-d12 (Surr)		108 %		80-132 %		"						

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Project Number: 7573-00

Project Manager: Steve Misner

Report ID:

A2K0762 - 01 19 23 1118

QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22K0956 - EPA 3015A						Water						
Blank (22K0956-BLK1)			Prepared: 11/29/22 10:36 Analyzed: 11/29/22 16:34									
EPA 6020B												
Arsenic	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Cadmium	ND	---	0.200	ug/L	1	---	---	---	---	---	---	
Chromium	ND	---	2.00	ug/L	1	---	---	---	---	---	---	
Copper	ND	---	2.00	ug/L	1	---	---	---	---	---	---	
Lead	ND	---	0.200	ug/L	1	---	---	---	---	---	---	
Manganese	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Mercury	ND	---	0.0800	ug/L	1	---	---	---	---	---	---	
Vanadium	ND	---	2.00	ug/L	1	---	---	---	---	---	---	
Zinc	ND	---	4.00	ug/L	1	---	---	---	---	---	---	
LCS (22K0956-BS1)			Prepared: 11/29/22 10:36 Analyzed: 11/29/22 16:39									
EPA 6020B												
Arsenic	52.8	---	1.00	ug/L	1	55.6	---	95	80-120%	---	---	
Cadmium	53.2	---	0.200	ug/L	1	55.6	---	96	80-120%	---	---	
Chromium	53.1	---	2.00	ug/L	1	55.6	---	96	80-120%	---	---	
Copper	55.6	---	2.00	ug/L	1	55.6	---	100	80-120%	---	---	
Lead	54.9	---	0.200	ug/L	1	55.6	---	99	80-120%	---	---	
Manganese	52.9	---	1.00	ug/L	1	55.6	---	95	80-120%	---	---	
Mercury	0.935	---	0.0800	ug/L	1	1.11	---	84	80-120%	---	---	
Vanadium	51.9	---	2.00	ug/L	1	55.6	---	93	80-120%	---	---	
Zinc	56.7	---	4.00	ug/L	1	55.6	---	102	80-120%	---	---	
Duplicate (22K0956-DUP1)			Prepared: 11/29/22 10:36 Analyzed: 11/29/22 17:16									
QC Source Sample: HC-2 (A2K0762-01)												
EPA 6020B												
Arsenic	1.60	---	1.00	ug/L	1	---	1.64	---	---	2	20%	
Cadmium	0.420	---	0.200	ug/L	1	---	0.395	---	---	6	20%	
Chromium	ND	---	2.00	ug/L	1	---	ND	---	---	---	20%	
Copper	ND	---	2.00	ug/L	1	---	ND	---	---	---	20%	
Lead	ND	---	0.200	ug/L	1	---	ND	---	---	---	20%	
Manganese	70.6	---	1.00	ug/L	1	---	69.8	---	---	1	20%	
Mercury	ND	---	0.0800	ug/L	1	---	ND	---	---	---	20%	
Vanadium	ND	---	2.00	ug/L	1	---	ND	---	---	---	20%	

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Page 15 of 31

01/19/2023

Page 15 of 23



ANALYTICAL REPORT

AMENDED REPORT

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6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Apex Companies, LLC

15618 SW 72nd Ave

Tigard, OR 97224

Project: **POP T4 - Slip 3 GW**

Project Number: 7573-00

Project Manager: Steve Misner

Report ID:

A2K0762 - 01 19 23 1118

QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22K0956 - EPA 3015A						Water						
Duplicate (22K0956-DUP1)			Prepared: 11/29/22 10:36 Analyzed: 11/29/22 17:16									
QC Source Sample: HC-2 (A2K0762-01)												
Zinc	91.0	---	4.00	ug/L	1	---	90.9	---	---	0.04	20%	
Matrix Spike (22K0956-MS1)			Prepared: 11/29/22 10:36 Analyzed: 11/29/22 17:21									
QC Source Sample: HC-2 (A2K0762-01)												
EPA 6020B												
Arsenic	55.8	---	1.00	ug/L	1	55.6	1.64	97	75-125%	---	---	
Cadmium	54.9	---	0.200	ug/L	1	55.6	0.395	98	75-125%	---	---	
Chromium	53.8	---	2.00	ug/L	1	55.6	ND	97	75-125%	---	---	
Copper	57.4	---	2.00	ug/L	1	55.6	ND	103	75-125%	---	---	
Lead	54.9	---	0.200	ug/L	1	55.6	ND	99	75-125%	---	---	
Manganese	124	---	1.00	ug/L	1	55.6	69.8	98	75-125%	---	---	
Mercury	0.686	---	0.0800	ug/L	1	1.11	ND	62	75-125%	---	---	A-01, Q-01
Vanadium	53.7	---	2.00	ug/L	1	55.6	ND	97	75-125%	---	---	
Zinc	145	---	4.00	ug/L	1	55.6	90.9	98	75-125%	---	---	

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503-718-2323

ORELAP ID: OR100062

Apex Companies, LLC

15618 SW 72nd Ave

Tigard, OR 97224

Project: **POP T4 - Slip 3 GW**Project Number: **7573-00**Project Manager: **Steve Misner**

Report ID:

A2K0762 - 01 19 23 1118

SAMPLE PREPARATION INFORMATION

Diesel and/or Oil Hydrocarbons by NWTPH-Dx with Acid/Silica Gel Cleanup

Prep: EPA 3510C (Fuels/Acid Ext.) w/Silica Gel + Acid

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 22K0866							
A2K0762-01	Water	NWTPH-Dx/SG	11/17/22 14:20	11/23/22 09:59	1040mL/5mL	1000mL/5mL	0.96
A2K0762-03	Water	NWTPH-Dx/SG	11/17/22 11:30	11/23/22 09:59	1040mL/5mL	1000mL/5mL	0.96
A2K0762-05	Water	NWTPH-Dx/SG	11/17/22 13:40	11/23/22 06:37	1050mL/5mL	1000mL/5mL	0.95

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Prep: EPA 3511 (Bottle Extraction)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 22K0826							
A2K0762-01RE1	Water	EPA 8270E LVI	11/17/22 14:20	11/22/22 08:09	121.65mL/5mL	125mL/5mL	1.03
A2K0762-03	Water	EPA 8270E LVI	11/17/22 11:30	11/22/22 08:09	105.96mL/5mL	125mL/5mL	1.18
A2K0762-05	Water	EPA 8270E LVI	11/17/22 13:40	11/22/22 08:09	101.06mL/5mL	125mL/5mL	1.24

Total Metals by EPA 6020B (ICPMS)

Prep: EPA 3015A

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 22K0956							
A2K0762-01	Water	EPA 6020B	11/17/22 14:20	11/29/22 10:36	45mL/50mL	45mL/50mL	1.00
A2K0762-02	Water	EPA 6020B	11/17/22 14:20	11/29/22 10:36	45mL/50mL	45mL/50mL	1.00
A2K0762-03	Water	EPA 6020B	11/17/22 11:30	11/29/22 10:36	45mL/50mL	45mL/50mL	1.00
A2K0762-04	Water	EPA 6020B	11/17/22 11:30	11/29/22 10:36	45mL/50mL	45mL/50mL	1.00
A2K0762-05	Water	EPA 6020B	11/17/22 13:40	11/29/22 10:36	45mL/50mL	45mL/50mL	1.00
A2K0762-05RE1	Water	EPA 6020B	11/17/22 13:40	11/29/22 10:36	45mL/50mL	45mL/50mL	1.00
A2K0762-06	Water	EPA 6020B	11/17/22 13:40	11/29/22 10:36	45mL/50mL	45mL/50mL	1.00
A2K0762-06RE1	Water	EPA 6020B	11/17/22 13:40	11/29/22 10:36	45mL/50mL	45mL/50mL	1.00

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Page 17 of 31

01/19/2023

Page 17 of 23

**ANALYTICAL REPORT****AMENDED REPORT****Apex Laboratories, LLC**

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

Apex Companies, LLC

15618 SW 72nd Ave
Tigard, OR 97224

Project: **POP T4 - Slip 3 GW**

Project Number: **7573-00**

Project Manager: **Steve Misner**

Report ID:

A2K0762 - 01 19 23 1118

QUALIFIER DEFINITIONS**Client Sample and Quality Control (QC) Sample Qualifier Definitions:****Apex Laboratories**

- A-01** Serial dilution was performed and meets acceptance criteria. Data are acceptable.
- AMEND** The Result, Reporting Level, Recovery and/or RPD has changed. Note: Batch QC marked as AMENDED may or may not have been issued prior to the change. Case Narrative included if client data is affected.
- F-11** The hydrocarbon pattern indicates possible weathered diesel, mineral oil, or a contribution from a related component.
- Q-01** Spike recovery and/or RPD is outside acceptance limits.
- Q-19** Blank Spike Duplicate (BSD) sample analyzed in place of Matrix Spike/Duplicate samples due to limited sample amount available for analysis.
- Q-42** Matrix Spike and/or Duplicate analysis was performed on this sample. % Recovery or RPD for this analyte is outside laboratory control limits. (Refer to the QC Section of Analytical Report.)
- R-02** The Reporting Limit for this analyte has been raised to account for interference from coeluting organic compounds present in the sample.
- R-04** Reporting levels elevated due to preparation and/or analytical dilution necessary for analysis.
- S-05** Surrogate recovery is estimated due to sample dilution required for high analyte concentration and/or matrix interference.
- X** See Case Narrative.

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Page 18 of 31 01/19/2023

Page 18 of 23

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Project: **POP T4 - Slip 3 GW**Project Number: **7573-00**Project Manager: **Steve Misner****Report ID:****A2K0762 - 01 19 23 1118****REPORTING NOTES AND CONVENTIONS:****Abbreviations:**

DET Analyte DETECTED at or above the detection or reporting limit.
ND Analyte NOT DETECTED at or above the detection or reporting limit.
NR Result Not Reported
RPD Relative Percent Difference. RPDs for Matrix Spikes and Matrix Spike Duplicates are based on concentration, not recovery.

Detection Limits: Limit of Detection (LOD)

Limits of Detection (LODs) are normally set at a level of one half the validated Limit of Quantitation (LOQ).

If no value is listed ('-----'), then the data has not been evaluated below the Reporting Limit.

Reporting Limits: Limit of Quantitation (LOQ)

Validated Limits of Quantitation (LOQs) are reported as the Reporting Limits for all analyses where the LOQ, MRL, PQL or CRL are requested. The LOQ represents a level at or above the low point of the calibration curve, that has been validated according to Apex Laboratories' comprehensive LOQ policies and procedures.

Reporting Conventions:

Basis: Results for soil samples are generally reported on a 100% dry weight basis.

The Result Basis is listed following the units as "dry", "wet", or " " (blank) designation.

"dry" Sample results and Reporting Limits are reported on a dry weight basis. (i.e. "ug/kg dry")

See Percent Solids section for details of dry weight analysis.

"wet" Sample results and Reporting Limits for this analysis are normally dry weight corrected, but have not been modified in this case.

" " Results without 'wet' or 'dry' designation are not normally dry weight corrected. These results are considered 'As Received'.

QC Source:

In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) may be analyzed to demonstrate accuracy and precision of the extraction batch.

Non-Client Batch QC Samples (Duplicates and Matrix Spike/Duplicates) may not be included in this report. Please request a Full QC report if this data is required.

Miscellaneous Notes:

" --- " QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.

" *** " Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).

Blanks:

Standard practice is to evaluate the results from Blank QC Samples down to a level equal to ½ the Reporting Limit (RL).

-For Blank hits falling between ½ the RL and the RL (J flagged hits), the associated sample and QC data will receive a 'B-02' qualifier.

-For Blank hits above the RL, the associated sample and QC data will receive a 'B' qualifier, per Apex Laboratories' Blank Policy.

For further details, please request a copy of this document.

Apex Laboratories

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Page 19 of 31

01/19/2023

Page 19 of 23

**ANALYTICAL REPORT****AMENDED REPORT****Apex Laboratories, LLC**

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Project Number: 7573-00

Project Manager: Steve Misner

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REPORTING NOTES AND CONVENTIONS (Cont.):**Blanks (Cont.):**

Sample results flagged with a 'B' or 'B-02' qualifier are potentially biased high if the sample results are less than ten times the level found in the blank for inorganic analyses, or less than five times the level found in the blank for organic analyses.

'B' and 'B-02' qualifications are only applied to sample results detected above the Reporting Level.

Preparation Notes:**Mixed Matrix Samples:****Water Samples:**

Water samples containing significant amounts of sediment are decanted or separated prior to extraction, and only the water portion analyzed, unless otherwise directed by the client.

Soil and Sediment Samples:

Soil and Sediment samples containing significant amounts of water are decanted prior to extraction, and only the solid portion analyzed, unless otherwise directed by the client.

Sampling and Preservation Notes:

Certain regulatory programs, such as National Pollutant Discharge Elimination System (NPDES), require that activities such as sample filtration (for dissolved metals, orthophosphate, hexavalent chromium, etc.) and testing of short hold analytes (pH, Dissolved Oxygen, etc.) be performed in the field (on-site) within a short time window. In addition, sample matrix spikes are required for some analyses, and sufficient volume must be provided, and billable site specific QC requested, if this is required. All regulatory permits should be reviewed to ensure that these requirements are being met.

Data users should be aware of which regulations pertain to the samples they submit for testing. If related sample collection activities are not approved for a particular regulatory program, results should be considered estimates. Apex Laboratories will qualify these analytes according to the most stringent requirements, however results for samples that are for non-regulatory purposes may be acceptable.

Samples that have been filtered and preserved at Apex Laboratories per client request are listed in the preparation section of the report with the date and time of filtration listed.

Apex Laboratories maintains detailed records on sample receipt, including client label verification, cooler temperature, sample preservation, hold time compliance and field filtration. Data is qualified as necessary, and the lack of qualification indicates compliance with required parameters.

Apex Laboratories

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.

Darrell Auvil, Client Services Manager

Report is complete only if it includes Fremont Analytical Laboratories Data.

Page 20 of 31

01/19/2023

Page 20 of 23

**ANALYTICAL REPORT****AMENDED REPORT****Apex Laboratories, LLC**

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

Apex Companies, LLC

15618 SW 72nd Ave
Tigard, OR 97224

Project: **POP T4 - Slip 3 GW**

Project Number: 7573-00

Project Manager: Steve Misner

Report ID:

A2K0762 - 01 19 23 1118

LABORATORY ACCREDITATION INFORMATION

ORELAP Certification ID: OR100062 (Primary Accreditation) -

EPA ID: OR01039

All methods and analytes reported from work performed at Apex Laboratories are included on Apex Laboratories' ORELAP Scope of Certification, with the exception of any analyte(s) listed below:

Apex Laboratories

Matrix	Analysis	TNI_ID	Analyte	TNI_ID	Accreditation
<u>All reported analytes are included in Apex Laboratories' current ORELAP scope.</u>					

Secondary Accreditations

Apex Laboratories also maintains reciprocal accreditation with non-TNI states (Washington DOE), as well as other state specific accreditations not listed here.

Subcontract Laboratory Accreditations

Subcontracted data falls outside of Apex Laboratories' Scope of Accreditation.

Please see the Subcontract Laboratory report for full details, or contact your Project Manager for more information.

Field Testing Parameters

Results for Field Tested data are provided by the client or sampler, and fall outside of Apex Laboratories' Scope of Accreditation.

Apex Laboratories

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Darrell Auvil, Client Services Manager

ANALYTICAL REPORT

AMENDED REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: **OR100062**

Apex Companies, LLC

15618 SW 72nd Ave

Tigard, OR 97224

Project: POP T4 - Slip 3 GW

Project Number: 7573-00

Project Manager: **Steve Misner**

Report ID:

A2K0762 - 01 19 23 1118

CHAIN OF CUSTODY RECORD

Client Name: Apex Companies, LLC

Address: 15618 SW 72nd Ave

City/State/Zip: Tigard, OR 97224

Telephone Number: 503.924.4704

Fax No.: 503.943.6357

Project Manager: Steve Misner

Project Name: Terminal 4 Slip 3 Groundwater Sampling

Project Number: 7573-00

Sampler Name: Franklin Sullivan

Report To: Steve.Misner@apexcos.com

Page: 1 of 1

ANALYZE FOR:

Sample ID / Description	Date Sampled	Time Sampled	No. of Containers Shipped	Grab	Composite	Field Filtered for Diss. Metals	Ice	HNO ₃ (Red Label)	HClO ₄ (Blue Label)	NaOH (Orange Label)	H ₂ SO ₄ (Yellow Label)	H ₂ SO ₄ Plastic (Yellow Label)	None (Black Label)	Other (Specify)	Groundwater	Drinking Water	Sludge	Soil	Other (Specify)	NWTFH-DX w/ Silica Gel Cleanup	PAHs EPA Method 8270 SIM	Total and Dissolved Metals (As, Cd, Cr, Cu, Pb, Mn, Hg, Zn, V)	C10-C12 Aliphatic Hydrocarbons (NM EPH/PH)	RUSH TAT (Pre-Schedule)	Standard TAT	Fax Results	Send QC with report
BE-1																											
BE-5																											
HC-2	11/17/22	1420	5	X		X	X	X	X						X					X	X	X					
HC-5	11/17/22	1130	5	X		X	X	X	X						X					X	X	X					
HC-6S																											
HC-12D	11/17/22	1340	5	X		X	X	X	X						X					X	X	X					

Special Instructions: Please sub the C10-C12 Aliphatic hydrocarbons to Fremont Lab in Seattle, Wa

Relinquished by: Name/Company	Date	Time	Received by: Name/Company	Date	Time
Franklin Sullivan / Apex	11/21/22	0930	Steve Misner / Apex	11/21/22	0930
Relinquished by: Name/Company	Date	Time	Received by: Name/Company	Date	Time
Steve Misner / Apex	11/21/22	1337	Franklin Sullivan / Apex	11/21/22	1337
Relinquished by: Name/Company	Date	Time	Received by: Name/Company	Date	Time
Relinquished by: Name/Company	Date	Time	Received by: Name/Company	Date	Time

Laboratory Comments:

Temperature Upon Receipt: _____

VOCs Free of Headspace? Y N

Apex Laboratories

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Darrell Auvil, Client Services Manager

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Page 22 of 31 01/19/2023

Page 22 of 23



ANALYTICAL REPORT

AMENDED REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Apex Companies, LLC

15618 SW 72nd Ave

Tigard, OR 97224

Project: POP T4 - Slip 3 GW

Project Number: 7573-00

Project Manager: Steve Misner

Report ID:

A2K0762 - 01 19 23 1118

APEXLABS COOLER RECEIPT FORM

Client: Apex Companies, LLC Element WO#: A2 K0762Project/Project #: Terminal 4 Slip 3 Groundwater Sampling #7573-00

Delivery Info:

Date/time received: 11/21/22 @ 1337 By: ALCDelivered by: Apex ☐ Client ☒ ESS ☐ FedEx ☐ UPS ☐ Swift ☐ Senvoy ☐ SDS ☐ Other ☐Cooler Inspection Date/time inspected: 11/21/22 @ 1337 By: ALCChain of Custody included? Yes ☒ No ☐ Custody seals? Yes ☐ No ☒Signed/dated by client? Yes ☒ No ☐Signed/dated by Apex? Yes ☒ No ☐

	Cooler #1	Cooler #2	Cooler #3	Cooler #4	Cooler #5	Cooler #6	Cooler #7
Temperature (°C)	<u>3.1</u>						
Received on ice? (Y/N)	<u>Y</u>						
Temp. blanks? (Y/N)	<u>Y</u>						
Ice type: (Gel/Real/Other)	<u>Real</u>						
Condition (In/Out):	<u>In</u>						

Cooler out of temp? (Y/N) No Possible reason why:Green dots applied to out of temperature samples? Yes ☒ No ☐Out of temperature samples form initiated? Yes ☒ No ☐Sample Inspection: Date/time inspected: 11/21/22 @ 13:57 By: ZAMAll samples intact? Yes ☒ No ☐ Comments:Bottle labels/COCs agree? Yes ☒ No ☒ Comments: 2AM 11/21/22
5 but 8 containers were received.COC/container discrepancies form initiated? Yes ☐ No ☒ Comments: 2AM 11/21/22Containers/volumes received appropriate for analysis? Yes ☒ No ☒ Comments: 2 1/2 HNO3 Polys
not indicated if FF, but listed on COC as FFDo VOA vials have visible headspace? Yes ☐ No ☐ NA ☒

Comments:

Water samples: pH checked: Yes ☒ No ☐ NA ☐ pH appropriate? Yes ☐ No ☒ NA ☐Comments: 1/4 IL Ambers for HC-2D pH 7

Additional information:

Labeled by:

ZAM

Witness:

DJS

Cooler Inspected by:

ZAM

Form Y-003 R-00

Apex Laboratories

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Darrell Auvil, Client Services Manager

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Page 23 of 31

01/19/2023

Page 23 of 23



3600 Fremont Ave. N.
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

Apex Laboratories
Darrell Auvil
6700 SW Sandburg St
Tigard, OR 97223

RE: A2K0762
Work Order Number: 2211597

December 12, 2022

Attention Darrell Auvil:

Fremont Analytical, Inc. received 3 sample(s) on 11/30/2022 for the analyses presented in the following report.

Extractable Petroleum Hydrocarbons by NWEPH

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Brianna Barnes
Project Manager

CC:
Sub Data

*DoD-ELAP Accreditation #79636 by PJLA, ISO/IEC 17025:2017 and QSM 5.3 for Environmental Testing
ORELAP Certification: WA 100009 (NELAP Recognized) for Environmental Testing
Washington State Department of Ecology Accredited for Environmental Testing, Lab ID C910*

Original

www.fremontanalytical.com

CLIENT: Apex Laboratories
Project: A2K0762
Work Order: 2211597

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
2211597-001	HC-2	11/17/2022 2:20 PM	11/30/2022 10:04 AM
2211597-002	HC-5	11/17/2022 11:30 AM	11/30/2022 10:04 AM
2211597-003	HC-12D	11/17/2022 1:40 PM	11/30/2022 10:04 AM

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

Original

CLIENT: Apex Laboratories**Project:** A2K0762

I. SAMPLE RECEIPT:

Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:

Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:

Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Qualifiers:

- * - Flagged value is not within established control limits
- B - Analyte detected in the associated Method Blank
- D - Dilution was required
- E - Value above quantitation range
- H - Holding times for preparation or analysis exceeded
- I - Analyte with an internal standard that does not meet established acceptance criteria
- J - Analyte detected below Reporting Limit
- N - Tentatively Identified Compound (TIC)
- Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria
- S - Spike recovery outside accepted recovery limits
- ND - Not detected at the Reporting Limit
- R - High relative percent difference observed

Acronyms:

- %Rec - Percent Recovery
- CCB - Continued Calibration Blank
- CCV - Continued Calibration Verification
- DF - Dilution Factor
- DUP - Sample Duplicate
- HEM - Hexane Extractable Material
- ICV - Initial Calibration Verification
- LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
- MCL - Maximum Contaminant Level
- MB or MBLANK - Method Blank
- MDL - Method Detection Limit
- MS/MSD - Matrix Spike / Matrix Spike Duplicate
- PDS - Post Digestion Spike
- Ref Val - Reference Value
- REP - Sample Replicate
- RL - Reporting Limit
- RPD - Relative Percent Difference
- SD - Serial Dilution
- SGT - Silica Gel Treatment
- SPK - Spike
- Surr - Surrogate



Analytical Report

Work Order: 2211597

Date Reported: 12/12/2022

CLIENT: Apex Laboratories

Project: A2K0762

Lab ID: 2211597-001

Client Sample ID: HC-2

Collection Date: 11/17/2022 2:20:00 PM

Matrix: Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed

Extractable Petroleum Hydrocarbons by NWEPH

Batch ID: 38618

Analyst: KJ

Aliphatic Hydrocarbon (C10-C12)	ND	39.5		µg/L	1	12/8/2022 12:53:18 PM
Surr: 1-Chlorooctadecane	68.5	50 - 150		%Rec	1	12/8/2022 12:53:18 PM

Lab ID: 2211597-002

Client Sample ID: HC-5

Collection Date: 11/17/2022 11:30:00 AM

Matrix: Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed

Extractable Petroleum Hydrocarbons by NWEPH

Batch ID: 38618

Analyst: KJ

Aliphatic Hydrocarbon (C10-C12)	137	39.6		µg/L	1	12/8/2022 1:16:29 PM
Surr: 1-Chlorooctadecane	47.0	50 - 150	S	%Rec	1	12/8/2022 1:16:29 PM

NOTES:

S - Outlying surrogate recovery(ies) observed.

Lab ID: 2211597-003

Client Sample ID: HC-12D

Collection Date: 11/17/2022 1:40:00 PM

Matrix: Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed

Extractable Petroleum Hydrocarbons by NWEPH

Batch ID: 38618

Analyst: KJ

Aliphatic Hydrocarbon (C10-C12)	ND	39.8		µg/L	1	12/8/2022 1:39:21 PM
Surr: 1-Chlorooctadecane	59.5	50 - 150		%Rec	1	12/8/2022 1:39:21 PM

Original

Work Order: 2211597
CLIENT: Apex Laboratories
Project: A2K0762

QC SUMMARY REPORT

Extractable Petroleum Hydrocarbons by NWEPH

Sample ID: MB-38618		SampType: MBLK			Units: µg/L		Prep Date: 11/23/2022			RunNo: 80391		
Client ID: MBLKW		Batch ID: 38618			Analysis Date: 12/8/2022					SeqNo: 1661073		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Aliphatic Hydrocarbon (C10-C12)	ND	39.9		0	0						
Surr: 1-Chlorooctadecane	288		399.0		72.3	50	150				

Sample ID: LCS-38618		SampType: LCS			Units: µg/L		Prep Date: 11/23/2022			RunNo: 80391		
Client ID: LCSW		Batch ID: 38618			Analysis Date: 12/8/2022					SeqNo: 1661074		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Aliphatic Hydrocarbon (C10-C12)	350	39.9	499.2	0	70.1	25.3	107				
Surr: 1-Chlorooctadecane	298		399.3		74.7	50	150				

Sample ID: LCSD-38618		SampType: LCSD			Units: µg/L		Prep Date: 11/23/2022			RunNo: 80391		
Client ID: LCSW02		Batch ID: 38618			Analysis Date: 12/8/2022					SeqNo: 1661075		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Aliphatic Hydrocarbon (C10-C12)	342	39.8	497.1	0	68.8	25.3	107	350.0	2.36	20	
Surr: 1-Chlorooctadecane	297		397.7		74.7	50	150		0		

Sample ID: 2211286-005BMS		SampType: MS			Units: µg/L		Prep Date: 11/23/2022			RunNo: 80391		
Client ID: BATCH		Batch ID: 38618			Analysis Date: 12/8/2022					SeqNo: 1661077		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Aliphatic Hydrocarbon (C10-C12)	349	40.8	510.1	0	68.4	17.1	108				
Surr: 1-Chlorooctadecane	274		408.0		67.1	50	150				

Client Name: **APEX**

 Work Order Number: **2211597**

 Logged by: **Elisabeth Samoray**

 Date Received: **11/30/2022 10:04:00 AM**

Chain of Custody

1. Is Chain of Custody complete? Yes ☒ No ☐ Not Present ☐
2. How was the sample delivered? UPS

Log In

3. Coolers are present? Yes ☒ No ☐ NA ☐
4. Shipping container/cooler in good condition? Yes ☒ No ☐
5. Custody Seals present on shipping container/cooler?
(Refer to comments for Custody Seals not intact) Yes ☐ No ☐ Not Present ☒
6. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
7. Were all items received at a temperature of >2°C to 6°C * Yes ☒ No ☐ NA ☐
8. Sample(s) in proper container(s)? Yes ☒ No ☐
9. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
10. Are samples properly preserved? Yes ☒ No ☐
11. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
12. Is there headspace in the VOA vials? Yes ☐ No ☐ NA ☒
13. Did all samples containers arrive in good condition(unbroken)? Yes ☒ No ☐
14. Does paperwork match bottle labels? Yes ☒ No ☐
15. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
16. Is it clear what analyses were requested? Yes ☒ No ☐
17. Were all holding times able to be met? Yes ☒ No ☐

Special Handling (if applicable)

18. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☒

Person Notified:		Date:	
By Whom:		Via:	☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:			
Client Instructions:			

19. Additional remarks:

Item Information

Item #	Temp °C
Sample 1	4.5

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

Original

SUBCONTRACT ORDER

Apex Laboratories

A2K0762

2211597

SENDING LABORATORY:

Apex Laboratories
6700 S.W. Sandburg Street
Tigard, OR 97223
Phone: (503) 718-2323
Fax: (503) 336-0745
Project Manager: Darrell Auvil

RECEIVING LABORATORY:

Fremont Analytical
3600 Fremont Avenue N.
Seattle, WA 98103
Phone: (206) 352-3790
Fax: (206) 352-7178

Sample Name: HC-2 Water CoC reads container quantity as 5 but 8 were r
Sampled: 11/17/22 14:20 (A2K0762-01)

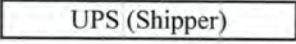
Analysis	Due	Expires	Comments
NWTPH-EPH (Sub)	12/13/22 17:00	12/01/22 14:20	c10-c12 aliphatic ONLY
Containers Supplied:			
(F)1 L Amber Glass - HCL			
(G)1 L Amber Glass - HCL			

Sample Name: HC-5 Water CoC reads container quantity as 5 but 8 were r
Sampled: 11/17/22 11:30 (A2K0762-03)

Analysis	Due	Expires	Comments
NWTPH-EPH (Sub)	12/13/22 17:00	12/01/22 11:30	c10-c12 aliphatic ONLY
Containers Supplied:			
(F)1 L Amber Glass - HCL			
(G)1 L Amber Glass - HCL			

Sample Name: HC-12D Water CoC reads container quantity as 5 but 8 were r
Sampled: 11/17/22 13:40 (A2K0762-05)

Analysis	Due	Expires	Comments
NWTPH-EPH (Sub)	12/13/22 17:00	12/01/22 13:40	c10-c12 aliphatic ONLY
Containers Supplied:			
(F)1 L Amber Glass - HCL			
(G)1 L Amber Glass - HCL			

Released By  Date 11-28-22
Received By  Date 11/30 10:04
Released By  Date
Received By  Date



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

Thursday, January 12, 2023

Steve Misner
Apex Companies, LLC
15618 SW 72nd Ave
Tigard, OR 97224

RE: A2L0619 - POP T4 - Slip 3 GW - 7573-00

Thank you for using Apex Laboratories. We greatly appreciate your business and strive to provide the highest quality services to the environmental industry.

Enclosed are the results of analyses for work order A2L0619, which was received by the laboratory on 12/14/2022 at 3:53:00PM.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: DAuvil@apex-labs.com, or by phone at 503-718-2323.

Please note: All samples will be disposed of within 30 days of sample receipt, unless prior arrangements have been made.

Cooler Receipt Information

(See Cooler Receipt Form for details)

Cooler #1	2.4 degC

This Final Report is the official version of the data results for this sample submission, unless superseded by a subsequent, labeled amended report.

All other deliverables derived from this data, including Electronic Data Deliverables (EDDs), CLP-like forms, client requested summary sheets, and all other products are considered secondary to this report.



Apex Laboratories

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

Apex Companies, LLC

15618 SW 72nd Ave
Tigard, OR 97224

Project: POP T4 - Slip 3 GW

Project Number: 7573-00

Project Manager: Steve Misner

Report ID:

A2L0619 - 01 12 23 1206

ANALYTICAL REPORT FOR SAMPLES

SAMPLE INFORMATION

Client Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BE-1	A2L0619-01	Water	12/14/22 12:00	12/14/22 15:53
BE-5	A2L0619-02	Water	12/14/22 12:00	12/14/22 15:53

Apex Laboratories

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323

ORELAP ID: OR100062

Apex Companies, LLC

15618 SW 72nd Ave
Tigard, OR 97224Project: POP T4 - Slip 3 GW

Project Number: 7573-00

Project Manager: Steve Misner

Report ID:

A2L0619 - 01 12 23 1206

ANALYTICAL SAMPLE RESULTS

Diesel and/or Oil Hydrocarbons by NWTPH-Dx with Acid/Silica Gel Cleanup

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
BE-1 (A2L0619-01)		Matrix: Water			Batch: 22L0833			
Diesel	ND	---	0.190	mg/L	1	12/27/22 22:11	NWTPH-Dx/SG	
Oil	ND	---	0.381	mg/L	1	12/27/22 22:11	NWTPH-Dx/SG	
Surrogate: o-Terphenyl (Surr)		Recovery: 85 %		Limits: 50-150 %	1	12/27/22 22:11	NWTPH-Dx/SG	
BE-5 (A2L0619-02)		Matrix: Water			Batch: 22L0833			
Diesel	ND	---	0.192	mg/L	1	12/27/22 22:31	NWTPH-Dx/SG	
Oil	ND	---	0.385	mg/L	1	12/27/22 22:31	NWTPH-Dx/SG	
Surrogate: o-Terphenyl (Surr)		Recovery: 86 %		Limits: 50-150 %	1	12/27/22 22:31	NWTPH-Dx/SG	

Apex Laboratories

Darrell Auvil, Client Services Manager

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ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323

ORELAP ID: OR100062

Apex Companies, LLC

15618 SW 72nd Ave
Tigard, OR 97224Project: **POP T4 - Slip 3 GW**

Project Number: 7573-00

Project Manager: Steve Misner

Report ID:

A2L0619 - 01 12 23 1206

ANALYTICAL SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
BE-1 (A2L0619-01)		Matrix: Water			Batch: 22L0585			
Acenaphthene	ND	---	0.0447	ug/L	1	12/16/22 20:41	EPA 8270E LVI	R-02
Acenaphthylene	ND	---	0.0447	ug/L	1	12/16/22 20:41	EPA 8270E LVI	
Anthracene	ND	---	0.0559	ug/L	1	12/16/22 20:41	EPA 8270E LVI	
Benz(a)anthracene	ND	---	0.0224	ug/L	1	12/16/22 20:41	EPA 8270E LVI	
Benzo(a)pyrene	ND	---	0.0224	ug/L	1	12/16/22 20:41	EPA 8270E LVI	
Benzo(b)fluoranthene	ND	---	0.0224	ug/L	1	12/16/22 20:41	EPA 8270E LVI	
Benzo(k)fluoranthene	ND	---	0.0224	ug/L	1	12/16/22 20:41	EPA 8270E LVI	
Benzo(g,h,i)perylene	ND	---	0.0447	ug/L	1	12/16/22 20:41	EPA 8270E LVI	
Chrysene	ND	---	0.0224	ug/L	1	12/16/22 20:41	EPA 8270E LVI	
Dibenz(a,h)anthracene	ND	---	0.0224	ug/L	1	12/16/22 20:41	EPA 8270E LVI	
Fluoranthene	ND	---	0.0447	ug/L	1	12/16/22 20:41	EPA 8270E LVI	
Fluorene	ND	---	0.0447	ug/L	1	12/16/22 20:41	EPA 8270E LVI	
Indeno(1,2,3-cd)pyrene	ND	---	0.0224	ug/L	1	12/16/22 20:41	EPA 8270E LVI	
1-Methylnaphthalene	0.103	---	0.0895	ug/L	1	12/16/22 20:41	EPA 8270E LVI	
2-Methylnaphthalene	0.114	---	0.0895	ug/L	1	12/16/22 20:41	EPA 8270E LVI	
Naphthalene	0.182	---	0.0895	ug/L	1	12/16/22 20:41	EPA 8270E LVI	
Phenanthrene	ND	---	0.0895	ug/L	1	12/16/22 20:41	EPA 8270E LVI	
Pyrene	ND	---	0.0447	ug/L	1	12/16/22 20:41	EPA 8270E LVI	
Carbazole	ND	---	0.0447	ug/L	1	12/16/22 20:41	EPA 8270E LVI	
Dibenzofuran	ND	---	0.0447	ug/L	1	12/16/22 20:41	EPA 8270E LVI	
Surrogate: Acenaphthylene-d8 (Surr)		Recovery: 100 %		Limits: 78-134 %	1	12/16/22 20:41	EPA 8270E LVI	
Benzo(a)pyrene-d12 (Surr)		106 %		80-132 %	1	12/16/22 20:41	EPA 8270E LVI	

BE-5 (A2L0619-02)

Matrix: Water

Batch: 22L0585

Acenaphthene	ND	---	0.0329	ug/L	1	12/16/22 21:13	EPA 8270E LVI
Acenaphthylene	ND	---	0.0329	ug/L	1	12/16/22 21:13	EPA 8270E LVI
Anthracene	ND	---	0.0329	ug/L	1	12/16/22 21:13	EPA 8270E LVI
Benz(a)anthracene	ND	---	0.0165	ug/L	1	12/16/22 21:13	EPA 8270E LVI
Benzo(a)pyrene	ND	---	0.0165	ug/L	1	12/16/22 21:13	EPA 8270E LVI
Benzo(b)fluoranthene	ND	---	0.0165	ug/L	1	12/16/22 21:13	EPA 8270E LVI
Benzo(k)fluoranthene	ND	---	0.0165	ug/L	1	12/16/22 21:13	EPA 8270E LVI
Benzo(g,h,i)perylene	ND	---	0.0329	ug/L	1	12/16/22 21:13	EPA 8270E LVI
Chrysene	ND	---	0.0165	ug/L	1	12/16/22 21:13	EPA 8270E LVI

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323

ORELAP ID: OR100062

Apex Companies, LLC

15618 SW 72nd Ave
Tigard, OR 97224Project: **POP T4 - Slip 3 GW**

Project Number: 7573-00

Project Manager: Steve Misner

Report ID:

A2L0619 - 01 12 23 1206

ANALYTICAL SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
BE-5 (A2L0619-02)		Matrix: Water			Batch: 22L0585			
Dibenz(a,h)anthracene	ND	---	0.0165	ug/L	1	12/16/22 21:13	EPA 8270E LVI	
Fluoranthene	ND	---	0.0329	ug/L	1	12/16/22 21:13	EPA 8270E LVI	
Fluorene	ND	---	0.0329	ug/L	1	12/16/22 21:13	EPA 8270E LVI	
Indeno(1,2,3-cd)pyrene	ND	---	0.0165	ug/L	1	12/16/22 21:13	EPA 8270E LVI	
1-Methylnaphthalene	ND	---	0.0659	ug/L	1	12/16/22 21:13	EPA 8270E LVI	
2-Methylnaphthalene	ND	---	0.0659	ug/L	1	12/16/22 21:13	EPA 8270E LVI	
Naphthalene	0.231	---	0.0659	ug/L	1	12/16/22 21:13	EPA 8270E LVI	
Phenanthrene	ND	---	0.0659	ug/L	1	12/16/22 21:13	EPA 8270E LVI	
Pyrene	ND	---	0.0329	ug/L	1	12/16/22 21:13	EPA 8270E LVI	
Carbazole	ND	---	0.0329	ug/L	1	12/16/22 21:13	EPA 8270E LVI	
Dibenzofuran	ND	---	0.0329	ug/L	1	12/16/22 21:13	EPA 8270E LVI	
Surrogate: Acenaphthylene-d8 (Surr)		Recovery:	101 %	Limits:	78-134 %	1	12/16/22 21:13	EPA 8270E LVI
Benzo(a)pyrene-d12 (Surr)			108 %		80-132 %	1	12/16/22 21:13	EPA 8270E LVI

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ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
BE-1 (A2L0619-01RE1) Matrix: Water								
Batch: 22L0892								
Arsenic	4.99	---	1.00	ug/L	1	12/28/22 20:32	EPA 6020B	
Cadmium	ND	---	0.200	ug/L	1	12/28/22 20:32	EPA 6020B	
Chromium	ND	---	2.00	ug/L	1	12/28/22 20:32	EPA 6020B	
Copper	ND	---	2.00	ug/L	1	12/28/22 20:32	EPA 6020B	
Lead	1.22	---	0.200	ug/L	1	12/28/22 20:32	EPA 6020B	
Mercury	ND	---	0.0800	ug/L	1	12/28/22 20:32	EPA 6020B	
Vanadium	ND	---	2.00	ug/L	1	12/28/22 20:32	EPA 6020B	
Zinc	7.93	---	4.00	ug/L	1	12/28/22 20:32	EPA 6020B	
BE-1 (A2L0619-01RE2) Matrix: Water								
Batch: 22L0892								
Manganese	3600	---	10.0	ug/L	10	12/29/22 14:42	EPA 6020B	
BE-5 (A2L0619-02RE1) Matrix: Water								
Batch: 22L0892								
Arsenic	ND	---	1.00	ug/L	1	12/28/22 20:37	EPA 6020B	
Cadmium	ND	---	0.200	ug/L	1	12/28/22 20:37	EPA 6020B	
Chromium	ND	---	2.00	ug/L	1	12/28/22 20:37	EPA 6020B	
Copper	19.3	---	2.00	ug/L	1	12/28/22 20:37	EPA 6020B	
Lead	0.567	---	0.200	ug/L	1	12/28/22 20:37	EPA 6020B	
Manganese	16.1	---	1.00	ug/L	1	12/28/22 20:37	EPA 6020B	
Mercury	ND	---	0.0800	ug/L	1	12/28/22 20:37	EPA 6020B	
Vanadium	ND	---	2.00	ug/L	1	12/28/22 20:37	EPA 6020B	
Zinc	64.4	---	4.00	ug/L	1	12/28/22 20:37	EPA 6020B	

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15618 SW 72nd Ave
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Project Number: 7573-00

Project Manager: Steve Misner

Report ID:

A2L0619 - 01 12 23 1206

ANALYTICAL SAMPLE RESULTS

Dissolved Metals by EPA 6020B (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
BE-1 (A2L0619-01) Matrix: Water								
Batch: 22L0908								
Arsenic	6.85	---	1.00	ug/L	1	12/29/22 15:46	EPA 6020B (Diss)	
Cadmium	ND	---	0.200	ug/L	1	12/29/22 15:46	EPA 6020B (Diss)	
Chromium	ND	---	2.00	ug/L	1	12/29/22 15:46	EPA 6020B (Diss)	
Copper	22.3	---	2.00	ug/L	1	12/29/22 15:46	EPA 6020B (Diss)	
Lead	0.733	---	0.200	ug/L	1	12/29/22 15:46	EPA 6020B (Diss)	
Mercury	ND	---	0.0800	ug/L	1	12/29/22 15:46	EPA 6020B (Diss)	
Vanadium	ND	---	2.00	ug/L	1	12/29/22 15:46	EPA 6020B (Diss)	
Zinc	11.9	---	4.00	ug/L	1	12/29/22 15:46	EPA 6020B (Diss)	
BE-1 (A2L0619-01RE3) Matrix: Water								
Batch: 22L0908								
Manganese	3280	---	10.0	ug/L	10	12/29/22 17:30	EPA 6020B (Diss)	
BE-5 (A2L0619-02) Matrix: Water								
Batch: 22L0908								
Arsenic	ND	---	1.00	ug/L	1	12/29/22 15:51	EPA 6020B (Diss)	
Cadmium	0.258	---	0.200	ug/L	1	12/29/22 15:51	EPA 6020B (Diss)	
Chromium	ND	---	2.00	ug/L	1	12/29/22 15:51	EPA 6020B (Diss)	
Copper	3.59	---	2.00	ug/L	1	12/29/22 15:51	EPA 6020B (Diss)	
Lead	4.56	---	0.200	ug/L	1	12/29/22 15:51	EPA 6020B (Diss)	
Manganese	89.3	---	1.00	ug/L	1	12/29/22 15:51	EPA 6020B (Diss)	
Mercury	ND	---	0.0800	ug/L	1	12/29/22 15:51	EPA 6020B (Diss)	
Vanadium	2.55	---	2.00	ug/L	1	12/29/22 15:51	EPA 6020B (Diss)	
Zinc	50.6	---	4.00	ug/L	1	12/29/22 15:51	EPA 6020B (Diss)	

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Apex Companies, LLC

15618 SW 72nd Ave
Tigard, OR 97224Project: **POP T4 - Slip 3 GW**

Project Number: 7573-00

Project Manager: Steve Misner

Report ID:

A2L0619 - 01 12 23 1206

QUALITY CONTROL (QC) SAMPLE RESULTS

Diesel and/or Oil Hydrocarbons by NWTPH-Dx with Acid/Silica Gel Cleanup

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22L0833 - EPA 3510C (Fuels/Acid Ext.) w/Silica Gel + Acid							Water					
Blank (22L0833-BLK1)			Prepared: 12/27/22 06:52 Analyzed: 12/27/22 21:11									
<u>NWTPH-Dx/SG</u>												
Diesel	ND	---	0.182	mg/L	1	---	---	---	---	---	---	
Oil	ND	---	0.364	mg/L	1	---	---	---	---	---	---	
Surr: o-Terphenyl (Surr)		Recovery: 85 %		Limits: 50-150 %		Dilution: 1x						
LCS (22L0833-BS1)			Prepared: 12/27/22 06:52 Analyzed: 12/27/22 21:31									
<u>NWTPH-Dx/SG</u>												
Diesel	0.793	---	0.200	mg/L	1	1.25	---	63	36-132%	---	---	
Surr: o-Terphenyl (Surr)		Recovery: 90 %		Limits: 50-150 %		Dilution: 1x						
LCS Dup (22L0833-BSD1)			Prepared: 12/27/22 06:52 Analyzed: 12/27/22 21:51									
<u>NWTPH-Dx/SG</u>												
Diesel	0.869	---	0.200	mg/L	1	1.25	---	70	36-132%	9	30%	
Surr: o-Terphenyl (Surr)		Recovery: 93 %		Limits: 50-150 %		Dilution: 1x						

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Project Number: 7573-00

Project Manager: Steve Misner

Report ID:

A2L0619 - 01 12 23 1206

QUALITY CONTROL (QC) SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22L0585 - EPA 3511 (Bottle Extraction)						Water						
Blank (22L0585-BLK1)			Prepared: 12/16/22 06:36 Analyzed: 12/16/22 13:22									
EPA 8270E LVI												
Acenaphthene	ND	---	0.0320	ug/L	1	---	---	---	---	---	---	
Acenaphthylene	ND	---	0.0320	ug/L	1	---	---	---	---	---	---	
Anthracene	ND	---	0.0320	ug/L	1	---	---	---	---	---	---	
Benz(a)anthracene	ND	---	0.0160	ug/L	1	---	---	---	---	---	---	
Benzo(a)pyrene	ND	---	0.0160	ug/L	1	---	---	---	---	---	---	
Benzo(b)fluoranthene	ND	---	0.0160	ug/L	1	---	---	---	---	---	---	
Benzo(k)fluoranthene	ND	---	0.0160	ug/L	1	---	---	---	---	---	---	
Benzo(g,h,i)perylene	ND	---	0.0320	ug/L	1	---	---	---	---	---	---	
Chrysene	ND	---	0.0160	ug/L	1	---	---	---	---	---	---	
Dibenz(a,h)anthracene	ND	---	0.0160	ug/L	1	---	---	---	---	---	---	
Fluoranthene	ND	---	0.0320	ug/L	1	---	---	---	---	---	---	
Fluorene	ND	---	0.0320	ug/L	1	---	---	---	---	---	---	
Indeno(1,2,3-cd)pyrene	ND	---	0.0160	ug/L	1	---	---	---	---	---	---	
1-Methylnaphthalene	ND	---	0.0640	ug/L	1	---	---	---	---	---	---	
2-Methylnaphthalene	ND	---	0.0640	ug/L	1	---	---	---	---	---	---	
Naphthalene	ND	---	0.0640	ug/L	1	---	---	---	---	---	---	
Phenanthrene	ND	---	0.0640	ug/L	1	---	---	---	---	---	---	
Pyrene	ND	---	0.0320	ug/L	1	---	---	---	---	---	---	
Carbazole	ND	---	0.0320	ug/L	1	---	---	---	---	---	---	
Dibenzofuran	ND	---	0.0320	ug/L	1	---	---	---	---	---	---	
Surr: Acenaphthylene-d8 (Surr)		Recovery: 106 %		Limits: 78-134 %		Dilution: 1x						
Benzo(a)pyrene-d12 (Surr)		103 %		80-132 %		"						

LCS (22L0585-BS1)

Prepared: 12/16/22 06:36 Analyzed: 12/16/22 14:24

EPA 8270E LVI												
Acenaphthene	1.52	---	0.0320	ug/L	1	1.60	---	95	80-120%	---	---	
Acenaphthylene	1.76	---	0.0320	ug/L	1	1.60	---	110	80-124%	---	---	
Anthracene	1.61	---	0.0320	ug/L	1	1.60	---	100	80-123%	---	---	
Benz(a)anthracene	1.59	---	0.0160	ug/L	1	1.60	---	99	80-122%	---	---	
Benzo(a)pyrene	1.66	---	0.0160	ug/L	1	1.60	---	104	80-129%	---	---	
Benzo(b)fluoranthene	1.61	---	0.0160	ug/L	1	1.60	---	101	80-124%	---	---	
Benzo(k)fluoranthene	1.61	---	0.0160	ug/L	1	1.60	---	101	80-125%	---	---	
Benzo(g,h,i)perylene	1.69	---	0.0320	ug/L	1	1.60	---	105	80-120%	---	---	

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Project Number: 7573-00

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Report ID:

A2L0619 - 01 12 23 1206

QUALITY CONTROL (QC) SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22L0585 - EPA 3511 (Bottle Extraction)						Water						
LCS (22L0585-BS1)			Prepared: 12/16/22 06:36 Analyzed: 12/16/22 14:24									
Chrysene	1.52	---	0.0160	ug/L	1	1.60	---	95	80-120%	---	---	
Dibenz(a,h)anthracene	1.48	---	0.0160	ug/L	1	1.60	---	92	80-120%	---	---	
Fluoranthene	1.63	---	0.0320	ug/L	1	1.60	---	102	80-126%	---	---	
Fluorene	1.58	---	0.0320	ug/L	1	1.60	---	99	77-127%	---	---	
Indeno(1,2,3-cd)pyrene	1.53	---	0.0160	ug/L	1	1.60	---	95	80-121%	---	---	
1-Methylnaphthalene	1.46	---	0.0640	ug/L	1	1.60	---	91	53-148%	---	---	
2-Methylnaphthalene	1.45	---	0.0640	ug/L	1	1.60	---	91	48-150%	---	---	
Naphthalene	1.57	---	0.0640	ug/L	1	1.60	---	98	78-120%	---	---	
Phenanthrene	1.50	---	0.0640	ug/L	1	1.60	---	94	80-120%	---	---	
Pyrene	1.65	---	0.0320	ug/L	1	1.60	---	103	80-125%	---	---	
Carbazole	1.61	---	0.0320	ug/L	1	1.60	---	101	65-141%	---	---	
Dibenzofuran	1.77	---	0.0320	ug/L	1	1.60	---	111	76-121%	---	---	
Surr: Acenaphthylene-d8 (Surr)		Recovery: 108 %		Limits: 78-134 %		Dilution: 1x						
Benzo(a)pyrene-d12 (Surr)		104 %		80-132 %		"						
Matrix Spike (22L0585-MS1)						Prepared: 12/16/22 06:37 Analyzed: 12/16/22 16:56						
QC Source Sample: Non-SDG (A2L0598-02RE1)												
EPA 8270E LVI												
Acenaphthene	6.18	---	3.30	ug/L	100	1.65	4.37	110	80-120%	---	---	Q-11
Acenaphthylene	3.92	---	3.30	ug/L	100	1.65	ND	237	80-124%	---	---	Q-11
Anthracene	4.66	---	3.30	ug/L	100	1.65	2.94	104	80-123%	---	---	Q-11
Benz(a)anthracene	1.65	---	1.65	ug/L	100	1.65	ND	100	80-122%	---	---	Q-11
Benzo(a)pyrene	ND	---	1.65	ug/L	100	1.65	ND	97	80-129%	---	---	Q-11
Benzo(b)fluoranthene	ND	---	1.65	ug/L	100	1.65	ND	97	80-124%	---	---	Q-11
Benzo(k)fluoranthene	ND	---	1.65	ug/L	100	1.65	ND	93	80-125%	---	---	Q-11
Benzo(g,h,i)perylene	ND	---	3.30	ug/L	100	1.65	ND	145	80-120%	---	---	Q-11
Chrysene	1.90	---	1.65	ug/L	100	1.65	ND	115	80-120%	---	---	Q-11
Dibenz(a,h)anthracene	1.69	---	1.65	ug/L	100	1.65	ND	102	80-120%	---	---	Q-11
Fluoranthene	ND	---	3.30	ug/L	100	1.65	ND	190	80-126%	---	---	Q-11
Fluorene	3.75	---	3.30	ug/L	100	1.65	2.45	79	77-127%	---	---	Q-11
Indeno(1,2,3-cd)pyrene	2.02	---	1.65	ug/L	100	1.65	0.858	70	80-121%	---	---	Q-11
1-Methylnaphthalene	6.59	---	6.59	ug/L	100	1.65	5.76	51	53-148%	---	---	Q-11
2-Methylnaphthalene	ND	---	6.59	ug/L	100	1.65	ND	230	48-150%	---	---	Q-11
Naphthalene	205	---	6.59	ug/L	100	1.65	199	382	78-120%	---	---	Q-11

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Report is complete only if it includes Fremont Analytical Laboratories Data.

Page 10 of 30

01/12/2023

Page 10 of 22



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Project Manager: Steve Misner

Report ID:

A2L0619 - 01 12 23 1206

QUALITY CONTROL (QC) SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22L0585 - EPA 3511 (Bottle Extraction)							Water					
Matrix Spike (22L0585-MS1)			Prepared: 12/16/22 06:37 Analyzed: 12/16/22 16:56									
QC Source Sample: Non-SDG (A2L0598-02RE1)												
Phenanthrene	ND	---	6.59	ug/L	100	1.65	4.09	85	80-120%	---	---	Q-11
Pyrene	ND	---	3.30	ug/L	100	1.65	ND	175	80-125%	---	---	Q-11
Carbazole	10.7	---	3.30	ug/L	100	1.65	9.15	92	65-141%	---	---	Q-11
Dibenzofuran	3.30	---	3.30	ug/L	100	1.65	ND	200	76-121%	---	---	Q-11
Surr: Acenaphthylene-d8 (Surr)		Recovery: 1120 %		Limits: 78-134 %		Dilution: 100x						S-05
Benzo(a)pyrene-d12 (Surr)		74 %		80-132 %		"						S-05

Matrix Spike Dup (22L0585-MSD1)

Prepared: 12/16/22 06:37 Analyzed: 12/16/22 17:28

QC Source Sample: Non-SDG (A2L0598-02RE1)												
Acenaphthene	7.03	---	3.29	ug/L	100	1.64	4.37	162	80-120%	13	30%	Q-11
Acenaphthylene	3.66	---	3.29	ug/L	100	1.64	ND	222	80-124%	7	30%	Q-11
Anthracene	5.06	---	3.29	ug/L	100	1.64	2.94	129	80-123%	8	30%	Q-11
Benz(a)anthracene	1.81	---	1.64	ug/L	100	1.64	ND	110	80-122%	9	30%	Q-11
Benzo(a)pyrene	1.64	---	1.64	ug/L	100	1.64	ND	100	80-129%	2	30%	Q-11
Benzo(b)fluoranthene	1.69	---	1.64	ug/L	100	1.64	ND	102	80-124%	5	30%	Q-11
Benzo(k)fluoranthene	1.85	---	1.64	ug/L	100	1.64	ND	112	80-125%	19	30%	Q-11
Benzo(g,h,i)perylene	ND	---	3.29	ug/L	100	1.64	ND	150	80-120%	3	30%	Q-11
Chrysene	2.01	---	1.64	ug/L	100	1.64	ND	122	80-120%	6	30%	Q-11
Dibenz(a,h)anthracene	1.64	---	1.64	ug/L	100	1.64	ND	100	80-120%	3	30%	Q-11
Fluoranthene	ND	---	3.29	ug/L	100	1.64	ND	190	80-126%	0.3	30%	Q-11
Fluorene	4.27	---	3.29	ug/L	100	1.64	2.45	111	77-127%	13	30%	Q-11
Indeno(1,2,3-cd)pyrene	2.26	---	1.64	ug/L	100	1.64	0.858	85	80-121%	11	30%	Q-11
1-Methylnaphthalene	7.60	---	6.58	ug/L	100	1.64	5.76	112	53-148%	14	30%	Q-11
2-Methylnaphthalene	ND	---	6.58	ug/L	100	1.64	ND	215	48-150%	7	30%	Q-11
Naphthalene	205	---	6.58	ug/L	100	1.64	199	409	78-120%	0.2	30%	Q-11
Phenanthrene	ND	---	6.58	ug/L	100	1.64	4.09	116	80-120%	9	30%	Q-11
Pyrene	ND	---	3.29	ug/L	100	1.64	ND	195	80-125%	11	30%	Q-11
Carbazole	10.2	---	3.29	ug/L	100	1.64	9.15	66	65-141%	4	30%	Q-11
Dibenzofuran	ND	---	3.29	ug/L	100	1.64	ND	190	76-121%	5	30%	Q-11
Surr: Acenaphthylene-d8 (Surr)		Recovery: 1060 %		Limits: 78-134 %		Dilution: 100x		S-05				
Benzo(a)pyrene-d12 (Surr)		80 %		80-132 %		"		S-05				

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Darrell Auvil, Client Services Manager

Report is complete only if it includes Fremont Analytical Laboratories Data.

Page 11 of 30

01/12/2023

Page 11 of 22



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

Apex Companies, LLC

15618 SW 72nd Ave
Tigard, OR 97224Project: **POP T4 - Slip 3 GW**

Project Number: 7573-00

Project Manager: Steve Misner

Report ID:

A2L0619 - 01 12 23 1206

QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22L0892 - EPA 3015A						Water						
Blank (22L0892-BLK1)			Prepared: 12/28/22 10:53		Analyzed: 12/28/22 19:44							
EPA 6020B												
Arsenic	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Cadmium	ND	---	0.200	ug/L	1	---	---	---	---	---	---	
Chromium	ND	---	2.00	ug/L	1	---	---	---	---	---	---	
Copper	ND	---	2.00	ug/L	1	---	---	---	---	---	---	
Lead	ND	---	0.200	ug/L	1	---	---	---	---	---	---	
Manganese	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Mercury	ND	---	0.0800	ug/L	1	---	---	---	---	---	---	
Vanadium	ND	---	2.00	ug/L	1	---	---	---	---	---	---	
Zinc	ND	---	4.00	ug/L	1	---	---	---	---	---	---	
LCS (22L0892-BS1)												
			Prepared: 12/28/22 10:53		Analyzed: 12/28/22 20:03							
EPA 6020B												
Arsenic	55.2	---	1.00	ug/L	1	55.6	---	99	80-120%	---	---	
Cadmium	52.9	---	0.200	ug/L	1	55.6	---	95	80-120%	---	---	
Chromium	55.3	---	2.00	ug/L	1	55.6	---	99	80-120%	---	---	
Copper	57.6	---	2.00	ug/L	1	55.6	---	104	80-120%	---	---	
Lead	55.9	---	0.200	ug/L	1	55.6	---	101	80-120%	---	---	
Manganese	55.4	---	1.00	ug/L	1	55.6	---	100	80-120%	---	---	
Mercury	1.04	---	0.0800	ug/L	1	1.11	---	94	80-120%	---	---	
Vanadium	53.7	---	2.00	ug/L	1	55.6	---	97	80-120%	---	---	
Zinc	55.8	---	4.00	ug/L	1	55.6	---	100	80-120%	---	---	
Duplicate (22L0892-DUP1)												
			Prepared: 12/28/22 10:53		Analyzed: 12/28/22 20:13							
QC Source Sample: Non-SDG (A2L0598-02)												
Arsenic	ND	---	1.00	ug/L	1	---	0.704	---	---	***	20%	
Cadmium	ND	---	0.200	ug/L	1	---	ND	---	---	---	20%	
Chromium	ND	---	2.00	ug/L	1	---	ND	---	---	---	20%	
Copper	ND	---	2.00	ug/L	1	---	1.65	---	---	***	20%	
Lead	0.259	---	0.200	ug/L	1	---	0.262	---	---	0.8	20%	
Manganese	297	---	1.00	ug/L	1	---	289	---	---	3	20%	
Mercury	ND	---	0.0800	ug/L	1	---	ND	---	---	---	20%	
Vanadium	ND	---	2.00	ug/L	1	---	ND	---	---	---	20%	
Zinc	ND	---	4.00	ug/L	1	---	2.25	---	---	***	20%	

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ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323

ORELAP ID: OR100062

Apex Companies, LLC

15618 SW 72nd Ave
Tigard, OR 97224Project: **POP T4 - Slip 3 GW**

Project Number: 7573-00

Project Manager: Steve Misner

Report ID:

A2L0619 - 01 12 23 1206

QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020B (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22L0892 - EPA 3015A						Water						
Matrix Spike (22L0892-MS1)				Prepared: 12/28/22 10:53 Analyzed: 12/28/22 20:18								
QC Source Sample: Non-SDG (A2L0598-02)												
EPA 6020B												
Arsenic	56.8	---	1.00	ug/L	1	55.6	0.704	101	75-125%	---	---	
Cadmium	54.6	---	0.200	ug/L	1	55.6	ND	98	75-125%	---	---	
Chromium	55.7	---	2.00	ug/L	1	55.6	ND	100	75-125%	---	---	
Copper	59.8	---	2.00	ug/L	1	55.6	1.65	105	75-125%	---	---	
Lead	54.9	---	0.200	ug/L	1	55.6	0.262	98	75-125%	---	---	
Manganese	349	---	1.00	ug/L	1	55.6	289	109	75-125%	---	---	
Mercury	1.03	---	0.0800	ug/L	1	1.11	ND	92	75-125%	---	---	
Vanadium	56.4	---	2.00	ug/L	1	55.6	ND	102	75-125%	---	---	
Zinc	57.9	---	4.00	ug/L	1	55.6	2.25	100	75-125%	---	---	

Matrix Spike Dup (22L0892-MSD1)

Prepared: 12/28/22 10:53 Analyzed: 12/28/22 20:22

QC Source Sample: Non-SDG (A2L0598-02)												
Arsenic	55.7	---	1.00	ug/L	1	55.6	0.704	99	75-125%	2	20%	
Cadmium	53.9	---	0.200	ug/L	1	55.6	ND	97	75-125%	1	20%	
Chromium	55.1	---	2.00	ug/L	1	55.6	ND	99	75-125%	1	20%	
Copper	58.9	---	2.00	ug/L	1	55.6	1.65	103	75-125%	1	20%	
Lead	54.9	---	0.200	ug/L	1	55.6	0.262	98	75-125%	0.04	20%	
Manganese	350	---	1.00	ug/L	1	55.6	289	110	75-125%	0.2	20%	
Mercury	1.05	---	0.0800	ug/L	1	1.11	ND	95	75-125%	3	20%	
Vanadium	56.1	---	2.00	ug/L	1	55.6	ND	101	75-125%	0.6	20%	
Zinc	57.3	---	4.00	ug/L	1	55.6	2.25	99	75-125%	1	20%	

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Darrell Auvil, Client Services Manager

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6700 S.W. Sandburg Street
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Apex Companies, LLC

15618 SW 72nd Ave
Tigard, OR 97224Project: **POP T4 - Slip 3 GW**

Project Number: 7573-00

Project Manager: Steve Misner

Report ID:

A2L0619 - 01 12 23 1206

QUALITY CONTROL (QC) SAMPLE RESULTS

Dissolved Metals by EPA 6020B (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22L0908 - Matrix Matched Direct Inject						Water						
Blank (22L0908-BLK1)			Prepared: 12/29/22 07:07 Analyzed: 12/29/22 15:37									
EPA 6020B (Diss)												
Arsenic	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Cadmium	ND	---	0.200	ug/L	1	---	---	---	---	---	---	
Chromium	ND	---	2.00	ug/L	1	---	---	---	---	---	---	
Copper	ND	---	2.00	ug/L	1	---	---	---	---	---	---	
Lead	ND	---	0.200	ug/L	1	---	---	---	---	---	---	
Manganese	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Mercury	ND	---	0.0800	ug/L	1	---	---	---	---	---	---	
Vanadium	ND	---	2.00	ug/L	1	---	---	---	---	---	---	
Zinc	ND	---	4.00	ug/L	1	---	---	---	---	---	---	
LCS (22L0908-BS1)			Prepared: 12/29/22 07:07 Analyzed: 12/29/22 15:41									
EPA 6020B (Diss)												
Arsenic	53.6	---	1.00	ug/L	1	55.6	---	96	80-120%	---	---	
Cadmium	54.0	---	0.200	ug/L	1	55.6	---	97	80-120%	---	---	
Chromium	52.8	---	2.00	ug/L	1	55.6	---	95	80-120%	---	---	
Copper	56.9	---	2.00	ug/L	1	55.6	---	102	80-120%	---	---	
Lead	59.2	---	0.200	ug/L	1	55.6	---	107	80-120%	---	---	
Manganese	54.2	---	1.00	ug/L	1	55.6	---	98	80-120%	---	---	
Mercury	1.18	---	0.0800	ug/L	1	1.11	---	106	80-120%	---	---	
Vanadium	51.9	---	2.00	ug/L	1	55.6	---	93	80-120%	---	---	
Zinc	55.8	---	4.00	ug/L	1	55.6	---	100	80-120%	---	---	
Duplicate (22L0908-DUP1)			Prepared: 12/29/22 07:07 Analyzed: 12/29/22 16:11									
QC Source Sample: Non-SDG (A2L0751-13)												
Arsenic	2.76	---	1.00	ug/L	1	---	2.88	---	---	4	20%	
Cadmium	ND	---	0.200	ug/L	1	---	ND	---	---	---	20%	
Chromium	ND	---	2.00	ug/L	1	---	ND	---	---	---	20%	
Copper	7.79	---	2.00	ug/L	1	---	7.85	---	---	0.7	20%	
Lead	ND	---	0.200	ug/L	1	---	0.128	---	---	***	20%	
Manganese	911	---	1.00	ug/L	1	---	919	---	---	0.8	20%	
Mercury	ND	---	0.0800	ug/L	1	---	ND	---	---	---	20%	
Vanadium	8.40	---	2.00	ug/L	1	---	8.38	---	---	0.2	20%	
Zinc	ND	---	4.00	ug/L	1	---	3.46	---	---	***	20%	

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323

ORELAP ID: OR100062

Apex Companies, LLC

15618 SW 72nd Ave
Tigard, OR 97224Project: POP T4 - Slip 3 GW

Project Number: 7573-00

Project Manager: Steve Misner

Report ID:

A2L0619 - 01 12 23 1206

QUALITY CONTROL (QC) SAMPLE RESULTS

Dissolved Metals by EPA 6020B (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 22L0908 - Matrix Matched Direct Inject							Water					
Matrix Spike (22L0908-MS1)				Prepared: 12/29/22 07:07 Analyzed: 12/29/22 16:16								
QC Source Sample: Non-SDG (A2L0751-13)												
EPA 6020B (Diss)												
Arsenic	58.9	---	1.00	ug/L	1	55.6	2.88	101	75-125%	---	---	
Cadmium	55.8	---	0.200	ug/L	1	55.6	ND	100	75-125%	---	---	
Chromium	53.5	---	2.00	ug/L	1	55.6	ND	96	75-125%	---	---	
Copper	61.7	---	2.00	ug/L	1	55.6	7.85	97	75-125%	---	---	
Lead	56.2	---	0.200	ug/L	1	55.6	0.128	101	75-125%	---	---	
Manganese	968	---	1.00	ug/L	1	55.6	919	88	75-125%	---	---	
Mercury	1.12	---	0.0800	ug/L	1	1.11	ND	101	75-125%	---	---	
Vanadium	61.3	---	2.00	ug/L	1	55.6	8.38	95	75-125%	---	---	
Zinc	56.0	---	4.00	ug/L	1	55.6	3.46	95	75-125%	---	---	

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**ANALYTICAL REPORT****Apex Laboratories, LLC**6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062**Apex Companies, LLC**15618 SW 72nd Ave
Tigard, OR 97224Project: **POP T4 - Slip 3 GW**Project Number: **7573-00**Project Manager: **Steve Misner****Report ID:****A2L0619 - 01 12 23 1206****SAMPLE PREPARATION INFORMATION****Diesel and/or Oil Hydrocarbons by NWTPH-Dx with Acid/Silica Gel Cleanup**

Prep: EPA 3510C (Fuels/Acid Ext.) w/Silica Gel + Acid

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 22L0833							
A2L0619-01	Water	NWTPH-Dx/SG	12/14/22 12:00	12/27/22 06:52	1050mL/5mL	1000mL/5mL	0.95
A2L0619-02	Water	NWTPH-Dx/SG	12/14/22 12:00	12/27/22 06:52	1040mL/5mL	1000mL/5mL	0.96

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Prep: EPA 3511 (Bottle Extraction)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 22L0585							
A2L0619-01	Water	EPA 8270E LVI	12/14/22 12:00	12/16/22 06:36	89.41mL/5mL	125mL/5mL	1.40
A2L0619-02	Water	EPA 8270E LVI	12/14/22 12:00	12/16/22 06:36	121.43mL/5mL	125mL/5mL	1.03

Total Metals by EPA 6020B (ICPMS)

Prep: EPA 3015A

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 22L0892							
A2L0619-01RE1	Water	EPA 6020B	12/14/22 12:00	12/28/22 10:53	45mL/50mL	45mL/50mL	1.00
A2L0619-01RE2	Water	EPA 6020B	12/14/22 12:00	12/28/22 10:53	45mL/50mL	45mL/50mL	1.00
A2L0619-02RE1	Water	EPA 6020B	12/14/22 12:00	12/28/22 10:53	45mL/50mL	45mL/50mL	1.00

Dissolved Metals by EPA 6020B (ICPMS)

Prep: Matrix Matched Direct Inject

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 22L0908							
A2L0619-01	Water	EPA 6020B (Diss)	12/14/22 12:00	12/29/22 07:07	22.5mL/25mL	45mL/50mL	1.00
A2L0619-01RE3	Water	EPA 6020B (Diss)	12/14/22 12:00	12/29/22 07:07	22.5mL/25mL	45mL/50mL	1.00
A2L0619-02	Water	EPA 6020B (Diss)	12/14/22 12:00	12/29/22 07:07	45mL/50mL	45mL/50mL	1.00

Apex Laboratories

Darrell Auvil, Client Services Manager

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ANALYTICAL REPORT

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6700 S.W. Sandburg Street
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503-718-2323
ORELAP ID: OR100062

Apex Companies, LLC

15618 SW 72nd Ave
Tigard, OR 97224

Project: **POP T4 - Slip 3 GW**

Project Number: 7573-00

Project Manager: Steve Misner

Report ID:

A2L0619 - 01 12 23 1206

QUALIFIER DEFINITIONS

Client Sample and Quality Control (QC) Sample Qualifier Definitions:

Apex Laboratories

- Q-11** Spike recovery is estimated due to sample dilution required for high analyte concentration and/or matrix interference.
- Q-19** Blank Spike Duplicate (BSD) sample analyzed in place of Matrix Spike/Duplicate samples due to limited sample amount available for analysis.
- R-02** The Reporting Limit for this analyte has been raised to account for interference from coeluting organic compounds present in the sample.
- S-05** Surrogate recovery is estimated due to sample dilution required for high analyte concentration and/or matrix interference.

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ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

Apex Companies, LLC

15618 SW 72nd Ave
Tigard, OR 97224

Project: **POP T4 - Slip 3 GW**

Project Number: **7573-00**

Project Manager: **Steve Misner**

Report ID:

A2L0619 - 01 12 23 1206

REPORTING NOTES AND CONVENTIONS:

Abbreviations:

DET Analyte DETECTED at or above the detection or reporting limit.
ND Analyte NOT DETECTED at or above the detection or reporting limit.
NR Result Not Reported
RPD Relative Percent Difference. RPDs for Matrix Spikes and Matrix Spike Duplicates are based on concentration, not recovery.

Detection Limits: Limit of Detection (LOD)

Limits of Detection (LODs) are normally set at a level of one half the validated Limit of Quantitation (LOQ).
If no value is listed ('-----'), then the data has not been evaluated below the Reporting Limit.

Reporting Limits: Limit of Quantitation (LOQ)

Validated Limits of Quantitation (LOQs) are reported as the Reporting Limits for all analyses where the LOQ, MRL, PQL or CRL are requested. The LOQ represents a level at or above the low point of the calibration curve, that has been validated according to Apex Laboratories' comprehensive LOQ policies and procedures.

Reporting Conventions:

Basis: Results for soil samples are generally reported on a 100% dry weight basis.
The Result Basis is listed following the units as "dry", "wet", or " " (blank) designation.

"dry" Sample results and Reporting Limits are reported on a dry weight basis. (i.e. "ug/kg dry")
See Percent Solids section for details of dry weight analysis.
"wet" Sample results and Reporting Limits for this analysis are normally dry weight corrected, but have not been modified in this case.
" " Results without 'wet' or 'dry' designation are not normally dry weight corrected. These results are considered 'As Received'.

QC Source:

In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) may be analyzed to demonstrate accuracy and precision of the extraction batch.

Non-Client Batch QC Samples (Duplicates and Matrix Spike/Duplicates) may not be included in this report. Please request a Full QC report if this data is required.

Miscellaneous Notes:

" --- " QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.

" *** " Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).

Blanks:

Standard practice is to evaluate the results from Blank QC Samples down to a level equal to ½ the Reporting Limit (RL).
-For Blank hits falling between ½ the RL and the RL (J flagged hits), the associated sample and QC data will receive a 'B-02' qualifier.
-For Blank hits above the RL, the associated sample and QC data will receive a 'B' qualifier, per Apex Laboratories' Blank Policy.
For further details, please request a copy of this document.

Apex Laboratories

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.

Darrell Auvil, Client Services Manager

**ANALYTICAL REPORT****Apex Laboratories, LLC**6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062**Apex Companies, LLC**15618 SW 72nd Ave
Tigard, OR 97224Project: **POP T4 - Slip 3 GW**

Project Number: 7573-00

Project Manager: Steve Misner

Report ID:

A2L0619 - 01 12 23 1206

REPORTING NOTES AND CONVENTIONS (Cont.):**Blanks (Cont.):**

Sample results flagged with a 'B' or 'B-02' qualifier are potentially biased high if the sample results are less than ten times the level found in the blank for inorganic analyses, or less than five times the level found in the blank for organic analyses.

'B' and 'B-02' qualifications are only applied to sample results detected above the Reporting Level.

Preparation Notes:**Mixed Matrix Samples:****Water Samples:**

Water samples containing significant amounts of sediment are decanted or separated prior to extraction, and only the water portion analyzed, unless otherwise directed by the client.

Soil and Sediment Samples:

Soil and Sediment samples containing significant amounts of water are decanted prior to extraction, and only the solid portion analyzed, unless otherwise directed by the client.

Sampling and Preservation Notes:

Certain regulatory programs, such as National Pollutant Discharge Elimination System (NPDES), require that activities such as sample filtration (for dissolved metals, orthophosphate, hexavalent chromium, etc.) and testing of short hold analytes (pH, Dissolved Oxygen, etc.) be performed in the field (on-site) within a short time window. In addition, sample matrix spikes are required for some analyses, and sufficient volume must be provided, and billable site specific QC requested, if this is required. All regulatory permits should be reviewed to ensure that these requirements are being met.

Data users should be aware of which regulations pertain to the samples they submit for testing. If related sample collection activities are not approved for a particular regulatory program, results should be considered estimates. Apex Laboratories will qualify these analytes according to the most stringent requirements, however results for samples that are for non-regulatory purposes may be acceptable.

Samples that have been filtered and preserved at Apex Laboratories per client request are listed in the preparation section of the report with the date and time of filtration listed.

Apex Laboratories maintains detailed records on sample receipt, including client label verification, cooler temperature, sample preservation, hold time compliance and field filtration. Data is qualified as necessary, and the lack of qualification indicates compliance with required parameters.

Apex Laboratories

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
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503-718-2323
ORELAP ID: OR100062

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15618 SW 72nd Ave
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A2L0619 - 01 12 23 1206

LABORATORY ACCREDITATION INFORMATION

ORELAP Certification ID: OR100062 (Primary Accreditation) -

EPA ID: OR01039

All methods and analytes reported from work performed at Apex Laboratories are included on Apex Laboratories' ORELAP Scope of Certification, with the exception of any analyte(s) listed below:

Apex Laboratories

Matrix	Analysis	TNI_ID	Analyte	TNI_ID	Accreditation
All reported analytes are included in Apex Laboratories' current ORELAP scope.					

Secondary Accreditations

Apex Laboratories also maintains reciprocal accreditation with non-TNI states (Washington DOE), as well as other state specific accreditations not listed here.

Subcontract Laboratory Accreditations

Subcontracted data falls outside of Apex Laboratories' Scope of Accreditation.

Please see the Subcontract Laboratory report for full details, or contact your Project Manager for more information.

Field Testing Parameters

Results for Field Tested data are provided by the client or sampler, and fall outside of Apex Laboratories' Scope of Accreditation.

Apex Laboratories

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Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street

Tigard, OR 97223

503-718-2323

ORELAP ID: OR100062

Apex Companies, LLC

15618 SW 72nd Ave

Tigard, OR 97224

Project: POP T4 - Slip 3 GW

Project Number: 7573-00

Project Manager: Steve Misner

Report ID:

A2L0619 - 01 12 23 1206

APEX LABS COOLER RECEIPT FORM

Client: Apex Companies, LLC Element WO#: A2L0619Project/Project #: Terminal 4 Slip 3 Groundwater Sampling #7573-00

Delivery Info:

Date/time received: 12/14/22 @ 1553 By: AKKDelivered by: Apex ☐ Client ☒ ESS ☐ FedEx ☐ UPS ☐ Swift ☐ Senvoy ☐ SDS ☐ Other ☐Cooler Inspection Date/time inspected: 12/14/22 @ 1553 By: AKKChain of Custody included? Yes ☒ No ☐ Custody seals? Yes ☐ No ☒Signed/dated by client? Yes ☒ No ☐Signed/dated by Apex? Yes ☒ No ☐

	Cooler #1	Cooler #2	Cooler #3	Cooler #4	Cooler #5	Cooler #6	Cooler #7
Temperature (°C)	<u>2.4</u>						
Received on ice? (Y/N)	<u>Y</u>						
Temp. blanks? (Y/N)	<u>Y</u>						
Ice type: (Gel/Real/Other)	<u>Real</u>						
Condition (In/Out):	<u>In</u>						

Cooler out of temp? (Y/N) Possible reason why:

Green dots applied to out of temperature samples? Yes ☒ No ☐Out of temperature samples form initiated? Yes ☒ No ☐Sample Inspection: Date/time inspected: 12/15/22 @ 1525 By: VHPAll samples intact? Yes ☒ No ☐ Comments: _____Bottle labels/COCs agree? Yes ☒ No ☐ Comments: _____COC/container discrepancies form initiated? Yes ☐ No ☒Containers/volumes received appropriate for analysis? Yes ☒ No ☐ Comments: Limitedvolume 17 212 Attic pads for BE-1 and BE-5 - 50ml eachDo VOA vials have visible headspace? Yes ☐ No ☐ NA ☒

Comments: _____

Water samples: pH checked: Yes ☒ No ☐ NA ☐ pH appropriate? Yes ☒ No ☐ NA ☐

Comments: _____

Additional information:

Labeled by:

VHP

Witness:

AKK

Cooler Inspected by:

AKK

Form Y-003 R-00

Apex Laboratories

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.

Darrell Auvin, Client Services Manager

Report is complete only if it includes Fremont Analytical Laboratories Data.

Page 22 of 30

01/12/2023

Page 22 of 22



Fremont
Analytical

3600 Fremont Ave. N.
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

Apex Laboratories
Darrell Auvil
6700 SW Sandburg St
Tigard, OR 97223

RE: A2L0619
Work Order Number: 2212423

January 10, 2023

Attention Darrell Auvil:

Fremont Analytical, Inc. received 2 sample(s) on 12/20/2022 for the analyses presented in the following report.

Extractable Petroleum Hydrocarbons by NWEPH

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Brianna Barnes
Project Manager

CC:
Sub Data

*DoD-ELAP Accreditation #79636 by PJLA, ISO/IEC 17025:2017 and QSM 5.3 for Environmental Testing
ORELAP Certification: WA 100009 (NELAP Recognized) for Environmental Testing
Washington State Department of Ecology Accredited for Environmental Testing, Lab ID C910*

Original

www.fremontanalytical.com



Date: 01/10/2023

CLIENT: Apex Laboratories
Project: A2L0619
Work Order: 2212423

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
2212423-001	BE-1	12/14/2022 12:00 PM	12/20/2022 10:24 AM
2212423-002	BE-5	12/14/2022 12:00 PM	12/20/2022 10:24 AM

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

Original

CLIENT: Apex Laboratories**Project:** A2L0619

I. SAMPLE RECEIPT:

Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:

Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:

Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below Reporting Limit
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit
R - High relative percent difference observed

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
DUP - Sample Duplicate
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MCL - Maximum Contaminant Level
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
REP - Sample Replicate
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

Original



Work Order: 2212423
Date Reported: 1/10/2023

CLIENT: Apex Laboratories
Project: A2L0619

Lab ID: 2212423-001
Client Sample ID: BE-1

Collection Date: 12/14/2022 12:00:00 PM
Matrix: Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed

Extractable Petroleum Hydrocarbons by NWEPH

Batch ID: 38803 Analyst: KJ

Aliphatic Hydrocarbon (C10-C12)	ND	39.6		µg/L	1	1/9/2023 1:17:42 PM
Surr: 1-Chlorooctadecane	77.1	50 - 150		%Rec	1	1/9/2023 1:17:42 PM

Lab ID: 2212423-002
Client Sample ID: BE-5

Collection Date: 12/14/2022 12:00:00 PM
Matrix: Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed

Extractable Petroleum Hydrocarbons by NWEPH

Batch ID: 38803 Analyst: KJ

Aliphatic Hydrocarbon (C10-C12)	ND	39.7		µg/L	1	1/9/2023 2:21:33 PM
Surr: 1-Chlorooctadecane	61.2	50 - 150		%Rec	1	1/9/2023 2:21:33 PM

Work Order: 2212423
CLIENT: Apex Laboratories
Project: A2L0619

QC SUMMARY REPORT

Extractable Petroleum Hydrocarbons by NWEPH

Sample ID: MB-38803		SampType: MBLK			Units: µg/L		Prep Date: 12/12/2022			RunNo: 80861		
Client ID: MBLKW		Batch ID: 38803			Analysis Date: 12/30/2022					SeqNo: 1672874		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Aliphatic Hydrocarbon (C10-C12)	ND	40.0		0	0						
Surr: 1-Chlorooctadecane	328		400.0		82.1	50	150				

Sample ID: LCS-38803		SampType: LCS			Units: µg/L		Prep Date: 12/12/2022			RunNo: 80861		
Client ID: LCSW		Batch ID: 38803			Analysis Date: 12/30/2022					SeqNo: 1672875		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Aliphatic Hydrocarbon (C10-C12)	320	40.0	500.0	0	63.9	25.3	107				
Surr: 1-Chlorooctadecane	320		400.0		80.1	50	150				

Sample ID: LCSD-38803		SampType: LCSD			Units: µg/L		Prep Date: 12/12/2022			RunNo: 80861		
Client ID: LCSW02		Batch ID: 38803			Analysis Date: 12/30/2022			SeqNo: 1672876				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Aliphatic Hydrocarbon (C10-C12)	343	40.0	500.0	0	68.6	25.3	107	319.5	7.13	20	
Surr: 1-Chlorooctadecane	325		400.0		81.2	50	150		0		

Sample ID: 2212180-002AMS		SampType: MS			Units: µg/L		Prep Date: 12/12/2022			RunNo: 80861		
Client ID: BATCH		Batch ID: 38803			Analysis Date: 12/30/2022					SeqNo: 1672880		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Aliphatic Hydrocarbon (C10-C12)	345	42.6	533.1	0	64.7	17.1	108				
Surr: 1-Chlorooctadecane	331		426.5		77.7	50	150				

Client Name: APEX
 Logged by: Clare Griggs

Work Order Number: 2212423
 Date Received: 12/20/2022 10:24:00 AM

Chain of Custody

1. Is Chain of Custody complete? Yes ☒ No ☐ Not Present ☐
 2. How was the sample delivered? UPS

Log In

3. Coolers are present? Yes ☒ No ☐ NA ☐
 4. Shipping container/cooler in good condition? Yes ☒ No ☐
 5. Custody Seals present on shipping container/cooler?
 (Refer to comments for Custody Seals not intact) Yes ☐ No ☐ Not Present ☒
 6. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
 7. Were all items received at a temperature of >2°C to 6°C * Yes ☒ No ☐ NA ☐
 8. Sample(s) in proper container(s)? Yes ☒ No ☐
 9. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
 10. Are samples properly preserved? Yes ☒ No ☐
 11. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
 12. Is there headspace in the VOA vials? Yes ☐ No ☐ NA ☒
 13. Did all samples containers arrive in good condition(unbroken)? Yes ☒ No ☐
 14. Does paperwork match bottle labels? Yes ☒ No ☐
 15. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
 16. Is it clear what analyses were requested? Yes ☒ No ☐
 17. Were all holding times able to be met? Yes ☒ No ☐

Special Handling (if applicable)

18. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☒

Person Notified:		Date:	
By Whom:		Via:	☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:			
Client Instructions:			

19. Additional remarks:

Item Information

Item #	Temp °C
Sample	0.2

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

Original

SUBCONTRACT ORDER

2212423

Apex Laboratories

12/16/22 A2L0619

SENDING LABORATORY:

Apex Laboratories
6700 S.W. Sandburg Street
Tigard, OR 97223
Phone: (503) 718-2323
Fax: (503) 336-0745
Project Manager: Darrell Auvil

RECEIVING LABORATORY:

Fremont Analytical
3600 Fremont Avenue N.
Seattle, WA 98103
Phone: (206) 352-3790
Fax: (206) 352-7178

Sample Name: BE-1

Water

Sampled: 12/14/22 12:00

AUG 12/19/22
(A2L0619-01)

Analysis

Due

Expires

Comments

NWTPH-EPH (Sub)

12/28/22 17:00

12/28/22 12:00

c10-c12 aliphatic ONLY

Containers Supplied:

(E)1 L Amber Glass - HCL

Sample Name: BE-5

Water

Sampled: 12/14/22 12:00

(A2L0619-02)

Analysis

Due

Expires

Comments

NWTPH-EPH (Sub)

12/28/22 17:00

12/28/22 12:00

c10-c12 aliphatic ONLY

Containers Supplied:

(E)1 L Amber Glass - HCL

Standard TAT

UPS (Shipper)

Released By

Date

UPS (Shipper)

Received By

Date

Received By

Date

Released By

Date

Appendix C

Historical Data Tables

Table C-1
Historical Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID	Date	Top of Casing	Initial Measurements				Product Removal		
			Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	Final Product Thickness
			(feet)				(gallons)		(feet)
MW-1	8/27/2003	29.93	22.35	21.69	0.66	8.17	0.50	0.50	0.04
MW-1	9/3/2003	29.93	21.98	21.81	0.17	8.10	0.25	0.75	0.00
MW-1	9/11/2003	29.93	21.84	21.82	0.02	8.11	0.01	0.76	0.00
MW-1	9/17/2003	29.93	22.00	21.92	0.08	8.00	0.01	0.77	0.00
MW-1	9/30/2003	29.93	21.88	21.81	0.07	8.11	0.01	0.78	0.01
MW-1	10/14/2003	29.93	21.03	21.00	0.03	8.93	0.01	0.79	0.01
MW-1	10/29/2003	29.93	21.93	21.85	0.08	8.07	0.25	1.04	0.00
MW-1	11/13/2003	29.93	21.95	21.93	0.02	8.00	0.01	1.05	0.00
MW-1	11/26/2003	29.93	21.84	21.83	0.01	8.10	0.01	1.06	0.00
MW-1	12/24/2003	29.93	21.05	21.04	0.01	8.89	0.01	1.07	0.01
MW-1	1/21/2004	29.93	20.92	20.89	0.03	9.04	0.01	1.08	0.01
MW-1	2/25/2004	29.93	21.39	20.57	0.82	9.27	0.50	1.58	0.01
MW-1	3/10/2004	29.93	21.22	20.91	0.31	8.99	0.15	1.73	0.01
MW-1	3/24/2004	29.93	21.45	20.90	0.55	8.97	0.30	2.03	0.01
Well Abandoned									
MW-2	8/27/2003	30.05	19.73	19.17	0.56	10.82	0.50	0.50	0.02
MW-2	9/3/2003	30.05	19.41	19.29	0.12	10.75	0.10	0.60	0.01
MW-2	9/11/2003	30.05	19.44	19.38	0.06	10.66	0.10	0.70	0.01
MW-2	9/17/2003	30.05	19.59	19.49	0.10	10.55	0.10	0.80	0.02
MW-2	9/30/2003	30.05	19.46	19.38	0.08	10.66	0.10	0.90	0.01
MW-2	10/14/2003	30.05	19.71	19.56	0.15	10.47	0.10	1.00	0.01
MW-2	10/29/2003	30.05	19.69	19.55	0.14	10.48	0.25	1.25	0.00
MW-2	11/13/2003	30.05	19.65	19.63	0.02	10.42	0.01	1.26	0.00
MW-2	11/26/2003	30.05	19.51	19.50	0.01	10.55	0.01	1.27	0.00
MW-2	12/24/2003	30.05	18.47	18.34	0.13	11.70	0.01	1.28	0.02
MW-2	12/30/2003	30.05	18.50	18.40	0.10	11.64	0.10	1.38	0.03
Well Abandoned									
MW-3	1/9/2004	30.05	18.30	17.95	0.35	12.06	0.10	0.10	0.01
MW-3	1/15/2004	30.05	18.19	17.88	0.31	12.14	0.10	0.20	0.01
MW-3	1/21/2004	30.05	18.10	17.95	0.15	12.08	0.10	0.30	0.01
MW-3	1/29/2004	30.05	18.20	17.70	0.50	12.30	0.20	0.50	0.01
MW-3	2/3/2004	30.05	18.20	17.71	0.49	12.29	0.20	0.70	0.01
MW-3	2/12/2004	30.05	18.34	17.81	0.53	12.18	0.30	1.00	0.02
MW-3	2/18/2004	30.05	18.30	17.84	0.46	12.16	0.30	1.30	0.00
MW-3	2/25/2004	30.05	17.98	17.85	0.13	12.19	0.10	1.40	0.00
MW-3	3/3/2004	30.05	18.10	18.00	0.10	12.04	0.01	1.41	0.00
MW-3	3/10/2004	30.05	18.15	18.03	0.12	12.01	0.03	1.44	0.00
MW-3	3/18/2004	30.05	18.45	18.12	0.33	11.89	0.20	1.64	0.01
MW-3	3/24/2004	30.05	18.60	18.15	0.45	11.85	0.25	1.89	0.01
MW-3	4/1/2004	30.05	18.55	18.00	0.55	11.99	0.30	2.19	0.01
MW-3	8/27/2003	30.09	20.85	20.82	0.03	9.27	0.01	2.20	0.00
MW-3	9/3/2003	30.09	20.91	20.89	0.02	9.20	0.01	2.21	0.01
MW-3	9/11/2003	30.09	20.94	20.92	0.02	9.17	0.01	2.22	0.01
MW-3	9/17/2003	30.09	21.04	21.00	0.04	9.09	0.01	2.23	0.01
MW-3	9/30/2003	30.09	19.89	19.85	0.04	10.24	0.01	2.24	0.01
MW-3	10/14/2003	30.09	21.95	21.83	0.12	8.25	0.01	2.25	0.01
MW-3	10/29/2003	30.09	21.02	21.00	0.02	9.09	0.01	2.26	0.00
MW-3	11/13/2003	30.09	21.07	21.06	0.01	9.03	0.01	2.27	0.00
MW-3	11/26/2003	30.09	21.00	20.99	0.01	9.10	0.01	2.28	0.00
MW-3	12/24/2003	30.09	19.85	19.84	0.01	10.25	0.01	2.29	0.00
MW-3	1/21/2004	30.09	19.32	19.28	0.04	10.81	0.01	2.30	0.01
MW-3	2/25/2004	30.09	19.15	19.13	0.02	10.96	0.00	2.30	0.02
MW-3	3/24/2004	30.09	19.86	19.80	0.06	10.28	0.00	2.30	0.06
Well Abandoned									
MW-8	8/27/2003	31.13	20.38	--	0.00	10.75	0.00	0.00	0.00
MW-8	9/3/2003	31.13	20.45	--	0.00	10.68	0.00	0.00	0.00
MW-8	9/11/2003	31.13	Not Accessible						
MW-8	9/17/2003	31.13	Not Accessible						
MW-8	9/30/2003	31.13	Not Accessible						
MW-8	10/14/2003	31.13	Not Accessible						
MW-8	10/29/2003	31.13	Not Accessible						
MW-8	11/13/2003	31.13	21.15	--	0.00	9.98	0.00	0.00	0.00
MW-8	11/26/2003	31.13	21.05	--	0.00	10.08	0.00	0.00	0.00
MW-8	12/24/2003	31.13	19.18	--	0.00	11.95	0.00	0.00	0.00
MW-8	1/21/2004	31.13	18.70	--	0.00	12.43	0.00	0.00	0.00
MW-8	2/25/2004	31.13	15.69	--	0.00	15.44	0.00	0.00	0.00
MW-8	3/24/2004	31.13	16.66	--	0.00	14.47	0.00	0.00	0.00
MW-8	1/14/2005	31.13	20.60	--	0.00	10.53	0.00	0.00	0.00
MW-8	1/28/2005	31.13	20.25	20.23	0.02	10.90	0.00	0.00	0.02
MW-8	2/25/2005	31.13	20.52	--	0.00	10.61	0.00	0.00	0.00
MW-8	3/25/2005	31.13	20.88	20.88	0.00	10.25	0.00	0.00	0.00
MW-8	4/30/2005	31.13	20.20	--	0.00	10.93	0.00	0.00	0.00

Please refer to notes at the end of table.

Table C-1
Historical Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID	Date	Top of Casing	Initial Measurements				Product Removal		
			Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	Final Product Thickness
			(feet)				(gallons)		(feet)
MW-8	5/31/2005	31.13	19.40	--	0.00	11.73	0.00	0.00	0.00
MW-8	6/24/2005	31.13	19.67	--	0.00	11.46	0.00	0.00	0.00
MW-8	7/29/2005	31.13	20.22	--	0.00	10.91	0.00	0.00	0.00
MW-8	8/26/2005	31.13	20.67	--	0.00	10.46	0.00	0.00	0.00
MW-8	9/24/2005	31.13	21.10	--	0.00	10.03	0.00	0.00	0.00
MW-8	10/21/2005	31.13	21.25	--	0.00	9.88	0.00	0.00	0.00
MW-8	11/28/2005	31.13	20.89	--	0.00	10.24	0.00	0.00	0.00
MW-8	1/3/2006	31.13	17.45	--	0.00	13.68	0.00	0.00	0.00
MW-8	2/17/2006	31.13	15.35	--	0.00	15.78	0.00	0.00	0.00
MW-8	9/19/2006	31.13	21.06	--	0.00	10.07	0.00	0.00	0.00
MW-8	12/13/2006	31.13	18.73	--	0.00	12.40	0.00	0.00	0.00
MW-8	3/29/2007	31.13	15.71	--	0.00	15.42	0.00	0.00	0.00
MW-8	6/27/2007	31.13	19.26	--	0.00	11.87	0.00	0.00	0.00
MW-8	9/18/2007	31.13	20.99	--	0.00	10.14	0.00	0.00	0.00
MW-8	12/6/2007	31.13	--	--	--	--	--	0.00	--
MW-8	3/10/2008	31.13	17.19	17.19	0.00	13.94	0.00	0.00	0.00
MW-8	6/12/2008	31.13	16.92	--	0.00	14.21	0.00	0.00	0.00
MW-8	9/8/2008	31.13	20.53	--	0.00	10.60	0.00	0.00	0.00
MW-8	12/29/2008	31.13	Unable to Gauge; Under Large Puddle of Water						
MW-8	3/10/2009	31.13	19.70	--	0.00	11.43	0.00	0.00	0.00
MW-8	6/4/2009	31.13	18.41	--	0.00	12.72	0.00	0.00	0.00
MW-8	9/9/2009	31.13	21.05	--	0.00	10.08	0.00	0.00	0.00
MW-8	12/15/2009	31.13	Unable to Gauge; Under Large Puddle of Water						
MW-8	3/11/2010	31.13	18.83	--	0.00	12.30	0.00	0.00	0.00
MW-8	6/8/2010	31.13	15.71	--	0.00	15.42	0.00	0.00	0.00
MW-8	9/16/2010	31.13	20.28	20.27	0.01	10.86	0.00	0.00	0.00
MW-8	12/15/2010	31.13	15.59	--	0.00	15.54	0.00	0.00	0.00
MW-8	6/9/2011	31.13	14.84	--	0.00	16.29	0.00	0.00	0.00
MW-8	12/1/2011	31.13	20.06	--	0.00	11.07	0.00	0.00	0.00
MW-8	6/11/2012	31.13	15.62	--	0.00	15.51	0.00	0.00	0.00
MW-8	12/19/2012	31.13	15.42	--	0.00	15.71	0.00	0.00	0.00
MW-8	12/17/2013	31.13	20.73	--	0.00	10.40	0.00	0.00	0.00
MW-8	12/11/2014	31.13	19.59	--	0.00	11.54	0.00	0.00	0.00
Well Abandoned May 14, 2015									
MW-10	8/27/2003	30.18	18.72	18.68	0.04	11.50	0.01	0.01	0.04
MW-10	9/3/2003	30.18	18.83	18.75	0.08	11.42	0.01	0.02	0.02
MW-10	9/11/2003	30.18	19.12	19.04	0.08	11.13	0.01	0.03	0.01
MW-10	9/17/2003	30.18	19.22	19.15	0.07	11.02	0.01	0.04	0.01
MW-10	9/30/2003	30.18	19.18	19.12	0.06	11.05	0.01	0.05	0.01
MW-10	10/14/2003	30.18	19.77	19.71	0.06	10.46	0.01	0.06	0.01
MW-10	10/29/2003	30.18	19.37	19.31	0.06	10.86	0.01	0.07	0.00
MW-10	11/13/2003	30.18	19.35	19.32	0.03	10.86	0.01	0.08	0.00
MW-10	11/26/2003	30.18	19.20	19.19	0.01	10.99	0.01	0.09	0.00
MW-10	12/24/2003	30.18	16.38	--	0.00	13.80	0.00	0.09	0.00
MW-10	1/21/2004	30.18	16.04	--	0.00	14.14	0.00	0.09	0.00
MW-10	2/25/2004	30.18	14.18	--	0.00	16.00	0.00	0.09	0.00
MW-10	3/24/2004	30.18	14.35	--	0.00	15.83	0.00	0.09	0.00
Well Abandoned									
MW-13	8/27/2003	31.49	18.74	--	0.00	12.75	0.00	0.09	0.00
MW-13	9/3/2003	31.49	18.79	--	0.00	12.70	0.00	0.09	0.00
MW-13	9/11/2003	31.49	19.18	--	0.00	12.31	0.00	0.09	0.00
MW-13	9/17/2003	31.49	19.25	--	0.00	12.24	0.00	0.09	0.00
MW-13	9/30/2003	31.49	19.01	--	0.00	12.48	0.00	0.09	0.00
MW-13	10/14/2003	31.49	19.52	--	0.00	11.97	0.00	0.09	0.00
MW-13	10/29/2003	31.49	19.40	--	0.00	12.09	0.00	0.09	0.00
MW-13	11/13/2003	31.49	19.65	--	0.00	11.84	0.00	0.09	0.00
MW-13	11/26/2003	31.49	19.50	--	0.00	11.99	0.00	0.09	0.00
MW-13	12/24/2003	31.49	17.97	--	0.00	13.52	0.00	0.09	0.00
MW-13	1/21/2004	31.49	17.47	--	0.00	14.02	0.00	0.09	0.00
MW-13	2/25/2004	31.49	14.61	--	0.00	16.88	0.00	0.09	0.00
MW-13	3/24/2004	31.49	15.91	--	0.00	15.58	0.00	0.09	0.00
Well Abandoned									
MW-14	8/27/2003	31.32	22.23	17.36	4.87	13.42	0.25	0.25	0.10
MW-14	9/3/2003	31.32	21.05	19.99	1.06	11.21	0.10	0.35	0.20
MW-14	9/11/2003	31.32	21.31	20.21	1.10	10.99	0.01	0.36	0.10
MW-14	9/17/2003	31.32	21.42	20.33	1.09	10.87	1.00	1.36	0.11
MW-14	9/30/2003	31.32	23.11	19.71	3.40	11.24	1.50	2.86	0.19
MW-14	10/14/2003	31.32	23.01	19.70	3.31	11.26	1.50	4.36	0.14
MW-14	10/29/2003	31.32	20.60	20.58	0.02	10.74	0.01	4.37	0.00
MW-14	11/13/2003	31.32	20.79	20.73	0.06	10.58	0.10	4.47	0.00
MW-14	11/26/2003	31.32	20.46	20.15	0.31	11.14	0.10	4.57	0.02
MW-14	12/10/2003	31.32	20.51	20.42	0.09	10.89	0.10	4.67	0.01

Please refer to notes at the end of table.

Table C-1
Historical Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID	Date	Top of Casing	Initial Measurements				Product Removal		
			Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	Final Product Thickness
			(feet)				(gallons)		(feet)
MW-14	12/24/2003	31.32	19.05	--	0.00	12.27	0.00	4.67	0.00
MW-14	1/21/2004	31.32	17.20	17.19	0.01	14.13	0.01	4.68	0.00
MW-14	2/25/2004	31.32	15.51	15.47	0.04	15.85	0.00	4.68	0.04
MW-14	3/24/2004	31.32	14.97	14.90	0.07	16.41	0.00	4.68	0.07
MW-14	1/14/2005	31.32	21.60	20.00	1.60	11.14	0.01	4.69	1.60
MW-14	1/21/2005	31.32	--	--	--	--	0.00	4.69	--
MW-14	1/28/2005	31.32	20.27	19.00	1.27	12.18	0.01	4.70	0.00
MW-14	2/4/2005	31.32	--	19.55	--	--	0.01	4.71	0.00
MW-14	2/11/2005	31.32	19.62	19.61	0.01	11.71	0.01	4.72	0.01
MW-14	2/18/2005	31.32	19.64	19.64	0.00	11.68	0.01	4.73	0.00
MW-14	2/25/2005	31.32	20.03	20.03	0.00	11.29	0.01	4.74	0.00
MW-14	3/25/2005	31.32	20.32	20.32	0.00	11.00	0.00	4.74	0.00
MW-14	4/30/2005	31.32	--	--	--	--	0.00	4.74	--
MW-14	5/13/2005	31.32	19.25	--	0.00	12.07	0.00	4.74	0.00
MW-14	5/31/2005	31.32	18.80	18.80	0.00	12.52	0.00	4.74	0.00
MW-14	6/24/2005	31.32	18.75	18.70	0.05	12.61	0.00	4.74	0.00
MW-14	7/29/2005	31.32	19.92	--	0.00	11.40	0.00	4.74	0.00
MW-14	8/26/2005	31.32	--	--	--	--	0.00	4.74	--
MW-14	9/24/2005	31.32	20.52	--	0.00	10.80	0.00	4.74	0.00
MW-14	10/21/2005	31.32	20.70	--	0.00	10.62	0.00	4.74	0.00
MW-14	11/28/2005	31.32	20.20	--	0.00	11.12	0.00	4.74	0.00
MW-14	1/3/2006	31.32	17.98	--	0.00	13.34	0.00	4.74	0.00
MW-14	2/17/2006	31.32	--	15.65	--	--	0.00	4.74	--
MW-14	9/19/2006	31.32	20.43	--	0.00	10.89	0.00	4.74	0.00
MW-14	12/13/2006	31.32	18.38	--	0.00	12.94	0.00	4.74	0.00
MW-14	3/29/2007	31.32	17.03	17.01	0.02	14.31	0.00	4.74	0.02
MW-14	6/27/2007	31.32	19.28	18.90	0.38	12.38	2.50	7.24	0.01
MW-14	9/18/2007	31.32	20.46	20.41	0.05	10.90	0.00	7.24	0.05
MW-14	12/6/2007	31.32	15.75	15.75	0.00	15.57	0.00	7.24	0.00
MW-14	3/10/2008	31.32	17.55	17.55	0.00	13.77	0.00	7.24	0.02
MW-14	6/12/2008	31.32	15.85	15.80	0.05	15.51	0.00	7.24	0.05
MW-14	9/8/2008	31.32	Well inadvertently not gauged during groundwater monitoring event.						
MW-14	12/29/2008	31.32	13.51	13.50	0.01	17.82	0.00	7.24	0.01
MW-14	3/10/2009	31.32	19.02	19.01	0.01	12.31	0.00	7.24	0.01
MW-14	6/4/2009	31.32	18.26	18.26	0.00	13.06	0.00	7.24	0.00
MW-14	9/9/2009	31.32	20.61	20.60	0.00	10.71	0.00	7.24	0.01
MW-14	12/15/2009	31.32	Unable to Gauge; Under Large Puddle of Water						
MW-14	3/11/2010	31.32	18.08	NP	0.00	13.24	0.00	7.24	0.00
MW-14	6/8/2010	31.32	17.07	NP	0.00	14.25	0.00	7.24	0.00
MW-14	9/16/2010	31.32	19.63	NP	0.00	11.69	0.00	7.24	0.00
MW-14	12/13/2010	31.32	15.16	NP	0.00	16.16	0.00	7.24	0.00
MW-14	6/9/2011	31.32	14.99	NP	0.00	16.33	0.00	7.24	0.00
MW-14	12/1/2011	31.32	19.68	NP	0.00	11.64	0.00	7.24	0.00
MW-14	6/11/2012	31.32	16.48	NP	0.00	14.84	0.00	7.24	0.00
MW-14	12/19/2012	31.32	11.89	11.89	0.00	19.43	0.00	7.24	0.00
MW-14	12/17/2013	31.32	20.14	NP	0.00	11.18	0.00	7.24	0.00
MW-14	12/11/2014	31.32	17.38	NP	0.00	13.94	0.00	7.24	0.00
Well Abandoned May 14, 2015									
MW-15	8/27/2003	31.57	19.83	16.23	3.60	14.94	0.00	0.00	0.00
MW-15	9/3/2003	31.57	17.16	16.41	0.75	15.08	0.50	0.50	0.04
MW-15	9/11/2003	31.57	16.98	16.63	0.35	14.90	0.10	0.60	0.02
MW-15	9/17/2003	31.57	17.07	16.77	0.30	14.77	0.30	0.90	0.02
MW-15	9/30/2003	31.57	17.00	16.71	0.29	14.83	0.40	1.30	0.03
MW-15	10/14/2003	31.57	17.74	17.31	0.43	14.21	0.30	1.60	0.02
MW-15	10/29/2003	31.57	17.98	17.50	0.48	14.02	0.50	2.10	0.01
MW-15	11/13/2003	31.57	18.42	18.13	0.29	13.41	0.10	2.20	0.00
MW-15	11/19/2003	31.57	18.10	17.92	0.18	13.63	0.20	2.40	0.02
MW-15	11/26/2003	31.57	18.07	17.88	0.19	13.67	0.10	2.50	0.00
MW-15	12/3/2003	31.57	17.19	17.12	0.07	14.44	0.01	2.51	0.02
MW-15	12/10/2003	31.57	18.20	18.10	0.10	13.46	0.10	2.61	0.01
MW-15	12/24/2003	31.57	15.74	15.59	0.15	15.96	0.01	2.62	0.02
MW-15	1/9/2004	31.57	15.86	15.66	0.20	15.89	0.10	2.72	0.00
MW-15	1/21/2004	31.57	15.30	15.22	0.08	16.34	0.01	2.73	0.01
MW-15	2/3/2004	31.57	15.69	15.60	0.09	15.96	0.00	2.73	0.09
MW-15	2/18/2004	31.57	14.56	14.53	0.03	17.04	0.00	2.73	0.03
MW-15	2/25/2004	31.57	14.11	14.10	0.01	17.47	0.00	2.73	0.01
MW-15	3/24/2004	31.57	14.72	NP	0.00	16.85	0.00	2.73	0.00
MW-15	1/14/2005	31.57	18.25	17.50	0.75	13.99	0.10	2.83	0.10
MW-15	1/21/2005	31.57	17.70	17.15	0.55	14.36	0.50	3.33	0.10
MW-15	1/28/2005	31.57	17.39	17.17	0.22	14.38	0.05	3.38	0.06
MW-15	2/4/2005	31.57	17.38	17.21	0.17	14.34	0.15	3.53	0.01
MW-15	2/11/2005	31.57	17.20	17.09	0.11	14.47	0.05	3.58	0.09
MW-15	2/18/2005	31.57	17.23	17.11	0.12	14.45	0.05	3.63	0.04

Please refer to notes at the end of table.

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Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID	Date	Top of Casing	Initial Measurements				Product Removal		
			Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	Final Product Thickness
			(feet)				(gallons)		(feet)
MW-15	2/25/2005	31.57	17.42	17.35	0.07	14.21	0.00	3.63	0.07
MW-15	3/4/2005	31.57	17.61	17.51	0.10	14.05	0.20	3.83	0.01
MW-15	3/11/2005	31.57	17.55	17.53	0.02	14.04	0.00	3.83	0.02
MW-15	3/25/2005	31.57	18.05	17.99	0.06	13.57	0.00	3.83	0.06
MW-15	4/14/2005	31.57	17.22	17.14	0.08	14.42	0.00	3.83	0.08
MW-15	4/30/2005	31.57	17.00	16.84	0.16	14.71	0.25	4.08	0.01
MW-15	5/13/2005	31.57	16.61	16.54	0.07	15.02	0.00	4.08	0.07
MW-15	5/31/2005	31.57	16.38	16.30	0.08	15.26	0.00	4.08	0.08
MW-15	6/24/2005	31.57	16.50	16.29	0.21	15.26	0.25	4.33	0.01
MW-15	7/8/2005	31.57	16.51	16.40	0.11	15.16	0.25	4.58	0.00
MW-15	7/15/2005	31.57	16.51	16.45	0.06	15.11	0.00	4.58	0.06
MW-15	7/29/2005	31.57	16.79	16.72	0.07	14.84	0.00	4.58	0.07
MW-15	8/26/2005	31.57	17.43	17.39	0.04	14.18	0.00	4.58	0.04
MW-15	9/24/2005	31.57	18.05	17.96	0.09	13.60	0.00	4.58	0.09
MW-15	10/21/2005	31.57	18.58	18.50	0.08	13.06	0.00	4.58	0.08
MW-15	11/28/2005	31.57	17.65	17.45	0.20	14.10	0.05	4.63	0.00
MW-15	12/14/2005	31.57	17.19	17.10	0.09	14.46	0.00	4.63	0.09
MW-15	1/3/2006	31.57	16.15	15.98	0.17	15.57	0.50	5.13	0.03
MW-15	1/17/2006	31.57	15.19	15.10	0.09	16.46	0.00	5.13	0.09
MW-15	1/23/2006	31.57	15.01	14.95	0.06	16.61	0.00	5.13	0.06
MW-15	2/17/2006	31.57	14.35	14.30	0.05	17.26	0.00	5.13	0.05
MW-15	9/19/2006	31.57	18.61	18.01	0.60	13.49	1.30	6.43	0.01
MW-15	12/13/2006	31.57	16.30	15.87	0.43	15.65	1.00	7.43	0.00
MW-15	3/29/2007	31.57	15.57	15.22	0.35	16.31	0.25	7.68	0.01
MW-15	6/27/2007	31.57	16.56	16.14	0.42	15.38	2.00	9.68	0.01
MW-15	9/18/2007	31.57	18.26	18.25	0.01	13.32	0.00	9.68	0.01
MW-15	12/6/2007	31.57	17.76	17.48	0.28	14.06	0.30	9.98	0.00
MW-15	3/10/2008	31.57	15.86	15.35	0.51	16.16	0.00	9.98	0.51
MW-15	3/14/2008	31.57	15.56	15.15	0.41	16.37	0.75	10.73	0.01
MW-15	6/13/2008	31.57	16.28	15.73	0.55	15.78	0.66	11.39	0.00
MW-15	9/8/2008	31.57	17.67	17.66	0.01	13.91	0.26	11.65	0.00
MW-15	12/29/2008	31.57	Unable to Gauge; Under Large Puddle of Water						
MW-15	3/10/2009	31.57	16.35	16.29	0.06	15.27	0.00	11.65	0.06
MW-15	6/4/2009	31.57	17.14	16.18	0.96	15.28	0.00	11.65	0.00
MW-15	7/13/2009	31.57	19.06	18.02	1.04	13.44	1.50	13.15	0.02
MW-15	8/10/2009	31.57	17.92	17.63	0.29	13.91	0.25	13.40	0.01
MW-15	9/9/2009	31.57	18.48	18.35	0.13	13.21	0.20	13.60	0.00
MW-15	10/15/2009	31.57	19.34	19.29	0.05	12.27	0.00	13.60	0.05
MW-15	11/18/2009	31.57	18.7	18.66	0.04	12.91	0.00	13.60	0.04
MW-15	12/15/2009	31.57	18.45	17.83	0.62	13.67	0.64	14.24	0.00
MW-15	1/13/2010	31.57	16.65	16.24	0.41	15.28	0.33	14.57	0.00
MW-15	1/21/2010	31.57	16.21	15.91	0.30	15.63	0.30	14.87	0.00
MW-15	1/26/2010	31.57	16.06	15.91	0.15	15.64	0.30	15.17	0.00
MW-15	2/5/2010	31.57	15.92	15.83	0.09	15.73	0.00	15.17	0.09
MW-15	3/2/2010	31.57	16.17	15.90	0.27	15.64	0.30	15.47	0.00
MW-15	3/12/2010	31.57	15.81	15.67	0.14	15.88	0.30	15.77	0.01
MW-15	3/25/2010	31.57	15.70	15.65	0.05	15.91	0.00	15.77	0.05
MW-15	4/2/2010	31.57	15.89	15.84	0.05	15.72	0.00	15.77	0.05
MW-15	4/9/2010	31.57	15.57	15.57	0.00	16.00	0.00	15.77	0.00
MW-15	4/16/2010	31.57	15.72	15.52	0.20	16.03	0.50	16.27	0.00
MW-15	4/23/2010	31.57	15.94	15.85	0.09	15.71	0.00	16.27	0.09
MW-15	5/4/2010	31.57	15.89	15.83	0.06	15.73	0.00	16.27	0.06
MW-15	6/8/2010	31.57	15.61	15.55	0.06	16.01	0.00	16.27	0.06
MW-15	7/9/2010	31.57	15.78	15.53	0.25	16.01	0.25	16.52	0.01
MW-15	7/23/2010	31.57	15.85	15.76	0.09	15.80	0.00	16.52	0.09
MW-15	8/6/2010	31.57	16.19	15.92	0.27	15.62	0.25	16.77	0.00
MW-15	8/19/2010	31.57	16.23	16.15	0.08	15.41	0.00	16.77	0.08
MW-15	8/27/2010	31.57	16.40	16.22	0.18	15.33	0.25	17.02	0.07
MW-15	9/17/2010	31.57	16.74	16.62	0.12	14.94	0.25	17.27	0.00
MW-15	10/8/2010	31.57	17.30	17.23	0.07	14.33	0.00	17.27	0.07
MW-15	11/11/2010	31.57	17.19	17.10	0.09	14.46	0.00	17.27	0.09
MW-15	12/15/2010	31.57	15.85	15.64	0.21	15.91	0.50	17.77	0.04
MW-15	12/21/2010	31.57	15.60	15.47	0.13	16.09	0.50	18.27	0.02
MW-15	12/30/2010	31.57	15.45	15.32	0.13	16.24	0.50	18.77	0.02
MW-15	1/6/2011	31.57	15.23	15.19	0.04	16.38	0.05	18.82	0.01
MW-15	1/13/2011	31.57	14.66	14.62	0.04	16.95	0.00	18.82	0.04
MW-15	1/19/2011	31.57	14.99	14.94	0.05	16.62	0.00	18.82	0.05
MW-15	1/28/2011	31.57	14.76	14.72	0.04	16.85	0.00	18.82	0.04
MW-15	2/9/2011	31.57	15.05	14.98	0.07	16.58	0.00	18.82	0.07
MW-15	2/23/2011	31.57	15.14	15.05	0.09	16.51	0.00	18.82	0.09
MW-15	3/9/2011	31.57	14.42	14.40	0.02	17.17	0.00	18.82	0.02
MW-15	3/29/2011	31.57	14.46	14.43	0.03	17.14	0.00	18.82	0.03
MW-15	4/21/2011	31.57	14.16	14.15	0.01	17.42	0.00	18.82	0.01
MW-15	5/6/2011	31.57	14.19	14.18	0.01	17.39	0.00	18.82	0.01

Please refer to notes at the end of table.

Table C-1
Historical Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID	Date	Top of Casing	Initial Measurements				Product Removal		
			Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	Final Product Thickness
			(feet)				(gallons)		(feet)
MW-15	6/9/2011	31.57	14.45	14.45	0.00	17.12	0.00	18.82	0.00
MW-15	7/7/2011	31.57	14.80	14.75	0.05	16.81	0.00	18.82	0.05
MW-15	8/3/2011	31.57	15.28	15.21	0.07	16.35	0.00	18.82	0.07
MW-15	9/8/2011	31.57	16.03	15.98	0.05	15.58	0.00	18.82	0.05
MW-15	10/3/2011	31.57	16.45	16.13	0.32	15.40	0.25	19.07	0.01
MW-15	11/10/2011	31.57	17.11	17.02	0.09	14.54	0.00	19.07	0.09
MW-15	12/1/2011	31.57	16.57	16.56	0.01	15.01	0.00	19.07	0.01
MW-15	1/16/2012	31.57	16.88	16.88	0.00	14.69	0.00	19.07	0.00
MW-15	1/25/2012	31.57	16.22	16.13	0.09	15.43	0.00	19.07	0.09
MW-15	3/3/2012	31.57	16.06	15.98	0.08	15.58	0.00	19.07	0.08
MW-15	3/14/2012	31.57	Well under large puddle.						
MW-15	3/22/2012	31.57	15.53	15.46	0.07	16.10	0.00	19.07	0.07
MW-15	3/29/2012	31.57	Well under large puddle.						
MW-15	4/5/2012	31.57	15.38	15.11	0.27	16.43	0.13	19.20	0.00
MW-15	4/13/2012	31.57	15.15	15.05	0.10	16.51	0.00	19.20	0.10
MW-15	4/23/2012	31.57	15.01	15.00	0.01	16.57	0.00	19.20	0.01
MW-15	5/14/2012	31.57	15.15	14.90	0.25	16.64	0.25	19.45	0.01
MW-15	5/25/2012	31.57	15.03	15.02	0.01	16.55	0.00	19.45	0.01
MW-15	6/12/2012	31.57	15.11	15.10	0.01	16.47	0.00	19.45	0.01
MW-15	7/3/2012	31.57	15.26	15.21	0.05	16.35	0.00	19.45	0.05
MW-15	8/23/2012	31.57	16.04	15.95	0.09	15.61	0.00	19.45	0.09
MW-15	9/24/2012	31.57	16.95	16.50	0.45	15.02	0.50	19.95	0.02
MW-15	10/8/2012	31.57	17.16	16.95	0.21	14.60	0.25	20.20	0.00
MW-15	11/14/2012	31.57	17.14	17.08	0.06	14.48	0.00	20.20	0.06
MW-15	12/19/2012	31.57	Well under large puddle.						
MW-15	1/4/2013	31.57	15.22	15.04	0.18	16.51	0.2	20.40	0.01
MW-15	1/18/2013	31.57	15.32	15.18	0.14	16.37	0.75	21.15	0.01
MW-15	1/31/2013	31.57	15.48	15.37	0.11	16.19	0.1	21.25	0.01
MW-15	3/6/2013	31.57	15.78	15.60	0.18	15.95	0.5	21.75	0.01
MW-15	4/3/2013	31.57	15.15	15.13	0.02	16.44	0.00	21.75	0.02
MW-15	5/6/2013	31.57	16.4	16.38	0.02	15.19	0.00	21.75	0.02
MW-15	6/12/2013	31.57	16.26	16.23	0.03	15.34	0.00	21.75	0.03
MW-15	7/16/2013	31.57	16.88	16.65	0.23	14.89	0.40	22.15	0.02
MW-15	8/26/2013	31.57	18.35	18.10	0.25	13.44	0.80	22.95	0.00
MW-15	9/25/2013	31.57	18.65	18.60	0.05	12.96	0.00	22.95	0.05
MW-15	10/31/2013	31.57	18.4	18.26	0.14	13.29	0.00	22.95	0.05
MW-15	11/27/2013	31.57	18.45	18.40	0.05	13.16	0.00	22.95	0.05
MW-15	12/17/2013	31.57	18.57	18.52	0.05	13.04	0.00	22.95	0.05
MW-15	12/11/2014	31.57	17.65	16.5	1.15	14.94	1.25	24.20	0.00
Well Abandoned May 14, 2015									
MW-16	8/27/2003	31.24	18.43	18.21	0.22	13.01	0.25	0.25	0.00
MW-16	9/3/2003	31.24	18.21	18.20	0.01	13.04	0.01	0.26	0.01
MW-16	9/11/2003	31.24	18.28	18.27	0.01	12.97	0.01	0.27	0.00
MW-16	9/17/2003	31.24	18.31	18.30	0.01	12.94	0.01	0.28	0.00
MW-16	9/30/2003	31.24	18.23	18.21	0.02	13.03	0.01	0.29	0.00
MW-16	10/14/2003	31.24	18.31	NP	0.00	12.93	0.00	0.29	0.00
MW-16	10/29/2003	31.24	18.34	18.32	0.02	12.92	0.01	0.30	0.00
MW-16	11/13/2003	31.24	18.37	18.36	0.01	12.88	0.01	0.31	0.00
MW-16	11/26/2003	31.24	18.23	18.20	0.03	13.04	0.01	0.32	0.00
MW-16	12/24/2003	31.24	17.41	--	0.00	13.83	0.00	0.32	0.00
MW-16	1/21/2004	31.24	17.04	17.03	0.01	14.21	0.01	0.33	0.00
MW-16	2/25/2004	31.24	17.08	17.07	0.01	14.17	0.00	0.33	0.01
MW-16	3/24/2004	31.24	18.61	18.60	0.01	12.64	0.00	0.33	0.01
Well Abandoned									
MW-17	8/27/2003	28.40	18.00	17.48	0.52	10.86	0.50	0.50	0.01
MW-17	9/3/2003	28.40	17.85	17.61	0.24	10.76	0.10	0.60	0.01
MW-17	9/11/2003	28.40	18.07	17.98	0.09	10.41	0.01	0.61	0.00
MW-17	9/17/2003	28.40	18.20	18.05	0.15	10.33	0.01	0.62	0.00
MW-17	9/30/2003	28.40	18.18	18.00	0.18	10.38	0.01	0.63	0.00
MW-17	10/14/2003	28.40	18.60	18.52	0.08	9.87	0.01	0.64	0.01
MW-17	10/29/2003	28.40	18.56	18.51	0.05	9.88	0.01	0.65	0.00
MW-17	11/13/2003	28.40	18.74	18.71	0.03	9.69	0.01	0.66	0.01
MW-17	11/26/2003	28.40	18.68	18.66	0.02	9.74	0.01	0.67	0.01
MW-17	12/24/2003	28.40	17.31	17.29	0.02	11.11	0.01	0.68	0.01
MW-17	1/21/2004	28.40	15.68	--	0.00	12.72	0.00	0.68	0.00
MW-17	2/25/2004	28.40	16.30	14.17	2.13	14.00	1.50	2.18	0.01
MW-17	3/10/2004	28.40	15.80	14.85	0.95	13.45	0.15	2.33	0.01
MW-17	3/24/2004	28.40	15.12	15.03	0.09	13.36	0.00	2.33	0.09
MW-17	1/14/2005	28.40	19.50	17.75	1.75	10.46	0.10	2.43	0.35
MW-17	1/21/2005	28.40	18.55	17.75	0.80	10.56	1.10	3.53	0.10
MW-17	1/28/2005	28.40	18.01	17.78	0.23	10.59	0.20	3.73	0.05
MW-17	2/4/2005	28.40	18.02	17.86	0.16	10.52	0.15	3.88	0.07

Please refer to notes at the end of table.

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Historical Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID	Date	Top of Casing	Initial Measurements				Product Removal		
			Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	Final Product Thickness
			(feet)				(gallons)		(feet)
MW-17	2/11/2005	28.40	17.81	17.68	0.13	10.71	0.05	3.93	0.07
MW-17	2/18/2005	28.40	17.86	17.74	0.12	10.65	0.05	3.98	0.05
MW-17	2/25/2005	28.40	17.99	17.91	0.08	10.48	0.00	3.98	0.08
MW-17	3/4/2005	28.40	18.15	18.05	0.10	10.34	0.15	4.13	0.03
MW-17	3/11/2005	28.40	18.03	18.00	0.03	10.40	0.00	4.13	0.03
MW-17	3/25/2005	28.40	18.33	18.26	0.07	10.13	0.00	4.13	0.07
MW-17	4/14/2005	28.40	17.82	17.74	0.08	10.65	0.00	4.13	0.08
MW-17	4/30/2005	28.40	17.54	17.46	0.08	10.93	0.00	4.13	0.08
MW-17	5/31/2005	28.40	16.74	16.66	0.08	11.73	0.00	4.13	0.08
MW-17	6/24/2005	28.40	16.85	16.78	0.07	11.61	0.00	4.13	0.07
MW-17	7/29/2005	28.40	17.52	17.42	0.10	10.97	0.00	4.13	0.10
MW-17	8/26/2005	28.40	17.97	17.90	0.07	10.49	0.00	4.13	0.07
MW-17	9/24/2005	28.40	18.56	18.50	0.06	9.89	0.00	4.13	0.06
MW-17	10/21/2005	28.40	18.90	18.82	0.08	9.57	0.00	4.13	0.08
MW-17	11/28/2005	28.40	18.40	18.30	0.10	10.09	0.00	4.13	0.10
MW-17	1/3/2006	28.40	16.10	16.01	0.09	12.38	0.00	4.13	0.09
MW-17	2/17/2006	28.40	15.22	13.65	1.57	14.58	1.50	5.63	0.05
MW-17	3/3/2006	28.40	14.79	13.90	0.89	14.40	0.75	6.38	0.05
MW-17	9/19/2006	28.40	18.86	18.18	0.68	10.15	0.80	7.18	0.05
MW-17	12/13/2006	28.40	17.11	15.34	1.77	12.87	1.60	8.78	0.03
MW-17	3/29/2007	28.40	17.56	13.66	3.90	14.31	4.00	12.78	0.05
MW-17	5/3/2007	28.40	16.10	14.74	1.36	13.51	7.50	20.28	0.05
MW-17	5/15/2007	28.40	15.50	14.75	0.75	13.57	2.00	22.28	0.02
MW-17	5/25/2007	28.40	15.35	14.79	0.56	13.55	1.00	23.28	0.05
MW-17	6/4/2007	28.40	15.90	15.53	0.37	12.83	0.75	24.03	0.10
MW-17	6/13/2007	28.40	16.11	15.77	0.34	12.59	0.50	24.53	0.04
MW-17	6/19/2007	28.40	16.02	15.84	0.18	12.54	0.25	24.78	0.05
MW-17	6/27/2007	28.40	16.47	16.31	0.16	12.07	1.00	25.78	0.04
MW-17	7/9/2007	28.40	16.75	16.66	0.09	11.73	0.00	25.78	0.09
MW-17	7/25/2007	28.40	17.01	16.87	0.14	11.51	0.10	25.88	0.10
MW-17	8/9/2007	28.40	17.42	17.24	0.18	11.14	0.15	26.03	0.10
MW-17	8/22/2007	28.40	17.66	17.57	0.09	10.82	0.00	26.03	0.09
MW-17	9/7/2007	28.40	17.97	17.90	0.07	10.49	0.00	26.03	0.07
MW-17	9/14/2007	28.40	17.84	17.70	0.14	10.68	0.50	26.53	0.01
MW-17	9/18/2007	28.40	18.23	18.19	0.04	10.21	0.00	26.53	0.04
MW-17	10/4/2007	28.40	18.50	18.46	0.04	9.94	0.00	26.53	0.04
MW-17	10/11/2007	28.40	18.55	18.51	0.04	9.89	0.00	26.53	0.04
MW-17	10/24/2007	28.40	18.65	18.60	0.05	9.79	0.00	26.53	0.05
MW-17	11/8/2007	28.40	18.77	18.72	0.05	9.67	0.00	26.53	0.05
MW-17	11/21/2007	28.40	18.71	18.65	0.06	9.74	0.00	26.53	0.06
MW-17	12/7/2007	28.40	17.79	17.50	0.29	10.87	0.40	26.93	0.06
MW-17	12/21/2007	28.40	17.40	16.96	0.44	11.39	0.40	27.33	0.00
MW-17	1/3/2008	28.40	16.00	15.19	0.81	13.12	1.00	28.33	0.04
MW-17	1/18/2008	28.40	15.80	14.48	1.32	13.77	1.50	29.83	0.01
MW-17	1/24/2008	28.40	14.96	14.39	0.57	13.95	0.90	30.73	0.00
MW-17	1/31/2008	28.40	14.97	14.57	0.40	13.79	0.75	31.48	0.00
MW-17	2/6/2008	28.40	14.81	14.27	0.54	14.07	1.00	32.48	0.00
MW-17	2/15/2008	28.40	14.62	13.98	0.64	14.35	1.00	33.48	0.00
MW-17	2/29/2008	28.40	15.00	14.45	0.55	13.89	0.75	34.23	0.00
MW-17	3/10/2008	28.40	15.18	14.81	0.37	13.55	0.00	34.23	0.37
MW-17	3/12/2008	28.40	15.25	14.79	0.46	13.56	0.50	34.73	0.00
MW-17	3/21/2008	28.40	15.35	15.03	0.32	13.33	0.40	35.13	0.00
MW-17	4/11/2008	28.40	15.63	15.32	0.31	13.05	0.79	35.92	0.00
MW-17	4/17/2008	28.40	15.53	15.34	0.19	13.04	0.26	36.18	0.00
MW-17	4/24/2008	28.40	15.57	15.48	0.09	12.91	0.13	36.31	0.00
MW-17	5/2/2008	28.40	15.54	15.35	0.19	13.03	0.50	36.81	0.01
MW-17	5/8/2008	28.40	15.54	15.42	0.12	12.97	0.20	37.01	0.00
MW-17	5/14/2008	28.40	15.61	15.50	0.11	12.89	0.50	37.51	0.00
MW-17	5/30/2008	28.40	14.76	14.54	0.22	13.84	0.40	37.91	0.00
MW-17	6/13/2008	28.40	14.45	14.20	0.25	14.17	0.40	38.31	0.00
MW-17	6/25/2008	28.40	15.01	14.84	0.17	13.54	0.21	38.52	0.00
MW-17	7/11/2008	28.40	15.85	15.73	0.12	12.66	0.10	38.62	0.00
MW-17	7/28/2008	28.40	16.68	16.62	0.06	11.77	0.00	38.62	0.06
MW-17	8/13/2008	28.40	17.27	17.12	0.15	11.26	0.13	38.75	0.00
MW-17	8/27/2008	28.40	17.48	17.42	0.06	10.97	0.00	38.75	0.06
MW-17	9/8/2008	28.40	17.73	17.68	0.05	10.71	0.00	38.75	0.05
MW-17	9/18/2008	28.40	18.00	17.95	0.05	10.44	0.00	38.75	0.05
MW-17	9/30/2008	28.40	17.17	17.12	0.05	11.27	0.00	38.75	0.05
MW-17	10/16/2008	28.40	18.46	18.40	0.06	9.99	0.00	38.75	0.06
MW-17	10/30/2008	28.40	18.60	18.56	0.04	9.84	0.00	38.75	0.04
MW-17	11/14/2008	28.40	18.53	18.46	0.07	9.93	0.00	38.75	0.07
MW-17	11/26/2008	28.40	18.36	18.27	0.09	10.12	0.00	38.75	0.09
MW-17	12/16/2008	28.40	18.44	18.36	0.08	10.03	0.00	38.75	0.08
MW-17	12/29/2008	28.40	18.23	18.04	0.19	10.34	0.13	38.88	0.00

Please refer to notes at the end of table.

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Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID	Date	Top of Casing	Initial Measurements				Product Removal		
			Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	Final Product Thickness
			(feet)				(gallons)		(feet)
MW-17	1/15/2009	28.40	16.49	15.62	0.87	12.68	0.40	39.28	0.01
MW-17	1/23/2009	28.40	16.22	15.82	0.40	12.54	0.40	39.68	0.01
MW-17	1/29/2009	28.40	16.19	15.96	0.23	12.41	0.26	39.94	0.00
MW-17	2/4/2009	28.40	16.15	15.94	0.21	12.44	0.40	40.34	0.01
MW-17	2/12/2009	28.40	16.34	16.22	0.12	12.17	0.26	40.60	0.00
MW-17	2/19/2009	28.40	16.65	16.57	0.08	11.82	0.00	40.60	0.08
MW-17	3/10/2009	28.40	16.61	16.49	0.12	11.90	0.13	40.73	0.00
MW-17	3/27/2009	28.40	16.69	16.58	0.11	11.81	0.13	40.86	0.00
MW-17	4/16/2009	28.40	16.64	16.55	0.09	11.84	0.00	40.86	0.09
MW-17	5/14/2009	28.40	16.27	16.15	0.12	12.24	0.07	40.93	0.00
MW-17	6/4/2009	28.40	15.79	15.73	0.06	12.66	0.00	40.93	0.00
MW-17	7/13/2009	28.40	17.26	17.14	0.12	11.25	0.13	41.06	0.01
MW-17	8/10/2009	28.40	17.90	17.84	0.06	10.55	0.00	41.06	0.06
MW-17	9/9/2009	28.40	18.52	18.47	0.05	9.92	0.00	41.06	0.05
MW-17	10/15/2009	28.40	18.79	18.73	0.06	9.66	0.00	41.06	0.06
MW-17	11/18/2009	28.40	18.34	18.32	0.02	10.08	0.00	41.06	0.02
MW-17	12/15/2009	28.40	17.43	17.31	0.12	11.08	0.16	41.22	0.00
MW-17	1/13/2010	28.40	16.80	15.54	1.26	12.72	1.33	42.55	0.00
MW-17	1/21/2010	28.40	--	16.83	--	--	0.80	43.35	--
MW-17	1/26/2010	28.40	15.74	15.07	0.67	13.26	0.70	44.05	0.00
MW-17	2/5/2010	28.40	15.60	15.53	0.07	12.86	0.00	44.05	0.07
MW-17	3/2/2010	28.40	16.85	14.92	1.93	13.27	2.10	46.15	0.00
MW-17	3/12/2010	28.40	16.06	15.13	0.93	13.17	1.00	47.15	0.00
MW-17	3/25/2010	28.40	16.10	15.25	0.85	13.06	1.00	48.15	0.21
MW-17	4/2/2010	28.40	16.63	16.12	0.51	12.22	0.25	48.40	0.01
MW-17	4/9/2010	28.40	15.63	14.94	0.69	13.38	0.50	48.90	0.00
MW-17	4/16/2010	28.40	14.79	14.79	0.00	13.61	0.00	48.90	0.00
MW-17	4/23/2010	28.40	16.30	15.22	1.08	13.06	1.00	49.90	0.02
MW-17	5/4/2010	28.40	15.91	15.31	0.60	13.02	0.40	50.30	0.00
MW-17	6/8/2010	28.40	14.43	13.80	0.63	14.53	0.75	51.05	0.02
MW-17	7/9/2010	28.40	16.02	14.75	1.27	13.51	1.00	52.05	0.00
MW-17	7/23/2010	28.40	16.24	15.58	0.66	12.75	0.50	52.55	0.02
MW-17	8/6/2010	28.40	16.45	16.08	0.37	12.28	0.50	53.05	0.01
MW-17	8/19/2010	28.40	16.73	16.48	0.25	11.89	0.25	53.30	0.01
MW-17	8/27/2010	28.40	16.77	16.69	0.08	11.70	0.00	53.30	0.01
MW-17	9/17/2010	28.40	17.27	17.13	0.14	11.25	0.50	53.80	0.01
MW-17	10/8/2010	28.40	17.48	17.43	0.05	10.96	0.00	53.80	0.05
MW-17	11/11/2010	28.40	17.20	16.88	0.32	11.48	0.40	54.20	0.02
MW-17	12/15/2010	28.40	16.81	14.18	2.63	13.93	2.50	56.70	0.01
MW-17	12/21/2010	28.40	15.39	14.20	1.19	14.07	1.25	57.95	0.01
MW-17	12/30/2010	28.40	14.87	13.83	1.04	14.46	1.00	58.95	0.01
MW-17	1/6/2011	28.40	14.46	13.74	0.72	14.58	0.75	59.70	0.03
MW-17	1/13/2011	28.40	14.41	13.83	0.58	14.51	0.75	60.45	0.01
MW-17	1/19/2011	28.40	13.50	13.10	0.40	15.26	0.50	60.95	0.00
MW-17	1/28/2011	28.40	13.66	12.96	0.70	15.36	0.75	61.70	0.02
MW-17	2/9/2011	28.40	14.75	13.95	0.80	14.36	1.50	63.20	0.02
MW-17	2/23/2011	28.40	14.80	14.75	0.05	13.64	0.00	63.20	0.00
MW-17	3/9/2011	28.40	14.05	13.32	0.73	15.00	0.40	63.60	0.01
MW-17	3/29/2011	28.40	14.97	13.06	1.91	15.13	2.50	66.10	0.02
MW-17	4/21/2011	28.40	14.04	12.65	1.39	15.60	1.20	67.30	0.02
MW-17	5/6/2011	28.40	14.01	13.02	0.99	15.27	0.50	67.80	0.02
MW-17	6/9/2011	28.40	12.58	12.05	0.53	16.29	0.50	68.30	0.01
MW-17	7/7/2011	28.40	14.06	14.05	0.01	14.35	0.00	68.30	0.01
MW-17	8/3/2011	28.40	14.79	14.44	0.35	13.92	0.50	68.80	0.01
MW-17	9/8/2011	28.40	16.32	16.22	0.10	12.17	0.00	68.80	0.10
MW-17	10/3/2011	28.40	17.08	16.83	0.25	11.54	0.50	69.30	0.02
MW-17	11/10/2011	28.40	17.65	17.57	0.08	10.82	0.00	69.30	0.80
MW-17	12/1/2011	28.40	17.07	17.05	0.02	11.35	0.00	69.30	0.02
MW-17	1/6/2012	28.40	16.82	16.78	0.04	11.62	0.00	69.30	0.04
MW-17	1/25/2012	28.40	15.70	15.49	0.21	12.89	0.30	69.60	0.01
MW-17	3/3/2012	28.40	16.52	15.57	0.95	12.73	1.00	70.60	0.06
MW-17	3/14/2012	28.40	15.81	14.85	0.96	13.44	0.75	71.35	0.01
MW-17	3/22/2012	28.40	14.99	14.05	0.94	14.25	0.50	71.85	0.01
MW-17	3/29/2012	28.40	14.22	13.64	0.58	14.70	0.50	72.35	0.02
MW-17	4/5/2012	28.40	13.44	12.92	0.52	15.42	0.25	72.60	0.01
MW-17	4/13/2012	28.40	13.30	13.21	0.09	15.18	0.00	72.60	0.09
MW-17	4/23/2012	28.40	13.75	13.09	0.66	15.24	0.50	73.10	0.01
MW-17	5/14/2012	28.40	13.85	13.05	0.80	15.26	0.50	73.60	0.02
MW-17	5/25/2012	28.40	13.16	13.15	0.01	15.25	0.00	73.60	0.01
MW-17	6/12/2012	28.40	14.16	13.40	0.76	14.92	0.75	74.35	0.01
MW-17	7/3/2012	28.40	14.04	13.69	0.35	14.67	0.25	74.60	0.01
MW-17	8/23/2012	28.40	16.50	16.21	0.29	12.16	0.25	74.85	0.01
MW-17	9/24/2012	28.40	17.25	17.05	0.20	11.33	0.25	75.10	0.00
MW-17	10/8/2012	28.40	17.47	17.44	0.03	10.96	0.00	75.10	0.03

Please refer to notes at the end of table.

Table C-1
Historical Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID	Date	Top of Casing	Initial Measurements				Product Removal		
			Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	Final Product Thickness
			(feet)				(gallons)		(feet)
MW-17	11/14/2012	28.40	16.95	16.91	0.04	11.49	0.00	75.10	0.04
MW-17	12/20/2012	28.40	15.45	13.51	1.94	14.68	2.00	77.10	0.01
MW-17	1/4/2013	28.40	15.11	13.59	1.52	14.64	1.75	78.85	0.01
MW-17	1/18/2013	28.40	14.80	14.01	0.79	14.30	0.75	79.60	0.01
MW-17	1/31/2013	28.40	15.01	14.49	0.52	13.85	0.40	80.00	0.01
MW-17	3/6/2013	28.40	15.82	15.33	0.49	13.02	0.80	80.80	0.01
MW-17	4/3/2013	28.40	16.25	16.15	0.10	12.24	0.50	81.30	0.01
MW-17	5/6/2013	28.40	16.17	16.04	0.13	12.35	0.20	81.50	0.01
MW-17	6/12/2013	28.40	16.39	16.04	0.35	12.32	0.50	82.00	0.00
MW-17	7/16/2013	28.40	16.97	16.73	0.24	11.64	0.20	82.20	0.01
MW-17	8/26/2013	28.40	17.78	17.59	0.19	10.79	0.10	82.30	0.01
MW-17	9/25/2013	28.40	18.13	18.11	0.02	10.29	0.00	82.30	0.02
MW-17	10/31/2013	28.40	18.00	17.93	0.07	10.46	0.00	82.30	0.07
MW-17	11/27/2013	28.40	18.01	17.87	0.14	10.51	0.10	82.40	0.01
MW-17	12/17/2013	28.40	17.92	17.85	0.07	10.54	0.00	82.40	0.07
MW-17	1/27/2014	28.40	18.08	18.00	0.08	10.39	0.00	82.40	0.00
MW-17	2/27/2014	28.40	16.90	16.59	0.31	11.78	0.20	82.60	0.03
MW-17	3/26/2014	28.40	15.78	14.91	0.87	13.39	1.00	83.60	0.02
MW-17	4/15/2014	28.40	16.03	14.93	1.10	13.35	0.50	84.10	0.01
MW-17	5/9/2014	28.40	15.60	14.40	1.20	13.87	1.75	85.85	0.00
MW-17	6/30/2014	28.40	15.90	15.60	0.30	12.77	0.50	86.35	0.00
MW-17	7/16/2014	28.40	14.95	14.45	0.50	13.90	0.50	86.85	0.00
MW-17	8/4/2014	28.40	17.21	16.81	0.40	11.55	0.30	87.15	0.00
MW-17	9/30/2014	28.40	15.49	15.45	0.04	12.95	0.00	87.15	0.00
MW-17	10/27/2014	28.40	15.61	15.51	0.10	12.88	0.00	87.15	0.00
MW-17	11/24/2014	28.40	18.40	17.55	0.85	10.76	1.00	88.15	0.00
MW-17	12/11/2014	28.40	16.66	16.48	0.18	11.90	0.20	88.35	0.00
MW-17	1/29/2015	28.40	16.90	16.55	0.35	11.81	0.70	89.05	0.00
MW-17	2/27/2015	28.40	16.70	16.50	0.20	11.88	0.40	89.45	0.00
MW-17	3/27/2015	28.40	18.08	14.72	3.36	13.31	3.00	92.45	0.01
MW-17	4/28/2015	28.40	17.01	15.01	2.00	13.17	3.00	95.45	0.00
Well Abandoned May 14, 2015									
MW-19	8/27/2003	30.73	21.43	18.61	2.82	11.81	2.00	2.00	0.12
MW-19	9/3/2003	30.73	19.55	18.91	0.64	11.75	0.50	2.50	0.02
MW-19	9/11/2003	30.73	19.38	19.28	0.10	11.44	0.10	2.60	0.01
MW-19	9/17/2003	30.73	19.55	19.46	0.09	11.26	0.10	2.70	0.01
MW-19	9/30/2003	30.73	19.65	19.57	0.08	11.15	0.01	2.71	0.02
MW-19	10/14/2003	30.73	19.76	19.66	0.10	11.06	0.01	2.72	0.01
MW-19	10/29/2003	30.73	19.77	19.65	0.12	11.07	0.10	2.82	0.02
MW-19	11/13/2003	30.73	19.91	19.86	0.05	10.86	0.01	2.83	0.00
MW-19	11/26/2003	30.73	19.80	19.74	0.06	10.98	0.01	2.84	0.00
MW-19	12/24/2003	30.73	19.18	18.07	1.11	12.54	0.20	3.04	0.06
MW-19	12/30/2003	30.73	19.15	18.10	1.05	12.51	0.20	3.24	0.02
MW-19	1/9/2004	30.73	19.41	15.41	4.00	14.88	0.30	3.54	0.02
MW-19	1/15/2004	30.73	19.15	15.59	3.56	14.75	1.90	5.44	0.07
MW-19	1/21/2004	30.73	17.34	15.34	2.00	15.17	1.00	6.44	0.02
MW-19	1/24/2004	30.73	16.55	14.96	1.59	15.60	0.80	7.24	0.01
MW-19	2/3/2004	30.73	17.70	14.45	3.25	15.92	1.00	8.24	0.01
MW-19	2/12/2004	30.73	16.75	14.60	2.15	15.89	1.00	9.24	0.01
MW-19	2/18/2004	30.73	16.17	14.85	1.32	15.73	0.90	10.14	0.00
MW-19	2/25/2004	30.73	15.12	14.71	0.41	15.97	0.30	10.44	0.00
MW-19	3/3/2004	30.73	15.25	14.99	0.26	15.71	0.10	10.54	0.01
MW-19	3/10/2004	30.73	15.60	15.03	0.57	15.64	0.40	10.94	0.02
MW-19	3/19/2004	30.73	15.85	15.08	0.77	15.57	0.50	11.44	0.01
MW-19	3/24/2004	30.73	15.90	15.22	0.68	15.44	0.40	11.84	0.01
MW-19	4/1/2004	30.73	16.55	15.61	0.94	15.02	0.60	12.44	0.01
MW-19	1/14/2005	30.73	--	--	--	--	--	12.44	0.00
MW-19	1/21/2005	30.73	20.10	19.00	1.10	11.61	0.75	13.19	0.10
MW-19	1/28/2005	30.73	19.22	19.10	0.12	11.62	0.01	13.20	0.03
MW-19	2/4/2005	30.73	19.17	19.08	0.09	11.64	0.00	13.20	0.09
MW-19	2/18/2005	30.73	19.06	18.97	0.09	11.75	0.00	13.20	0.09
MW-19	2/25/2005	30.73	19.35	19.24	0.11	11.48	0.05	13.25	0.03
MW-19	3/11/2005	30.73	19.35	19.31	0.04	11.42	0.00	13.25	0.04
MW-19	3/25/2005	30.73	19.69	19.61	0.08	11.11	0.00	13.25	0.08
MW-19	4/30/2005	30.73	19.36	18.91	0.45	11.77	0.25	13.50	0.00
MW-19	5/13/2005	30.73	18.88	18.56	0.32	12.13	0.25	13.75	0.03
MW-19	5/31/2005	30.73	19.00	18.00	1.00	12.62	1.00	14.75	0.05
MW-19	6/24/2005	30.73	19.32	18.11	1.21	12.49	1.50	16.25	0.08
MW-19	7/8/2005	30.73	19.40	18.42	0.98	12.20	0.75	17.00	0.01
MW-19	7/15/2005	30.73	18.87	18.64	0.23	12.06	0.10	17.10	0.01
MW-19	7/22/2005	30.73	19.93	19.86	0.07	10.86	0.00	17.10	0.07
MW-19	7/29/2005	30.73	19.00	18.93	0.07	11.79	0.00	17.10	0.07
MW-19	8/12/2005	30.73	19.34	19.18	0.16	11.53	0.10	17.20	0.02

Please refer to notes at the end of table.

Table C-1
Historical Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID	Date	Top of Casing	Initial Measurements				Product Removal		
			Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	Final Product Thickness
			(feet)				(gallons)		(feet)
MW-19	8/26/2005	30.73	19.44	19.39	0.05	11.33	0.00	17.20	0.05
MW-19	9/24/2005	30.73	19.84	19.75	0.09	10.97	0.00	17.20	0.09
MW-19	10/21/2005	30.73	20.00	19.99	0.01	10.74	0.00	17.20	0.01
MW-19	11/28/2005	30.73	19.55	19.42	0.13	11.30	0.05	17.25	0.00
MW-19	12/14/2005	30.73	19.65	19.22	0.43	11.46	0.10	17.35	0.08
MW-19	12/21/2005	30.73	19.16	18.82	0.34	11.87	0.50	17.85	0.10
MW-19	1/3/2006	30.73	20.15	17.35	2.80	13.07	2.50	20.35	0.10
MW-19	1/11/2006	30.73	17.40	15.00	2.40	15.47	2.50	22.85	0.10
MW-19	1/17/2006	30.73	15.75	14.46	1.29	16.13	1.10	23.95	0.03
MW-19	1/23/2006	30.73	15.38	14.50	0.88	16.13	0.70	24.65	0.10
MW-19	1/31/2006	30.73	14.92	14.33	0.59	16.34	0.20	24.85	0.08
MW-19	2/17/2006	30.73	15.25	14.43	0.82	16.21	1.50	26.35	0.04
MW-19	2/24/2006	30.73	15.11	14.62	0.49	16.06	1.50	27.85	0.03
MW-19	3/3/2006	30.73	15.23	14.57	0.66	16.09	0.50	28.35	0.03
MW-19	3/14/2006	30.73	16.19	14.95	1.24	15.64	0.75	29.10	0.05
MW-19	3/21/2006	30.73	15.66	14.89	0.77	15.76	0.50	29.60	0.10
MW-19	3/31/2006	30.73	15.48	14.89	0.59	15.78	0.30	29.90	0.02
MW-19	4/6/2006	30.73	15.45	15.21	0.24	15.49	0.20	30.10	0.01
MW-19	4/14/2006	30.73	15.04	14.81	0.23	15.89	0.20	30.30	0.10
MW-19	4/24/2006	30.73	15.19	14.75	0.44	15.93	0.25	30.55	0.01
MW-19	5/9/2006	30.73	15.58	14.98	0.60	15.68	0.70	31.25	0.07
MW-19	5/19/2006	30.73	15.50	15.02	0.48	15.66	0.90	32.15	0.01
MW-19	5/25/2006	30.73	15.41	15.06	0.35	15.63	0.70	32.85	0.01
MW-19	6/2/2006	30.73	15.33	15.10	0.23	15.60	0.30	33.15	0.03
MW-19	Product Skimmer Installed in Well								
MW-19	6/9/2006	30.73	--	--	--	--	0.25	33.40	--
MW-19	6/19/2006	30.73	--	--	--	--	0.15	33.55	--
MW-19	6/28/2006	30.73	--	--	--	--	0.20	33.75	--
MW-19	7/3/2006	30.73	--	--	--	--	0.10	33.85	--
MW-19	7/10/2006	30.73	--	--	--	--	0.10	33.95	--
MW-19	7/18/2006	30.73	--	--	--	--	0.20	34.15	--
MW-19	7/25/2006	30.73	--	--	--	--	0.40	34.55	--
MW-19	8/4/2006	30.73	--	--	--	--	0.10	34.65	--
MW-19	8/11/2006	30.73	--	--	--	--	0.90	35.55	--
MW-19	8/18/2006	30.73	--	--	--	--	0.30	35.85	--
MW-19	8/23/2006	30.73	--	--	--	--	0.10	35.95	--
MW-19	9/8/2006	30.73	--	--	--	--	0.05	36.00	--
MW-19	9/20/2006	30.73	--	--	--	--	0.10	36.10	--
MW-19	10/3/2006	30.73	--	--	--	--	0.05	36.15	--
MW-19	11/6/2006	30.73	--	--	--	--	0.05	36.20	--
MW-19	11/22/2006	30.73	--	--	--	--	0.00	36.20	--
MW-19	12/4/2006	30.73	--	--	--	--	1.90	38.10	--
MW-19	12/13/2006	30.73	--	--	--	--	1.30	39.40	--
MW-19	12/18/2006	30.73	--	--	--	--	1.00	40.40	--
MW-19	12/26/2006	30.73	--	--	--	--	1.10	41.50	--
MW-19	1/9/2007	30.73	--	--	--	--	1.20	42.70	--
MW-19	1/15/2007	30.73	--	--	--	--	1.00	43.70	--
MW-19	1/26/2007	30.73	--	--	--	--	1.10	44.80	--
MW-19	1/31/2007	30.73	--	--	--	--	1.10	45.90	--
MW-19	2/9/2007	30.73	--	--	--	--	1.00	46.90	--
MW-19	2/13/2007	30.73	--	--	--	--	1.00	47.90	--
MW-19	2/28/2007	30.73	--	--	--	--	1.10	49.00	--
MW-19	3/6/2007	30.73	--	--	--	--	1.20	50.20	--
MW-19	3/23/2007	30.73	--	--	--	--	4.00	54.20	--
MW-19	3/29/2007	30.73	--	--	--	--	5.00	59.20	--
MW-19	4/5/2007	30.73	--	--	--	--	0.50	59.70	--
MW-19	4/11/2007	30.73	--	--	--	--	0.40	60.10	--
MW-19	4/16/2007	30.73	--	--	--	--	8.20	68.30	--
MW-19	4/25/2007	30.73	--	--	--	--	0.80	69.10	--
MW-19	5/3/2007	30.73	--	--	--	--	5.00	74.10	--
MW-19	5/10/2007	30.73	--	--	--	--	0.90	75.00	--
MW-19	5/15/2007	30.73	--	--	--	--	0.50	75.50	--
MW-19	5/25/2007	30.73	--	--	--	--	0.25	75.75	--
MW-19	6/4/2007	30.73	--	--	--	--	0.75	76.50	--
MW-19	6/13/2007	30.73	--	--	--	--	0.20	76.70	--
MW-19	6/19/2007	30.73	--	--	--	--	0.10	76.80	--
MW-19	6/27/2007	30.73	--	--	--	--	1.00	77.80	--
MW-19	7/9/2007	30.73	--	--	--	--	1.20	79.00	--
MW-19	7/25/2007	30.73	--	--	--	--	0.10	79.10	--
MW-19	8/9/2007	30.73	--	--	--	--	0.15	79.25	--
MW-19	8/22/2007	30.73	--	--	--	--	0.00	79.25	--
MW-19	9/7/2007	30.73	--	--	--	--	0.10	79.35	--
MW-19	9/14/2007	30.73	--	--	--	--	0.10	79.45	--
MW-19	9/19/2007	30.73	--	--	--	--	0.00	79.45	--

Please refer to notes at the end of table.

Table C-1
Historical Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID	Date	Top of Casing	Initial Measurements				Product Removal		
			Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	Final Product Thickness
			(feet)				(gallons)		(feet)
MW-19	10/4/2007	30.73	--	--	--	--	0.10	79.55	--
MW-19	10/11/2007	30.73	--	--	--	--	0.00	79.55	--
MW-19	10/24/2007	30.73	--	--	--	--	0.10	79.65	--
MW-19	11/8/2007	30.73	--	--	--	--	0.10	79.75	--
MW-19	11/21/2007	30.73	--	--	--	--	0.00	79.75	--
MW-19	12/7/2007	30.73	--	--	--	--	0.05	79.80	--
MW-19	12/21/2007	30.73	--	--	--	--	0.05	79.85	--
MW-19	1/3/2008	30.73	17.59	16.98	0.61	--	1.50	81.35	0.04
MW-19	1/18/2008	30.73	17.94	16.25	1.69	--	2.75	84.10	0.00
MW-19	1/24/2008	30.73	16.29	15.52	0.77	--	2.00	86.10	0.00
MW-19	1/31/2008	30.73	16.48	15.37	1.11	--	2.50	88.60	0.00
MW-19	2/6/2008	30.73	16.88	15.07	1.81	--	4.00	92.60	0.00
MW-19	2/15/2008	30.73	15.54	14.75	0.79	--	2.75	95.35	0.00
MW-19	2/29/2008	30.73	17.00	14.71	2.29	--	2.50	97.85	0.00
MW-19	3/14/2008	30.73	16.89	14.88	2.01	--	2.50	100.35	0.00
MW-19	3/21/2008	30.73	15.67	15.19	0.48	--	2.25	102.60	0.00
MW-19	4/11/2008	30.73	15.87	15.45	0.42	--	1.00	103.60	0.00
MW-19	4/17/2008	30.73	15.63	15.50	0.13	--	0.66	104.26	0.00
MW-19	4/24/2008	30.73	15.89	15.88	0.01	--	0.40	104.66	0.01
MW-19	5/2/2008	30.73	16.12	16.10	0.02	--	0.25	104.91	0.02
MW-19	5/8/2008	30.73	16.35	16.32	0.03	--	0.13	105.04	0.03
MW-19	5/14/2008	30.73	17.01	17.00	0.01	--	0.00	105.04	0.01
MW-19	5/30/2008	30.73	16.13	16.12	0.01	--	0.60	105.64	0.01
MW-19	6/13/2008	30.73	15.64	15.63	0.01	--	0.13	105.77	0
MW-19	6/25/2008	30.73	16.92	16.91	0.01	--	0.00	105.77	0.01
MW-19	7/11/2008	30.73	16.82	16.81	0.01	--	0.05	105.83	0.01
MW-19	7/28/2008	30.73	17.88	17.82	0.06	--	0.00	105.83	0.06
MW-19	8/13/2008	30.73	18.31	18.28	0.03	--	0.07	105.89	0.03
MW-19	8/27/2008	30.73	19.07	19.00	0.07	--	0.07	105.96	0.07
MW-19	9/8/2008	30.73	19.43	19.19	0.24	--	0.26	106.22	0.01
MW-19	9/18/2008	30.73	19.66	19.65	0.01	--	0.00	106.22	0.01
MW-19	9/30/2008	30.73	20.02	20.01	0.01	--	0.00	106.22	0.01
MW-19	10/16/2008	30.73	20.42	20.40	0.02	--	0.00	106.22	0.02
MW-19	10/30/2008	30.73	20.41	20.41	0.00	--	0.05	106.27	0.00
MW-19	11/14/2008	30.73	20.80	20.80	0.00	--	0.01	106.28	0.00
MW-19	11/26/2008	30.73	20.42	20.42	0.00	--	0.00	106.28	0.00
MW-19	12/16/2008	30.73	20.68	20.67	0.01	--	0.00	106.28	0.01
MW-19	12/29/2008	30.73	19.45	19.45	0.00	--	0.00	106.28	0.00
MW-19	1/15/2009	30.73	18.60	16.96	1.64	--	1.19	107.47	0.00
MW-19	1/23/2009	30.73	17.12	17.12	0.00	--	0.08	107.55	0
MW-19	1/29/2009	30.73	17.30	17.29	0.01	--	0.26	107.81	0.00
MW-19	2/4/2009	30.73	17.24	17.24	0.00	--	0.66	108.47	0.01
MW-19	2/12/2009	30.73	17.33	17.33	0.00	--	0.53	109.00	0.00
MW-19	2/19/2009	30.73	19.34	19.30	0.04	--	0.00	109.00	0.04
MW-19	3/10/2009	30.73	18.97	18.94	0.03	--	0.00	109.00	0.03
MW-19	3/27/2009	30.73	18.74	18.70	0.04	--	0.05	109.05	0.04
MW-19	4/16/2009	30.73	19.00	18.99	0.01	--	0.00	109.05	0.01
MW-19	5/14/2009	30.73	18.46	18.45	0.01	--	0.00	109.05	0.01
MW-19	6/5/2009	30.73	17.88	17.86	0.02	--	0.03	109.08	0.00
MW-19	7/13/2009	30.73	19.34	19.30	0.04	--	0.04	109.12	0.04
MW-19	8/10/2009	30.73	20.15	20.09	0.06	--	0.00	109.12	0.06
MW-19	9/9/2009	30.73	21.60	21.52	0.08	--	0.00	109.12	0.08
MW-19	10/15/2009	30.73	20.73	20.72	0.01	--	0.00	109.12	0.01
MW-19	11/18/2009	30.73	20.53	20.53	0.00	--	0.00	109.12	0.00
MW-19	12/16/2009	30.73	19.03	19.03	0.00	--	0.00	109.12	0.00
MW-19	1/13/2010	30.73	21.65	17.75	3.90	--	5.00	114.12	0.00
MW-19	1/21/2010	30.73	20.26	16.82	3.44	--	3.10	117.22	0.00
MW-19	1/26/2010	30.73	--	--	--	--	1.10	118.32	--
MW-19	2/5/2010	30.73	--	--	--	--	0.90	119.22	0.00
MW-19	3/2/2010	30.73	23.70	15.72	7.98	--	10.75	129.97	0.03
MW-19	3/12/2010	30.73	17.36	15.51	1.85	--	3.50	133.47	0.01
MW-19	3/25/2010	30.73	19.13	16.10	3.03	--	3.00	136.47	--
MW-19	4/2/2010	30.73	17.33	17.33	0.00	--	1.00	137.47	0.00
MW-19	4/9/2010	30.73	17.35	15.31	2.04	--	2.50	139.97	0.01
MW-19	4/16/2010	30.73	17.43	15.32	2.11	--	2.50	142.47	0.06
MW-19	4/23/2010	30.73	17.23	15.72	1.51	--	2.00	144.47	0.01
MW-19	5/4/2010	30.73	19.86	15.94	3.92	--	3.25	147.72	0.03
MW-19	6/8/2010	30.73	16.19	14.98	1.21	--	1.50	149.22	0.05
MW-19	7/9/2010	30.73	22.54	15.25	7.29	--	5.50	154.72	0.09
MW-19	7/23/2010	30.73	17.12	15.73	1.39	--	3.25	157.97	0.01
MW-19	8/6/2010	30.73	17.06	16.38	0.68	--	1.25	159.22	0.01
MW-19	8/19/2010	30.73	17.51	17.48	0.03	--	0.50	159.72	0.01
MW-19	8/27/2010	30.73	18.01	17.97	0.04	--	0.00	159.72	0.01
MW-19	9/17/2010	30.73	18.75	18.68	0.07	--	0.25	159.97	0.01

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Table C-1
Historical Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID	Date	Top of Casing	Initial Measurements				Product Removal		
			Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	Final Product Thickness
			(feet)				(gallons)		(feet)
MW-19	10/8/2010	30.73	18.60	18.58	0.02	--	0.20	160.17	0.02
MW-19	11/11/2010	30.73	18.95	18.88	0.07	--	0.00	160.17	0.07
MW-19	12/15/2010	30.73	20.10	15.51	4.59	--	4.75	164.92	0.02
MW-19	12/21/2010	30.73	18.49	15.20	3.29	--	3.00	167.92	0.04
MW-19	12/30/2010	30.73	18.90	16.09	2.81	--	3.00	170.92	0.02
MW-19	1/6/2011	30.73	15.90	14.65	1.25	--	2.25	173.17	0.03
MW-19	1/13/2011	30.73	16.30	16.07	0.23	--	2.50	175.67	0.01
MW-19	1/19/2011	30.73	15.53	14.62	0.91	--	2.25	177.92	0.01
MW-19	1/28/2011	30.73	14.43	14.34	0.09	--	0.15	178.07	0.09
MW-19	2/9/2011	30.73	15.62	14.51	1.11	--	2.50	180.57	0.02
MW-19	2/23/2011	30.73	14.80	14.75	0.05	--	--	180.57	0.00
MW-19	3/9/2011	30.73	14.57	14.16	0.41	--	0.85	181.42	0.00
MW-19	3/29/2011	30.73	14.21	13.86	0.35	--	1.25	182.67	0.02
MW-19	4/21/2011	30.73	13.90	13.78	0.12	--	0.60	183.27	0.02
MW-19	5/6/2011	30.73	14.06	14.00	0.06	--	0.00	183.27	0.06
MW-19	6/9/2011	30.73	13.93	13.86	0.07	--	0.00	183.27	0.07
MW-19	7/7/2011	30.73	14.23	14.09	0.14	--	0.25	183.52	0.01
MW-19	8/3/2011	30.73	14.52	14.48	0.04	--	0.00	183.52	0.04
MW-19	9/8/2011	30.73	15.98	15.91	0.07	--	0.00	183.52	0.07
MW-19	10/3/2011	30.73	15.79	15.67	0.12	--	0.20	183.72	0.03
MW-19	11/10/2011	30.73	16.80	16.73	0.07	--	0.00	183.72	0.07
MW-19	12/1/2011	30.73	16.02	16.02	0.00	--	0.00	183.72	0.00
MW-19	1/6/2012	30.73	Well buried under asphalt pile.						
MW-19	1/25/2012	30.73	Well buried under asphalt pile.						
MW-19	3/3/2012	30.73	Well buried under asphalt pile.						
MW-19	3/6/2012	30.73	18.75	14.98	3.77	--	3.00	186.72	0.00
MW-19	3/14/2012	30.73	Well under large puddle.						
MW-19	3/22/2012	30.73	15.57	14.45	1.12	--	1.00	187.72	0.01
MW-19	3/29/2012	30.73	Well under large puddle.						
MW-19	4/5/2012	30.73	15.66	15.33	0.33	--	0.87	188.59	0.01
MW-19	4/13/2012	30.73	14.33	14.24	0.09	--	0.10	188.69	0.09
MW-19	4/23/2012	30.73	14.26	14.25	0.01	--	0.13	188.82	0.01
MW-19	5/14/2012	30.73	14.20	14.19	0.01	--	0.05	188.87	0.01
MW-19	5/25/2012	30.73	14.29	14.29	0.00	--	0.00	188.87	0.00
MW-19	6/12/2012	30.73	14.30	--	0.00	--	0.00	188.87	0.00
MW-19	7/3/2012	30.73	14.64	14.62	0.02	--	0.00	188.87	0.00
MW-19	8/23/2012	30.73	15.80	15.35	0.45	--	0.50	189.37	0.05
MW-19	9/24/2012	30.73	16.16	16.00	0.16	--	0.75	190.12	0.02
MW-19	10/8/2012	30.73	16.68	16.61	0.07	--	0.25	190.37	0.07
MW-19	11/14/2012	30.73	16.39	16.38	0.01	--	0.25	190.62	0.01
MW-19	12/20/2012	30.73	14.81	14.32	0.49	--	0.75	191.37	0.02
MW-19	1/4/2013	30.73	14.19	14.17	0.02	--	0.25	191.62	0.02
MW-19	1/18/2013	30.73	14.59	14.58	0.01	--	0.25	191.87	0.02
MW-19	1/31/2013	30.73	14.74	14.74	0.00	--	0.00	191.87	0.00
MW-19	3/6/2013	30.73	15.22	15.16	0.06	--	0.60	192.47	0.01
MW-19	4/3/2013	30.73	15.98	15.48	0.50	--	0.85	193.32	0.01
MW-19	5/6/2013	30.73	16.72	15.98	0.74	--	1.50	194.82	0.01
MW-19	6/12/2013	30.73	16.39	16.00	0.39	--	2.50	197.32	0.01
MW-19	7/16/2013	30.73	16.65	16.38	0.27	--	0.40	197.72	0.03
MW-19	8/26/2013	30.73	17.80	17.63	0.17	--	0.50	198.22	0.01
MW-19	9/25/2013	30.73	20.15	20.13	0.02	--	0.00	198.22	0.02
MW-19	10/31/2013	30.73	17.50	17.42	0.08	--	0.00	198.22	0.08
MW-19	11/27/2013	30.73	17.84	17.77	0.07	--	0.00	198.22	0.07
MW-19	12/17/2013	30.73	16.80	16.68	0.12	--	0.20	198.42	0.01
MW-19	1/27/2014	30.73	18.60	16.55	2.05	--	2.00	200.42	0.05
MW-19	2/27/2014	30.73	16.15	16.05	0.10	--	0.10	200.52	0.01
MW-19	3/26/2014	30.73	18.30	15.53	2.77	--	1.00	201.52	0.03
MW-19	4/15/2014	30.73	16.30	14.92	1.38	--	0.50	202.02	0.01
MW-19	5/9/2014	30.73	15.86	14.68	1.18	--	1.50	203.52	0.00
MW-19	6/30/2014	30.73	16.90	15.60	1.30	--	2.50	206.02	0.00
MW-19	7/16/2004	30.73	14.95	14.20	0.75	--	0.25	206.27	0.00
MW-19	8/4/2014	30.73	16.55	16.05	0.50	--	0.50	206.77	0.00
MW-19	9/30/2014	30.73	18.10	17.30	0.80	--	1.50	208.27	0.00
MW-19	10/27/2014	30.73	17.80	17.50	0.30	--	0.25	208.52	0.00
MW-19	11/24/2014	30.73	19.20	17.85	1.35	--	2.00	210.52	0.00
MW-19	12/11/2014	30.73	17.43	17.30	0.13	--	0.25	210.77	0.00
MW-19	1/29/2015	30.73	16.15	16.10	0.05	--	0.20	210.97	0.00
MW-19	2/27/2015	30.73	17.95	17.75	0.20	--	0.40	211.37	0.00
MW-19	3/27/2015	30.73	20.14	15.05	5.09	--	4.25	215.62	0.06
MW-19	4/28/2015	30.73	20.27	19.57	0.70	--	2.00	217.62	0.02
MW-19	5/29/2015	30.73	17.90	17.30	0.60	--	2.00	219.62	0.01
MW-19	6/23/2015	30.73	17.20	17.12	0.08	--	0.00	219.62	0.08
MW-19	7/8/2015	30.73	17.46	17.33	0.13	--	0.50	220.12	0.01
MW-19	8/12/2015	30.73	18.09	17.97	0.12	--	3.00	223.12	0.02

Please refer to notes at the end of table.

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Historical Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID	Date	Top of Casing	Initial Measurements				Product Removal		
			Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	Final Product Thickness
			(feet)				(gallons)		(feet)
MW-19	9/11/2015	30.73	18.46	18.32	0.14	--	1.50	224.62	0.00
MW-19	10/15/2015	30.73	19.04	18.85	0.19	--	1.00	225.62	0.00
MW-19	11/10/2015	30.73	18.80	18.60	0.20	--	1.50	227.12	0.00
MW-19	12/16/2015	30.73	17.35	17.20	0.15	--	1.00	228.12	0.00
MW-19	1/21/2016	30.73	15.41	14.05	1.36	--	2.00	230.12	0.05
MW-19	2/17/2016	30.73	14.80	13.95	0.85	--	2.00	232.12	0.04
MW-19	3/29/2016	30.73	14.16	13.84	0.32	--	0.50	232.62	0.00
MW-19	4/27/2016	30.73	14.35	14.20	0.15	--	0.25	232.87	0.30
MW-19	5/27/2016	30.73	14.65	14.53	0.12	--	0.25	233.12	0.01
MW-19	6/29/2016	30.73	15.07	15.00	0.07	--	0.00	233.12	0.07
MW-19	7/20/2016	30.73	15.69	15.50	0.19	--	0.25	233.37	0.04
MW-19	8/31/2016	30.73	16.45	16.20	0.25	--	0.45	233.82	0.02
MW-19	9/16/2016	30.73	16.48	16.31	0.17	--	0.60	234.42	0.05
MW-19	10/20/2016	30.73	16.66	16.65	0.01	--	0.50	234.92	0.00
MW-19	11/28/2016	30.73	16.60	15.08	1.52	--	1.00	235.92	0.05
MW-19	12/19/2016	30.73	15.10	14.61	0.49	--	0.75	236.67	0.00
MW-19	1/5/2017	30.73	14.65	14.65	0.00	--	1.00	237.67	0.00
MW-19	2/14/2017	30.73	14.97	14.59	0.38	--	0.50	238.17	0.03
MW-19	3/28/2017	30.73	13.10	13.08	0.02	--	0.00	238.17	0.02
MW-19	4/18/2017	30.73	13.20	13.20	0.00	--	0.50	238.67	0.00
MW-19	5/26/2017	30.73	13.51	13.51	0.00	--	0.00	238.67	0.00
MW-19	6/23/2017	30.73	13.83	13.83	0.00	--	0.00	238.67	0.00
MW-19	7/21/2017	30.73	14.33	14.32	0.01	--	0.00	238.67	0.01
MW-19	8/18/2017	30.73	14.74	14.72	0.02	--	0.00	238.67	0.02
MW-19	9/26/2017	30.73	14.91	14.90	0.01	--	0.50	239.17	0.01
MW-19	10/30/2017	30.73	14.66	14.65	0.01	--	0.50	239.67	0.01
MW-19	11/17/2017	30.73	14.49	14.45	0.04	--	0.00	239.67	0.04
MW-19	12/13/2017	30.73	14.29	14.27	0.02	--	0.00	239.67	0.02
MW-19	1/26/2018	30.73	13.84	13.80	0.04	--	0.00	239.67	0.04
MW-19	2/14/2018	30.73	14.08	14.07	0.01	--	0.00	239.67	0.01
MW-19	3/26/2018	30.73	14.20	14.15	0.05	--	1.00	240.67	0.01
MW-19	5/3/2018	30.73	14.24	14.20	0.04	--	0.00	240.67	0.04
MW-19	5/31/2018	30.73	14.55	14.54	0.01	--	0.00	240.67	0.01
MW-19	6/21/2018	30.73	14.98	14.97	0.01	--	0.00	240.67	0.01
MW-19	7/17/2018	30.73	15.21	15.20	0.01	--	0.00	240.67	0.01
MW-19	8/17/2018	30.73	15.93	15.92	0.01	--	0.00	240.67	0.01
MW-19	10/16/2018	30.73	16.67	16.66	0.01	--	0.00	240.67	0.01
MW-19	11/5/2018	30.73	16.53	16.52	0.01	--	0.00	240.67	0.01
MW-19	12/5/2018	30.73	16.06	16.05	0.01	--	0.00	240.67	0.01
MW-19	12/31/2018	30.73	15.53	15.08	0.45	--	3.00	243.67	0.00
MW-19	1/18/2019	30.73	15.62	15.07	0.55	15.60	1.50	245.17	0.05
MW-19	2/21/2019	30.73	14.56	14.42	0.14	16.29	0.50	245.67	0.01
MW-19	4/2/2019	30.73	14.99	14.92	0.07	15.80	0.00	245.67	0.07
MW-19	4/18/2019	30.73	14.71	14.60	0.11	16.12	0.10	245.77	0.01
MW-19	5/16/2019	30.73	15.11	15.10	0.01	15.63	0.00	245.77	0.01
MW-19	6/19/2019	30.73	15.57	15.56	0.01	15.17	0.00	245.77	0.01
MW-19	7/23/2019	30.73	16.25	16.24	0.01	14.49	0.00	245.77	0.01
MW-19	8/22/2019	30.73	16.09	--	0.00	14.64	0.00	245.77	0.00
MW-19	9/25/2019	30.73	16.26	16.25	0.01	14.48	0.00	245.77	0.00
MW-19	10/25/2019	30.73	16.21	16.20	0.01	14.53	0.00	245.77	0.01
MW-19	11/20/2019	30.73	16.33	16.32	0.01	14.41	0.00	245.77	0.01
MW-19	12/9/2019	30.73	16.65	16.64	0.01	14.09	0.00	245.77	0.01
MW-19	2/18/2020	30.73	14.38	14.35	0.03	16.38	0.00	245.77	0.03
MW-19	2/28/2020	30.73	14.50	14.49	0.01	16.24	0.20	245.97	0.01
MW-19	3/19/2020	30.73	14.93	14.92	0.01	15.81	0.00	245.97	0.01
MW-19	4/20/2020	30.73	14.75	14.74	0.01	15.99	0.00	245.97	0.01
MW-19	5/29/2020	30.73	15.53	15.52	0.01	15.21	0.00	245.97	0.01
MW-19	6/11/2020	30.73	14.97	14.96	0.01	15.77	0.00	245.97	0.01
MW-19	7/15/2020	30.73	15.90	15.88	0.02	14.85	0.00	245.97	0.02
MW-19	8/31/2020	30.73	15.65	15.64	0.01	15.09	0.00	245.97	0.01
MW-19	9/28/2020	30.73	17.29	17.28	0.01	13.45	0.00	245.97	0.01
MW-19	10/23/2020	30.73	17.02	17.01	0.01	13.72	0.00	245.97	0.01
MW-19	11/13/2020	30.73	16.85	16.84	0.01	13.89	0.00	245.97	0.01
MW-19	12/10/2020	30.73	16.06	16.05	0.01	14.68	0.00	245.97	0.01
MW-19	1/20/2021	30.73	14.40	--	0.00	16.33	0.00	243.87	0.00
MW-19	2/24/2021	30.73	13.94	--	0.00	16.79	0.00	243.87	0.00
MW-19	1/6/2022	30.73	14.79	13.92	0.87	16.71	1.50	245.37	0.06
MW-19	12/5/2022	30.73	16.01	15.95	0.06	14.77	0.09	245.46	0.00
MW-20	8/27/2003	30.73	20.58	19.46	1.12	11.15	2.00	2.00	0.04
MW-20	9/3/2003	30.73	19.99	19.59	0.40	11.10	0.50	2.50	0.03
MW-20	9/11/2003	30.73	20.15	19.91	0.24	10.79	0.50	3.00	0.01
MW-20	9/17/2003	30.73	20.27	19.99	0.28	10.71	0.50	3.50	0.01
MW-20	9/30/2003	30.73	20.32	20.17	0.15	10.54	0.10	3.60	0.00

Please refer to notes at the end of table.

Table C-1
Historical Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID	Date	Top of Casing	Initial Measurements				Product Removal		
			Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	Final Product Thickness
			(feet)				(gallons)		(feet)
MW-20	10/14/2003	30.73	20.38	20.26	0.12	10.46	0.10	3.70	0.00
MW-20	10/29/2003	30.73	20.36	20.21	0.15	10.50	0.10	3.80	0.00
MW-20	11/13/2003	30.73	20.45	20.37	0.08	10.35	0.10	3.90	0.01
MW-20	11/26/2003	30.73	20.41	20.35	0.06	10.37	0.10	4.00	0.02
MW-20	12/24/2003	30.73	20.66	18.68	1.98	11.83	0.30	4.30	0.04
MW-20	12/30/2003	30.73	20.69	18.75	1.94	11.77	0.20	4.50	0.01
MW-20	1/9/2004	30.73	20.71	18.88	1.83	11.65	0.10	4.60	0.01
MW-20	1/15/2004	30.73	20.70	17.66	3.04	12.74	1.50	6.10	0.04
MW-20	1/21/2004	30.73	19.22	16.14	3.08	14.25	1.50	7.60	0.03
MW-20	1/29/2004	30.73	19.90	15.55	4.35	14.70	2.00	9.60	0.01
MW-20	2/3/2004	30.73	20.90	15.42	5.48	14.71	2.50	12.10	0.01
MW-20	2/12/2004	30.73	18.05	15.40	2.65	15.04	1.50	13.60	0.02
MW-20	2/18/2004	30.73	19.02	15.62	3.40	14.74	2.20	15.80	0.00
MW-20	2/25/2004	30.73	16.56	15.44	1.12	15.17	0.70	16.50	0.00
MW-20	3/3/2004	30.73	16.95	15.85	1.10	14.76	0.50	17.00	0.01
MW-20	3/10/2004	30.73	17.66	16.00	1.66	14.55	1.00	18.00	0.02
MW-20	3/18/2004	30.73	17.29	15.92	1.37	14.66	0.75	18.75	0.02
MW-20	3/24/2004	30.73	17.75	16.20	1.55	14.36	1.00	19.75	0.00
MW-20	4/1/2004	30.73	17.78	16.92	0.86	13.72	0.50	20.25	0.00
MW-20	1/14/2005	30.73	20.70	19.75	0.95	10.88	1.20	21.45	0.01
MW-20	1/21/2005	30.73	20.00	19.60	0.40	11.09	1.20	22.65	0.10
MW-20	1/28/2005	30.73	19.70	19.50	0.20	11.21	0.10	22.75	0.05
MW-20	2/4/2005	30.73	19.73	19.61	0.12	11.11	0.05	22.80	0.06
MW-20	2/11/2005	30.73	19.48	19.38	0.10	11.34	0.05	22.85	0.03
MW-20	2/18/2005	30.73	19.51	19.45	0.06	11.27	0.00	22.85	0.06
MW-20	2/25/2005	30.73	19.77	19.69	0.08	11.03	0.00	22.85	0.08
MW-20	3/11/2005	30.73	19.89	19.82	0.07	10.90	0.20	23.05	0.00
MW-20	3/25/2005	30.73	20.18	20.12	0.06	10.60	0.00	23.05	0.06
MW-20	4/30/2005	30.73	19.49	19.45	0.04	11.28	0.00	23.05	0.04
MW-20	5/31/2005	30.73	18.65	18.60	0.05	12.12	0.00	23.05	0.05
MW-20	6/24/2005	30.73	21.02	18.57	2.45	11.89	3.00	26.05	0.00
MW-20	7/8/2005	30.73	20.10	18.95	1.15	11.65	1.00	27.05	0.05
MW-20	7/15/2005	30.73	19.62	19.14	0.48	11.54	0.25	27.30	0.05
MW-20	7/22/2005	30.73	19.61	19.33	0.28	11.37	2.50	29.80	0.09
MW-20	7/29/2005	30.73	19.67	19.45	0.22	11.26	2.00	31.80	0.02
MW-20	8/5/2005	30.73	19.70	19.61	0.09	11.11	0.00	31.80	0.09
MW-20	8/12/2005	30.73	19.85	19.72	0.13	11.00	0.15	31.95	0.02
MW-20	8/26/2005	30.73	20.07	19.93	0.14	10.78	0.50	32.45	0.02
MW-20	9/9/2005	30.73	20.15	20.10	0.05	10.62	0.00	32.45	0.05
MW-20	9/24/2005	30.73	20.36	20.28	0.08	10.44	0.00	32.45	0.08
MW-20	10/21/2005	30.73	20.58	20.50	0.08	10.22	0.00	32.45	0.08
MW-20	11/28/2005	30.73	20.05	19.95	0.10	10.77	0.00	32.45	0.10
MW-20	1/3/2006	30.73	21.43	17.81	3.62	12.52	3.50	35.95	0.10
MW-20	1/17/2006	30.73	19.77	14.86	4.91	15.33	3.75	39.70	0.03
MW-20	1/23/2006	30.73	16.68	15.07	1.61	15.48	1.50	41.20	0.06
MW-20	1/31/2006	30.73	15.91	14.95	0.96	15.67	0.70	41.90	0.03
MW-20	2/17/2006	30.73	16.50	15.21	1.29	15.38	2.00	43.90	0.03
MW-20	2/24/2006	30.73	16.09	15.52	0.57	15.15	1.50	45.40	0.05
MW-20	3/3/2006	30.73	15.81	15.45	0.36	15.24	0.25	45.65	0.01
MW-20	3/14/2006	30.73	16.19	15.81	0.38	14.88	0.25	45.90	0.05
MW-20	3/21/2006	30.73	16.30	16.09	0.21	14.62	0.25	46.15	0.06
MW-20	3/31/2006	30.73	16.65	16.30	0.35	14.39	0.40	46.55	0.03
MW-20	4/6/2006	30.73	15.80	15.57	0.23	15.13	0.10	46.65	0.00
MW-20	4/14/2006	30.73	15.96	15.59	0.37	15.10	0.30	46.95	0.05
MW-20	4/24/2006	30.73	16.02	15.50	0.52	15.17	0.75	47.70	0.00
MW-20	5/9/2006	30.73	16.60	15.95	0.65	14.71	0.70	48.40	0.05
MW-20	5/19/2006	30.73	16.51	15.89	0.62	14.77	1.10	49.50	0.01
MW-20	5/25/2006	30.73	16.41	15.84	0.57	14.83	0.80	50.30	0.01
MW-20	6/2/2006	30.73	16.32	15.78	0.54	14.89	0.50	50.80	0.04
MW-20	Product Skimmer Installed in Well								
MW-20	6/9/2006	30.73	--	--	--	--	0.75	51.55	--
MW-20	6/19/2006	30.73	--	--	--	--	0.25	51.80	--
MW-20	6/28/2006	30.73	--	--	--	--	0.30	52.10	--
MW-20	7/3/2006	30.73	--	--	--	--	0.15	52.25	--
MW-20	7/10/2006	30.73	--	--	--	--	0.10	52.35	--
MW-20	7/18/2006	30.73	--	--	--	--	0.20	52.55	--
MW-20	7/25/2006	30.73	--	--	--	--	0.50	53.05	--
MW-20	8/4/2006	30.73	--	--	--	--	0.50	53.55	--
MW-20	8/11/2006	30.73	--	--	--	--	0.20	53.75	--
MW-20	8/18/2006	30.73	--	--	--	--	0.20	53.95	--
MW-20	8/23/2006	30.73	--	--	--	--	0.10	54.05	--

Please refer to notes at the end of table.

Table C-1
Historical Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID	Date	Top of Casing	Initial Measurements				Product Removal		
			Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	Final Product Thickness
			(feet)				(gallons)		(feet)
MW-20	9/8/2006	30.73	--	--	--	--	0.00	54.05	--
MW-20	9/20/2006	30.73	--	--	--	--	0.20	54.25	--
MW-20	10/3/2006	30.73	--	--	--	--	0.05	54.30	--
MW-20	11/6/2006	30.73	--	--	--	--	0.10	54.40	--
MW-20	11/22/2006	30.73	--	--	--	--	0.10	54.50	--
MW-20	12/4/2006	30.73	--	--	--	--	1.90	56.40	--
MW-20	12/13/2006	30.73	--	--	--	--	1.30	57.70	--
MW-20	12/18/2006	30.73	--	--	--	--	1.20	58.90	--
MW-20	12/26/2006	30.73	--	--	--	--	1.20	60.10	--
MW-20	1/5/2007	30.73	--	--	--	--	1.30	61.40	--
MW-20	1/9/2007	30.73	--	--	--	--	1.20	62.60	--
MW-20	1/15/2007	30.73	--	--	--	--	0.00	62.60	--
MW-20	1/26/2007	30.73	--	--	--	--	1.20	63.80	--
MW-20	1/31/2007	30.73	--	--	--	--	1.10	64.90	--
MW-20	2/9/2007	30.73	--	--	--	--	1.00	65.90	--
MW-20	2/13/2007	30.73	--	--	--	--	1.00	66.90	--
MW-20	2/28/2007	30.73	--	--	--	--	1.10	68.00	--
MW-20	3/6/2007	30.73	--	--	--	--	1.00	69.00	--
MW-20	3/23/2007	30.73	--	--	--	--	1.00	70.00	--
MW-20	3/29/2007	30.73	--	--	--	--	4.00	74.00	--
MW-20	4/5/2007	30.73	--	--	--	--	1.00	75.00	--
MW-20	4/11/2007	30.73	--	--	--	--	1.20	76.20	--
MW-20	4/5/2007	30.73	--	--	--	--	1.00	77.20	--
MW-20	4/11/2007	30.73	--	--	--	--	1.20	78.40	--
MW-20	4/16/2007	30.73	--	--	--	--	2.70	81.10	--
MW-20	4/25/2007	30.73	--	--	--	--	0.30	81.40	--
MW-20	5/3/2007	30.73	--	--	--	--	4.10	85.50	--
MW-20	5/10/2007	30.73	--	--	--	--	0.80	86.30	--
MW-20	5/15/2007	30.73	--	--	--	--	1.20	87.50	--
MW-20	5/25/2007	30.73	--	--	--	--	0.50	88.00	--
MW-20	6/4/2007	30.73	--	--	--	--	0.50	88.50	--
MW-20	6/13/2007	30.73	--	--	--	--	0.50	89.00	--
MW-20	6/19/2007	30.73	--	--	--	--	0.00	89.00	--
MW-20	6/27/2007	30.73	--	--	--	--	1.00	90.00	--
MW-20	7/9/2007	30.73	--	--	--	--	0.50	90.50	--
MW-20	7/25/2007	30.73	--	--	--	--	0.10	90.60	--
MW-20	8/9/2007	30.73	--	--	--	--	0.10	90.70	--
MW-20	8/22/2007	30.73	--	--	--	--	0.10	90.80	--
MW-20	9/7/2007	30.73	--	--	--	--	0.10	90.90	--
MW-20	9/14/2007	30.73	--	--	--	--	0.90	91.80	--
MW-20	9/19/2007	30.73	--	--	--	--	0.10	91.90	--
MW-20	10/4/2007	30.73	--	--	--	--	0.10	92.00	--
MW-20	10/11/2007	30.73	--	--	--	--	0.00	92.00	--
MW-20	10/24/2007	30.73	--	--	--	--	0.10	92.10	--
MW-20	11/8/2007	30.73	--	--	--	--	0.10	92.20	--
MW-20	11/21/2007	30.73	--	--	--	--	0.00	92.20	--
MW-20	12/7/2007	30.73	--	--	--	--	0.05	92.25	--
MW-20	12/21/2007	30.73	--	--	--	--	0.05	92.30	--
MW-20	1/3/2008	30.73	19.70	17.44	2.26	13.04	3.00	95.30	0.02
MW-20	1/18/2008	30.73	18.00	16.93	1.07	13.68	2.50	97.80	0.00
MW-20	1/24/2008	30.73	17.57	16.57	1.00	14.05	1.00	98.80	0.00
MW-20	1/31/2008	30.73	17.61	16.76	0.85	13.88	1.75	100.55	0.00
MW-20	2/6/2008	30.73	18.02	16.55	1.47	14.02	3.00	103.55	0.00
MW-20	2/15/2008	30.73	17.46	15.94	1.52	14.62	4.25	107.80	0.00
MW-20	2/29/2008	30.73	18.18	16.28	1.90	14.24	2.50	110.30	0.00
MW-20	3/14/2008	30.73	17.62	16.59	1.03	14.03	2.50	112.80	0.00
MW-20	3/21/2008	30.73	17.40	17.33	0.07	13.39	1.00	113.80	0.00
MW-20	4/11/2008	30.73	17.80	17.57	0.23	13.13	2.00	115.80	0.00
MW-20	4/17/2008	30.73	17.67	17.56	0.11	13.16	1.06	116.86	0.00
MW-20	4/24/2008	30.73	17.84	17.71	0.13	13.01	0.26	117.12	0.00
MW-20	5/2/2008	30.73	17.58	17.50	0.08	13.22	0.25	117.37	0.08
MW-20	5/8/2008	30.73	17.63	17.59	0.04	13.14	1.30	118.67	0.04
MW-20	5/14/2008	30.73	17.92	17.88	0.04	12.85	0.03	118.70	0.04
MW-20	5/30/2008	30.73	16.79	16.71	0.08	14.01	0.03	118.73	0.08
MW-20	6/13/2008	30.73	16.50	16.43	0.07	14.29	0.26	118.99	0.00
MW-20	6/25/2008	30.73	17.05	16.86	0.19	13.85	0.00	118.99	0.00
MW-20	7/11/2008	30.73	17.85	17.76	0.09	12.96	0.13	119.12	0.09
MW-20	7/28/2008	30.73	18.22	18.21	0.01	12.52	0.03	119.15	0.01
MW-20	8/13/2008	30.73	19.30	19.28	0.02	11.45	0.00	119.15	0.02
MW-20	8/27/2008	30.73	19.56	19.55	0.01	11.18	0.13	119.28	0.01
MW-20	9/8/2008	30.73	19.71	19.68	0.03	11.05	0.00	119.28	0.03
MW-20	9/18/2008	30.73	19.86	19.84	0.02	10.89	0.03	119.31	0.02

Please refer to notes at the end of table.

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Historical Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID	Date	Top of Casing	Initial Measurements				Product Removal		
			Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	Final Product Thickness
			(feet)				(gallons)		(feet)
MW-20	9/30/2008	30.73	20.05	20.02	0.03	10.71	0.00	119.31	0.03
MW-20	10/16/2008	30.73	20.41	20.40	0.01	10.33	0.00	119.31	0.01
MW-20	10/30/2008	30.73	20.40	20.39	0.01	10.34	0.00	119.31	0.01
MW-20	11/14/2008	30.73	20.55	20.54	0.01	10.19	0.00	119.31	0.01
MW-20	11/26/2008	30.73	20.28	20.23	0.05	10.49	0.00	119.31	0.05
MW-20	12/16/2008	30.73	20.47	20.46	0.01	10.27	0.00	119.31	0.01
MW-20	12/29/2008	30.73	20.46	20.44	0.02	10.29	0.00	119.31	0.02
MW-20	1/15/2009	30.73	18.62	18.07	0.55	12.60	0.33	119.64	0.00
MW-20	1/23/2009	30.73	18.85	17.93	0.92	12.70	0.40	120.04	0.01
MW-20	1/29/2009	30.73	18.42	18.28	0.14	12.43	0.26	120.30	0.00
MW-20	2/4/2009	30.73	18.31	18.03	0.28	12.67	0.79	121.09	0.01
MW-20	2/12/2009	30.73	18.53	18.40	0.13	12.32	0.60	121.69	0.00
MW-20	2/19/2009	30.73	18.88	18.81	0.07	11.91	0.00	121.69	0.07
MW-20	3/10/2009	30.73	19.15	19.12	0.03	11.61	0.05	121.74	0.03
MW-20	3/27/2009	30.73	19.06	19.03	0.03	11.70	0.05	121.79	0.03
MW-20	4/16/2009	30.73	18.70	18.67	0.03	12.06	0.00	121.79	0.03
MW-20	5/14/2009	30.73	18.51	18.48	0.03	12.25	0.00	121.79	0.03
MW-20	6/5/2009	30.73	17.95	17.94	0.01	12.79	0.05	121.84	0.00
MW-20	7/13/2009	30.73	19.28	19.28	0.00	11.45	0.00	121.84	0.00
MW-20	8/10/2009	30.73	20.10	20.10	0.00	10.63	0.00	121.84	0.00
MW-20	9/9/2009	30.73	20.84	20.82	0.02	9.91	0.00	121.84	0.02
MW-20	10/15/2009	30.73	20.84	20.80	0.04	9.93	0.00	121.84	0.04
MW-20	11/18/2009	30.73	20.46	20.46	0.00	10.27	0.00	121.84	0.00
MW-20	12/16/2009	30.73	19.90	19.90	0.00	10.83	0.00	121.84	0.00
MW-20	1/13/2010	30.73	20.22	18.38	1.84	12.15	2.50	124.34	0.00
MW-20	1/21/2010	30.73	18.67	17.62	1.05	12.99	2.10	126.44	0.00
MW-20	1/26/2010	30.73	18.45	17.80	0.65	12.86	1.00	127.44	0.00
MW-20	2/5/2010	30.73	--	--	--	--	1.00	128.44	0.00
MW-20	3/2/2010	30.73	20.57	17.51	3.06	12.88	2.65	131.09	0.02
MW-20	3/12/2010	30.73	18.70	17.35	1.35	13.23	2.25	133.34	0.01
MW-20	3/25/2010	30.73	18.56	17.49	1.07	13.12	2.00	135.34	0.01
MW-20	4/2/2010	30.73	18.15	17.23	0.92	13.40	2.50	137.84	0.00
MW-20	4/9/2010	30.73	18.39	17.43	0.96	13.19	1.25	139.09	0.01
MW-20	4/16/2010	30.73	18.44	17.39	1.05	13.22	1.25	140.34	0.03
MW-20	4/23/2010	30.73	18.44	17.60	0.84	13.04	2.00	142.34	0.01
MW-20	5/4/2010	30.73	19.58	17.59	1.99	12.92	2.25	144.59	0.02
MW-20	6/8/2010	30.73	17.65	16.05	1.60	14.50	1.50	146.09	0.05
MW-20	7/9/2010	30.73	19.73	16.80	2.93	13.61	3.75	149.84	0.01
MW-20	7/23/2010	30.73	19.05	17.90	1.15	12.70	1.25	151.09	0.01
MW-20	8/6/2010	30.73	18.66	18.47	0.19	12.24	1.30	152.39	0.01
MW-20	8/19/2010	30.73	18.96	18.90	0.06	11.82	0.00	152.39	0.01
MW-20	8/27/2010	30.73	18.91	18.88	0.03	11.85	0.50	152.89	0.01
MW-20	9/17/2010	30.73	19.44	19.43	0.01	11.30	0.00	152.89	0.01
MW-20	10/8/2010	30.73	19.66	19.63	0.03	11.10	0.00	152.89	0.03
MW-20	11/11/2010	30.73	19.96	19.92	0.04	10.81	0.00	152.89	0.04
MW-20	12/15/2010	30.73	19.93	16.93	3.00	13.47	5.00	157.89	0.02
MW-20	12/21/2010	30.73	18.68	16.39	2.29	14.09	2.25	160.14	0.03
MW-20	12/30/2010	30.73	17.84	15.03	2.81	15.39	3.00	163.14	0.02
MW-20	1/6/2011	30.73	15.81	15.62	0.19	15.09	2.00	165.14	0.01
MW-20	1/13/2011	30.73	16.30	16.07	0.23	14.63	1.00	166.14	0.01
MW-20	1/19/2011	30.73	15.76	15.63	0.13	15.09	0.75	166.89	0.03
MW-20	1/28/2011	30.73	15.55	15.43	0.12	15.29	0.75	167.64	0.02
MW-20	2/9/2011	30.73	16.92	16.13	0.79	14.51	2.00	169.64	0.01
MW-20	2/23/2011	30.73	16.30	16.29	0.01	14.44	0.00	169.64	0.01
MW-20	3/9/2011	30.73	15.82	15.53	0.29	15.17	0.75	170.39	0.02
MW-20	3/29/2011	30.73	16.25	15.27	0.98	15.35	1.25	171.64	0.02
MW-20	4/21/2011	30.73	16.11	14.84	1.27	15.75	1.00	172.64	0.01
MW-20	6/9/2011	30.73	15.15	14.33	0.82	16.31	0.95	173.59	0.02
MW-20	7/7/2011	30.73	15.27	15.06	0.21	15.65	0.50	174.09	0.01
MW-20	8/3/2011	30.73	18.35	16.23	2.12	14.27	2.00	176.09	0.01
MW-20	9/8/2011	30.73	18.76	18.26	0.50	12.42	0.50	176.59	0.02
MW-20	10/3/2011	30.73	19.09	18.89	0.20	11.82	0.50	177.09	0.02
MW-20	11/10/2011	30.73	19.53	19.50	0.03	11.23	0.30	177.39	0.03
MW-20	12/1/2011	30.73	19.19	19.18	0.01	11.55	0.00	177.39	0.01
MW-20	1/6/2012	30.73	19.15	--	0.00	11.58	0.25	177.64	--
MW-20	1/25/2012	30.73	--	--	--	--	0.10	177.74	--
MW-20	3/3/2012	30.73	19.80	18.00	1.80	12.53	4.00	181.74	0.26
MW-20	3/6/2012	30.73	18.90	17.57	1.33	13.01	1.50	183.24	0.00
MW-20	3/14/2012	30.73	18.62	17.19	1.43	13.38	2.55	185.79	0.01
MW-20	3/22/2012	30.73	18.67	16.43	2.24	14.05	1.50	187.29	0.01
MW-20	3/29/2012	30.73	16.25	15.84	0.41	14.84	2.00	189.29	0.03
MW-20	4/5/2012	30.73	14.35	14.35	0.00	16.38	0.50	189.79	0.00
MW-20	4/13/2012	30.73	14.37	14.33	0.04	16.40	0.55	190.34	0.04
MW-20	4/13/2012	30.73	16.65	15.26	1.39	15.32	2.30	192.64	0.02

Please refer to notes at the end of table.

Table C-1
Historical Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID	Date	Top of Casing	Initial Measurements				Product Removal		
			Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	Final Product Thickness
			(feet)				(gallons)		(feet)
MW-20	5/14/2012	30.73	--	--	--	--	0.79	193.43	--
MW-20	5/25/2012	30.73	16.58	15.32	1.26	15.27	1.75	195.18	0.00
MW-20	6/12/2012	30.73	15.67	15.61	0.06	15.11	1.25	196.43	0.00
MW-20	7/3/2012	30.73	16.40	15.71	0.69	14.94	0.50	196.93	0.01
MW-20	8/23/2012	30.73	18.65	18.31	0.34	12.38	0.60	197.53	0.05
MW-20	9/24/2012	30.73	19.42	19.25	0.17	11.46	0.25	197.78	0.02
MW-20	10/8/2012	30.73	19.61	19.50	0.11	11.22	0.25	198.03	0.02
MW-20	11/14/2012	30.73	19.51	19.48	0.03	11.25	0.00	198.03	0.03
MW-20	12/20/2012	30.73	17.71	15.62	2.09	14.88	2.50	200.53	0.00
MW-20	1/4/2013	30.73	16.38	15.62	0.76	15.03	2.30	202.83	0.04
MW-20	1/18/2013	30.73	16.56	16.26	0.30	14.44	1.25	204.08	0.03
MW-20	1/31/2013	30.73	17.03	17.00	0.03	13.73	1.00	205.08	0.01
MW-20	3/6/2013	30.73	17.78	17.75	0.03	12.98	0.10	205.18	0.01
MW-20	4/3/2013	30.73	17.65	17.54	0.11	13.18	0.90	206.08	--
MW-20	5/6/2013	30.73	16.54	15.74	0.80	14.90	1.50	207.58	0.01
MW-20	6/12/2013	30.73	18.11	18.10	0.01	12.63	1.00	208.58	0.01
MW-20	7/16/2013	30.73	18.81	18.78	0.03	11.95	0.50	209.08	0.03
MW-20	8/26/2013	30.73	20.12	20.01	0.11	10.71	0.30	209.38	0.11
MW-20	9/25/2013	30.73	20.15	20.10	0.05	10.62	0.20	209.58	0.05
MW-20	10/31/2013	30.73	20.14	20.10	0.04	10.63	0.00	209.58	0.04
MW-20	11/27/2013	30.73	19.95	19.93	0.02	10.80	0.00	209.58	0.02
MW-20	12/17/2013	30.73	19.90	19.89	0.01	10.84	0.00	209.58	0.01
MW-20	1/27/2014	30.73	20.35	20.34	0.01	10.39	0.00	209.58	0.01
MW-20	2/27/2014	30.73	19.30	19.30	0.00	11.43	0.00	209.58	0.00
MW-20	3/26/2014	30.73	18.54	17.01	1.53	13.55	2.00	211.58	0.01
MW-20	4/15/2014	30.73	18.11	17.42	0.69	13.23	0.50	212.08	0.01
MW-20	5/9/2014	30.73	17.25	16.80	0.45	13.88	1.25	213.33	0.00
MW-20	6/30/2014	30.73	18.20	17.80	0.40	12.89	0.50	213.83	0.00
MW-20	7/16/2014	30.73	19.00	18.45	0.55	12.22	2.00	215.83	0.00
MW-20	8/4/2014	30.73	18.95	18.90	0.05	11.82	0.25	216.08	0.00
MW-20	9/30/2014	30.73	20.40	19.80	0.60	10.86	0.50	216.58	0.00
MW-20	10/27/2014	30.73	19.40	19.20	0.20	11.51	0.25	216.83	0.00
MW-20	11/24/2014	30.73	19.90	19.70	0.20	11.01	1.00	217.83	0.00
MW-20	12/11/2014	30.73	18.84	18.83	0.01	11.90	0.00	217.83	0.00
MW-20	1/29/2015	30.73	18.40	17.80	0.60	12.86	1.00	218.83	0.10
MW-20	2/27/2015	30.73	20.00	19.75	0.25	10.95	0.50	219.33	0.00
MW-20	3/27/2015	30.73	18.60	17.49	1.11	13.12	1.50	220.83	0.02
MW-20	4/28/2015	30.73	18.71	18.00	0.71	12.65	2.00	222.83	0.01
MW-20	5/29/2015	30.73	19.32	19.02	0.30	11.68	1.50	224.33	0.01
MW-20	6/23/2015	30.73	19.74	19.44	0.30	11.26	2.00	226.33	0.01
MW-20	7/8/2015	30.73	19.66	19.58	0.08	11.14	0.00	226.33	0.08
MW-20	8/12/2015	30.73	20.21	19.98	0.23	10.72	3.00	229.33	0.02
MW-20	9/11/2015	30.73	20.48	20.30	0.18	10.41	1.50	230.83	0.01
MW-20	10/15/2015	30.73	20.73	20.61	0.12	10.11	1.00	231.83	0.00
MW-20	11/10/2015	30.73	20.76	20.62	0.14	10.09	0.75	232.58	0.00
MW-20	12/16/2015	30.73	18.25	18.15	0.10	12.57	1.00	233.58	0.00
MW-20	1/21/2016	30.73	15.68	15.64	0.04	15.09	1.00	234.58	0.00
MW-20	2/17/2016	30.73	15.42	15.39	0.03	15.34	0.00	234.58	0.00
MW-20	3/29/2016	30.73	15.70	15.20	0.50	15.48	0.50	235.08	0.00
MW-20	4/27/2016	30.73	16.19	15.71	0.48	14.97	0.50	235.58	0.03
MW-20	5/27/2016	30.73	17.40	17.13	0.27	13.57	0.50	236.08	0.02
MW-20	6/29/2016	30.73	18.95	18.35	0.60	12.31	1.50	237.58	0.06
MW-20	7/20/2016	30.73	19.32	19.03	0.29	11.67	0.25	237.83	0.03
MW-20	8/31/2016	30.73	20.10	19.78	0.32	10.91	0.50	238.33	0.05
MW-20	9/16/2016	30.73	20.39	20.03	0.36	10.66	0.65	238.98	0.06
MW-20	10/20/2016	30.73	20.05	20.00	0.05	10.72	0.50	239.48	0.00
MW-20	11/28/2016	30.73	18.95	18.91	0.04	11.82	0.00	239.48	0.00
MW-20	12/19/2016	30.73	18.30	17.50	0.80	13.14	1.50	240.98	0.00
MW-20	1/5/2017	30.73	18.55	17.52	1.03	13.10	1.50	242.48	0.01
MW-20	2/14/2017	30.73	16.76	15.17	1.59	15.39	4.00	246.48	0.02
MW-20	3/28/2017	30.73	14.38	13.90	0.48	16.78	1.50	247.98	0.00
MW-20	4/18/2017	30.73	14.42	14.20	0.22	16.51	1.50	249.48	0.00
MW-20	5/26/2017	30.73	14.66	14.42	0.24	16.28	1.50	250.98	0.01
MW-20	6/23/2017	30.73	15.12	15.11	0.01	15.62	0.00	250.98	0.01
MW-20	7/21/2017	30.73	16.11	15.80	0.31	14.90	0.10	251.08	0.00
MW-20	8/18/2017	30.73	18.52	18.44	0.08	12.28	0.00	251.08	0.08
MW-20	9/26/2017	30.73	19.10	18.99	0.11	11.73	0.50	251.58	0.00
MW-20	10/30/2017	30.73	18.95	18.91	0.04	11.82	0.25	251.83	0.04
MW-20	11/17/2017	30.73	18.85	18.69	0.16	12.02	0.40	252.23	0.03
MW-20	12/13/2017	30.73	17.34	17.16	0.18	13.55	1.25	253.48	0.02
MW-20	1/26/2018	30.73	16.65	16.14	0.51	14.53	0.50	253.98	0.05
MW-20	2/14/2018	30.73	16.17	15.94	0.23	14.76	0.85	254.83	0.05
MW-20	3/26/2018	30.73	17.31	17.20	0.11	13.52	1.50	256.33	0.01
MW-20	5/3/2018	30.73	16.10	16.06	0.04	14.67	0.50	256.83	0.04

Please refer to notes at the end of table.

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Port of Portland

Well ID	Date	Top of Casing	Initial Measurements				Product Removal		
			Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	Final Product Thickness
			(feet)				(gallons)		(feet)
MW-20	5/31/2018	30.73	16.92	15.41	1.51	15.15	3.10	259.93	0.03
MW-20	6/21/2018	30.73	18.33	17.75	0.58	12.92	1.50	261.43	0.01
MW-20	7/17/2018	30.73	18.97	18.96	0.01	11.77	0.00	261.43	0.01
MW-20	8/17/2018	30.73	19.77	19.76	0.01	10.97	0.00	261.43	0.01
MW-20	10/16/2018	30.73	20.69	20.64	0.05	10.08	0.10	261.53	0.01
MW-20	11/5/2018	30.73	20.79	20.70	0.09	10.02	0.20	261.73	0.01
MW-20	12/5/2018	30.73	20.57	20.55	0.02	10.18	0.00	261.73	0.02
MW-20	12/31/2018	30.73	19.92	19.91	0.01	10.82	0.00	261.73	0.01
MW-20	1/18/2019	30.73	19.52	19.43	0.09	11.29	0.50	262.23	0.00
MW-20	2/21/2019	30.73	18.21	17.70	0.51	12.97	1.50	263.73	0.01
MW-20	4/2/2019	30.73	18.34	18.24	0.10	12.48	0.50	264.23	0.01
MW-20	4/18/2019	30.73	17.23	17.11	0.12	13.61	0.01	264.24	0.01
MW-20	5/16/2019	30.73	17.91	17.75	0.16	12.96	0.01	264.25	0.01
MW-20	6/19/2019	30.73	18.88	18.83	0.05	11.89	0.00	264.25	0.05
MW-20	7/23/2019	30.73	20.14	20.12	0.02	10.61	0.00	264.25	0.02
MW-20	8/22/2019	30.73	19.85	19.84	0.01	10.89	0.00	264.25	0.01
MW-20	9/25/2019	30.73	20.72	20.56	0.16	10.15	0.25	264.50	0.01
MW-20	10/25/2019	30.73	20.86	20.80	0.06	9.92	0.00	264.50	0.06
MW-20	11/20/2019	30.73	20.26	20.24	0.02	10.49	0.00	264.50	0.02
MW-20	12/9/2019	30.73	20.90	20.89	0.01	9.84	0.00	264.50	0.01
MW-20	2/18/2020	30.73	17.41	16.42	0.99	14.20	1.00	265.50	0.02
MW-20	2/28/2020	30.73	16.99	16.82	0.17	13.89	0.15	265.65	0.00
MW-20	3/19/2020	30.73	18.20	18.18	0.02	12.55	0.05	265.70	0.02
MW-20	4/20/2020	30.73	17.32	17.27	0.05	13.45	0.45	266.15	0.00
MW-20	5/29/2020	30.73	18.40	18.35	0.05	12.37	0.00	266.15	0.05
MW-20	6/11/2020	30.73	18.07	18.04	0.03	12.69	0.00	266.15	0.03
MW-20	7/15/2020	30.73	19.21	19.20	0.01	11.53	0.00	266.15	0.01
MW-20	8/31/2020	30.73	19.08	19.07	0.01	11.66	0.00	266.15	0.01
MW-20	9/28/2020	30.73	20.64	20.60	0.04	10.13	0.00	266.15	0.04
MW-20	10/23/2020	30.73	21.00	20.95	0.05	9.77	0.06	266.21	0.05
MW-20	11/13/2020	30.73	20.68	20.67	0.01	10.06	0.00	266.21	0.01
MW-20	12/10/2020	30.73	20.30	20.30	0.00	10.43	0.00	266.21	0.00
MW-20	1/20/2021	30.73	16.90	16.32	0.58	14.35	0.35	263.79	0.02
MW-20	2/24/2021	30.73	16.03	15.94	0.09	14.78	0.10	263.89	0.00
MW-20	1/6/2022	30.73	16.01	15.28	0.73	15.37	1.20	265.09	0.03
MW-20	12/5/2022	30.73	19.86	19.83	0.03	10.90	0.06	263.95	0.00
HC-1	2/2/2005	32.36	28.72	--	0.00	3.64	0.00	0.00	0.00
HC-1	6/2/2005	32.36	26.42	--	0.00	5.94	0.00	0.00	0.00
HC-1	9/14/2005	32.36	30.29	--	0.00	2.07	0.00	0.00	0.00
HC-1	12/6/2005	32.36	27.88	--	0.00	4.48	0.00	0.00	0.00
HC-1	3/13/2006	32.36	27.05	--	0.00	5.31	0.00	0.00	0.00
HC-1	6/27/2006	32.36	25.32	--	0.00	7.04	0.00	0.00	0.00
HC-1	9/19/2006	32.36	30.42	--	0.00	1.94	0.00	0.00	0.00
HC-1	12/13/2006	32.36	27.40	--	0.00	4.96	0.00	0.00	0.00
HC-1	3/29/2007	32.36	24.85	--	0.00	7.51	0.00	0.00	0.00
HC-1	6/27/2007	32.36	28.33	--	0.00	4.03	0.00	0.00	0.00
HC-1	9/18/2007	32.36	30.65	--	0.00	1.71	0.00	0.00	0.00
HC-2	2/2/2005	32.19	27.69	--	0.00	4.50	0.00	0.00	0.00
HC-2	6/2/2005	32.19	25.16	--	0.00	7.03	0.00	0.00	0.00
HC-2	9/14/2005	32.19	29.88	--	0.00	2.31	0.00	0.00	0.00
HC-2	12/6/2005	32.19	27.60	--	0.00	4.59	0.00	0.00	0.00
HC-2	3/13/2006	32.19	26.50	--	0.00	5.69	0.00	0.00	0.00
HC-2	6/27/2006	32.19	24.20	--	0.00	7.99	0.00	0.00	0.00
HC-2	9/19/2006	32.19	29.89	--	0.00	2.30	0.00	0.00	0.00
HC-2	12/13/2006	32.19	26.83	--	0.00	5.36	0.00	0.00	0.00
HC-2	3/29/2007	32.19	24.43	--	0.00	7.76	0.00	0.00	0.00
HC-2	6/27/2007	32.19	27.44	--	0.00	4.75	0.00	0.00	0.00
HC-2	9/18/2007	32.19	29.99	--	0.00	2.20	0.00	0.00	0.00
HC-2	12/6/2007	32.19	25.41	--	0.00	6.78	0.00	0.00	0.00
HC-2	3/10/2008	32.19	27.90	--	0.00	4.29	0.00	0.00	0.00
HC-2	6/12/2008	32.19	20.07	--	0.00	12.12	0.00	0.00	0.00
HC-2	9/8/2008	32.19	29.44	--	0.00	2.75	0.00	0.00	0.00
HC-2	12/29/2008	32.19	28.02	--	0.00	4.17	0.00	0.00	0.00
HC-2	3/9/2009	32.19	27.98	--	0.00	4.21	0.00	0.00	0.00
HC-2	6/4/2009	32.19	22.40	--	0.00	9.79	0.00	0.00	0.00
HC-2	4/25/2022	32.19	27.23	--	0.00	4.55	0.00	0.00	0.00
HC-2	11/17/2022	32.19	28.60	--	0.00	3.18	0.00	0.00	0.00
HC-3	2/2/2005	32.88	25.17	--	0.00	7.71	0.00	0.00	0.00
HC-3	6/2/2005	32.88	26.72	--	0.00	6.16	0.00	0.00	0.00
HC-3	9/14/2005	32.88	31.24	--	0.00	1.64	0.00	0.00	0.00
HC-3	12/6/2005	32.88	29.00	--	0.00	3.88	0.00	0.00	0.00
HC-3	3/13/2006	32.88	27.82	--	0.00	5.06	0.00	0.00	0.00

Please refer to notes at the end of table.

Table C-1
Historical Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID	Date	Top of Casing	Initial Measurements				Product Removal		
			Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	Final Product Thickness
			(feet)				(gallons)		(feet)
HC-3	6/27/2006	32.88	25.52	--	0.00	7.36	0.00	0.00	0.00
HC-3	9/19/2006	32.88	31.29	--	0.00	1.59	0.00	0.00	0.00
HC-3	12/13/2006	32.88	28.21	--	0.00	4.67	0.00	0.00	0.00
HC-3	3/29/2007	32.88	25.79	--	0.00	7.09	0.00	0.00	0.00
HC-3	6/27/2007	32.88	28.92	--	0.00	3.96	0.00	0.00	0.00
HC-3	9/18/2007	32.88	31.32	--	0.00	1.56	0.00	0.00	0.00
HC-3	12/6/2007	32.88	27.36	--	0.00	5.52	0.00	0.00	0.00
HC-3	3/10/2008	32.88	29.19	--	0.00	3.69	0.00	0.00	0.00
HC-3	6/12/2008	32.88	21.28	--	0.00	11.60	0.00	0.00	0.00
HC-3	9/8/2008	32.88	30.91	--	0.00	1.97	0.00	0.00	0.00
HC-3	12/29/2008	32.88	29.34	--	0.00	3.54	0.00	0.00	0.00
HC-3	3/9/2009	32.88	29.35	--	0.00	3.53	0.00	0.00	0.00
HC-3	6/4/2009	32.88	23.77	--	0.00	9.11	0.00	0.00	0.00
HC-4S	2/2/2005	32.35	26.14	--	0.00	6.21	0.00	0.00	0.00
HC-4S	6/2/2005	32.35	26.10	--	0.00	6.25	0.00	0.00	0.00
HC-4S	9/14/2005	32.35	26.05	--	0.00	6.30	0.00	0.00	0.00
HC-4S	12/6/2005	32.35	26.05	--	0.00	6.30	0.00	0.00	0.00
HC-4S	3/13/2006	32.35	26.05	--	0.00	6.30	0.00	0.00	0.00
HC-4S	6/27/2006	32.35	26.06	--	0.00	6.29	0.00	0.00	0.00
HC-4S	9/19/2006	32.35	26.12	--	0.00	6.23	0.00	0.00	0.00
HC-4S	12/13/2006	32.35	26.13	--	0.00	6.22	0.00	0.00	0.00
HC-4S	3/29/2007	32.35	26.08	--	0.00	6.27	0.00	0.00	0.00
HC-4S	6/27/2007	32.35	26.13	--	0.00	6.22	0.00	0.00	0.00
HC-4S	9/18/2007	32.35	26.14	--	0.00	6.21	0.00	0.00	0.00
HC-4S	12/6/2007	32.35	27.73	--	0.00	4.62	0.00	0.00	0.00
HC-4S	3/10/2008	32.35	26.09	--	0.00	6.26	0.00	0.00	0.00
HC-4S	6/12/2008	32.35	22.08	--	0.00	10.27	0.00	0.00	0.00
HC-4S	9/8/2008	32.35	26.42	--	0.00	5.93	0.00	0.00	0.00
HC-4S	12/29/2008	32.35	26.13	--	0.00	6.22	0.00	0.00	0.00
HC-4S	3/9/2009	32.35	26.08	--	0.00	6.27	0.00	0.00	0.00
HC-4S	6/4/2009	32.35	24.59	--	0.00	7.76	0.00	0.00	0.00
HC-4D	2/2/2005	32.18	29.46	--	0.00	2.72	0.00	0.00	0.00
HC-4D	6/2/2005	32.18	27.22	--	0.00	4.96	0.00	0.00	0.00
HC-4D	9/14/2005	32.18	31.91	--	0.00	0.27	0.00	0.00	0.00
HC-4D	12/6/2005	32.18	30.02	--	0.00	2.16	0.00	0.00	0.00
HC-4D	3/13/2006	32.18	27.45	--	0.00	4.73	0.00	0.00	0.00
HC-4D	6/27/2006	32.18	25.31	--	0.00	6.87	0.00	0.00	0.00
HC-4D	9/19/2006	32.18	31.94	--	0.00	0.24	0.00	0.00	0.00
HC-4D	12/13/2006	32.18	29.74	--	0.00	2.44	0.00	0.00	0.00
HC-4D	3/29/2007	32.18	26.58	--	0.00	5.60	0.00	0.00	0.00
HC-4D	6/27/2007	32.18	29.53	--	0.00	2.65	0.00	0.00	0.00
HC-4D	9/18/2007	32.18	32.13	--	0.00	0.05	0.00	0.00	0.00
HC-4D	12/6/2007	32.18	26.16	--	0.00	6.02	0.00	0.00	0.00
HC-4D	3/10/2008	32.18	29.77	--	0.00	2.41	0.00	0.00	0.00
HC-4D	6/12/2008	32.18	22.48	--	0.00	9.70	0.00	0.00	0.00
HC-4D	9/8/2008	32.18	31.92	--	0.00	0.26	0.00	0.00	0.00
HC-4D	12/29/2008	32.18	29.75	--	0.00	2.43	0.00	0.00	0.00
HC-4D	3/9/2009	32.18	29.53	--	0.00	2.65	0.00	0.00	0.00
HC-4D	6/4/2009	32.18	24.49	--	0.00	7.69	0.00	0.00	0.00
HC-5	2/11/2005	32.10	18.24	--	0.00	13.86	0.00	0.00	0.00
HC-5	6/3/2005	32.10	18.06	--	0.00	14.04	0.00	0.00	0.00
HC-5	9/14/2005	32.10	18.63	--	0.00	13.47	0.00	0.00	0.00
HC-5	12/6/2005	32.10	17.90	--	0.00	14.20	0.00	0.00	0.00
HC-5	3/13/2006	32.10	18.02	--	0.00	14.08	0.00	0.00	0.00
HC-5	6/27/2006	32.10	18.36	--	0.00	13.74	0.00	0.00	0.00
HC-5	9/19/2006	32.10	18.78	--	0.00	13.32	0.00	0.00	0.00
HC-5	12/13/2006	32.10	18.11	--	0.00	13.99	0.00	0.00	0.00
HC-5	3/29/2007	32.10	18.15	--	0.00	13.95	0.00	0.00	0.00
HC-5	6/27/2007	32.10	18.59	--	0.00	13.51	0.00	0.00	0.00
HC-5	9/18/2007	32.10	19.08	--	0.00	13.02	0.00	0.00	0.00
HC-5	12/6/2007	32.10	17.91	--	0.00	14.19	0.00	0.00	0.00
HC-5	3/10/2008	32.10	18.26	--	0.00	13.84	0.00	0.00	0.00
HC-5	6/12/2008	32.10	18.26	--	0.00	13.84	0.00	0.00	0.00
HC-5	9/8/2008	32.10	19.00	--	0.00	13.10	0.00	0.00	0.00
HC-5	12/29/2008	32.10	18.41	--	0.00	13.69	0.00	0.00	0.00
HC-5	3/9/2009	32.10	18.58	--	0.00	13.52	0.00	0.00	0.00
HC-5	6/4/2009	32.10	19.50	--	0.00	12.60	0.00	0.00	0.00
HC-5	9/9/2009	32.10	19.46	--	0.00	12.64	0.00	0.00	0.00
HC-5	12/15/2009	32.10	18.49	--	0.00	13.61	0.00	0.00	0.00
HC-5	3/11/2010	32.10	18.27	--	0.00	13.83	0.00	0.00	0.00
HC-5	6/8/2010	32.10	17.83	--	0.00	14.27	0.00	0.00	0.00
HC-5	9/16/2010	32.10	18.78	--	0.00	13.32	0.00	0.00	0.00

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Table C-1
Historical Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID	Date	Top of Casing	Initial Measurements				Product Removal		
			Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	Final Product Thickness
			(feet)				(gallons)		(feet)
HC-5	12/13/2010	32.10	17.46	--	0.00	14.64	0.00	0.00	0.00
HC-5	6/9/2011	32.10	15.78	15.78	0.00	16.32	0.00	0.00	0.00
HC-5	12/1/2011	32.10	18.01	--	0.00	14.09	0.00	0.00	0.00
HC-5	6/11/2012	32.10	18.17	--	0.00	13.93	0.00	0.00	0.00
HC-5	12/19/2012	32.10	17.70	--	0.00	14.40	0.00	0.00	0.00
HC-5	12/17/2013	32.10	18.68	--	0.00	13.42	0.00	0.00	0.00
HC-5	12/11/2014	32.10	18.14	--	0.00	13.96	0.00	0.00	0.00
HC-5	12/15/2015	32.10	17.52	--	0.00	14.58	0.00	0.00	0.00
HC-5	12/19/2016	32.10	18.09	--	0.00	14.01	0.00	0.00	0.00
HC-5	12/13/2017	32.10	18.27	--	0.00	13.83	0.00	0.00	0.00
HC-5	12/5/2018	32.10	19.73	19.70	0.03	12.40	0.10	0.10	0.00
HC-5	12/31/2018	32.10	18.59	18.50	0.09	13.59	0.50	0.60	0.00
HC-5	1/17/2019	32.10	18.53	18.48	0.05	12.24	0.50	1.10	0.00
HC-5	2/21/2019	32.10	18.19	18.13	0.06	12.59	0.50	1.60	0.00
HC-5	4/2/2019	32.10	18.80	18.74	0.06	11.98	0.25	1.85	0.01
HC-5	4/18/2019	32.10	18.35	18.32	0.03	12.41	0.01	1.86	0.00
HC-5	5/16/2019	32.10	18.67	18.63	0.04	12.10	0.01	1.87	0.00
HC-5	6/19/2019	32.10	18.91	18.90	0.01	11.83	0.00	1.87	0.01
HC-5	7/23/2019	32.10	19.25	19.23	0.02	11.50	0.00	1.87	0.02
HC-5	8/22/2019	32.10	19.10	--	0.00	11.63	0.00	1.87	0.00
HC-5	9/25/2019	32.10	19.47	19.47	0.00	11.26	0.00	1.87	0.00
HC-5	10/25/2019	32.10	19.65	19.65	0.00	11.08	0.00	1.87	0.00
HC-5	11/20/2019	32.10	19.71	19.71	0.00	11.02	0.00	1.87	0.00
HC-5	12/9/2019	32.10	20.10	19.83	0.27	10.87	1.00	2.87	0.00
HC-5	2/18/2020	32.10	18.32	18.32	0.00	13.78	0.00	2.87	0.00
HC-5	2/28/2020	32.10	18.44	18.44	0.00	13.66	0.00	2.87	0.00
HC-5	3/19/2020	32.10	18.61	18.61	0.00	13.49	0.00	2.87	0.00
HC-5	4/20/2020	32.10	18.52	18.52	0.00	13.58	0.00	2.87	0.00
HC-5	5/29/2020	32.10	18.93	18.93	0.00	13.17	0.00	2.87	0.00
HC-5	6/11/2020	32.10	18.71	18.71	0.00	13.39	0.00	2.87	0.00
HC-5	7/15/2020	32.10	19.62	19.62	0.00	12.48	0.00	2.87	0.00
HC-5	8/31/2020	32.10	19.48	19.48	0.00	12.62	0.00	2.87	0.00
HC-5	9/28/2020	32.10	19.82	19.82	0.00	12.28	0.00	2.87	0.00
HC-5	10/23/2020	32.10	19.66	19.66	0.00	12.44	0.00	2.87	0.00
HC-5	11/13/2020	32.10	18.98	18.98	0.00	13.12	0.00	2.87	0.00
HC-5	12/10/2020	32.10	18.71	18.71	0.00	13.39	0.00	2.87	0.00
HC-5	1/20/2021	32.10	17.97	--	0.00	14.13	0.00	0.60	0.00
HC-5	2/24/2021	32.10	16.64	--	0.00	15.46	0.00	0.60	0.00
HC-5	4/7/2021	32.10	18.60	--	0.00	13.50	0.00	0.60	0.00
HC-5	12/22/2021	32.10	17.81	17.77	0.04	14.33	0.30	0.90	0.00
HC-5	1/6/2022	32.10	17.72	--	0.00	14.38	0.00	0.90	0.00
HC-5	4/25/2022	32.10	18.21	--	0.00	13.89	0.00	0.90	0.00
HC-5	11/17/2022	32.10	18.57	--	0.00	13.53	0.00	0.90	0.00
HC-6S	8/27/2003	32.62	18.93	--	0.00	13.69	0.00	0.00	0.00
HC-6S	9/3/2003	32.62	19.00	--	0.00	13.62	0.00	0.00	0.00
HC-6S	9/11/2003	32.62	19.11	--	0.00	13.51	0.00	0.00	0.00
HC-6S	9/17/2003	32.62	19.20	--	0.00	13.42	0.00	0.00	0.00
HC-6S	9/30/2003	32.62	19.15	--	0.00	13.47	0.00	0.00	0.00
HC-6S	10/14/2003	32.62	19.19	--	0.00	13.43	0.00	0.00	0.00
HC-6S	10/29/2003	32.62	19.29	--	0.00	13.33	0.00	0.00	0.00
HC-6S	11/13/2003	32.62	19.33	--	0.00	13.29	0.00	0.00	0.00
HC-6S	11/26/2003	32.62	19.13	--	0.00	13.49	0.00	0.00	0.00
HC-6S	12/24/2003	32.62	18.60	--	0.00	14.02	0.00	0.00	0.00
HC-6S	1/21/2004	32.62	17.31	--	0.00	15.31	0.00	0.00	0.00
HC-6S	2/25/2004	32.62	17.81	--	0.00	14.81	0.00	0.00	0.00
HC-6S	3/24/2004	32.62	16.31	--	0.00	16.31	0.00	0.00	0.00
HC-6S	2/2/2005	32.62	18.69	--	0.00	13.93	0.00	0.00	0.00
HC-6S	6/2/2005	32.62	18.41	--	0.00	14.21	0.00	0.00	0.00
HC-6S	9/14/2005	32.62	18.64	--	0.00	13.98	0.00	0.00	0.00
HC-6S	12/6/2005	32.62	18.47	--	0.00	14.15	0.00	0.00	0.00
HC-6S	3/13/2006	32.62	17.71	--	0.00	14.91	0.00	0.00	0.00
HC-6S	6/27/2006	32.62	18.11	--	0.00	14.51	0.00	0.00	0.00
HC-6S	9/19/2006	32.62	18.68	--	0.00	13.94	0.00	0.00	0.00
HC-6S	12/13/2006	32.62	18.39	--	0.00	14.23	0.00	0.00	0.00
HC-6S	3/29/2007	32.62	18.13	--	0.00	14.49	0.00	0.00	0.00
HC-6S	6/27/2007	32.62	18.60	--	0.00	14.02	0.00	0.00	0.00
HC-6S	9/18/2007	32.62	19.13	--	0.00	13.49	0.00	0.00	0.00
HC-6S	12/6/2007	32.62	18.79	--	0.00	13.83	0.00	0.00	0.00
HC-6S	3/10/2008	32.62	18.16	--	0.00	14.46	0.00	0.00	0.00
HC-6S	6/12/2008	32.62	18.20	--	0.00	14.42	0.00	0.00	0.00
HC-6S	9/8/2008	32.62	19.11	--	0.00	13.51	0.00	0.00	0.00
HC-6S	12/29/2008	32.62	21.56	--	0.00	11.06	0.00	0.00	0.00
HC-6S	3/9/2009	32.62	18.43	--	0.00	14.19	0.00	0.00	0.00

Please refer to notes at the end of table.

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Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID	Date	Top of Casing	Initial Measurements				Product Removal		
			Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	Final Product Thickness
			(feet)				(gallons)		(feet)
HC-6S	6/4/2009	32.62	18.84	--	0.00	13.78	0.00	0.00	0.00
HC-6S	4/25/2022	32.62	18.98	--	0.00	14.05	0.00	0.00	0.00
HC-6D	8/27/2003	32.48	21.90	--	0.00	10.58	0.00	0.00	0.00
HC-6D	9/3/2003	32.48	21.99	--	0.00	10.49	0.00	0.00	0.00
HC-6D	9/11/2003	32.48	22.04	--	0.00	10.44	0.00	0.00	0.00
HC-6D	9/17/2003	32.48	22.10	--	0.00	10.38	0.00	0.00	0.00
HC-6D	9/30/2003	32.48	22.06	--	0.00	10.42	0.00	0.00	0.00
HC-6D	10/14/2003	32.48	22.16	--	0.00	10.32	0.00	0.00	0.00
HC-6D	10/29/2003	32.48	22.04	--	0.00	10.44	0.00	0.00	0.00
HC-6D	11/13/2003	32.48	22.10	--	0.00	10.38	0.00	0.00	0.00
HC-6D	11/26/2003	32.48	21.96	--	0.00	10.52	0.00	0.00	0.00
HC-6D	12/24/2003	32.48	21.35	--	0.00	11.13	0.00	0.00	0.00
HC-6D	1/21/2004	32.48	19.88	--	0.00	12.60	0.00	0.00	0.00
HC-6D	2/25/2004	32.48	20.71	--	0.00	11.77	0.00	0.00	0.00
HC-6D	3/24/2004	32.48	17.88	--	0.00	14.60	0.00	0.00	0.00
HC-6D	2/2/2005	32.48	22.45	--	0.00	10.03	0.00	0.00	0.00
HC-6D	6/2/2005	32.48	21.38	--	0.00	11.10	0.00	0.00	0.00
HC-6D	9/14/2005	32.48	21.90	--	0.00	10.58	0.00	0.00	0.00
HC-6D	12/6/2005	32.48	21.33	--	0.00	11.15	0.00	0.00	0.00
HC-6D	3/13/2006	32.48	20.68	--	0.00	11.80	0.00	0.00	0.00
HC-6D	6/27/2006	32.48	20.72	--	0.00	11.76	0.00	0.00	0.00
HC-6D	9/19/2006	32.48	21.75	--	0.00	10.73	0.00	0.00	0.00
HC-6D	12/13/2006	32.48	21.23	--	0.00	11.25	0.00	0.00	0.00
HC-6D	3/29/2007	32.48	20.42	--	0.00	12.06	0.00	0.00	0.00
HC-6D	6/27/2007	32.48	21.43	--	0.00	11.05	0.00	0.00	0.00
HC-6D	9/18/2007	32.48	21.96	--	0.00	10.52	0.00	0.00	0.00
HC-6D	12/6/2007	32.48	20.57	--	0.00	11.91	0.00	0.00	0.00
HC-6D	3/10/2008	32.48	20.98	--	0.00	11.50	0.00	0.00	0.00
HC-6D	6/12/2008	32.48	19.28	--	0.00	13.20	0.00	0.00	0.00
HC-6D	9/8/2008	32.48	21.91	--	0.00	10.57	0.00	0.00	0.00
HC-6D	12/29/2008	32.48	19.03	18.81	0.22	13.65	0.10	0.10	0.00
HC-6D	3/9/2009	32.48	21.76	--	0.00	10.72	0.00	0.10	0.00
HC-6D	6/4/2009	32.48	20.86	--	0.00	11.62	0.00	0.10	0.00
HC-10	8/27/2003	29.30	21.98	17.71	4.27	11.12	2.00	2.00	0.21
HC-10	9/3/2003	29.30	20.06	18.03	2.03	11.05	0.50	2.50	0.04
HC-10	9/11/2003	29.30	19.61	18.46	1.15	10.71	0.10	2.60	0.03
HC-10	9/17/2003	29.30	19.77	18.65	1.12	10.53	0.20	2.80	0.03
HC-10	9/30/2003	29.30	19.69	18.99	0.70	10.23	0.20	3.00	0.01
HC-10	10/14/2003	29.30	19.68	18.85	0.83	10.36	0.30	3.30	0.02
HC-10	10/29/2003	29.30	19.62	18.83	0.79	10.38	0.10	3.40	0.07
HC-10	11/13/2003	29.30	19.60	19.05	0.55	10.19	0.01	3.41	0.01
HC-10	11/19/2003	29.30	19.60	19.15	0.45	10.10	0.10	3.51	0.03
HC-10	11/26/2003	29.30	19.51	19.00	0.51	10.24	0.10	3.61	0.01
HC-10	12/3/2003	29.30	19.27	18.89	0.38	10.37	0.10	3.71	0.01
HC-10	12/10/2003	29.30	19.88	19.60	0.28	9.67	0.10	3.81	0.01
HC-10	12/17/2003	29.30	18.66	18.36	0.30	10.91	0.10	3.91	0.01
HC-10	12/24/2003	29.30	17.98	17.76	0.22	11.52	0.01	3.92	0.00
HC-10	1/9/2004	29.30	17.11	16.84	0.27	12.43	0.10	4.02	0.01
HC-10	1/15/2004	29.30	17.00	16.71	0.29	12.56	0.10	4.12	0.01
HC-10	1/21/2004	29.30	16.01	15.85	0.16	13.43	0.10	4.22	0.01
HC-10	1/29/2004	29.30	16.00	15.30	0.70	13.92	0.30	4.52	0.01
HC-10	2/3/2004	29.30	16.10	15.40	0.70	13.82	0.30	4.82	0.01
HC-10	2/12/2004	29.30	15.87	15.28	0.59	13.96	0.10	4.92	0.01
HC-10	2/18/2004	29.30	16.22	15.41	0.81	13.80	0.10	5.02	0.00
HC-10	2/25/2004	29.30	15.47	14.86	0.61	14.37	0.10	5.12	0.00
HC-10	3/3/2004	29.30	15.95	15.55	0.40	13.71	0.10	5.22	0.01
HC-10	3/10/2004	29.30	16.10	15.65	0.45	13.60	0.05	5.27	0.01
HC-10	3/18/2004	29.30	16.03	15.59	0.44	13.66	0.05	5.32	0.00
HC-10	3/24/2004	29.30	16.33	15.99	0.34	13.27	0.05	5.37	0.00
HC-10	4/1/2004	29.30	16.50	15.95	0.55	13.29	0.08	5.45	0.00
HC-10	1/14/2005	29.30	18.90	18.49	0.41	10.76	0.10	5.55	0.09
HC-10	1/21/2005	29.30	18.60	18.25	0.35	11.01	1.00	6.55	0.10
HC-10	1/28/2005	29.30	18.48	18.22	0.26	11.05	0.15	6.70	0.09
HC-10	2/2/2005	29.30	18.66	18.47	0.19	10.81	0.00	6.70	0.00
HC-10	2/4/2005	29.30	18.49	18.27	0.22	11.01	0.20	6.90	0.03
HC-10	2/11/2005	29.30	18.30	18.12	0.18	11.16	0.05	6.95	0.06
HC-10	2/18/2005	29.30	18.26	18.11	0.15	11.17	0.10	7.05	0.06
HC-10	2/25/2005	29.30	18.50	18.37	0.13	10.92	0.05	7.10	0.06
HC-10	3/4/2005	29.30	18.64	18.52	0.12	10.77	0.05	7.15	0.02
HC-10	3/11/2005	29.30	18.58	18.48	0.10	10.81	0.15	7.30	0.01
HC-10	3/18/2005	29.30	18.56	18.47	0.09	10.82	0.00	7.30	0.09
HC-10	3/25/2005	29.30	18.86	18.75	0.11	10.54	0.05	7.35	0.01
HC-10	4/1/2005	29.30	18.52	18.46	0.06	10.83	0.00	7.35	0.06

Please refer to notes at the end of table.

Table C-1
Historical Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID	Date	Top of Casing	Initial Measurements				Product Removal		
			Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	Final Product Thickness
			(feet)				(gallons)		(feet)
HC-10	4/14/2005	29.30	18.44	18.43	0.01	10.87	0.10	7.45	0.01
HC-10	4/30/2005	29.30	18.22	18.14	0.08	11.15	0.00	7.45	0.08
HC-10	5/13/2005	29.30	18.88	18.82	0.06	10.47	0.00	7.45	0.06
HC-10	5/31/2005	29.30	17.38	17.32	0.06	11.97	0.00	7.45	0.06
HC-10	6/2/2005	29.30	17.45	17.33	0.12	11.96	0.00	7.45	--
HC-10	6/24/2005	29.30	17.55	17.50	0.05	11.79	0.00	7.45	0.05
HC-10	7/29/2005	29.30	18.16	18.09	0.07	11.20	0.00	7.45	0.07
HC-10	8/26/2005	29.30	18.60	18.52	0.08	10.77	0.00	7.45	0.08
HC-10	9/14/2005	29.30	18.93	0.00	18.93	27.22	0.00	7.45	--
HC-10	9/24/2005	29.30	19.05	18.90	0.15	10.38	0.05	7.50	0.00
HC-10	10/10/2005	29.30	19.25	19.05	0.20	10.23	0.50	8.00	0.04
HC-10	10/21/2005	29.30	19.25	19.19	0.06	10.10	0.00	8.00	0.06
HC-10	11/28/2005	29.30	18.70	18.65	0.05	10.64	0.00	8.00	0.05
HC-10	12/6/2005	29.30	18.62	0.00	18.62	27.25	0.00	8.00	--
HC-10	1/3/2006	29.30	17.35	17.30	0.05	11.99	0.00	8.00	0.05
HC-10	2/17/2006	29.30	15.33	14.79	0.54	14.45	1.00	9.00	0.08
HC-10	3/3/2006	29.30	15.43	14.89	0.54	14.35	0.25	9.25	0.06
HC-10	3/13/2006	29.30	15.54	15.15	0.39	14.11	0.00	9.25	0.39
HC-10	6/27/2006	29.30	15.58	15.41	0.17	13.87	0.10	9.35	0.01
HC-10	9/19/2006	29.30	19.18	18.34	0.84	10.87	0.35	9.70	0.02
HC-10	12/13/2006	29.30	17.16	16.63	0.53	12.61	0.25	9.95	0.02
HC-10	3/29/2007	29.30	15.91	15.33	0.58	13.91	0.25	10.20	0.08
HC-10	6/27/2007	29.30	17.50	17.03	0.47	12.22	2.00	12.20	0.07
HC-10	9/19/2007	29.30	19.09	18.70	0.39	10.56	0.25	12.45	0.01
HC-10	12/6/2007	29.30	18.76	18.49	0.27	10.78	0.40	12.85	0.00
HC-10	3/10/2008	29.30	16.16	15.82	0.34	13.44	0.00	12.85	0.08
HC-10	3/12/2008	29.30	16.28	15.82	0.46	13.43	0.50	13.35	0.00
HC-10	6/13/2008	29.30	15.23	15.10	0.13	14.19	0.26	13.61	0.00
HC-10	9/8/2008	29.30	18.61	18.16	0.45	11.09	0.20	13.81	0.00
HC-10	9/9/2008	29.30	18.46	18.40	0.06	10.89	0.79	14.60	0.00
HC-10	12/29/2008	29.30	19.03	18.81	0.22	10.47	0.33	14.93	0.01
HC-10	3/10/2009	29.30	17.34	17.32	0.02	11.98	0.00	14.93	0.02
HC-10	6/4/2009	29.30	16.75	16.54	0.21	12.74	0.08	15.01	0.01
HC-10	9/9/2009	29.30	19.01	18.83	0.18	10.45	0.07	15.08	0.00
HC-10	12/15/2009	29.30	18.32	18.23	0.09	11.06	0.00	15.08	0.09
HC-10	3/12/2010	29.30	16.62	16.21	0.41	13.04	0.25	15.33	0.00
HC-10	3/25/2010	29.30	16.35	16.30	0.05	12.99	0.00	15.33	0.05
HC-10	4/16/2010	29.30	16.50	16.09	0.41	13.16	0.25	15.58	0.01
HC-10	4/23/2010	29.30	16.77	16.48	0.29	12.79	0.13	15.71	0.00
HC-10	5/4/2010	29.30	16.71	16.63	0.08	12.66	0.00	15.71	0.08
HC-10	6/8/2010	29.30	15.53	15.27	0.26	14.00	0.25	15.96	0.00
HC-10	7/9/2010	29.30	--	--	--	--	0.00	15.96	0.00
HC-10	7/23/2010	29.30	--	--	--	--	0.00	15.96	0.00
HC-10	8/6/2010	29.30	17.34	16.95	0.39	12.31	0.25	16.21	0.02
HC-10	8/19/2010	29.30	17.59	17.30	0.29	11.97	0.25	16.46	0.00
HC-10	8/27/2010	29.30	17.71	17.49	0.22	11.79	0.25	16.71	0.01
HC-10	9/17/2010	29.30	18.01	17.82	0.19	11.46	0.25	16.96	0.02
HC-10	10/8/2010	29.30	18.36	18.18	0.18	11.10	0.10	17.06	0.01
HC-10	11/11/2010	29.30	18.15	18.02	0.13	11.27	0.10	17.16	0.00
HC-10	12/15/2010	29.30	16.32	16.15	0.17	13.13	0.10	17.26	0.01
HC-10	12/21/2010	29.30	15.88	15.72	0.16	13.56	0.20	17.46	0.01
HC-10	12/30/2010	29.30	--	--	--	--	0.00	17.46	--
HC-10	1/6/2011	29.30	15.22	15.08	0.14	14.20	0.25	17.71	0.02
HC-10	1/13/2011	29.30	15.34	15.31	0.03	13.99	0.00	17.71	0.03
HC-10	1/19/2011	29.30	15.09	14.76	0.33	14.50	0.25	17.96	0.00
HC-10	1/28/2011	29.30	14.41	14.12	0.29	15.15	0.25	18.21	0.00
HC-10	2/9/2011	29.30	15.35	15.19	0.16	14.09	0.25	18.46	0.00
HC-10	2/23/2011	29.30	15.31	15.11	0.20	14.17	0.10	18.56	0.03
HC-10	3/9/2011	29.30	15.49	15.31	0.18	13.97	0.25	18.81	0.02
HC-10	3/29/2011	29.30	14.98	14.64	0.34	14.62	0.25	19.06	0.00
HC-10	4/21/2011	29.30	14.42	14.08	0.34	15.18	0.30	19.36	0.00
HC-10	5/6/2011	29.30	14.57	14.23	0.34	15.03	0.15	19.51	0.00
HC-10	6/9/2011	29.30	13.42	13.12	0.30	16.15	0.20	19.71	0.00
HC-10	7/7/2011	29.30	13.43	12.84	0.59	16.40	0.25	19.96	0.01
HC-10	8/3/2011	29.30	15.69	15.45	0.24	13.82	0.20	20.16	0.00
HC-10	9/8/2011	29.30	17.25	17.04	0.21	12.24	0.25	20.41	0.01
HC-10	10/3/2011	29.30	17.67	17.54	0.13	11.75	0.20	20.61	0.01
HC-10	11/10/2011	29.30	18.26	18.13	0.13	11.16	0.10	20.71	0.10
HC-10	12/1/2011	29.30	17.96	17.88	0.08	11.41	0.00	20.71	0.08
HC-10	1/6/2012	29.30	17.72	17.63	0.09	11.66	0.00	20.71	0.09
HC-10	1/25/2012	29.30	17.16	17.06	0.10	12.23	0.00	20.71	0.10
HC-10	3/3/2012	29.30	17.11	16.93	0.18	12.35	0.20	20.91	0.01
HC-10	3/14/2012	29.30	16.35	16.22	0.13	13.07	0.15	21.06	0.00

Please refer to notes at the end of table.

Table C-1
Historical Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID	Date	Top of Casing	Initial Measurements				Product Removal		
			Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	Final Product Thickness
			(feet)				(gallons)		(feet)
HC-10	3/22/2012	29.30	15.80	15.67	0.13	13.62	0.12	21.18	0.00
HC-10	3/29/2012	29.30	15.07	14.99	0.08	14.30	0.00	21.18	0.08
HC-10	4/5/2012	29.30	14.46	14.36	0.10	14.93	0.13	21.30	0.00
HC-10	4/13/2012	29.30	14.41	14.41	0.00	14.89	0.00	21.30	0.00
HC-10	4/23/2012	29.30	14.58	14.38	0.20	14.90	0.25	21.55	0.00
HC-10	5/14/2012	29.30	14.31	14.16	0.15	15.12	0.20	21.75	0.00
HC-10	5/25/2012	29.30	14.36	14.33	0.03	14.97	0.00	21.75	0.03
HC-10	6/12/2012	29.30	14.81	14.61	0.20	14.67	0.10	21.85	0.01
HC-10	7/3/2012	29.30	15.10	14.75	0.35	14.51	0.13	21.98	0.01
HC-10	8/23/2012	29.30	17.08	17.02	0.06	12.27	0.00	21.98	0.06
HC-10	9/24/2012	29.30	18.01	17.77	0.24	11.50	0.13	22.10	0.00
HC-10	10/8/2012	29.30	18.23	18.15	0.08	11.14	0.00	22.10	0.08
HC-10	11/14/2012	29.30	18.00	17.99	0.01	11.31	0.00	22.10	0.01
HC-10	12/20/2012	29.30	15.36	15.11	0.25	14.16	0.10	22.20	0.01
HC-10	1/4/2013	29.30	15.44	15.08	0.36	14.18	0.10	22.30	0.01
HC-10	1/18/2013	29.30	15.53	15.24	0.29	14.03	0.25	22.55	0.00
HC-10	1/31/2013	29.30	16.14	15.87	0.27	13.40	0.05	22.60	0.01
HC-10	3/6/2013	29.30	16.53	16.33	0.20	12.95	0.10	22.70	0.01
HC-10	4/3/2013	29.30	17.27	17.10	0.17	12.18	0.20	22.90	0.01
HC-10	5/6/2013	29.30	17.11	16.90	0.21	12.38	0.50	23.40	0.00
HC-10	6/12/2013	29.30	17.12	17.00	0.12	12.29	0.15	23.55	0.00
HC-10	7/16/2013	29.30	17.50	17.38	0.12	11.91	0.10	23.65	0.01
HC-10	8/26/2013	29.30	18.45	18.40	0.05	10.89	0.10	23.75	0.01
HC-10	9/25/2013	29.30	20.09	20.08	0.01	9.22	0.00	23.75	0.01
HC-10	10/31/2013	29.30	18.68	18.61	0.07	10.68	0.10	23.85	0.07
HC-10	11/27/2013	29.30	18.56	18.45	0.11	10.84	0.10	23.95	0.01
HC-10	12/17/2013	29.30	18.53	18.46	0.07	10.83	0.00	23.95	0.01
HC-10	12/12/2014	29.30	17.48	17.31	0.17	11.97	0.20	24.15	0.00
HC-10	1/29/2015	29.30	17.70	17.50	0.20	11.78	0.50	24.65	0.00
HC-10	2/27/2015	29.30	17.60	17.40	0.20	11.88	0.40	25.05	0.00
HC-10	3/27/2015	29.30	15.60	15.58	0.02	13.72	0.00	25.05	0.02
HC-10	4/28/2015	29.30	15.64	15.61	0.03	13.69	0.00	25.05	0.03
HC-10	5/29/2015	29.30	17.53	17.48	0.05	11.81	0.00	25.05	0.05
HC-10	6/23/2015	29.30	18.06	17.97	0.09	11.32	0.00	25.05	0.09
HC-10	7/8/2015	29.30	18.20	18.11	0.09	11.18	0.00	25.05	0.09
HC-10	8/12/2015	29.30	18.70	18.62	0.08	10.67	0.00	25.05	0.08
HC-10	9/11/2015	29.30	19.16	18.86	0.30	10.41	1.00	26.05	0.00
HC-10	10/15/2015	29.30	19.68	19.20	0.48	10.05	1.00	27.05	0.01
HC-10	11/10/2015	29.30	19.80	19.30	0.50	9.95	1.00	28.05	0.01
HC-10	12/16/2015	29.30	17.20	17.00	0.20	12.28	1.25	29.30	0.00
HC-10	1/21/2016	29.30	15.00	14.80	0.20	14.48	0.25	29.55	0.02
HC-10	2/17/2016	29.30	14.41	14.25	0.16	15.03	0.25	29.80	0.01
HC-10	3/29/2016	29.30	14.80	14.18	0.62	15.05	0.70	30.50	0.00
HC-10	4/27/2016	29.30	15.24	14.70	0.54	14.54	0.50	31.00	0.04
HC-10	5/27/2016	29.30	16.68	16.10	0.58	13.14	0.50	31.50	0.01
HC-10	6/29/2016	29.30	17.51	17.00	0.51	12.24	0.75	32.25	0.05
HC-10	7/20/2016	29.30	18.10	17.58	0.52	11.66	0.50	32.75	0.03
HC-10	8/31/2016	29.30	18.81	18.31	0.50	10.94	0.50	33.25	0.01
HC-10	9/16/2016	29.30	18.85	18.62	0.23	10.65	0.50	33.75	0.01
HC-10	10/20/2016	29.30	19.00	18.65	0.35	10.61	0.50	34.25	0.00
HC-10	11/28/2016	29.30	17.91	17.61	0.30	11.66	0.10	34.35	0.00
HC-10	12/19/2016	29.30	16.78	16.50	0.28	12.77	0.50	34.85	0.00
HC-10	1/5/2017	29.30	16.73	16.50	0.23	12.77	0.50	35.35	0.01
HC-10	2/14/2017	29.30	14.97	14.59	0.38	14.67	0.50	35.85	0.01
HC-10	3/28/2017	29.30	12.73	12.42	0.31	16.85	0.50	36.35	0.00
HC-10	4/18/2017	29.30	13.03	12.36	0.67	16.87	0.50	36.85	0.03
HC-10	5/26/2017	29.30	13.13	12.70	0.43	16.55	0.50	37.35	0.05
HC-10	6/23/2017	29.30	13.91	13.63	0.28	15.64	0.50	37.85	0.00
HC-10	7/21/2017	29.30	16.11	15.80	0.31	13.47	0.50	38.35	0.00
HC-10	8/18/2017	29.30	17.49	17.04	0.45	12.21	0.10	38.45	0.04
HC-10	9/26/2017	29.30	17.79	17.49	0.30	11.78	0.50	38.95	0.01
HC-10	10/30/2017	29.30	18.03	17.74	0.29	11.53	0.25	39.20	0.00
HC-10	11/17/2017	29.30	17.89	17.59	0.30	11.68	0.10	39.30	0.01
HC-10	12/13/2017	29.30	16.69	16.27	0.42	12.98	2.00	41.30	0.03
HC-10	1/26/2018	29.30	16.32	15.52	0.80	13.69	0.15	41.45	0.01
HC-10	2/14/2018	29.30	15.51	15.21	0.30	14.06	0.10	41.55	0.01
HC-10	3/26/2018	29.30	16.75	16.34	0.41	12.91	1.00	42.55	0.01
HC-10	5/3/2018	29.30	15.57	15.22	0.35	14.04	0.10	42.65	0.01
HC-10	5/31/2018	29.30	14.50	14.36	0.14	14.92	0.50	43.15	0.02
HC-10	6/21/2018	29.30	16.70	16.41	0.29	12.86	0.50	43.65	0.01

Please refer to notes at the end of table.

Table C-1
Historical Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID	Date	Top of Casing	Initial Measurements				Product Removal		
			Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	Final Product Thickness
			(feet)				(gallons)		(feet)
HC-10	7/17/2018	29.30	17.78	17.56	0.22	11.72	0.50	44.15	0.00
HC-10	8/17/2018	29.30	18.47	18.20	0.27	11.07	0.10	44.25	0.00
HC-10	10/16/2018	29.30	19.51	19.05	0.46	10.20	0.10	44.35	0.01
HC-10	11/5/2018	29.30	19.59	19.15	0.44	10.10	0.50	44.85	0.07
HC-10	12/5/2018	29.30	19.40	19.15	0.25	10.12	0.10	44.95	0.01
HC-10	12/31/2018	29.30	18.82	18.60	0.22	10.68	0.50	45.45	0.01
HC-10	1/18/2019	29.30	18.30	18.19	0.11	11.10	0.50	45.95	0.00
HC-10	2/21/2019	29.30	17.41	16.92	0.49	12.33	1.00	46.95	0.01
HC-10	4/2/2019	29.30	17.08	16.76	0.32	12.50	0.50	47.45	0.01
HC-10	4/18/2019	29.30	16.04	15.89	0.15	13.39	0.05	47.50	0.01
HC-10	5/16/2019	29.30	16.50	16.35	0.15	12.93	0.05	47.55	0.01
HC-10	6/19/2019	29.30	17.49	17.30	0.19	11.98	0.05	47.60	0.01
HC-10	7/23/2019	29.30	18.45	18.41	0.04	10.89	0.25	47.85	0.01
HC-10	8/22/2019	29.30	18.33	NP	0.00	10.97	0.00	47.85	0.00
HC-10	9/25/2019	29.30	19.02	19.01	0.01	10.29	0.00	47.85	0.00
HC-10	10/25/2019	29.30	19.24	19.23	0.01	10.07	0.00	47.85	0.01
HC-10	11/20/2019	29.30	18.95	18.94	0.01	10.36	0.00	47.85	0.01
HC-10	12/9/2019	29.30	19.42	19.39	0.03	9.91	0.00	47.85	0.03
HC-10	2/18/2020	29.30	13.14	13.14	0.00	16.16	0.00	47.85	0.00
HC-10	2/28/2020	29.30	15.94	15.71	0.23	13.56	0.05	47.90	0.00
HC-10	3/19/2020	29.30	17.13	16.80	0.33	12.46	0.50	48.40	0.00
HC-10	4/20/2020	29.30	16.48	16.38	0.10	12.91	0.25	48.65	0.00
HC-10	5/29/2020	29.30	17.10	16.77	0.33	12.49	0.06	48.71	0.00
HC-10	6/11/2020	29.30	16.58	16.32	0.26	12.95	0.07	48.78	0.00
HC-10	7/15/2020	29.30	17.20	17.16	0.04	12.14	0.05	48.83	0.00
HC-10	8/31/2020	29.30	17.09	17.02	0.07	12.27	0.08	48.91	0.00
HC-10	9/28/2020	29.30	19.07	19.05	0.02	10.25	0.00	48.91	0.02
HC-10	10/23/2020	29.30	19.25	19.22	0.03	10.08	0.00	48.91	0.03
HC-10	11/13/2020	29.30	19.06	19.04	0.02	10.26	0.00	48.91	0.02
HC-10	12/10/2020	29.30	18.75	18.57	0.18	10.71	0.06	48.97	0.00
HC-10	1/20/2021	29.30	15.99	15.57	0.42	13.68	0.07	46.64	0.00
HC-10	2/24/2021	29.30	14.98	14.92	0.06	14.37	0.10	46.74	0.00
HC-10	1/6/2022	29.30	13.32	12.91	0.41	16.34	0.25	46.99	0.22
HC-10	11/17/2022	29.30	17.57	17.53	0.04	11.77	0.07	46.81	0.00
HC-12S	8/27/2003	29.19	14.14	--	0.00	15.05	0.00	0.00	0.00
HC-12S	9/3/2003	29.19	14.20	--	0.00	14.99	0.00	0.00	0.00
HC-12S	9/11/2003	29.19	14.34	--	0.00	14.85	0.00	0.00	0.00
HC-12S	9/17/2003	29.19	14.44	--	0.00	14.75	0.00	0.00	0.00
HC-12S	9/30/2003	29.19	14.39	--	0.00	14.80	0.00	0.00	0.00
HC-12S	10/14/2003	29.19	14.44	--	0.00	14.75	0.00	0.00	0.00
HC-12S	10/29/2003	29.19	14.60	--	0.00	14.59	0.00	0.00	0.00
HC-12S	11/13/2003	29.19	14.63	--	0.00	14.56	0.00	0.00	0.00
HC-12S	11/26/2003	29.19	14.50	--	0.00	14.69	0.00	0.00	0.00
HC-12S	12/24/2003	29.19	14.01	--	0.00	15.18	0.00	0.00	0.00
HC-12S	1/21/2004	29.19	12.75	--	0.00	16.44	0.00	0.00	0.00
HC-12S	2/25/2004	29.19	13.56	--	0.00	15.63	0.00	0.00	0.00
HC-12S	3/24/2004	29.19	12.97	--	0.00	16.22	0.00	0.00	0.00
HC-12S	2/2/2005	29.19	24.00	--	0.00	5.19	0.00	0.00	0.00
HC-12S	6/2/2005	29.19	13.91	--	0.00	15.28	0.00	0.00	0.00
HC-12S	9/14/2005	29.19	14.21	--	0.00	14.98	0.00	0.00	0.00
HC-12S	12/6/2005	29.19	13.97	--	0.00	15.22	0.00	0.00	0.00
HC-12S	3/13/2006	29.19	13.41	--	0.00	15.78	0.00	0.00	0.00
HC-12S	6/27/2006	29.19	13.73	--	0.00	15.46	0.00	0.00	0.00
HC-12S	9/19/2006	29.19	14.03	--	0.00	15.16	0.00	0.00	0.00
HC-12S	12/13/2006	29.19	13.61	--	0.00	15.58	0.00	0.00	0.00
HC-12S	3/29/2007	29.19	13.45	--	0.00	15.74	0.00	0.00	0.00
HC-12S	6/27/2007	29.19	13.89	--	0.00	15.30	0.00	0.00	0.00
HC-12S	9/18/2007	29.19	14.22	--	0.00	14.97	0.00	0.00	0.00
HC-12S	12/6/2007	29.19	14.75	--	0.00	14.44	0.00	0.00	0.00
HC-12S	3/10/2008	29.19	13.68	--	0.00	15.51	0.00	0.00	0.00
HC-12S	6/12/2008	29.19	13.75	--	0.00	15.44	0.00	0.00	0.00
HC-12S	9/8/2008	29.19	14.24	--	0.00	14.95	0.00	0.00	0.00
HC-12S	12/29/2008	29.19	14.38	--	0.00	14.81	0.00	0.00	0.00
HC-12S	3/9/2009	29.19	13.88	--	0.00	15.31	0.00	0.00	0.00
HC-12S	6/4/2009	29.19	13.93	--	0.00	15.26	0.00	0.00	0.00
HC-12D	8/27/2003	28.91	18.26	--	0.00	10.65	0.00	0.00	0.00
HC-12D	9/3/2003	28.91	18.34	--	0.00	10.57	0.00	0.00	0.00
HC-12D	9/11/2003	28.91	18.65	--	0.00	10.26	0.00	0.00	0.00
HC-12D	9/17/2003	28.91	18.71	--	0.00	10.20	0.00	0.00	0.00
HC-12D	9/30/2003	28.91	18.60	--	0.00	10.31	0.00	0.00	0.00
HC-12D	10/14/2003	28.91	18.69	--	0.00	10.22	0.00	0.00	0.00

Please refer to notes at the end of table.

Table C-1
Historical Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID	Date	Top of Casing	Initial Measurements				Product Removal		
			Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	Final Product Thickness
			(feet)				(gallons)		(feet)
HC-12D	10/29/2003	28.91	19.01	--	0.00	9.90	0.00	0.00	0.00
HC-12D	11/13/2003	28.91	19.16	--	0.00	9.75	0.00	0.00	0.00
HC-12D	11/26/2003	28.91	18.98	--	0.00	9.93	0.00	0.00	0.00
HC-12D	12/24/2003	28.91	17.89	--	0.00	11.02	0.00	0.00	0.00
HC-12D	1/21/2004	28.91	17.63	--	0.00	11.28	0.00	0.00	0.00
HC-12D	2/25/2004	28.91	15.03	--	0.00	13.88	0.00	0.00	0.00
HC-12D	3/24/2004	28.91	17.17	--	0.00	11.74	0.00	0.00	0.00
HC-12D	2/2/2005	28.91	18.73	--	0.00	10.18	0.00	0.00	0.00
HC-12D	6/2/2005	28.91	17.26	17.25	0.01	11.66	0.00	0.00	0.01
HC-12D	9/14/2005	28.91	18.76	--	0.00	10.15	0.00	0.00	0.00
HC-12D	12/6/2005	28.91	18.45	--	0.00	10.46	0.00	0.00	0.00
HC-12D	3/13/2006	28.91	15.03	--	0.00	13.88	0.00	0.00	0.00
HC-12D	6/27/2006	28.91	15.39	--	0.00	13.52	0.00	0.00	0.00
HC-12D	9/19/2006	28.91	18.47	--	0.00	10.44	0.00	0.00	0.00
HC-12D	12/13/2006	28.91	15.72	--	0.00	13.19	0.00	0.00	0.00
HC-12D	3/29/2007	28.91	15.25	--	0.00	13.66	0.00	0.00	0.00
HC-12D	6/27/2007	28.91	17.03	--	0.00	11.88	0.00	0.00	0.00
HC-12D	9/18/2007	28.91	18.76	--	0.00	10.15	0.00	0.00	0.00
HC-12D	12/6/2007	28.91	18.34	--	0.00	10.57	0.00	0.00	0.00
HC-12D	3/10/2008	28.91	15.91	--	0.00	13.00	0.00	0.00	0.00
HC-12D	6/12/2008	28.91	14.76	--	0.00	14.15	0.00	0.00	0.00
HC-12D	9/8/2008	28.91	18.25	--	0.00	10.66	0.00	0.00	0.00
HC-12D	12/29/2008	28.91	17.07	--	0.00	11.84	0.00	0.00	0.00
HC-12D	3/9/2009	28.91	17.39	--	0.00	11.52	0.00	0.00	0.00
HC-12D	6/4/2009	28.91	16.19	--	0.00	12.72	0.00	0.00	0.00
HC-12D	12/11/2014	28.91	17.34	--	0.00	11.57	0.00	0.00	0.00
HC-12D	12/15/2015	28.91	17.36	--	0.00	11.55	0.00	0.00	0.00
HC-12D	12/19/2016	28.91	16.50	--	0.00	12.41	0.00	0.00	0.00
HC-12D	12/13/2017	28.91	16.40	--	0.00	12.51	0.00	0.00	0.00
HC-12D	12/5/2018	28.91	19.30	--	0.00	9.61	0.00	0.00	0.00
HC-12D	1/17/2019	28.91	18.23	--	0.00	10.68	0.00	0.00	0.00
HC-12D	12/9/2019	28.91	19.60	--	0.00	9.31	0.00	0.00	0.00
HC-12D	12/10/2020	28.91	18.97	--	0.00	10.35	0.00	0.00	0.00
HC-12D	12/22/2021	28.91	15.98	--	0.00	13.34	0.00	0.00	0.00
HC-12D	1/6/2022	28.91	14.82	--	0.00	14.50	0.00	0.00	0.00
HC-12D	4/25/2022	28.91	15.81	--	0.00	37844.19	0.00	0.00	0.00
HC-12D	11/17/2022	28.91	18.20	--	0.00	37841.80	0.00	0.00	0.00
HC-13	9/14/2005	NS	Unable to locate well						
HC-13	12/6/2005	NS	Unable to locate well						
HC-13	3/13/2006	NS	Unable to locate well						
HC-13	6/27/2006	NS	Unable to locate well						
HC-13	9/19/2006	NS	17.09	--	0.00	--	0.00	0.00	0.00
HC-13	12/13/2006	NS	16.95	--	0.00	--	0.00	0.00	0.00
HC-13	3/29/2007	NS	16.73	--	0.00	--	0.00	0.00	0.00
HC-13	6/27/2007	NS	17.01	--	0.00	--	0.00	0.00	0.00
HC-13	9/18/2007	NS	18.08	--	0.00	--	0.00	0.00	0.00
HC-13	12/6/2007	NS	17.22	--	0.00	--	0.00	0.00	0.00
HC-13	3/10/2008	NS	16.70	--	0.00	--	0.00	0.00	0.00
HC-13	6/12/2008	NS	16.70	--	0.00	--	0.00	0.00	0.00
HC-13	9/8/2008	NS	17.34	17.34	0.00	--	0.00	0.00	0.00
HC-13	12/29/2008	NS	17.38	--	0.00	--	0.00	0.00	0.00
HC-13	3/9/2009	NS	17.20	--	0.00	--	0.00	0.00	0.00
HC-13	6/4/2009	NS	17.09	--	0.00	--	0.00	0.00	0.00
Well Abandoned									
HC-15	8/27/2003	33.16	15.59	--	0.00	17.57	0.00	0.00	0.00
HC-15	9/3/2003	33.16	15.68	--	0.00	17.48	0.00	0.00	0.00
HC-15	9/11/2003	33.16	15.85	--	0.00	17.31	0.00	0.00	0.00
HC-15	9/17/2003	33.16	15.98	--	0.00	17.18	0.00	0.00	0.00
HC-15	9/30/2003	33.16	16.03	--	0.00	17.13	0.00	0.00	0.00
HC-15	10/14/2003	33.16	16.07	--	0.00	17.09	0.00	0.00	0.00
HC-15	10/29/2003	33.16	16.11	--	0.00	17.05	0.00	0.00	0.00
HC-15	11/13/2003	33.16	16.19	--	0.00	16.97	0.00	0.00	0.00
HC-15	11/26/2003	33.16	16.03	--	0.00	17.13	0.00	0.00	0.00
HC-15	12/24/2003	33.16	15.36	--	0.00	17.80	0.00	0.00	0.00
HC-15	1/21/2004	33.16	14.76	--	0.00	18.40	0.00	0.00	0.00
HC-15	2/25/2004	33.16	14.35	--	0.00	18.81	0.00	0.00	0.00
HC-15	3/24/2004	33.16	14.66	--	0.00	18.50	0.00	0.00	0.00
HC-15	1/14/2005	33.16	--	--	--	--	--	0.00	--
HC-15	1/21/2005	33.16	15.45	--	0.00	17.71	0.00	0.00	0.00
HC-15	1/28/2005	33.16	15.44	--	0.00	17.72	0.00	0.00	0.00
HC-15	2/25/2005	33.16	15.45	--	0.00	17.71	0.00	0.00	0.00
HC-15	3/25/2005	33.16	15.61	--	0.00	17.55	0.00	0.00	0.00
HC-15	4/30/2005	33.16	15.25	--	0.00	17.91	0.00	0.00	0.00

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Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID	Date	Top of Casing	Initial Measurements				Product Removal		
			Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	Final Product Thickness
			(feet)				(gallons)		(feet)
HC-15	5/13/2005	33.16	15.32	--	0.00	17.84	0.00	0.00	0.00
Well Abandoned									
HC-16	8/27/2003	32.83	15.75	--	0.00	17.08	0.00	0.00	0.00
HC-16	9/3/2003	32.83	15.83	--	0.00	17.00	0.00	0.00	0.00
HC-16	9/11/2003	32.83	16.00	--	0.00	16.83	0.00	0.00	0.00
HC-16	9/17/2003	32.83	16.16	--	0.00	16.67	0.00	0.00	0.00
HC-16	9/30/2003	32.83	16.15	--	0.00	16.68	0.00	0.00	0.00
HC-16	10/14/2003	32.83	16.18	--	0.00	16.65	0.00	0.00	0.00
HC-16	10/29/2003	32.83	16.28	--	0.00	16.55	0.00	0.00	0.00
HC-16	11/13/2003	32.83	16.28	--	0.00	16.55	0.00	0.00	0.00
HC-16	11/26/2003	32.83	16.15	--	0.00	16.68	0.00	0.00	0.00
HC-16	12/24/2003	32.83	15.49	--	0.00	17.34	0.00	0.00	0.00
HC-16	1/21/2004	32.83	15.88	--	0.00	16.95	0.00	0.00	0.00
HC-16	2/25/2004	32.83	14.45	--	0.00	18.38	0.00	0.00	0.00
HC-16	3/24/2004	32.83	14.76	--	0.00	18.07	0.00	0.00	0.00
HC-16	1/14/2005	32.83	15.71	--	0.00	17.12	0.00	0.00	0.00
HC-16	1/28/2005	32.83	15.67	15.65	0.02	17.18	0.00	0.00	0.02
HC-16	2/2/2005	32.83	15.69	--	0.00	17.14	0.00	0.00	0.00
HC-16	2/25/2005	32.83	15.66	15.65	0.01	17.18	0.00	0.00	0.01
HC-16	3/25/2005	32.83	15.81	15.80	0.01	17.03	0.00	0.00	0.01
HC-16	4/30/2005	32.83	15.58	--	0.00	17.25	0.00	0.00	0.00
HC-16	5/31/2005	32.83	15.35	--	0.00	17.48	0.00	0.00	0.00
HC-16	6/2/2005	32.83	15.35	--	0.00	17.48	0.00	0.00	0.00
HC-16	6/24/2005	32.83	15.36	--	0.00	17.47	0.00	0.00	0.00
HC-16	7/29/2005	32.83	15.52	--	0.00	17.31	0.00	0.00	0.00
HC-16	8/26/2005	32.83	15.70	--	0.00	17.13	0.00	0.00	0.00
HC-16	9/14/2005	32.83	15.72	--	0.00	17.11	0.00	0.00	0.00
HC-16	9/24/2005	32.83	15.85	--	0.00	16.98	0.00	0.00	0.00
HC-16	10/21/2005	32.83	15.95	--	0.00	16.88	0.00	0.00	0.00
HC-16	11/28/2005	32.83	15.63	--	0.00	17.20	0.00	0.00	0.00
HC-16	12/6/2005	32.83	15.51	--	0.00	17.32	0.00	0.00	0.00
HC-16	1/3/2006	32.83	15.14	--	0.00	17.69	0.00	0.00	0.00
HC-16	2/17/2006	32.83	14.20	--	0.00	18.63	0.00	0.00	0.00
HC-16	3/13/2006	32.83	14.40	--	0.00	18.43	0.00	0.00	0.00
HC-16	6/27/2006	32.83	14.98	--	0.00	17.85	0.00	0.00	0.00
HC-16	9/19/2006	32.83	15.62	--	0.00	17.21	0.00	0.00	0.00
HC-16	12/13/2006	32.83	15.04	--	0.00	17.79	0.00	0.00	0.00
HC-16	3/29/2007	32.83	14.66	--	0.00	18.17	0.00	0.00	0.00
HC-16	6/27/2007	32.83	15.31	--	0.00	17.52	0.00	0.00	0.00
HC-16	9/18/2007	32.83	15.95	--	0.00	16.88	0.00	0.00	0.00
HC-16	12/6/2007	32.83	15.81	--	0.00	17.02	0.00	0.00	0.00
HC-16	3/10/2008	32.83	14.84	--	0.00	17.99	0.00	0.00	0.00
HC-16	6/12/2008	32.83	15.10	--	0.00	17.73	0.00	0.00	0.00
HC-16	9/8/2008	32.83	15.87	--	0.00	16.96	0.00	0.00	0.00
HC-16	12/29/2008	32.83	15.85	--	0.00	16.98	0.00	0.00	0.00
HC-16	3/10/2009	32.83	15.44	--	0.00	17.39	0.00	0.00	0.00
HC-16	6/4/2009	32.83	15.47	--	0.00	17.36	0.00	0.00	0.00
HC-17R	11/13/2003	33.61	16.94	--	0.00	16.67	0.00	0.00	0.00
HC-17R	11/26/2003	33.61	16.41	--	0.00	17.20	0.00	0.00	0.00
HC-17R	12/24/2003	33.61	16.41	--	0.00	17.20	0.00	0.00	0.00
HC-17R	1/9/2004	33.61	16.05	16.02	0.03	17.59	0.00	0.00	0.03
HC-17R	1/21/2004	33.61	15.82	15.79	0.03	17.82	0.00	0.00	0.03
HC-17R	2/3/2004	33.61	15.90	15.88	0.02	17.73	0.00	0.00	0.02
HC-17R	2/18/2004	33.61	15.71	15.55	0.16	18.04	0.03	0.03	0.00
HC-17R	2/25/2004	33.61	15.58	15.48	0.10	18.12	0.02	0.05	0.00
HC-17R	3/10/2004	33.61	15.69	15.60	0.09	18.00	0.00	0.05	0.09
HC-17R	3/24/2004	33.61	16.87	16.78	0.09	16.82	0.00	0.05	0.09
HC-17R	1/14/2005	33.61	17.60	--	0.00	16.01	0.00	0.05	0.00
HC-17R	1/28/2005	33.61	17.47	17.47	0.00	16.14	0.00	0.05	0.00
HC-17R	2/2/2005	33.61	17.56	--	0.00	16.05	0.00	0.05	0.00
HC-17R	2/25/2005	33.61	17.52	17.52	0.00	16.09	0.00	0.05	0.00
HC-17R	3/25/2005	33.61	17.65	17.63	0.02	15.98	0.00	0.05	0.02
HC-17R	4/30/2005	33.61	17.35	--	0.00	16.26	0.00	0.05	0.00
HC-17R	5/31/2005	33.61	17.15	--	0.00	16.46	0.00	0.05	0.00
HC-17R	6/2/2005	33.61	17.14	17.13	0.01	16.48	0.00	0.05	0.01
HC-17R	6/24/2005	33.61	17.14	--	0.00	16.47	0.00	0.05	0.00
HC-17R	7/29/2005	33.61	17.33	--	0.00	16.28	0.00	0.05	0.00
HC-17R	8/26/2005	33.61	17.46	--	0.00	16.15	0.00	0.05	0.00
HC-17R	9/14/2005	33.61	17.50	--	0.00	16.11	0.00	0.05	0.00
HC-17R	9/24/2005	33.61	17.55	--	0.00	16.06	0.00	0.05	0.00
HC-17R	10/21/2005	33.61	17.62	--	0.00	15.99	0.00	0.05	0.00
HC-17R	11/28/2005	33.61	17.30	--	0.00	16.31	0.00	0.05	0.00

Please refer to notes at the end of table.

Table C-1
Historical Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID	Date	Top of Casing	Initial Measurements				Product Removal		
			Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	Final Product Thickness
			(feet)				(gallons)		(feet)
HC-17R	12/6/2005	33.61	17.12	--	0.00	16.49	0.00	0.05	0.00
HC-17R	1/3/2006	33.61	16.73	--	0.00	16.88	0.00	0.05	0.00
HC-17R	2/17/2006	33.61	16.20	--	0.00	17.41	0.00	0.05	0.00
HC-17R	3/13/2006	33.61	16.36	--	0.00	17.25	0.00	0.05	0.00
HC-17R	6/27/2006	33.61	16.82	--	0.00	16.79	0.00	0.05	0.00
HC-17R	9/19/2006	33.61	17.47	--	0.00	16.14	0.00	0.05	0.00
HC-17R	12/13/2006	33.61	16.93	--	0.00	16.68	0.00	0.05	0.00
HC-17R	3/29/2007	33.61	16.70	--	0.00	16.91	0.00	0.05	0.00
HC-17R	6/27/2007	33.61	17.29	--	0.00	16.32	0.00	0.05	0.00
HC-17R	9/18/2007	33.61	17.89	--	0.00	15.72	0.00	0.05	0.00
HC-17R	12/6/2007	33.61	17.24	--	0.00	16.37	0.00	0.05	0.00
HC-17R	3/10/2008	33.61	16.85	--	0.00	16.76	0.00	0.05	0.00
HC-17R	6/12/2008	33.61	16.88	--	0.00	16.73	0.00	0.05	0.00
HC-17R	9/8/2008	33.61	17.85	--	0.00	15.76	0.00	0.05	0.00
HC-17R	12/29/2008	33.61	17.89	--	0.00	15.72	0.00	0.05	0.00
HC-17R	3/10/2009	33.61	17.61	--	0.00	16.00	0.00	0.05	0.00
HC-17R	6/4/2009	33.61	17.54	--	0.00	16.07	0.00	0.05	0.00
HC-18	11/13/2003	33.29	16.37	--	0.00	16.92	0.00	0.00	0.00
HC-18	11/26/2003	33.29	15.83	--	0.00	17.46	0.00	0.00	0.00
HC-18	12/24/2003	33.29	15.38	--	0.00	17.91	0.00	0.00	0.00
HC-18	1/21/2004	33.29	14.73	--	0.00	18.56	0.00	0.00	0.00
HC-18	2/25/2004	33.29	14.37	--	0.00	18.92	0.00	0.00	0.00
HC-18	3/24/2004	33.29	14.68	--	0.00	18.61	0.00	0.00	0.00
HC-18	1/14/2005	33.29	15.71	--	0.00	17.58	0.00	0.00	0.00
HC-18	2/2/2005	33.29	15.66	--	0.00	17.63	0.00	0.00	0.00
HC-18	1/28/2005	33.29	15.60	--	0.00	17.69	0.00	0.00	0.00
HC-18	2/25/2005	33.29	15.65	15.65	0.00	17.64	0.00	0.00	0.00
HC-18	3/25/2005	33.29	15.81	15.81	0.00	17.48	0.00	0.00	0.00
HC-18	4/30/2005	33.29	16.50	--	0.00	16.79	0.00	0.00	0.00
HC-18	5/31/2005	33.29	15.34	--	0.00	17.95	0.00	0.00	0.00
HC-18	6/2/2005	33.29	15.33	--	0.00	17.96	0.00	0.00	0.00
HC-18	6/24/2005	33.29	15.35	--	0.00	17.94	0.00	0.00	0.00
HC-18	7/29/2005	33.29	15.52	--	0.00	17.77	0.00	0.00	0.00
HC-18	8/26/2005	33.29	15.67	--	0.00	17.62	0.00	0.00	0.00
HC-18	9/14/2005	33.29	15.75	--	0.00	17.54	0.00	0.00	0.00
HC-18	9/24/2005	33.29	15.83	--	0.00	17.46	0.00	0.00	0.00
HC-18	10/21/2005	33.29	15.95	--	0.00	17.34	0.00	0.00	0.00
HC-18	11/28/2005	33.29	15.63	--	0.00	17.66	0.00	0.00	0.00
HC-18	12/6/2005	33.29	15.01	--	0.00	18.28	0.00	0.00	0.00
HC-18	1/3/2006	33.29	15.06	--	0.00	18.23	0.00	0.00	0.00
HC-18	2/17/2006	33.29	14.13	--	0.00	19.16	0.00	0.00	0.00
HC-18	3/13/2006	33.29	14.35	--	0.00	18.94	0.00	0.00	0.00
HC-18	6/27/2006	33.29	15.97	--	0.00	17.32	0.00	0.00	0.00
HC-18	9/19/2006	33.29	15.65	--	0.00	17.64	0.00	0.00	0.00
HC-18	12/13/2006	33.29	15.09	--	0.00	18.20	0.00	0.00	0.00
HC-18	3/29/2007	33.29	14.65	--	0.00	18.64	0.00	0.00	0.00
HC-18	6/27/2007	33.29	15.35	--	0.00	17.94	0.00	0.00	0.00
HC-18	9/18/2007	33.29	15.99	--	0.00	17.30	0.00	0.00	0.00
HC-18	12/6/2007	33.29	15.89	--	0.00	17.40	0.00	0.00	0.00
HC-18	3/10/2008	33.29	14.79	--	0.00	18.50	0.00	0.00	0.00
HC-18	6/12/2008	33.29	15.12	--	0.00	18.17	0.00	0.00	0.00
HC-18	9/8/2008	33.29	15.96	--	0.00	17.33	0.00	0.00	0.00
HC-18	12/29/2008	33.29	16.43	--	0.00	16.86	0.00	0.00	0.00
HC-18	3/10/2009	33.29	15.45	--	0.00	17.84	0.00	0.00	0.00
HC-18	6/4/2009	33.29	15.51	--	0.00	17.78	0.00	0.00	0.00
HC-19	11/13/2003	33.05	17.92	--	0.00	15.13	0.00	0.00	0.00
HC-19	11/26/2003	33.05	17.79	--	0.00	15.26	0.00	0.00	0.00
HC-19	12/24/2003	33.05	16.85	--	0.00	16.20	0.00	0.00	0.00
HC-19	1/21/2004	33.05	16.29	--	0.00	16.76	0.00	0.00	0.00
HC-19	2/25/2004	33.05	18.11	--	0.00	14.94	0.00	0.00	0.00
HC-19	3/24/2004	33.05	16.41	--	0.00	16.64	0.00	0.00	0.00
HC-19	1/14/2005	33.05	17.40	--	0.00	15.65	0.00	0.00	0.00
HC-19	1/28/2005	33.05	17.29	17.29	0.00	15.76	0.00	0.00	0.00
HC-19	2/2/2005	33.05	17.34	--	0.00	15.71	0.00	0.00	0.00
HC-19	2/25/2005	33.05	17.29	17.29	0.00	15.76	0.00	0.00	0.00
HC-19	3/25/2005	33.05	17.45	17.45	0.00	15.60	0.00	0.00	0.00
HC-19	4/30/2005	33.05	17.14	--	0.00	15.91	0.00	0.00	0.00
HC-19	5/31/2005	33.05	15.90	--	0.00	17.15	0.00	0.00	0.00
HC-19	6/2/2005	33.05	15.15	--	0.00	17.90	0.00	0.00	0.00
HC-19	6/24/2005	33.05	16.95	--	0.00	16.10	0.00	0.00	0.00
HC-19	7/29/2005	33.05	17.11	--	0.00	15.94	0.00	0.00	0.00
HC-19	8/26/2005	33.05	17.28	--	0.00	15.77	0.00	0.00	0.00
HC-19	9/14/2005	33.05	17.25	--	0.00	15.80	0.00	0.00	0.00

Please refer to notes at the end of table.

Table C-1
Historical Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID	Date	Top of Casing	Initial Measurements				Product Removal		
			Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	Final Product Thickness
			(feet)				(gallons)		(feet)
HC-19	9/24/2005	33.05	17.40	--	0.00	15.65	0.00	0.00	0.00
HC-19	10/21/2005	33.05	17.43	--	0.00	15.62	0.00	0.00	0.00
HC-19	11/28/2005	33.05	17.09	--	0.00	15.96	0.00	0.00	0.00
HC-19	12/6/2005	33.05	16.84	--	0.00	16.21	0.00	0.00	0.00
HC-19	1/3/2006	33.05	16.30	--	0.00	16.75	0.00	0.00	0.00
HC-19	2/17/2006	33.05	15.96	--	0.00	17.09	0.00	0.00	0.00
HC-19	3/13/2006	33.05	16.13	--	0.00	16.92	0.00	0.00	0.00
HC-19	6/27/2006	33.05	16.60	--	0.00	16.45	0.00	0.00	0.00
HC-19	9/19/2006	33.05	17.26	--	0.00	15.79	0.00	0.00	0.00
HC-19	12/13/2006	33.05	16.67	--	0.00	16.38	0.00	0.00	0.00
HC-19	3/29/2007	33.05	16.36	--	0.00	16.69	0.00	0.00	0.00
HC-19	6/27/2007	33.05	17.04	--	0.00	16.01	0.00	0.00	0.00
HC-19	9/18/2007	33.05	17.63	--	0.00	15.42	0.00	0.00	0.00
HC-19	12/6/2007	33.05	16.59	--	0.00	16.46	0.00	0.00	0.00
HC-19	3/10/2008	33.05	16.48	--	0.00	16.57	0.00	0.00	0.00
HC-19	6/12/2008	33.05	16.01	--	0.00	17.04	0.00	0.00	0.00
HC-19	9/8/2008	33.05	17.64	--	0.00	15.41	0.00	0.00	0.00
HC-19	12/29/2008	33.05	17.55	--	0.00	15.50	0.00	0.00	0.00
HC-19	3/10/2009	33.05	17.34	--	0.00	15.71	0.00	0.00	0.00
HC-19	6/4/2009	33.05	17.27	--	0.00	15.78	0.00	0.00	0.00
HC-19	9/9/2009	33.05	18.03	--	0.00	15.02	0.00	0.00	0.00
HC-19	12/15/2009	33.05	17.52	--	0.00	15.53	0.00	0.00	0.00
HC-19	3/11/2010	33.05	16.75	--	0.00	16.30	0.00	0.00	0.00
HC-19	6/8/2010	33.05	16.50	--	0.00	16.55	0.00	0.00	0.00
HC-19	9/16/2010	33.05	17.26	--	0.00	15.79	0.00	0.00	0.00
HC-19	12/13/2010	33.05	16.26	--	0.00	16.79	0.00	0.00	0.00
HC-19	6/9/2011	33.05	15.12	--	0.00	17.93	0.00	0.00	0.00
HC-19	12/1/2011	33.05	17.03	--	0.00	16.02	0.00	0.00	0.00
HC-19	6/11/2012	33.05	16.30	--	0.00	16.75	0.00	0.00	0.00
HC-19	12/19/2012	33.05	16.13	--	0.00	16.92	0.00	0.00	0.00
HC-19	12/17/2013	33.05	17.84	--	0.00	15.21	0.00	0.00	0.00
HC-19	12/11/2014	33.05	17.28	--	0.00	15.77	0.00	0.00	0.00
HC-19	12/15/2015	33.05	16.08	--	0.00	16.97	0.00	0.00	0.00
HC-19	12/19/2016	33.05	16.86	--	0.00	16.19	0.00	0.00	0.00
HC-19	12/13/2017	33.05	16.96	--	0.00	16.09	0.00	0.00	0.00
HC-19	12/5/2018	33.05	18.47	--	0.00	14.58	0.00	0.00	0.00
HC-19	1/17/2019	33.05	17.89	--	0.00	15.16	0.00	0.00	0.00
HC-19	12/9/2019	33.05	18.90	--	0.00	14.15	0.00	0.00	0.00
HC-19	12/10/2020	33.05	18.45	--	0.00	14.60	0.00	0.00	0.00
HC-19	1/6/2022	33.05	15.08	--	0.00	17.97	0.00	0.00	0.00
HC-19	11/17/2022	33.05	18.03	--	0.00	15.02	0.00	0.00	0.00
HC-20	11/13/2003	32.26	16.18	--	0.00	16.08	0.00	0.00	0.00
HC-20	11/26/2003	32.26	15.99	--	0.00	16.27	0.00	0.00	0.00
HC-20	12/24/2003	32.26	15.36	--	0.00	16.90	0.00	0.00	0.00
HC-20	1/21/2004	32.26	14.78	--	0.00	17.48	0.00	0.00	0.00
HC-20	2/25/2004	32.26	14.50	14.46	0.04	17.80	0.00	0.00	0.04
HC-20	3/10/2004	32.26	14.70	14.65	0.05	17.60	0.00	0.00	0.05
HC-20	3/24/2004	32.26	14.85	14.81	0.04	17.45	0.00	0.00	0.04
HC-20	1/14/2005	32.26	--	--	--	--	--	0.00	--
HC-20	1/21/2005	32.26	17.40	--	0.00	14.86	0.00	0.00	0.00
HC-20	1/28/2005	32.26	15.40	--	0.00	16.86	0.00	0.00	0.00
HC-20	2/2/2005	32.26	15.45	--	0.00	16.81	0.00	0.00	0.00
HC-20	2/25/2005	32.26	15.36	--	0.00	16.90	0.00	0.00	0.00
HC-20	3/25/2005	32.26	15.56	15.56	0.00	16.70	0.00	0.00	0.00
HC-20	4/30/2005	32.26	15.31	--	0.00	16.95	0.00	0.00	0.00
HC-20	5/31/2005	32.26	15.17	--	0.00	17.09	0.00	0.00	0.00
HC-20	6/2/2005	32.26	15.15	--	0.00	17.11	0.00	0.00	0.00
HC-20	6/24/2005	32.26	15.17	--	0.00	17.09	0.00	0.00	0.00
HC-20	7/29/2005	32.26	15.33	--	0.00	16.93	0.00	0.00	0.00
HC-20	8/26/2005	32.26	15.49	--	0.00	16.77	0.00	0.00	0.00
HC-20	9/14/2005	32.26	15.50	--	0.00	16.76	0.00	0.00	0.00
HC-20	9/24/2005	32.26	16.69	--	0.00	15.57	0.00	0.00	0.00
HC-20	10/21/2005	32.26	15.70	--	0.00	16.56	0.00	0.00	0.00
HC-20	11/28/2005	32.26	15.32	--	0.00	16.94	0.00	0.00	0.00
HC-20	12/6/2005	32.26	15.22	--	0.00	17.04	0.00	0.00	0.00
HC-20	1/3/2006	32.26	14.82	--	0.00	17.44	0.00	0.00	0.00
HC-20	2/17/2006	32.26	14.16	--	0.00	18.10	0.00	0.00	0.00
HC-20	3/13/2006	32.26	14.30	--	0.00	17.96	0.00	0.00	0.00
HC-20	6/27/2006	32.26	--	--	--	--	--	0.00	--
HC-20	9/19/2006	32.26	15.58	--	0.00	16.68	0.00	0.00	0.00
HC-20	12/13/2006	32.26	14.78	--	0.00	17.48	0.00	0.00	0.00
HC-20	3/29/2007	32.26	14.50	--	0.00	17.76	0.00	0.00	0.00
HC-20	6/27/2007	32.26	15.15	--	0.00	17.11	0.00	0.00	0.00

Please refer to notes at the end of table.

Table C-1
Historical Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID	Date	Top of Casing	Initial Measurements				Product Removal		
			Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	Final Product Thickness
			(feet)				(gallons)		(feet)
HC-20	9/18/2007	32.26	15.70	--	0.00	16.56	0.00	0.00	0.00
HC-20	12/6/2007	32.26	15.09	--	0.00	17.17	0.00	0.00	0.00
HC-20	3/10/2008	32.26	14.71	--	0.00	17.55	0.00	0.00	0.00
HC-20	6/12/2008	32.26	14.83	--	0.00	17.43	0.00	0.00	0.00
HC-20	9/8/2008	32.26	15.63	--	0.00	16.63	0.00	0.00	0.00
HC-20	12/29/2008	32.26	Well inadvertently not gauged during groundwater monitoring event.						
HC-20	3/10/2009	32.26	15.70	--	0.00	16.56	0.00	0.00	0.00
HC-20	6/4/2009	32.26	15.25	--	0.00	17.01	0.00	0.00	0.00
HC-21	11/13/2003	31.95	17.60	--	0.00	14.35	0.00	0.00	0.00
HC-21	11/26/2003	31.95	17.41	--	0.00	14.54	0.00	0.00	0.00
HC-21	12/24/2003	31.95	16.22	--	0.00	15.73	0.00	0.00	0.00
HC-21	1/21/2004	31.95	15.53	--	0.00	16.42	0.00	0.00	0.00
HC-21	2/25/2004	31.95	15.32	--	0.00	16.63	0.00	0.00	0.00
HC-21	3/24/2004	31.95	14.60	--	0.00	17.35	0.00	0.00	0.00
HC-21	1/14/2005	31.95	16.36	--	0.00	15.59	0.00	0.00	0.00
HC-21	1/28/2005	31.95	16.53	16.52	0.01	15.43	0.00	0.00	0.01
HC-21	2/2/2005	31.95	16.62	--	0.00	15.33	0.00	0.00	0.00
HC-21	2/25/2005	31.95	16.57	16.57	0.00	15.38	0.00	0.00	0.00
HC-21	3/25/2005	31.95	16.78	16.78	0.00	15.17	0.00	0.00	0.00
HC-21	4/30/2005	31.95	16.44	--	0.00	15.51	0.00	0.00	0.00
HC-21	5/31/2005	31.95	16.18	--	0.00	15.77	0.00	0.00	0.00
HC-21	6/2/2005	31.95	16.20	--	0.00	15.75	0.00	0.00	0.00
HC-21	6/24/2005	31.95	16.29	--	0.00	15.66	0.00	0.00	0.00
HC-21	7/29/2005	31.95	16.49	--	0.00	15.46	0.00	0.00	0.00
HC-21	8/26/2005	31.95	16.65	--	0.00	15.30	0.00	0.00	0.00
HC-21	9/14/2005	31.95	16.52	--	0.00	15.43	0.00	0.00	0.00
HC-21	9/24/2005	31.95	17.70	--	0.00	14.25	0.00	0.00	0.00
HC-21	10/21/2005	31.95	16.70	--	0.00	15.25	0.00	0.00	0.00
HC-21	11/28/2005	31.95	16.21	--	0.00	15.74	0.00	0.00	0.00
HC-21	12/6/2005	31.95	15.81	--	0.00	16.14	0.00	0.00	0.00
HC-21	1/3/2006	31.95	15.07	--	0.00	16.88	0.00	0.00	0.00
HC-21	2/17/2006	31.95	14.95	--	0.00	17.00	0.00	0.00	0.00
HC-21	3/13/2006	31.95	15.02	--	0.00	16.93	0.00	0.00	0.00
HC-21	6/27/2006	31.95	15.62	--	0.00	16.33	0.00	0.00	0.00
HC-21	9/19/2006	31.95	16.54	--	0.00	15.41	0.00	0.00	0.00
HC-21	12/13/2006	31.95	15.53	--	0.00	16.42	0.00	0.00	0.00
HC-21	3/29/2007	31.95	15.09	--	0.00	16.86	0.00	0.00	0.00
HC-21	6/27/2007	31.95	16.11	--	0.00	15.84	0.00	0.00	0.00
HC-21	9/18/2007	31.95	16.84	--	0.00	15.11	0.00	0.00	0.00
HC-21	12/6/2007	31.95	15.05	--	0.00	16.90	0.00	0.00	0.00
HC-21	3/10/2008	31.95	15.29	--	0.00	16.66	0.00	0.00	0.00
HC-21	6/12/2008	31.95	15.36	--	0.00	16.59	0.00	0.00	0.00
HC-21	9/8/2008	31.95	16.83	--	0.00	15.12	0.00	0.00	0.00
HC-21	12/29/2008	31.95	16.44	--	0.00	15.51	0.00	0.00	0.00
HC-21	3/10/2009	31.95	16.40	--	0.00	15.55	0.00	0.00	0.00
HC-21	6/4/2009	31.95	16.25	--	0.00	15.70	0.00	0.00	0.00
HC-21	9/9/2009	31.95	17.37	--	0.00	14.58	0.00	0.00	0.00
HC-21	12/15/2009	31.95	16.32	--	0.00	15.63	0.00	0.00	0.00
HC-21	3/11/2010	31.95	15.43	--	0.00	16.52	0.00	0.00	0.00
HC-21	6/8/2010	31.95	15.14	--	0.00	16.81	0.00	0.00	0.00
HC-21	9/16/2010	31.95	15.39	--	0.00	16.56	0.00	0.00	0.00
HC-21	12/13/2010	31.95	14.90	--	0.00	17.05	0.00	0.00	0.00
HC-21	6/9/2011	31.95	13.78	--	0.00	18.17	0.00	0.00	0.00
HC-21	12/1/2011	31.95	15.94	--	0.00	16.01	0.00	0.00	0.00
HC-21	6/11/2012	31.95	15.05	--	0.00	16.90	0.00	0.00	0.00
HC-21	12/19/2012	31.95	14.65	--	0.00	17.30	0.00	0.00	0.00
HC-21	12/17/2013	31.95	17.06	--	0.00	14.89	0.00	0.00	0.00
HC-21	12/11/2014	31.95	16.14	--	0.00	15.81	0.00	0.00	0.00
HC-21	12/15/2015	31.95	14.43	--	0.00	17.52	0.00	0.00	0.00
HC-21	12/19/2016	31.95	15.23	--	0.00	16.72	0.00	0.00	0.00
HC-21	12/13/2017	31.95	15.25	--	0.00	16.70	0.00	0.00	0.00
HC-21	12/5/2018	31.95	17.57	--	0.00	14.38	0.00	0.00	0.00
HC-21	1/17/2019	31.95	16.59	--	0.00	15.36	0.00	0.00	0.00
HC-21	12/9/2019	31.95	18.16	--	0.00	13.79	0.00	0.00	0.00
HC-21	12/10/2020	31.95	17.43	--	0.00	14.52	0.00	0.00	0.00
HC-21	1/6/2022	31.95	14.74	--	0.00	17.21	0.00	0.00	0.00
HC-21	11/17/2022	31.95	17.11	--	0.00	37842.89	0.00	0.00	0.00
HC-22	11/13/2003	31.91	16.04	--	0.00	15.87	0.00	0.00	0.00
HC-22	11/26/2003	31.91	15.88	--	0.00	16.03	0.00	0.00	0.00
HC-22	12/24/2003	31.91	14.46	--	0.00	17.45	0.00	0.00	0.00
HC-22	1/21/2004	31.91	13.79	--	0.00	18.12	0.00	0.00	0.00
HC-22	2/25/2004	31.91	13.43	--	0.00	18.48	0.00	0.00	0.00
HC-22	3/24/2004	31.91	15.33	--	0.00	16.58	0.00	0.00	0.00

Please refer to notes at the end of table.

Table C-1
Historical Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID	Date	Top of Casing	Initial Measurements				Product Removal		
			Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	Final Product Thickness
			(feet)				(gallons)		(feet)
HC-22	1/14/2005	31.91	--	--	--	--	--	0.00	--
HC-22	1/21/2005	31.91	14.50	--	0.00	17.41	0.00	0.00	0.00
HC-22	2/2/2005	31.91	14.51	--	0.00	17.40	0.00	0.00	0.00
HC-22	1/28/2005	31.91	14.46	--	0.00	17.45	0.00	0.00	0.00
HC-22	2/25/2005	31.91	15.49	15.49	0.00	16.42	0.00	0.00	0.00
HC-22	3/25/2005	31.91	15.65	15.65	0.00	16.26	0.00	0.00	0.00
HC-22	4/30/2005	31.91	14.36	--	0.00	17.55	0.00	0.00	0.00
HC-22	5/31/2005	31.91	14.15	--	0.00	17.76	0.00	0.00	0.00
HC-22	6/2/2005	31.91	14.14	--	0.00	17.77	0.00	0.00	0.00
HC-22	6/24/2005	31.91	14.22	--	0.00	17.69	0.00	0.00	0.00
HC-22	7/29/2005	31.91	14.39	--	0.00	17.52	0.00	0.00	0.00
HC-22	8/26/2005	31.91	14.55	--	0.00	17.36	0.00	0.00	0.00
HC-22	9/14/2005	31.91	14.60	--	0.00	17.31	0.00	0.00	0.00
HC-22	9/24/2005	31.91	14.70	--	0.00	17.21	0.00	0.00	0.00
HC-22	10/21/2005	31.91	14.81	--	0.00	17.10	0.00	0.00	0.00
HC-22	11/28/2005	31.91	14.39	--	0.00	17.52	0.00	0.00	0.00
HC-22	12/6/2005	31.91	14.12	--	0.00	17.79	0.00	0.00	0.00
HC-22	1/3/2006	31.91	13.69	--	0.00	18.22	0.00	0.00	0.00
HC-22	2/17/2006	31.91	13.07	--	0.00	18.84	0.00	0.00	0.00
HC-22	3/13/2006	31.91	13.15	--	0.00	18.76	0.00	0.00	0.00
HC-22	6/27/2006	31.91	13.82	--	0.00	18.09	0.00	0.00	0.00
HC-22	9/19/2006	31.91	14.45	--	0.00	17.46	0.00	0.00	0.00
HC-22	12/13/2006	31.91	13.74	--	0.00	18.17	0.00	0.00	0.00
HC-22	3/29/2007	31.91	13.45	--	0.00	18.46	0.00	0.00	0.00
HC-22	6/27/2007	31.91	14.14	--	0.00	17.77	0.00	0.00	0.00
HC-22	9/18/2007	31.91	14.74	--	0.00	17.17	0.00	0.00	0.00
HC-22	12/6/2007	31.91	14.07	--	0.00	17.84	0.00	0.00	0.00
HC-22	3/10/2008	31.91	13.68	--	0.00	18.23	0.00	0.00	0.00
HC-22	6/12/2008	31.91	--	--	--	--	--	0.00	--
HC-22	9/8/2008	31.91	14.67	--	0.00	17.24	0.00	0.00	0.00
HC-22	12/29/2008	31.91	13.91	--	0.00	18.00	0.00	0.00	0.00
HC-22	3/10/2009	31.91	14.18	--	0.00	17.73	0.00	0.00	0.00
HC-22	6/4/2009	31.91	14.24	--	0.00	17.67	0.00	0.00	0.00
HC-23	11/13/2003	32.74	15.28	--	0.00	17.46	0.00	0.00	0.00
HC-23	11/26/2003	32.74	14.88	--	0.00	17.86	0.00	0.00	0.00
HC-23	12/24/2003	32.74	15.23	15.15	0.08	17.58	0.01	0.01	0.00
HC-23	12/30/2003	32.74	15.22	15.05	0.17	17.67	0.01	0.02	0.00
HC-23	1/9/2004	32.74	14.85	14.77	0.08	17.96	0.01	0.03	0.01
HC-23	1/15/2004	32.74	14.61	--	0.00	18.13	0.00	0.03	0.00
HC-23	1/21/2004	32.74	14.42	14.41	0.01	18.33	0.01	0.04	0.01
HC-23	2/3/2004	32.74	14.05	--	0.00	18.69	0.00	0.04	0.00
HC-23	2/18/2004	32.74	14.05	--	0.00	18.69	0.00	0.04	0.00
HC-23	2/25/2004	32.74	13.98	--	0.00	18.76	0.00	0.04	0.00
HC-23	3/10/2004	32.74	14.15	--	0.00	18.59	0.00	0.04	0.00
HC-23	3/24/2004	32.74	14.33	--	0.00	18.41	0.00	0.04	0.00
HC-23	1/14/2005	32.74	--	--	--	--	0.00	0.04	0.00
HC-23	1/21/2005	32.74	15.35	15.30	0.05	17.43	0.01	0.05	0.00
HC-23	1/28/2005	32.74	15.28	15.27	0.01	17.47	0.00	0.05	0.01
HC-23	2/2/2005	32.74	15.36	15.33	0.03	17.41	0.00	0.05	0.03
HC-23	2/25/2005	32.74	15.31	15.30	0.01	17.44	0.00	0.05	0.01
HC-23	3/25/2005	32.74	15.48	15.45	0.03	17.29	0.00	0.05	0.03
HC-23	4/30/2005	32.74	15.18	--	0.00	17.56	0.00	0.05	0.00
HC-23	5/31/2005	32.74	14.95	--	0.00	17.79	0.00	0.05	0.00
HC-23	6/2/2005	32.74	14.97	14.95	0.02	17.79	0.00	0.05	0.02
HC-23	6/24/2005	32.74	15.01	14.96	0.05	17.77	0.00	0.05	0.05
HC-23	7/29/2005	32.74	16.25	16.25	0.00	16.49	0.00	0.05	0.00
HC-23	8/26/2005	32.74	15.51	15.30	0.21	17.42	0.50	0.55	0.05
HC-23	9/9/2005	32.74	15.49	15.40	0.09	17.33	0.00	0.55	0.09
HC-23	9/14/2005	32.74	15.50	--	0.00	17.24	0.00	0.55	0.00
HC-23	9/24/2005	32.74	15.64	15.47	0.17	17.25	0.05	0.60	0.05
HC-23	10/10/2005	32.74	15.55	15.52	0.03	17.22	0.00	0.60	0.03
HC-23	10/21/2005	32.74	15.47	15.45	0.02	17.29	0.00	0.60	0.02
HC-23	11/28/2005	32.74	15.27	15.27	0.00	17.47	0.00	0.60	0.00
HC-23	12/6/2005	32.74	15.14	--	0.00	17.60	0.00	0.60	0.00
HC-23	1/3/2006	32.74	14.75	--	0.00	17.99	0.00	0.60	0.00
HC-23	2/17/2006	32.74	13.73	--	0.00	19.01	0.00	0.60	0.00
HC-23	3/13/2006	32.74	13.91	--	0.00	18.83	0.00	0.60	0.00
HC-23	6/27/2006	32.74	--	--	--	--	--	0.60	--
HC-23	9/19/2006	32.74	15.25	15.23	0.02	17.51	0.00	0.60	0.02
HC-23	12/13/2006	32.74	14.68	14.65	0.03	18.09	0.00	0.60	0.03
HC-23	3/29/2007	32.74	14.20	14.19	0.01	18.55	0.00	0.60	0.01
HC-23	6/27/2007	32.74	14.93	14.91	0.02	17.83	0.00	0.60	0.02
HC-23	9/18/2007	32.74	15.59	15.56	0.03	17.18	0.00	0.60	0.03

Please refer to notes at the end of table.

Table C-1
Historical Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID	Date	Top of Casing	Initial Measurements				Product Removal		
			Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	Final Product Thickness
			(feet)				(gallons)		(feet)
HC-23	12/6/2007	32.74	15.51	--	0.00	17.23	0.00	0.60	0.00
HC-23	3/10/2008	32.74	14.37	--	0.00	18.37	0.00	0.60	0.00
HC-23	6/12/2008	32.74	14.65	--	0.00	18.09	0.00	0.60	0.00
HC-23	9/8/2008	32.74	15.50	--	0.00	17.24	0.00	0.60	0.00
HC-23	12/29/2008	32.74	15.50	--	0.00	17.24	0.00	0.60	0.00
HC-23	3/10/2009	32.74	15.04	--	0.00	17.70	0.00	0.60	0.00
HC-23	6/4/2009	32.74	15.04	--	0.00	17.70	0.00	0.60	0.00
HC-23	9/9/2009	32.74	15.81	--	0.00	16.93	0.00	0.60	0.00
HC-23	12/15/2009	32.74	15.12	--	0.00	17.62	0.00	0.60	0.00
HC-23	3/11/2010	32.74	14.55	--	0.00	18.19	0.00	0.60	0.00
HC-23	6/8/2010	32.74	14.48	--	0.00	18.26	0.00	0.60	0.00
HC-23	9/16/2010	32.74	15.11	--	0.00	17.63	0.00	0.60	0.00
HC-23	12/13/2010	32.74	14.60	--	0.00	18.14	0.00	0.60	0.00
HC-23	6/9/2011	32.74	13.60	13.60	0.00	19.14	0.00	0.60	0.00
HC-23	12/1/2011	32.74	14.93	--	0.00	17.81	0.00	0.60	0.00
HC-23	6/11/2012	32.74	14.00	--	0.00	18.74	0.00	0.60	0.00
HC-23	12/19/2012	32.74	14.12	--	0.00	18.62	0.00	0.60	0.00
HC-23	12/17/2013	32.74	15.68	15.57	0.11	17.16	0.10	0.70	0.00
HC-23	12/11/2014	32.74	17.05	--	0.00	15.69	0.00	0.70	0.00
HC-23	12/15/2015	32.74	14.62	--	0.00	18.12	0.00	0.70	0.00
HC-23	12/19/2016	32.74	14.42	--	0.00	18.32	0.00	0.70	0.00
HC-23	12/13/2017	32.74	14.04	--	0.00	18.70	0.00	0.70	0.00
HC-23	12/5/2018	32.74	15.35	--	0.00	17.39	0.00	0.70	0.00
HC-23	1/17/2019	32.74	14.74	--	0.00	18.00	0.00	0.70	0.00
HC-23	12/9/2019	32.74	15.71	--	0.00	17.03	0.00	0.70	0.00
HC-23	12/10/2020	32.74	15.19	--	0.00	17.55	0.00	0.70	0.00
HC-23	1/6/2022	32.74	13.77	--	0.00	18.97	0.00	0.70	0.00
HC-23	12/5/2022	32.74	14.75	--	0.00	37923.25	0.00	0.70	0.00
HC-24	11/13/2003	30.04	15.08	--	0.00	14.96	0.00	0.00	0.00
HC-24	11/26/2003	30.04	14.68	--	0.00	15.36	0.00	0.00	0.00
HC-24	12/24/2003	30.04	13.82	--	0.00	16.22	0.00	0.00	0.00
HC-24	1/21/2004	30.04	13.13	--	0.00	16.91	0.00	0.00	0.00
HC-24	2/25/2004	30.04	12.35	--	0.00	17.69	0.00	0.00	0.00
HC-24	3/24/2004	30.04	12.61	--	0.00	17.43	0.00	0.00	0.00
HC-24	1/14/2005	30.04	14.90	--	0.00	15.14	0.00	0.00	0.00
HC-24	1/28/2005	30.04	15.79	--	0.00	14.25	0.00	0.00	0.00
HC-24	2/2/2005	30.04	14.85	--	0.00	15.19	0.00	0.00	--
HC-24	2/25/2005	30.04	14.80	14.80	0.00	15.24	0.00	0.00	0.00
HC-24	3/25/2005	30.04	15.07	15.07	0.00	14.97	0.00	0.00	0.00
HC-24	4/30/2005	30.04	14.62	--	0.00	15.42	0.00	0.00	0.00
HC-24	5/31/2005	30.04	17.34	--	0.00	12.70	0.00	0.00	0.00
HC-24	6/2/2005	30.04	14.31	--	0.00	15.73	0.00	0.00	--
HC-24	6/24/2005	30.04	14.30	--	0.00	15.74	0.00	0.00	0.00
HC-24	7/29/2005	30.04	14.60	--	0.00	15.44	0.00	0.00	0.00
HC-24	8/26/2005	30.04	14.92	--	0.00	15.12	0.00	0.00	0.00
HC-24	9/14/2005	30.04	15.05	--	0.00	14.99	0.00	0.00	--
HC-24	9/24/2005	30.04	15.18	--	0.00	14.86	0.00	0.00	0.00
HC-24	10/21/2005	30.04	15.33	--	0.00	14.71	0.00	0.00	0.00
HC-24	11/28/2005	30.04	14.55	--	0.00	15.49	0.00	0.00	0.00
HC-24	12/6/2005	30.04	14.30	--	0.00	15.74	0.00	0.00	--
HC-24	1/3/2006	30.04	13.53	--	0.00	16.51	0.00	0.00	0.00
HC-24	2/17/2006	30.04	12.23	--	0.00	17.81	0.00	0.00	0.00
HC-24	3/13/2006	30.04	12.38	--	0.00	17.66	0.00	0.00	0.00
HC-24	6/27/2006	30.04	13.31	--	0.00	16.73	0.00	0.00	0.00
HC-24	9/19/2006	30.04	14.64	--	0.00	15.40	0.00	0.00	0.00
HC-24	12/13/2006	30.04	12.84	--	0.00	17.20	0.00	0.00	0.00
HC-24	3/29/2007	30.04	12.30	--	0.00	17.74	0.00	0.00	0.00
HC-24	6/27/2007	30.04	13.74	13.73	0.01	16.31	0.00	0.00	0.01
HC-24	9/18/2007	30.04	14.99	--	0.00	15.05	0.00	0.00	0.00
HC-24	12/6/2007	30.04	13.13	--	0.00	16.91	0.00	0.00	0.00
HC-24	3/10/2008	30.04	12.72	--	0.00	17.32	0.00	0.00	0.00
HC-24	6/12/2008	30.04	13.22	--	0.00	16.82	0.00	0.00	0.00
HC-24	9/8/2008	30.04	14.68	--	0.00	15.36	0.00	0.00	0.00
HC-24	12/29/2008	30.04	13.05	--	0.00	16.99	0.00	0.00	0.00
HC-24	3/10/2009	30.04	13.92	--	0.00	16.12	0.00	0.00	0.00
HC-24	6/4/2009	30.04	13.89	--	0.00	16.15	0.00	0.00	0.00
HC-24	9/9/2009	30.04	15.01	--	0.00	15.03	0.00	0.00	0.00
HC-24	12/15/2009	30.04	14.09	--	0.00	15.95	0.00	0.00	0.00
HC-24	3/11/2010	30.04	12.65	--	0.00	17.39	0.00	0.00	0.00
HC-24	6/8/2010	30.04	12.57	--	0.00	17.47	0.00	0.00	0.00
HC-24	9/16/2010	30.04	15.05	15.05	0.00	14.99	0.00	0.00	0.00
HC-24	12/13/2010	30.04	12.31	12.31	0.00	17.73	0.00	0.00	0.00
HC-24	6/9/2011	30.04	11.84	--	0.00	18.20	0.00	0.00	0.00

Please refer to notes at the end of table.

Table C-1
Historical Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID	Date	Top of Casing	Initial Measurements				Product Removal		
			Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	Final Product Thickness
			(feet)				(gallons)		(feet)
HC-24	12/1/2011	30.04	13.29	--	0.00	16.75	0.00	0.00	0.00
HC-24	6/11/2012	30.04	12.22	--	0.00	17.82	0.00	0.00	0.00
HC-24	12/19/2012	30.04	12.02	--	0.00	18.02	0.00	0.00	0.00
HC-24	12/17/2013	30.04	14.64	--	0.00	15.40	0.00	0.00	0.00
HC-24	12/11/2014	30.04	13.29	--	0.00	16.75	0.00	0.00	0.00
HC-24	12/15/2015	30.04	11.87	--	0.00	18.17	0.00	0.00	0.00
HC-24	12/19/2016	30.04	12.33	--	0.00	17.71	0.00	0.00	0.00
HC-24	12/13/2017	30.04	12.25	--	0.00	17.79	0.00	0.00	0.00
HC-24	12/5/2018	30.04	14.29	--	0.00	15.75	0.00	0.00	0.00
HC-24	12/9/2019	30.04	14.92	--	0.00	15.12	0.00	0.00	0.00
HC-24	12/10/2020	30.04	13.60	--	0.01	16.45	0.00	0.00	0.00
HC-24	1/6/2022	30.04	11.09	--	0.00	18.95	0.00	0.00	0.00
HC-24	11/17/2022	30.04	12.12	--	0.00	38057.88	0.00	0.00	0.00
EX-1	8/27/2003	33.08	15.78	--	0.00	17.30	0.00	0.00	0.00
EX-1	9/3/2003	33.08	15.88	--	0.00	17.20	0.00	0.00	0.00
EX-1	9/11/2003	33.08	16.06	--	0.00	17.02	0.00	0.00	0.00
EX-1	9/17/2003	33.08	16.21	--	0.00	16.87	0.00	0.00	0.00
EX-1	9/30/2003	33.08	16.22	--	0.00	16.86	0.00	0.00	0.00
EX-1	10/14/2003	33.08	16.25	--	0.00	16.83	0.00	0.00	0.00
EX-1	10/29/2003	33.08	16.38	--	0.00	16.70	0.00	0.00	0.00
EX-1	11/13/2003	33.08	16.45	--	0.00	16.63	0.00	0.00	0.00
EX-1	11/26/2003	33.08	16.07	--	0.00	17.01	0.00	0.00	0.00
EX-1	12/24/2003	33.08	15.46	--	0.00	17.62	0.00	0.00	0.00
EX-1	1/21/2004	33.08	15.06	--	0.00	18.02	0.00	0.00	0.00
EX-1	2/25/2004	33.08	14.53	--	0.00	18.55	0.00	0.00	0.00
EX-1	3/24/2004	33.08	14.84	--	0.00	18.24	0.00	0.00	0.00
EX-1	1/28/2005	33.08	15.79	--	0.00	17.29	0.00	0.00	0.00
EX-1	2/25/2005	33.08	14.80	14.80	0.00	18.28	0.00	0.00	0.00
EX-1	3/25/2005	33.08	15.07	15.07	0.00	18.01	0.00	0.00	0.00
EX-1	4/30/2005	33.08	14.62	--	0.00	18.46	0.00	0.00	0.00
EX-1	5/31/2005	33.08	17.34	--	0.00	15.74	0.00	0.00	0.00
EX-1	6/24/2005	33.08	14.30	--	0.00	18.78	0.00	0.00	0.00
EX-1	7/29/2005	33.08	14.60	--	0.00	18.48	0.00	0.00	0.00
EX-1	8/26/2005	33.08	14.92	--	0.00	18.16	0.00	0.00	0.00
EX-1	9/24/2005	33.08	15.18	--	0.00	17.90	0.00	0.00	0.00
EX-1	10/21/2005	33.08	15.33	--	0.00	17.75	0.00	0.00	0.00
EX-1	11/28/2005	33.08	14.55	--	0.00	18.53	0.00	0.00	0.00
EX-1	1/3/2006	33.08	13.53	--	0.00	19.55	0.00	0.00	0.00
EX-1	2/17/2006	33.08	12.23	--	0.00	20.85	0.00	0.00	0.00
EX-1	3/13/2006	33.08	12.38	--	0.00	20.70	0.00	0.00	0.00
EX-1	6/27/2006	33.08	13.31	--	0.00	19.77	0.00	0.00	0.00
EX-1	9/19/2006	33.08	14.64	--	0.00	18.44	0.00	0.00	0.00
EX-1	12/13/2006	33.08	12.84	--	0.00	20.24	0.00	0.00	0.00
EX-1	3/29/2007	33.08	12.30	--	0.00	20.78	0.0	0.00	0.00
EX-1	6/27/2007	33.08	13.74	13.73	0.01	19.35	0.0	0.00	0.01
EX-1	9/18/2007	33.08	14.99	--	0.00	18.09	0.0	0.00	0.00
EX-1	12/6/2007	33.08	13.13	--	0.00	19.95	0.0	0.00	0.00
EX-1	3/10/2008	33.08	12.72	--	0.00	20.36	0.0	0.00	0.00
EX-1	6/12/2008	33.08	13.22	--	0.00	19.86	0.0	0.00	0.00
EX-1	9/8/2008	33.08	14.68	--	0.00	18.40	0.0	0.00	0.00
EX-1	12/29/2008	33.08	13.05	--	0.00	20.03	0.0	0.00	0.00
EX-1	3/10/2009	33.08	--	--	--	--	--	0.00	--
EX-1	6/24/2009	33.08	--	--	--	--	--	0.00	--
BE-1	6/2/2005	19.75	10.02	--	0.00	9.73	0.00	0.00	0.00
BE-1	6/24/2005	19.75	10.01	--	0.00	9.74	0.00	0.00	0.00
BE-1	7/29/2005	19.75	10.23	--	0.00	9.52	0.00	0.00	0.00
BE-1	8/26/2005	19.75	10.27	--	0.00	9.48	0.00	0.00	0.00
BE-1	9/14/2005	19.75	10.05	--	0.00	9.70	0.00	0.00	0.00
BE-1	9/24/2005	19.75	10.22	--	0.00	9.53	0.00	0.00	0.00
BE-1	10/21/2005	19.75	10.10	--	0.00	9.65	0.00	0.00	0.00
BE-1	11/28/2005	19.75	9.91	--	0.00	9.84	0.00	0.00	0.00
BE-1	12/6/2005	19.75	9.70	--	0.00	10.05	0.00	0.00	0.00
BE-1	1/3/2006	19.75	--	--	0.00	--	0.00	0.00	0.00
BE-1	2/17/2006	19.75	9.61	--	0.00	10.14	0.00	0.00	0.00
BE-1	3/13/2006	19.75	9.55	--	0.00	10.20	0.00	0.00	0.00
BE-1	6/27/2006	19.75	9.66	--	0.00	10.09	0.00	0.00	0.00
BE-1	9/19/2006	19.75	10.10	--	0.00	9.65	0.00	0.00	0.00
BE-1	12/13/2006	19.75	6.57	--	0.00	13.18	0.00	0.00	0.00
BE-1	3/29/2007	19.75	6.23	--	0.00	13.52	0.00	0.00	0.00
BE-1	6/27/2007	19.75	6.76	--	0.00	12.99	0.00	0.00	0.00
BE-1	9/18/2007	19.75	7.79	--	0.00	11.96	0.00	0.00	0.00
BE-1	12/6/2007	19.75	6.38	--	0.00	13.37	0.00	0.00	0.00

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Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID	Date	Top of Casing	Initial Measurements				Product Removal		
			Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	Final Product Thickness
			(feet)				(gallons)		(feet)
BE-1	3/10/2008	19.75	6.49	--	0.00	13.26	0.00	0.00	0.00
BE-1	6/12/2008	19.75	3.90	--	0.00	15.85	0.00	0.00	0.00
BE-1	9/8/2008	19.75	7.08	--	0.00	12.67	0.00	0.00	0.00
BE-1	12/29/2008	19.75	6.51	--	0.00	13.24	0.00	0.00	0.00
BE-1	3/10/2009	19.75	6.89	--	0.00	12.86	0.00	0.00	0.00
BE-1	6/4/2009	19.75	5.63	--	0.00	14.12	0.00	0.00	0.00
BE-1	9/9/2009	19.75	7.25	--	0.00	12.50	0.00	0.00	0.00
BE-1	12/15/2009	19.75	7.01	--	0.00	12.74	0.00	0.00	0.00
BE-1	3/11/2010	19.75	6.72	--	0.00	13.03	0.00	0.00	0.00
BE-1	6/8/2010	19.75	2.40	--	0.00	17.35	0.00	0.00	0.00
BE-1	9/16/2010	19.75	6.86	--	0.00	12.89	0.00	0.00	0.00
BE-1	12/13/2010	19.75	6.15	--	0.00	13.60	0.00	0.00	0.00
BE-1	6/21/2011	19.75	2.09	--	0.00	17.66	0.00	0.00	0.00
BE-1	12/1/2011	19.75	6.73	--	0.00	13.02	0.00	0.00	0.00
BE-1	6/12/2012	19.75	5.30	--	0.00	14.45	0.00	0.00	0.00
BE-1	12/19/2012	19.75	5.88	--	0.00	13.87	0.00	0.00	0.00
BE-1	12/17/2013	19.75	6.84	--	0.00	12.91	0.00	0.00	0.00
BE-1	12/11/2014	19.75	6.24	--	0.00	13.51	0.00	0.00	0.00
BE-1	12/15/2015	19.75	5.94	--	0.00	13.81	0.00	0.00	0.00
BE-1	12/19/2016	19.75	6.34	--	0.00	13.41	0.00	0.00	0.00
BE-1	12/13/2017	19.75	6.69	--	0.00	13.06	0.00	0.00	0.00
BE-1	12/5/2018	19.75	7.01	--	0.00	12.74	0.00	0.00	0.00
BE-1	1/17/2019	19.75	6.62	--	0.00	13.13	0.00	0.00	0.00
BE-1	12/9/2019	19.75	7.19	--	0.00	12.56	0.00	0.00	0.00
BE-1	12/10/2020	19.75	6.99	--	0.00	12.76	0.00	0.00	0.00
BE-1	12/22/2021	19.75	6.15	--	0.00	13.60	0.00	0.00	0.00
BE-1	1/7/2022	19.75	7.37	--	0.00	12.38	0.00	0.00	0.00
BE-1	4/25/2022	19.75	6.52	--	0.00	13.23	0.00	0.00	0.00
BE-1	11/17/2022	19.75	6.64	--	0.00	13.11	0.00	0.00	0.00
BE-2	6/2/2005	19.69	8.94	--	0.00	10.75	0.00	0.00	0.00
BE-2	6/24/2005	19.69	8.94	--	0.00	10.75	0.00	0.00	0.00
BE-2	7/29/2005	19.69	9.04	--	0.00	10.65	0.00	0.00	0.00
BE-2	8/26/2005	19.69	9.12	--	0.00	10.57	0.00	0.00	0.00
BE-2	9/14/2005	19.69	8.94	--	0.00	10.75	0.00	0.00	0.00
BE-2	9/24/2005	19.69	6.02	--	0.00	13.67	0.00	0.00	0.00
BE-2	10/21/2005	19.69	8.95	--	0.00	10.74	0.00	0.00	0.00
BE-2	11/28/2005	19.69	8.64	--	0.00	11.05	0.00	0.00	0.00
BE-2	12/6/2005	19.69	8.48	--	0.00	11.21	0.00	0.00	0.00
BE-2	1/3/2006	19.69	--	--	0.00	--	--	0.00	--
BE-2	2/17/2006	19.69	8.43	--	0.00	11.26	0.00	0.00	0.00
BE-2	3/13/2006	19.69	8.21	--	0.00	11.48	0.00	0.00	0.00
BE-2	6/27/2006	19.69	8.45	--	0.00	11.24	0.00	0.00	0.00
BE-2	9/19/2006	19.69	8.79	--	0.00	10.90	0.00	0.00	0.00
BE-2	12/13/2006	19.69	8.57	--	0.00	11.12	0.00	0.00	0.00
BE-2	3/29/2007	19.69	8.07	--	0.00	11.62	0.00	0.00	0.00
BE-2	6/27/2007	19.69	8.55	--	0.00	11.14	0.00	0.00	0.00
BE-2	9/18/2007	19.69	8.90	--	0.00	10.79	0.00	0.00	0.00
BE-2	12/6/2007	19.69	7.89	--	0.00	11.80	0.00	0.00	0.00
BE-2	3/10/2008	19.69	8.21	--	0.00	11.48	0.00	0.00	0.00
BE-2	6/12/2008	19.69	5.73	--	0.00	13.96	0.00	0.00	0.00
BE-2	9/8/2008	19.69	8.98	--	0.00	10.71	0.00	0.00	0.00
Well Destroyed									
BE-3	6/2/2005	17.55	6.56	--	0.00	10.99	0.00	0.00	--
BE-3	6/24/2005	17.55	6.42	--	0.00	11.13	0.00	0.00	0.00
BE-3	7/29/2005	17.55	6.66	--	0.00	10.89	0.00	0.00	0.00
BE-3	8/26/2005	17.55	6.79	--	0.00	10.76	0.00	0.00	0.00
BE-3	9/14/2005	17.55	6.73	--	0.00	10.82	0.00	0.00	0.00
BE-3	9/24/2005	17.55	6.80	--	0.00	10.75	0.00	0.00	0.00
BE-3	10/21/2005	17.55	6.75	--	0.00	10.80	0.00	0.00	0.00
BE-3	11/28/2005	17.55	6.58	--	0.00	10.97	0.00	0.00	0.00
BE-3	12/6/2005	17.55	6.50	--	0.00	11.05	0.00	0.00	0.00
BE-3	1/3/2006	17.55	--	--	0.00	--	--	0.00	--
BE-3	2/17/2006	17.55	6.64	--	0.00	10.91	0.00	0.00	0.00
BE-3	3/13/2006	17.55	6.47	--	0.00	11.08	0.00	0.00	0.00
BE-3	6/27/2006	17.55	6.31	--	0.00	11.24	0.00	0.00	0.00
BE-3	9/19/2006	17.55	6.83	--	0.00	10.72	0.00	0.00	0.00
BE-3	12/13/2006	17.55	9.47	--	0.00	8.08	0.00	0.00	0.00
BE-3	3/29/2007	17.55	9.44	--	0.00	8.11	0.00	0.00	0.00
BE-3	6/27/2007	17.55	9.99	--	0.00	7.56	0.00	0.00	0.00
BE-3	9/18/2007	17.55	10.13	--	0.00	7.42	0.00	0.00	0.00
BE-3	12/6/2007	17.55	8.79	--	0.00	8.76	0.00	0.00	0.00
BE-3	3/10/2008	17.55	10.41	--	0.00	7.14	0.00	0.00	0.00
BE-3	6/12/2008	17.55	5.97	--	0.00	11.58	0.00	0.00	0.00

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Port of Portland

Well ID	Date	Top of Casing	Initial Measurements				Product Removal		
			Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	Final Product Thickness
			(feet)				(gallons)		(feet)
BE-3	9/8/2008	17.55	10.18	--	0.00	7.37	0.00	0.00	0.00
BE-3	12/29/2008	17.55	9.59	--	0.00	7.96	0.00	0.00	0.00
BE-3	3/10/2009	17.55	9.85	--	0.00	7.70	0.00	0.00	0.00
BE-3	6/4/2009	17.55	8.13	--	0.00	9.42	0.00	0.00	0.00
BE-3	9/9/2009	17.55	10.36	--	0.00	7.19	0.00	0.00	0.00
BE-3	12/15/2009	17.55	9.88	--	0.00	7.67	0.00	0.00	0.00
BE-3	3/11/2010	17.55	9.65	--	0.00	7.90	0.00	0.00	0.00
BE-3	6/8/2010	17.55	4.60	--	0.00	12.95	0.00	0.00	0.00
BE-3	9/16/2010	17.55	9.81	--	0.00	7.74	0.00	0.00	0.00
BE-3	12/13/2010	17.55	8.67	--	0.00	8.88	0.00	0.00	0.00
BE-3	6/9/2011	17.55	1.89	--	0.00	15.66	0.00	0.00	0.00
BE-3	12/1/2011	17.55	9.63	--	0.00	7.92	0.00	0.00	0.00
BE-3	6/11/2012	17.55	7.16	--	0.00	10.39	0.00	0.00	0.00
BE-3	12/19/2012	17.55	8.09	--	0.00	9.46	0.00	0.00	0.00
BE-3	12/17/2013	17.55	9.96	--	0.00	7.59	0.00	0.00	0.00
BE-3	12/11/2014	17.55	9.13	--	0.00	8.42	0.00	0.00	0.00
BE-3	12/15/2015	17.55	8.37	--	0.00	9.18	0.00	0.00	0.00
BE-3	12/19/2016	17.55	9.25	--	0.00	8.30	0.00	0.00	0.00
BE-3	12/13/2017	17.55	9.48	--	0.00	8.07	0.00	0.00	0.00
BE-3	12/5/2018	17.55	9.86	--	0.00	7.69	0.00	0.00	0.00
BE-3	1/17/2019	17.55	9.78	--	0.00	7.77	0.00	0.00	0.00
BE-3	12/9/2019	17.55	10.25	--	0.00	7.30	0.00	0.00	0.00
BE-3	12/10/2020	17.55	10.15	--	0.00	7.40	0.00	0.00	0.00
BE-3	11/17/2022	17.55	9.91	--	0.00	7.64	0.00	0.00	0.00
BE-4	6/2/2005	31.16	18.12	--	0.00	13.04	0.00	0.00	0.00
BE-4	6/24/2005	31.16	18.81	--	0.00	12.35	0.00	0.00	0.00
BE-4	7/29/2005	31.16	19.14	--	0.00	12.02	0.00	0.00	1.00
BE-4	8/26/2005	31.16	19.07	--	0.00	12.09	0.00	0.00	2.00
BE-4	9/14/2005	31.16	18.73	--	0.00	12.43	0.00	0.00	3.00
BE-4	9/24/2005	31.16	18.75	--	0.00	12.41	0.00	0.00	4.00
BE-4	10/21/2005	31.16	18.29	--	0.00	12.87	0.00	0.00	5.00
BE-4	11/28/2005	31.16	17.39	17.39	0.00	13.77	0.00	0.00	0.00
BE-4	12/6/2005	31.16	17.06	17.05	0.01	14.11	0.00	0.00	--
BE-4	1/3/2006	31.16	14.72	14.69	0.03	16.47	0.00	0.00	0.03
BE-4	2/17/2006	31.16	14.88	14.82	0.06	16.33	0.00	0.00	0.06
BE-4	3/13/2006	31.16	15.55	15.51	0.04	15.65	0.00	0.00	0.04
BE-4	6/27/2006	31.16	16.03	15.95	0.08	15.20	0.00	0.00	0.08
BE-4	9/19/2006	31.16	17.01	16.79	0.22	14.35	0.75	0.75	0.02
BE-4	12/13/2006	31.16	15.67	15.66	0.01	15.50	0.00	0.75	0.02
BE-4	3/29/2007	31.16	15.25	15.18	0.07	15.97	0.00	0.75	0.07
BE-4	6/27/2007	31.16	16.51	16.31	0.20	14.83	1.00	1.75	0.01
BE-4	8/9/2007	31.16	16.85	16.47	0.38	14.65	0.50	2.25	0.01
BE-4	8/22/2007	31.16	16.82	16.58	0.24	14.55	1.00	3.25	0.01
BE-4	9/7/2007	31.16	17.62	16.76	0.86	14.31	1.50	4.75	0.01
BE-4	9/14/2007	31.16	18.16	18.06	0.10	13.09	0.25	5.00	0.00
BE-4	9/18/2007	31.16	16.78	16.72	0.06	14.43	0.00	5.00	--
BE-4	10/4/2007	31.16	16.81	16.71	0.10	14.44	0.40	5.40	0.00
BE-4	10/11/2007	31.16	16.74	16.66	0.08	14.49	0.00	5.40	0.08
BE-4	10/24/2007	31.16	16.62	16.54	0.08	14.61	0.00	5.40	0.08
BE-4	11/8/2007	31.16	16.78	16.71	0.07	14.44	0.00	5.40	0.07
BE-4	11/21/2007	31.16	16.68	16.60	0.08	14.55	0.00	5.40	0.08
BE-4	12/7/2007	31.16	14.16	14.13	0.03	17.03	0.00	5.40	0.03
BE-4	12/21/2007	31.16	15.76	15.75	0.01	15.41	0.00	5.40	0.01
BE-4	1/3/2008	31.16	14.64	14.63	0.01	16.53	0.00	5.40	0.01
BE-4	1/18/2008	31.16	14.32	14.31	0.01	16.85	0.00	5.40	0.01
BE-4	1/24/2008	31.16	14.98	14.95	0.03	16.21	0.00	5.40	0.03
BE-4	1/31/2008	31.16	15.31	15.28	0.03	15.88	0.00	5.40	0.03
BE-4	2/6/2008	31.16	14.17	14.16	0.01	17.00	0.00	5.40	0.03
BE-4	2/15/2008	31.16	14.18	14.18	0.00	16.98	0.00	5.40	0.00
BE-4	2/29/2008	31.16	15.35	15.35	0.00	15.81	0.00	5.40	0.00
BE-4	3/10/2008	31.16	16.61	16.61	0.00	14.55	0.00	5.40	0.00
BE-4	3/21/2008	31.16	15.63	15.63	0.00	15.53	0.00	5.40	0.00
BE-4	4/11/2008	31.16	15.69	15.67	0.02	15.49	0.00	5.40	0.00
BE-4	4/17/2008	31.16	15.76	15.71	0.05	15.44	0.00	5.40	0.00
BE-4	4/24/2008	31.16	15.72	15.67	0.05	15.48	0.05	5.45	0.00
BE-4	5/2/2008	31.16	15.73	15.66	0.07	15.49	0.00	5.45	0.00
BE-4	5/8/2008	31.16	16.02	15.78	0.24	15.35	0.10	5.55	0.01
BE-4	5/14/2008	31.16	16.00	15.93	0.07	15.22	0.00	5.55	0.07
BE-4	5/30/2008	31.16	15.22	15.18	0.04	15.98	0.00	5.55	0.04
BE-4	6/13/2008	31.16	15.30	15.26	0.04	15.90	0.00	5.55	0.04
BE-4	6/25/2008	31.16	15.78	15.76	0.02	15.40	0.00	5.55	0.02
BE-4	7/11/2008	31.16	16.34	16.08	0.26	15.05	0.05	5.60	0.01
BE-4	7/28/2008	31.16	16.65	16.35	0.30	14.78	0.07	5.67	0.00

Please refer to notes at the end of table.

Table C-1
Historical Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID	Date	Top of Casing	Initial Measurements				Product Removal		
			Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	Final Product Thickness
			(feet)				(gallons)		(feet)
BE-4	8/13/2008	31.16	16.92	16.60	0.32	14.52	0.13	5.80	0.01
BE-4	8/27/2008	31.16	16.98	16.73	0.25	14.40	0.53	6.33	0.01
BE-4	9/8/2008	31.16	17.12	16.82	0.30	14.31	0.53	6.86	0.02
BE-4	9/18/2008	31.16	17.16	16.92	0.24	14.21	0.66	7.52	0.00
BE-4	9/30/2008	31.16	17.28	17.05	0.23	14.08	0.05	7.57	0.01
BE-4	10/16/2008	31.16	17.40	17.18	0.22	13.96	0.10	7.67	0.01
BE-4	10/30/2008	31.16	17.42	17.25	0.17	13.89	0.20	7.87	0.00
BE-4	11/14/2008	31.16	16.92	16.91	0.01	14.25	0.00	7.87	0.01
BE-4	11/26/2008	31.16	16.98	16.94	0.04	14.22	0.00	7.87	0.04
BE-4	12/29/2008	31.16	16.54	16.52	0.02	14.64	0.00	7.87	0.02
BE-4	1/15/2009	31.16	15.39	15.37	0.02	15.79	0.00	7.87	0.02
BE-4	1/23/2009	31.16	15.93	15.92	0.01	15.24	0.00	7.87	0.01
BE-4	1/29/2009	31.16	16.11	16.10	0.01	15.06	0.00	7.87	0.01
BE-4	2/4/2009	31.16	16.18	16.17	0.01	14.99	0.00	7.87	0.01
BE-4	2/12/2009	31.16	16.40	16.34	0.06	14.81	0.00	7.87	0.06
BE-4	2/19/2009	31.16	12.58	12.56	0.02	18.60	0.00	7.87	0.02
BE-4	3/10/2009	31.16	16.60	16.54	0.06	14.61	0.00	7.87	0.06
BE-4	3/27/2009	31.16	16.63	16.49	0.14	14.65	0.05	7.92	0.02
BE-4	4/16/2009	31.16	16.67	16.59	0.08	14.56	0.00	7.92	0.08
BE-4	5/14/2009	31.16	16.76	16.53	0.23	14.60	0.05	7.97	0.00
BE-4	6/4/2009	31.16	16.35	16.27	0.08	14.88	0.00	7.97	0.08
BE-4	7/13/2009	31.16	17.15	17.06	0.09	14.09	0.00	7.97	0.09
BE-4	8/10/2009	31.16	17.43	17.09	0.34	14.03	0.01	7.98	0.01
BE-4	9/9/2009	31.16	17.29	17.26	0.03	13.90	0.03	8.01	0.03
BE-4	10/15/2009	31.16	17.93	17.39	0.54	13.71	0.03	8.04	0.00
BE-4	11/18/2009	31.16	16.92	16.72	0.20	14.42	0.05	8.09	0.00
BE-4	12/15/2009	31.16	16.62	16.45	0.17	14.69	0.02	8.11	0.01
BE-4	1/13/2010	31.16	15.64	15.56	0.08	15.59	0.00	8.11	0.08
BE-4	3/2/2010	31.16	15.74	15.66	0.08	15.49	0.00	8.11	0.08
BE-4	3/11/2010	31.16	15.78	15.70	0.08	15.45	0.00	8.11	0.08
BE-4	3/25/2010	31.16	15.95	15.80	0.15	15.34	0.10	8.21	0.01
BE-4	4/2/2010	31.16	15.65	15.65	0.00	15.51	0.00	8.21	0.00
BE-4	4/9/2010	31.16	15.62	15.41	0.21	15.73	0.25	8.46	0.08
BE-4	4/16/2010	31.16	15.67	15.45	0.22	15.69	0.25	8.71	0.01
BE-4	4/23/2010	31.16	15.70	15.62	0.08	15.53	0.00	8.71	0.08
BE-4	6/8/2010	31.16	13.61	13.59	0.02	17.57	0.00	8.71	0.02
BE-4	7/9/2010	31.16	14.63	14.61	0.02	16.55	0.00	8.71	0.02
BE-4	7/23/2010	31.16	15.90	15.89	0.01	15.27	0.00	8.71	0.01
BE-4	8/6/2010	31.16	16.29	16.00	0.29	15.13	0.25	8.96	0.05
BE-4	8/19/2010	31.16	16.37	16.31	0.06	14.84	0.00	8.96	0.05
BE-4	8/27/2010	31.16	16.41	16.19	0.22	14.95	0.50	9.46	0.04
BE-4	9/17/2010	31.16	16.55	16.33	0.22	14.81	0.25	9.71	0.05
BE-4	10/8/2010	31.16	16.44	16.42	0.02	14.74	0.00	9.71	0.02
BE-4	11/11/2010	31.16	16.94	16.81	0.13	14.34	0.05	9.76	0.01
BE-4	12/15/2010	31.16	14.22	14.06	0.16	17.08	0.25	10.01	0.02
BE-4	12/21/2010	31.16	14.15	13.95	0.20	17.19	0.20	10.21	0.02
BE-4	12/30/2010	31.16	13.68	13.25	0.43	17.86	0.50	10.71	0.01
BE-4	1/6/2011	31.16	13.67	13.64	0.03	17.52	0.00	10.71	0.03
BE-4	1/13/2011	31.16	13.92	13.89	0.03	17.27	0.00	10.71	0.03
BE-4	1/19/2011	31.16	13.87	13.83	0.04	17.33	0.00	10.71	0.04
BE-4	1/28/2011	31.16	14.13	14.11	0.02	17.05	0.00	10.71	0.02
BE-4	2/9/2011	31.16	15.03	15.01	0.02	16.15	0.00	10.71	0.02
BE-4	2/23/2011	31.16	15.18	15.17	0.01	15.99	0.00	10.71	0.01
BE-4	3/9/2011	31.16	15.38	15.34	0.04	15.82	0.00	10.71	0.04
BE-4	3/29/2011	31.16	14.00	13.96	0.04	17.20	0.00	10.71	0.04
BE-4	4/21/2011	31.16	13.93	13.90	0.03	17.26	0.00	10.71	0.03
BE-4	5/6/2011	31.16	14.14	14.10	0.04	17.06	0.00	10.71	0.04
BE-4	6/9/2011	31.16	13.02	13.01	0.01	18.15	0.00	10.71	0.01
BE-4	7/7/2011	31.16	14.17	13.89	0.28	17.24	0.25	10.96	0.00
BE-4	8/3/2011	31.16	15.31	15.29	0.02	15.87	0.00	10.96	0.02
BE-4	9/8/2011	31.16	15.86	15.79	0.07	15.36	0.00	10.96	0.07
BE-4	10/3/2011	31.16	16.18	16.03	0.15	15.11	0.20	11.16	0.01
BE-4	11/10/2011	31.16	16.50	16.37	0.13	14.78	0.20	11.36	0.00
BE-4	12/1/2011	31.16	17.96	17.88	0.08	13.27	0.00	11.36	0.08
BE-4	1/6/2012	31.16	16.13	16.09	0.04	15.07	0.00	11.36	0.04
BE-4	1/25/2012	31.16	15.84	15.80	0.04	15.36	0.00	11.36	0.04
BE-4	3/3/2012	31.16	15.63	15.58	0.05	15.57	0.00	11.36	0.05
BE-4	3/14/2012	31.16	15.27	15.25	0.02	15.91	0.00	11.36	0.02
BE-4	3/22/2012	31.16	14.40	14.38	0.02	16.78	0.00	11.36	0.02
BE-4	3/29/2012	31.16	14.34	14.31	0.03	16.85	0.00	11.36	0.03
BE-4	4/5/2012	31.16	13.73	13.72	0.01	17.44	0.00	11.36	0.01
BE-4	4/13/2012	31.16	14.35	14.30	0.05	16.85	0.00	11.36	0.05
BE-4	4/23/2012	31.16	14.37	14.32	0.05	16.83	0.00	11.36	0.05
BE-4	5/14/2012	31.16	14.38	14.35	0.03	16.81	0.00	11.36	0.03

Please refer to notes at the end of table.

Table C-1
Historical Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID	Date	Top of Casing	Initial Measurements				Product Removal		
			Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	Final Product Thickness
			(feet)				(gallons)		(feet)
BE-4	5/25/2012	31.16	--	--	0.00	--	--	11.36	--
BE-4	6/12/2012	31.16	14.75	14.73	0.02	16.43	0.00	11.36	0.02
BE-4	7/3/2012	31.16	14.86	14.85	0.01	16.31	0.00	11.36	0.01
BE-4	8/28/2012	31.16	16.01	15.96	0.05	15.19	0.00	11.36	0.05
BE-4	9/24/2012	31.16	Well Not Accessible						
BE-4	10/8/2012	31.16	16.44	16.40	0.04	14.76	0.00	11.36	0.04
BE-4	11/14/2012	31.16	16.04	16.04	0.00	15.12	0.00	11.36	0.00
BE-4	12/19/2012	31.16	14.16	14.09	0.07	17.06	0.00	11.36	0.07
BE-4	1/4/2013	31.16	14.21	14.09	0.12	17.06	0.10	11.46	0.01
BE-4	1/18/2013	31.16	15.07	15.04	0.03	16.12	0.00	11.46	0.01
BE-4	1/31/2013	31.16	15.39	15.38	0.01	15.78	0.00	11.46	0.01
BE-4	3/6/2013	31.16	15.76	15.74	0.02	15.42	0.00	11.46	0.01
BE-4	4/3/2013	31.16	16.13	16.11	0.02	15.05	0.00	11.46	0.01
BE-4	5/6/2013	31.16	16.39	16.38	0.01	14.78	0.00	11.46	0.01
BE-4	6/12/2013	31.16	16.15	16.14	0.01	15.02	0.00	11.46	0.01
BE-4	7/16/2013	31.16	16.60	16.40	0.20	14.74	0.10	11.56	0.05
BE-4	8/26/2013	31.16	17.31	17.30	0.01	13.86	0.00	11.56	0.01
BE-4	9/25/2013	31.16	17.90	17.88	0.02	13.28	0.00	11.56	0.02
BE-4	10/31/2013	31.16	18.68	18.61	0.07	12.54	0.00	11.56	0.07
BE-4	11/27/2013	31.16	16.78	16.78	0.00	14.38	0.00	11.56	0.00
BE-4	12/17/2013	31.16	16.84	16.80	0.04	14.36	0.00	11.56	0.02
BE-4	12/11/2014	31.16	16.06	15.99	0.07	15.16	0.00	11.56	0.02
BE-4	12/15/2015	31.16	16.20	16.00	0.20	15.14	0.00	11.56	0.20
BE-4	2/17/2016	31.16	14.54	14.40	0.14	16.74	0.50	12.06	0.01
BE-4	3/29/2016	31.16	14.12	14.11	0.01	17.05	0.10	12.16	0.00
BE-4	4/27/2016	31.16	15.19	15.18	0.01	15.98	0.10	12.26	0.00
BE-4	5/27/2016	31.16	15.81	15.80	0.01	15.36	0.00	12.26	0.01
BE-4	6/29/2016	31.16	16.25	16.20	0.05	14.95	0.00	12.26	0.05
BE-4	7/20/2016	31.16	16.39	16.34	0.05	14.81	0.00	12.26	0.05
BE-4	8/31/2016	31.16	16.70	16.65	0.05	14.50	0.00	12.26	0.05
BE-4	9/16/2016	31.16	16.92	16.88	0.04	14.28	0.00	12.26	0.04
BE-4	10/20/2016	31.16	16.38	16.35	0.03	14.81	0.00	12.26	0.03
BE-4	11/28/2016	31.16	15.48	15.48	0.00	15.68	0.00	12.26	0.00
BE-4	12/19/2016	31.16	15.19	15.18	0.01	15.98	0.00	12.26	0.01
BE-4	1/5/2017	31.16	15.48	15.45	0.03	15.71	0.00	12.26	0.03
BE-4	2/14/2017	31.16	13.86	13.85	0.01	17.31	0.00	12.26	0.01
BE-4	3/28/2017	31.16	12.44	12.42	0.02	18.74	0.00	12.26	0.02
BE-4	4/18/2017	31.16	13.56	13.55	0.01	17.61	0.00	12.26	0.01
BE-4	5/26/2017	31.16	13.79	13.78	0.01	17.38	0.00	12.26	0.01
BE-4	6/23/2017	31.16	14.29	14.28	0.01	16.88	0.00	12.26	0.01
BE-4	7/21/2017	31.16	15.54	15.53	0.01	15.63	0.00	12.26	0.01
BE-4	8/18/2017	31.16	15.97	15.95	0.02	15.21	0.00	12.26	0.02
BE-4	9/26/2017	31.16	16.45	16.42	0.03	14.74	0.00	12.26	0.03
BE-4	10/30/2017	31.16	16.22	16.20	0.02	14.96	0.00	12.26	0.02
BE-4	11/17/2017	31.16	16.18	16.09	0.09	15.06	0.00	12.26	0.09
BE-4	12/13/2017	31.16	15.31	15.30	0.01	15.86	0.00	12.26	0.01
BE-4	1/26/2018	31.16	15.00	14.99	0.01	16.17	0.00	12.26	0.01
BE-4	2/14/2018	31.16	14.99	14.98	0.01	16.18	0.00	12.26	0.01
BE-4	3/26/2018	31.16	15.15	15.10	0.05	16.05	0.50	12.76	0.01
BE-4	5/3/2018	31.16	15.17	15.16	0.01	16.00	0.00	12.76	0.01
BE-4	5/31/2018	31.16	14.54	14.52	0.02	16.64	0.00	12.76	0.02
BE-4	6/21/2018	31.16	15.91	15.90	0.01	15.26	0.00	12.76	0.01
BE-4	7/17/2018	31.16	15.72	15.71	0.01	15.45	0.00	12.76	0.01
BE-4	8/17/2018	31.16	16.83	16.81	0.02	14.35	0.00	12.76	0.02
BE-4	10/16/2018	31.16	17.01	17.01	0.00	14.15	0.00	12.76	0.00
BE-4	11/5/2018	31.16	17.20	17.20	0.00	13.96	0.00	12.76	0.00
BE-4	12/5/2018	31.16	17.20	17.19	0.01	13.97	0.00	12.76	0.01
BE-4	12/31/2018	31.16	16.49	16.49	0.00	14.67	0.00	12.76	0.01
BE-4	1/17/2019	31.16	16.34	--	0.00	14.82	0.00	12.76	0.00
BE-4	2/21/2019	31.16	15.55	15.54	0.01	15.62	0.00	12.76	0.01
BE-4	4/2/2019	31.16	15.80	15.78	0.02	15.38	0.00	12.76	0.02
BE-4	4/18/2019	31.16	15.80	15.78	0.02	15.38	0.00	12.76	0.02
BE-4	5/16/2019	31.16	15.73	15.72	0.01	15.44	0.00	12.76	0.01
BE-4	6/19/2019	31.16	16.13	16.12	0.01	15.04	0.00	12.76	0.01
BE-4	7/23/2019	31.16	17.13	17.11	0.02	14.05	0.00	12.76	0.02
BE-4	8/22/2019	31.16	17.02	17.02	0.00	14.14	0.00	12.76	0.00
BE-4	9/25/2019	31.16	17.50	17.49	0.01	13.67	0.00	12.76	0.00
BE-4	10/25/2019	31.16	17.58	17.56	0.02	13.60	0.00	12.76	0.02
BE-4	11/20/2019	31.16	17.22	17.21	0.01	13.95	0.00	12.76	0.01
BE-4	12/9/2019	31.16	17.79	17.76	0.03	13.40	0.00	12.76	0.03
BE-4	2/18/2020	31.16	15.50	15.50	0.00	15.66	0.00	12.76	0.00
BE-4	2/28/2020	31.16	15.74	15.74	0.00	15.42	0.00	12.76	0.00
BE-4	3/19/2020	31.16	16.08	16.08	0.00	15.08	0.00	12.76	0.00

Please refer to notes at the end of table.

Table C-1
Historical Groundwater and Product Level Monitoring
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID	Date	Top of Casing	Initial Measurements				Product Removal		
			Depth to Water	Depth to Product	Product Thickness	Groundwater Elevation *	Discrete Event	Cumulative	Final Product Thickness
			(feet)				(gallons)		(feet)
BE-4	4/20/2020	31.16	15.91	15.91	0.00	15.25	0.00	12.76	0.00
BE-4	5/29/2020	31.16	16.53	16.52	0.01	14.64	0.00	12.76	0.01
BE-4	6/11/2020	31.16	16.16	16.14	0.02	15.02	0.00	12.76	0.02
BE-4	7/15/2020	31.16	17.05	17.04	0.01	14.12	0.00	12.76	0.01
BE-4	8/31/2020	31.16	16.90	16.89	0.01	14.27	0.00	12.76	0.01
BE-4	9/28/2020	31.16	17.75	17.74	0.01	13.42	0.00	12.76	0.01
BE-4	10/23/2020	31.16	17.71	17.70	0.01	13.46	0.00	12.76	0.01
BE-4	11/13/2020	31.16	17.32	17.32	0.00	13.84	0.00	12.76	0.00
BE-4	12/10/2020	31.16	17.13	17.12	0.01	14.04	0.00	12.76	0.01
BE-4	1/20/2021	31.16	14.92	--	0.00	16.24	0.00	12.76	0.00
BE-4	2/24/2021	31.16	14.03	--	0.00	17.13	0.00	12.76	0.00
BE-4	1/6/2022	31.16	14.48	--	0.00	16.68	0.00	12.76	0.00
BE-4	11/17/2022	31.16	16.60	16.57	0.03	14.59	<0.01	12.76	0.00
BE-5	9/9/2009	21.12	11.08	--	0.00	10.04	0.00	0.00	0.00
BE-5	12/15/2009	21.12	10.87	--	0.00	10.25	0.00	0.00	0.00
BE-5	3/11/2010	21.12	10.61	--	0.00	10.51	0.00	0.00	0.00
BE-5	6/8/2010	21.12	6.04	--	0.00	15.08	0.00	0.00	0.00
BE-5	9/16/2010	21.12	10.87	--	0.00	10.25	0.00	0.00	0.00
BE-5	12/13/2010	21.12	9.52	--	0.00	11.60	0.00	0.00	0.00
BE-5	6/9/2011	21.12	3.29	--	0.00	17.83	0.00	0.00	0.00
BE-5	12/1/2011	21.12	10.83	--	0.00	10.29	0.00	0.00	0.00
BE-5	6/11/2012	21.12	8.33	--	0.00	12.79	0.00	0.00	0.00
BE-5	12/19/2012	21.12	9.24	--	0.00	11.88	0.00	0.00	0.00
BE-5	12/17/2013	21.12	11.12	--	0.00	10.00	0.00	0.00	0.00
BE-5	12/11/2014	21.12	10.10	--	0.00	11.02	0.00	0.00	0.00
BE-5	12/15/2015	21.12	9.39	--	0.00	11.73	0.00	0.00	0.00
BE-5	12/19/2016	21.12	10.19	--	0.00	10.93	0.00	0.00	0.00
BE-5	12/13/2017	21.12	10.37	--	0.00	10.75	0.00	0.00	0.00
BE-5	12/5/2018	21.12	11.06	--	0.00	10.06	0.00	0.00	0.00
BE-5	1/17/2019	21.12	10.72	--	0.00	10.40	0.00	0.00	0.00
BE-5	12/9/2019	21.12	11.29	--	0.00	9.83	0.00	0.00	0.00
BE-5	12/10/2020	21.12	11.02	--	0.00	10.10	0.00	0.00	0.00
BE-5	12/22/2021	21.12	8.37	--	0.00	12.75	0.00	0.00	0.00
BE-5	1/7/2022	21.12	7.39	--	0.00	13.73	0.00	0.00	0.00
BE-5	4/25/2022	21.12	9.92	--	0.00	11.20	0.00	0.00	0.00
BE-5	11/17/2022	21.12	10.63	--	0.00	10.00	0.00	0.00	0.00

Notes:

- * Phreatic Elevation = (Casing Elevation - Depth to Water) + S_g * (Product Thickness). S_g = 0.89
- = Not measured or not applicable.

Table C-2
Historical LNAPL Recovery
Terminal 4 Slip 3 Upland Facility
Port of Portland

Year	MW-15	MW-17	MW-19	MW-20	HC-10	BE-4	HC-5	Total
	LNAPL Removed (gallons)							
2005	Data for individual wells not shown							24
2006	Data for individual wells not shown							61
2007	Data for individual wells not shown							100
2008	Data for individual wells not shown							71
2009	2.59	2.34	2.84	2.53	0.15	0.24	--	10.69
2010	4.53	15.48	61.80	41.40	2.38	2.60	--	155.69
2011	0.30	10.55	13.05	16.50	3.25	0.65	--	50.69
2012	1.13	7.80	7.66	23.14	1.50	0.00	--	41.22
2013	2.75	5.30	6.95	9.05	1.75	0.20	--	26.00
2014	1.25	0.20	12.35	8.25	0.20	0.00	--	22.25
2015	n/a	6.50	18.10	15.95	6.15	n/a	--	46.70
2016	n/a	n/a	8.55	7.40	5.55	0.70	--	22.20
2017	n/a	n/a	3.00	12.50	6.45	0.00	--	21.95
2018	n/a	n/a	5.50	8.75	4.65	0.50	1.70	21.10
2019	n/a	n/a	2.10	2.77	2.40	0.00	2.27	9.54
2020	n/a	n/a	0.20	1.31	1.12	0.00	0.00	2.28
2021	n/a	n/a	1.50	1.65	0.42	0.00	0.30	3.87
2022	n/a	n/a	0.09	0.06	0.06	<0.01	N/A	0.21

Notes:

1. The current (2017) LNAPL recovery program includes wells MW-19, MW-20, HC-10, and BE-4. If LNAPL is present at a thickness that is practical for recovery (greater than 0.1 foot), the LNAPL is removed.
2. n/a = not available
3. Wells MW-15 and MW-17 were abandoned in May 2015.

Table C-3
Historical Groundwater Analytical Results
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID	Date	TPH		PAHs																			
		Diesel-Range	Residual-Range	Acenaph-thene	Acenaph-thylene	Anthracene	Benzo(a)-anthracene	Benzo(a)-pyrene	Benzo(b)-fluoranthene	Benzo(g,h,i)-perylene	Benzo(k)-fluoranthene	Chrysene	Dibenz(a,h)-anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	1-Methyl naphthalene	2-Methyl naphthalene	Naphthalene	Phenanthrene	Pyrene		
		Concentration in µg/L																					
HC-2	11/5/1998	--	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	--	--	<0.1	<0.1	<0.1	
HC-2	5/10/2004	<250	<500	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	--	--	<0.1	<0.1	<0.1	
HC-2	2/11/2005	120 J	310 J	<0.021	--	--	0.0053	<0.021	--	--	--	--	0.0084	<0.021	--	--	--	--	--	0.14	0.0069	--	
HC-2	6/2/2005	20 J	<500	0.0058 J	0.0055 J	0.027	0.0043 J	0.0044 J	0.0056 J	0.0046 J	0.0042 J	0.0049 J	<0.020	0.0086 J	0.0094 J	0.0052 J	--	--	--	0.026	0.017 J	0.0075 J	
HC-2	9/15/2005	<238	<476	<0.098	<0.098	<0.098	<0.098	<0.098	<0.098	<0.098	<0.098	<0.098	<0.098	<0.098	<0.098	<0.098	--	--	--	<0.098	<0.098	<0.098	
HC-2	12/9/2005	<236	<472	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	--	--	--	<0.0952	<0.0952	<0.0952	
HC-2	6/28/2006	<240	<481	<0.0943	<0.0943	<0.0943	<0.0943	<0.0943	<0.0943	<0.0943	<0.0943	<0.0943	<0.0943	<0.0943	<0.0943	<0.0943	--	--	--	<0.0943	<0.0943	<0.0943	
HC-2	6/27/2007	<238	<476	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	--	--	--	<0.0952	<0.0952	<0.0952	
HC-2	6/12/2008	<236	<472	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	--	--	--	<0.0952	<0.0952	<0.0952	
HC-2	6/4/2009	<238	<476	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	--	--	--	<0.0952	<0.0952	<0.0952	
HC-2	4/25/2022	<198	<396	<0.0432	<0.0432	<0.0432	<0.0432	<0.0432	<0.0432	<0.0432	<0.0432	<0.0432	<0.0432	<0.0432	<0.0432	<0.0432	<0.0664	<0.0664	<0.0664	<0.0664	<0.0664	<0.0432	<0.0432
HC-2	8/11/2022	<190	<381	<0.0332	<0.0332	0.0195	<0.0166	<0.0166	<0.0166	<0.0166	<0.0166	<0.0166	<0.0166	<0.0166	<0.0166	<0.0166	<0.0664	<0.0664	<0.0664	<0.0664	<0.0664	<0.0332	<0.0332
HC-2	11/17/2022	<192	<385	<0.0329	<0.0329	<0.0329	<0.0164	<0.0164	<0.0164	<0.0329	<0.0164	<0.0164	<0.0164	<0.0164	<0.0164	<0.0164	<0.0658	<0.0658	<0.0658	<0.0658	<0.0658	<0.0329	<0.0329
HC-5	11/12/1998	--	--	<2.5	<2.5	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<2.5	<0.1	--	--	--	<0.1	<0.5	<0.1	
HC-5	5/10/2004	990,000	<50,000	<25	<25	27.6	0.742	<0.5	<0.5	<0.5	<0.5	1.65	<1.0	<0.25	86.1	<0.5	--	--	--	<37.5	43.0	14.9	
HC-5	6/10/2004	102,000	<5,000	11.4	<10	<10	0.422	<0.25	<0.25	<0.25	<0.25	0.815	<0.25	<10	35.3	<0.25	--	--	--	16.8	17.4	4.68	
HC-5	2/11/2005	26,000 J	4,800 J	0.65	--	--	<0.02	<0.02	--	--	--	--	--	0.07	2.9	--	--	--	--	<0.19	0.28	--	
HC-5	6/2/2005	3,200 Y	<500	0.26	<0.064	<0.37	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.096	2.7	<0.020	--	--	--	<0.17	<0.21	<0.20	
HC-5	9/15/2005	1,510 J	<476	0.973	<0.476	<0.476	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.190	4.21	<0.0952	--	--	--	<0.952	<0.952	<0.143	
HC-5	12/7/2005	1,940	<485	<0.143	<0.0952	<0.238	<0.0952	<0.476	<0.476	<0.476	<0.476	<0.0952	<0.0952	<0.0952	1.15	<0.476	--	--	--	<0.143	<0.143	<0.238	
HC-5	6/28/2006	2,990	<476	<0.190	<0.190	<0.190	<0.190	<0.190	<0.190	<0.190	<0.190	<0.190	<0.381	<0.190	1.10	<0.190	--	--	--	<0.190	<0.190	<0.190	
HC-5	6/27/2007	856	<476	0.835	<0.288	<0.192	<0.192	<0.192	<0.192	<0.192	<0.192	<0.192	<0.385	<0.192	3.08	<0.192	--	--	--	<0.421	<0.288	<0.192	
HC-5	6/12/2008	1,050 Q11	<472	0.495	0.476	0.190	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.190	<0.0952	1.55	<0.0952	--	--	--	<0.266	<0.190	<0.0952	
HC-5	6/4/2009	999 Q11	<476	0.279	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.190	<0.0952	1.41	<0.0952	--	--	--	<0.143	<0.143	<0.0952	
HC-5	9/16/2010	2,810 Q11	<400	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
HC-5	6/10/2011	5,220 Q11	156 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
HC-5	6/11/2012	3,600 Q11	<400	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
HC-5	12/20/2012	1,200 J	<480	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
HC-5	12/20/12 DUP	640 J	<480	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
HC-5	12/17/2013	2,200 JY	<250	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
HC-5	12/17/2013 DUP	4,600 JY	890	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
HC-5	12/12/2014	9,200 JY	2,100 JY	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
HC-5	12/12/2014 DUP	6,100 JY	1,300 JY	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
HC-5	12/16/2015	8,000	840 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
HC-5	12/18/2015 DUP	9,200	1,300 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
HC-5	12/19/2016	4,300 J	580 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
HC-5	12/19/16 DUP	6,100 J	1,900 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
HC-5	12/13/2017	9,300 J, R	5,900 J, R	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
HC-5	12/13/17 DUP	10,000 J, R	4,100 J, R	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
HC-5	2/14/2018	3,000	<350	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
HC-5	2/14/2018 DUP	3,300	<350	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
HC-5	12/5/2018	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
HC-5	12/10/2019	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
HC-5	12/9/2020	216,000 J	<20,000 UJ	<13.1	<4.04	<9.09	<4.04	<4.04	<4.04	<4.04	<4.04	<4.04	<4.04	<4.04	3.67 J	40.3	<4.04	<4.04	--	<8.08	<4.04	5.48	
HC-5	4/7/2021	7,890	<220	<0.610 UJ	<0.134 UJ	<0.366 UJ	<0.0488 UJ	<0.0244 UJ	<0.0244 UJ	<0.0244 UJ	<0.0244 UJ	<0.0244 UJ	<0.0244 UJ	<0.0244 UJ	1.19 J	1.36 J	<0.0244 UJ	--	<0.0976 UJ	<0.0976 UJ	<0.0976 UJ	0.202 J	
HC-5	7/8/2021	14,000	<215	0.871	<0.105	<0.0952	<0.0381	<0.0190	<0.0190	<0.0190	<0.0190	<0.0571	<0.0190	<0.0952	2.45	<0.0190	--	--	--	<0.133	<0.114	<0.171	
HC-5	4/26/2022	2,460	<385	<1.38	<1.38	<1.38	<0.688	<0.688	<0.688	<0.688	<0.688	<0.688	<1.38	<0.688	<1.38	<0.688	<2.75	<2.75	<2.75	<2.75	<1.38	<1.38	
HC-5	8/11/2022	3,310	<385	<1.33	<1.33	<1.33	<0.664	<0.664	<0.664	<0.664	<0.664	<0.664	<1.33	<0.664									

Table C-3
Historical Groundwater Analytical Results
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID	Date	TPH		Acenaph- thene	Acenaph- thylene	Anthracene	Benzo(a)- anthracene	Benzo(a)- pyrene	Benzo(b)- fluoranthene	Benzo(g,h,i)- perylene	Benzo(k)- fluoranthene	PAHs										1-Methyl naphthalene	2-Methyl naphthalene	Naphthalene	Phenanthrene	Pyrene			
		Diesel-Range	Residual- Range									Concentration in µg/L																	
												Dibenz(a,h)- anthracene	Fluoranthene	Fluorene	Indeno(1,2,3- cd)pyrene														
HC-21	5/10/2004	1,210	< 625	1.95	< 0.5	0.966	1.43	1.63	1.5	1.44	1.5	1.66	< 1.0	3.4	1.28	1.21	--	--	--	--	< 0.5	4.38	3.6						
HC-21	2/11/2005	13,000 J	3,200 J	0.58	--	--	3.8	5.7	--	--	--	--	--	4.7	0.94	--	--	--	--	0.18	--	--							
HC-21	6/3/2005	430 Y	< 500	0.30	< 0.059	0.24	0.62	0.95	0.79	0.82	0.56	0.77	0.22	1.2	0.82	1.1	--	--	--	0.13	0.62	1.3							
HC-21	9/15/2005	179 J	< 476	< 0.485	< 0.485	< 0.485	0.410	0.515	0.577	0.283	0.470	0.521	< 0.194	0.679	1.87	0.262	--	--	--	< 0.485	< 0.485	0.925							
HC-21	12/7/2005	652	< 481	0.495	< 0.0962	< 0.240	0.259	0.397	0.405	0.252	0.375	0.342	< 0.385	0.403	0.808	0.224	--	--	--	0.172	0.334	0.667							
HC-21	3/14/2006	221	< 481	< 0.102	< 0.102	< 0.153	0.242	0.244	0.188	0.184	0.208	< 0.204	0.318	< 0.102	0.156	0.156	--	--	--	< 0.102	< 0.204	0.298							
HC-21	6/28/2006	2,460	< 476	1.07	< 0.400	0.840	4.62	5.37	5.67	4.43	4.02	4.61	1.73	7.33	0.996	3.97	--	--	--	0.457	3.21	8.31							
HC-21	9/19/2006	600	< 476	3.74	< 0.476	3.33	19.6	21.5	20.6	15.2	17.6	19.8	4.64	25.1	3.08	14.4	--	--	--	0.759	14	25.8							
HC-21	12/13/2006	1,210	< 481	< 0.0952	< 0.0952	< 0.143	0.135	0.174	0.167	0.133	0.141	0.122	< 0.190	0.184	< 0.0952	0.125	--	--	--	< 0.0952	< 0.190	0.125							
HC-21	3/29/2007	< 238	< 476	< 0.0952	< 0.0952	< 0.190	0.145	0.202	0.186	0.166	0.152	0.175	< 0.190	0.315	< 0.0952	0.153	--	--	--	< 0.0952	< 0.0952	0.192							
HC-21	6/27/2007	390	< 476	0.745	< 0.476	< 0.476	< 0.476	< 0.476	< 0.476	< 0.476	< 0.476	< 0.476	< 0.952	< 0.476	2.06	< 0.476	--	--	--	< 0.476	< 0.476	< 0.476							
HC-21	9/18/2007	261	< 472	0.247	< 0.0952	< 0.190	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.190	< 0.190	0.622	< 0.0952	--	--	--	< 0.190	< 0.190	< 0.190							
HC-21	12/6/2007	582	< 476	< 0.0952	< 0.0952	< 0.0952	0.0978	0.128	0.116	0.0994	0.106	0.114	< 0.190	0.149	< 0.0952	< 0.0952	--	--	--	< 0.0952	< 0.0952	0.144							
HC-21	3/10/2008	<238	<476	<0.0952	<0.0952	<0.143	0.156	0.194	0.220	0.109	0.139	0.169	<0.190	0.218	<0.0952	0.117	--	--	--	<0.0952	<0.143	0.212							
HC-21	6/12/2008	<236	<472	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.190	<0.0952	<0.0952	<0.0952	--	--	--	<0.0952	<0.0952	<0.0952							
HC-21	9/8/2008	<240	<481	<0.0962	<0.0962	<0.144	<0.0962	<0.0962	<0.0962	<0.0962	<0.0962	<0.0962	<0.192	<0.144	0.258	<0.0962	--	--	--	<0.0962	<0.144	<0.144							
HC-21	12/29/2008	16,100 Q9	<5,000	<0.190	<0.190	<0.381	0.269	0.208	<0.190	<0.190	<0.190	0.276	<0.381	0.279	<0.190	<0.190	--	--	--	1.28	<0.190	0.463							
HC-21	3/10/2009	569 Q11	< 476	0.336	< 0.0952	< 0.0952	< 0.0952	0.0619 J	0.0568 J	0.0568 J	0.054 J	0.0952	< 0.190	< 0.0952	1.18	< 0.0952	--	--	--	< 0.0952	< 0.0952	0.0939 J							
HC-21	6/4/2009	5,070 Q11	802	0.309	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.190	< 0.0952	0.77	< 0.0952	--	--	--	< 0.0952	0.099	1.44							
HC-21	9/9/2009	559 Q11	<476	0.284	<0.0952	<0.143	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.190	0.121	1.19	<0.0952	--	--	--	<0.429	<0.143	0.171							
HC-21	12/15/2009	3,110 Q11	<472	<0.190	<0.190	<0.190	0.216	0.196	<0.190	<0.190	<0.190	<0.190	<0.381	0.194	<0.190	<0.190	--	--	--	<0.190	<0.190	0.222							
HC-21	3/11/2010	387 Q11	<476	<0.476	<0.476	<0.476	<0.476	<0.476	<0.476	<0.476	<0.476	<0.476	<0.952	<0.476	<0.476	<0.476	--	--	--	<0.476	<0.476	<0.476							
HC-21	6/8/2010	246 Q11	<472	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.190	<0.0952	<0.0952	<0.0952	--	--	--	<0.0952	<0.0952	<0.0952							
HC-21	9/16/2010	1,480 Q11	133 J	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.190	<0.0952	<0.0952	<0.0952	--	--	--	<0.0952	<0.0952	<0.0952							
HC-21	12/13/2010	2,080 Q12	631 O7	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.190	<0.0952	<0.0952	<0.0952	--	--	--	<0.0952	<0.0952	<0.0952							
HC-21	6/9/2011	1,110 Q11	102 J	<0.0943	<0.0943	<0.0943	0.314	0.396	0.343	0.341	0.331	0.340	<0.189	0.409	<0.0943	0.306	--	--	--	<0.0943	0.217	0.506							
HC-21	12/1/2011	6,890 Q11	1,010	<0.0943	<0.0943	<0.189	0.120	0.185	0.165	0.171	0.128	0.140	<0.189	0.181	<0.0943	0.139	--	--	--	<0.0943	<0.0943	0.217							
HC-21	6/11/2012	1,300 Q11	<400	<0.095	<0.095	<0.095	<0.095	0.099	0.098	<0.095	<0.095	<0.095	<0.019	0.11	<0.095	<0.095	--	--	--	<0.095	<0.095	0.096							
HC-24	5/10/2004	736	< 500	1.21	< 0.25	< 0.3	< 0.1	0.118	0.101	0.101	< 0.1	0.109	< 0.2	0.144	3.51	< 0.1	--	--	--	< 1.5	4.09	0.163							
HC-24	2/11/2005	4,500 J	970 J	1.2	--	--	0.11	0.15	--	--	--	--	--	0.18	--	< 0.55	--	--	--	< 0.55	1.8	--							
HC-24	6/6/2005	450 Y	30 J	1.1	< 0.25	0.13	0.021	0.019 J	0.019 J	0.015 J	0.018 J	0.022	< 0.020	0.053	5.0	0.019 J	--	--	--	< 0.63	2.8	0.071							
HC-24	9/15/2005	4,480 J	536	0.594	< 0.146	< 0.243	0.288	0.370	0.342	0.247	0.363	0.353	< 0.194	0.427	3.79	0.224	--	--	--	< 0.874	0.698	0.462							
HC-24	12/7/2005	837	< 481	0.861	< 0.144	< 0.192	< 0.0962	< 0.0962	< 0.0962	< 0.0962	< 0.0962	< 0.0962	< 0.192	< 0.0962	2.83	< 0.0962	--	--	--	< 1.06	1.91	< 0.0962							
HC-24	3/13/2006	706	< 481	0.441	< 0.153	< 0.102	< 0.102	< 0.102	< 0.102	< 0.102	< 0.102	< 0.102	< 0.204	< 0.102	1.60	< 0.102	--	--	--	< 0.255	1.06	< 0.102							
HC-24	6/28/2006	1,020	< 476	1.99	< 0.377	0.363	0.996	1.10	1.97 J	0.834	< 0.189 J	0.989	< 0.377	1.49	6.00	0.754	--	--	--	< 0.943	4.24	1.34							
HC-24	9/20/2006	705	< 481	1.49	< 0.481	0.753	0.948	0.935	0.668	0.823	0.82	< 0.962	1.02	4.35	0.62	< 0.481	--	--	--	< 0.481	1.00	1.04							
HC-24	12/13/2006	1,810	< 481	2.10	< 0.962	< 0.962	< 0.962	< 0.962	< 0.962	< 0.962	< 0.962	< 0.962	< 1.92	6.99	< 0.962	< 1.44	--	--	--	< 1.44	5.73	< 0.962							
HC-24	3/29/2007	787	< 481	1.01	< 0.190	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.190	< 0.0952	3.43	< 0.0952	--	--	--	< 0.524	1.10	< 0.0952							
HC-24	6/27/2007	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--						
HC-24	9/18/2007	436	< 472	1.05	< 0.286	< 0.190	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.190	< 0.0952	3.53	< 0.0952	--	--	--	< 1.14	1.92	0.12							
HC-24	12/6/2007	676	< 476	1.32	< 0.476	< 0.190	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.190	< 0.0952	4.71	< 0.0952	--	--	--	< 0.476	3.72	< 0.0952							
HC-24	3/10/2008	2,270	<476	2.3	<0.952	<0.952 Q10	<0.952	<0.952	<0.952	<0.952	<0.952	<0.952	<1.90	<0.952	7.08	<0.952	--	--	--	<1.43	6.64	<0.952							
HC-24	6/12/2008	1,150	<472	1.51	<0.286	<0.143	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.0952	<0.190	<0.0952	4.99	<0.0952	--	--	--	<0.429	3.42	<0.0952							
HC-24	9/9/2008	459 Q9	<481	1.22	<0.192	0.117	<0.0962	<0.0962	<0.0962	<0.0962	<0.0962	<0.0962	<0.192	<0.0962	4.74	&													

Table C-3
Historical Groundwater Analytical Results
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID	Date	TPH		Acenaph- thene	Acenaph- thylene	Anthracene	Benzo(a)- anthracene	Benzo(a)- pyrene	Benzo(h)- fluoranthene	Benzo(g,h,i)- perylene	Benzo(k)- fluoranthene	PAHs										1-Methyl naphthalene	2-Methyl naphthalene	Naphthalene	Phenanthrene	Pyrene
		Diesel-Range	Residual- Range									Chrysene	Dibenzo(a,h)- anthracene	Fluoranthene	Fluorene	Indeno(1,2,3- cd)pyrene										
																	Concentration in µg/L									
BE-1	6/6/2005	3,500 Y ^a	2,300 O ^a	0.31	0.11	0.28	1.7	2.1	2.0	1.8	1.6	2.2	0.36	3.4	0.16	2.0	--	--	--	0.49	1.4	3.4				
BE-1	9/15/2005	172 J ^b	< 515 ^a	0.0575 J	< 0.103	0.0516 J	0.322	0.385	0.368	0.296	0.370	0.424	< 0.206	0.646	< 0.103	0.251	--	--	--	< 0.103	0.286	0.674				
BE-1	12/7/2005	430 ^b	< 400 ^a	< 0.200	< 0.200	< 0.200	0.397	0.449	0.540	0.214	0.459	0.501	< 0.400	0.866	< 0.200	0.169 J	--	--	--	< 0.200	0.461	1.12				
BE-1	3/13/2006	< 102 J	< 191 J	< 0.333	< 0.333	< 0.333	< 0.333	0.350	0.333	< 0.333	< 0.333	< 0.333	< 0.667	0.448	< 0.333	< 0.333	--	--	--	< 0.333	< 0.333	0.431				
BE-1	6/28/2006	< 312	< 625	< 0.0962	< 0.0962	< 0.0962	0.112	0.133	0.137	0.105	< 0.0962	0.124	< 0.192	0.181	< 0.0962	< 0.0962	--	--	--	< 0.0962	< 0.0962	0.244				
BE-1	9/20/2006	< 357	< 714	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--					
BE-1	12/14/2006	801	< 476	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.190	< 0.0952	0.298	< 0.0952	--	--	--	< 0.0952	0.503	< 0.0952				
BE-1	3/30/2007	210	< 250	< 0.0267	< 0.0267	< 0.0267	0.0267	< 0.0267	< 0.0267	< 0.0267	< 0.0267	< 0.0267	< 0.0267	< 0.0267	< 0.0267	< 0.0267	--	--	--	< 0.0533	0.0431	0.0423				
BE-1	6/27/2007	518	< 476	< 0.476	< 0.476	< 0.476	2.19	2.78	2.61	2.20	2.31	2.49	< 0.952	3.14	< 0.476	1.98	--	--	--	< 0.476	1.34	3.09				
BE-1	9/18/2007	598	< 1,000	< 0.0333	< 0.0333	< 0.0333	< 0.0333	< 0.0333	< 0.0333	< 0.0333	< 0.0333	< 0.0333	< 0.0333	< 0.0333	< 0.050	0.0791	< 0.0333	--	--	--	0.498	0.145	0.0598			
BE-1	12/6/2007	< 238	< 476	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.190	< 0.0952	< 0.0952	< 0.0952	--	--	--	< 0.0952	< 0.0952	< 0.0952				
BE-1	3/12/2008	449	< 500	< 0.0943	< 0.0943	< 0.0943	< 0.0943	< 0.0943	< 0.0943	< 0.0943	< 0.0943	< 0.0943	< 0.189	0.101	< 0.0943	< 0.0943	--	--	--	< 0.0943	< 0.0943	0.145				
BE-1	6/12/2008	< 236	< 472	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.190	< 0.0952	< 0.0952	< 0.0952	--	--	--	< 0.0952	< 0.0952	< 0.0952				
BE-1	9/9/2008	190 Q11	< 588	< 0.357	< 0.357	< 0.357	< 0.357	< 0.357	< 0.357	< 0.357	< 0.357	< 0.357	< 0.714	< 0.357	< 0.357	< 0.357	--	--	--	< 0.357	< 0.357	< 0.357				
BE-1	12/29/2008	377 Q9	< 500	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.190	< 0.0952	< 0.0952	< 0.0952	--	--	--	< 0.0952	< 0.0952	< 0.0952				
BE-1	3/9/2009	< 236	< 472	< 0.0971	< 0.0971	< 0.0971	< 0.0971	< 0.0971	< 0.0971	< 0.0971	< 0.0971	< 0.0971	< 0.194	< 0.0971	< 0.0971	< 0.0971	--	--	--	< 0.0971	< 0.0971	< 0.0971				
BE-1	6/5/2009	< 238	< 476	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.190	< 0.0952	< 0.0952	< 0.0952	--	--	--	< 0.0952	< 0.0952	< 0.0952				
BE-1	9/9/2009	< 250	< 500	< 0.0971	< 0.0971	< 0.0971	< 0.0971	< 0.0971	< 0.0971	< 0.0971	< 0.0971	< 0.0971	< 0.194	< 0.0971	< 0.0971	< 0.0971	--	--	--	0.141	< 0.0971	< 0.0971				
BE-1	12/15/2009	< 236	< 472	< 0.0962	< 0.0962	< 0.0962	< 0.0962	< 0.0962	< 0.0962	< 0.0962	< 0.0962	< 0.0962	< 0.192	< 0.0962	< 0.0962	< 0.0962	--	--	--	< 0.0962	< 0.0962	< 0.0962				
BE-1	3/11/2010	< 238	< 476	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.190	< 0.0952	< 0.0952	< 0.0952	--	--	--	< 0.0952	< 0.0952	< 0.0952				
BE-1	6/8/2010	< 236	< 472	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.190	< 0.0952	< 0.0952	< 0.0952	--	--	--	< 0.0952	< 0.0952	< 0.0952				
BE-1	9/16/2010	380	< 400	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.190	< 0.0952	0.252	< 0.0952	--	--	--	< 0.0952	0.229	< 0.0952				
BE-1	12/13/2010	1,340 Q12	345 J	< 0.0971	< 0.0971	< 0.0971	< 0.0971	< 0.0971	< 0.0971	< 0.0971	< 0.0971	< 0.0971	< 0.194	< 0.0971	< 0.0971	< 0.0971	--	--	--	< 0.0971	< 0.0971	< 0.0971				
BE-1	6/21/2011	91.8 J	78.8 J	< 0.0943	< 0.0943	< 0.0943	< 0.0943	< 0.0943	< 0.0943	< 0.0943	< 0.0943	< 0.0943	< 0.189	< 0.0943	< 0.0943	< 0.0943	--	--	--	< 0.0943	< 0.0943	< 0.0943				
BE-1	12/11/2011	319 Q11 J	< 400	< 0.0943	< 0.0943	< 0.0943	< 0.0943	< 0.0943	< 0.0943	< 0.0943	< 0.0943	< 0.0943	< 0.189	< 0.0943	< 0.0943	< 0.0943	--	--	--	< 0.0943	< 0.0943	< 0.0943				
BE-1	6/12/2012	< 400	< 400	< 0.099	< 0.099	< 0.099	< 0.099	< 0.099	< 0.099	< 0.099	< 0.099	< 0.099	< 0.20	< 0.099	< 0.099	< 0.099	--	--	--	< 0.099	< 0.099	< 0.099				
BE-1	12/19/2012	< 400	< 400	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.20	< 0.10	< 0.10	< 0.10	--	--	--	< 0.10	< 0.10	< 0.10				
BE-1	12/17/2013	220 Y	< 250	< 0.096	< 0.096	< 0.096	< 0.096	< 0.096	< 0.096	< 0.096	< 0.096	< 0.096	< 0.096	< 0.096	< 0.096	< 0.096	--	--	--	< 0.096	< 0.096	< 0.096				
BE-1	12/11/2014	1,200 Y	420 Y	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	--	--	--	0.050	< 0.020	0.032				
BE-1	12/15/2015	180	< 250	< 0.020 H	< 0.020 H	< 0.020 H	< 0.020 H	< 0.020 H	< 0.020 H	< 0.020 H	< 0.020 H	< 0.020 H	< 0.020 H	< 0.020 H	< 0.020 H	< 0.020 H	--	--	--	0.058 H	< 0.020 H	< 0.020 H				
BE-1	12/19/2016	1,000	280	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	--	--	--	< 0.040	< 0.020	0.029 B				
BE-1	12/14/2017	1,900 R	890 R	< 0.041	< 0.041	< 0.10	< 0.041	< 0.041	< 0.041	< 0.041	< 0.041	< 0.041	< 0.041	< 0.041	< 0.041	< 0.041	--	--	--	< 0.041	< 0.041	< 0.041				
BE-1	2/14/2018	< 350	< 350	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
BE-1	12/5/2018	19,000 J-	2,900 J-	< 0.019 H	< 0.019 H	0.061 J, H	< 0.019 H	< 0.019 H	< 0.019 H	< 0.019 H	< 0.019 H	< 0.019 H	< 0.019 H	< 0.019 H	< 0.019 H	< 0.019 H	--	--	--	< 0.019 H	0.022 J-, H	< 0.019 H				
BE-1	1/18/2019	430	< 350	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
BE-1	5/16/2019	66 J	< 91	0.025 J	< 0.0986	0.026 J	< 0.013	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.015	< 0.025	< 0.048	0.061 J	< 0.025	--	--	--	0.04 J	0.07 J	< 0.031			
BE-1	12/9/2019	170	< 330	0.023 J,B	< 0.049	< 0.049	< 0.049	< 0.098	< 0.049	< 0.049	< 0.049	< 0.049	< 0.098	< 0.098	< 0.20	0.031 J,B	< 0.049	--	--	--	0.048 J	< 0.098	0.049 J			
BE-1	12/9/2020	2,920 J	286 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
BE																										

Table C-3
Historical Groundwater Analytical Results
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID	Date	TPH					PAHs														
		Diesel-Range	Residual-Range	Acenaph-thene	Acenaph-thylene	Anthracene	Benzo(a)-anthracene	Benzo(a)-pyrene	Benzo(b)-fluoranthene	Benzo(g,h,i)-perylene	Benzo(k)-fluoranthene	Chrysene	Dibenzo(a,h)-anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	1-Methyl naphthalene	2-Methyl naphthalene	Naphthalene	Phenanthrene	Pyrene
		Concentration in µg/L																			
BE-4	6/3/2005	590 Y	< 500	1.9	< 0.25	< 0.22	0.012 J	< 0.020	< 0.020	< 0.020	< 0.020	0.034	< 0.020	0.036	3.8	< 0.020	--	--	< 0.31	< 0.088	0.084
BE-4	9/15/2005	1,560 J	< 476	< 0.714	< 0.476	< 0.190	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.0952	< 0.19	< 0.0952	0.844	< 0.0952	--	--	< 0.476	< 0.190	< 0.0952
BE-4	12/7/2005 ²	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BE-4	3/13/2006 ²	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BE-4	6/28/2006 ²	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BE-4	9/20/2006 ²	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BE-4	12/13/2006 ²	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BE-4	3/30/2007 ²	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BE-4	6/27/2007 ²	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BE-4	9/18/2007 ²	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BE-4	12/6/2007 ²	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BE-4	9/8/2008 ²	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BE-4	12/29/2008 ²	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BE-4	03/9/2009 ²	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BE-4	06/5/2009 ²	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BE-4	09/9/2009 ²	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BE-4	12/15/2009 ²	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BE-4	3/11/2010 ²	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BE-4	6/8/2010 ²	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BE-4	9/16/2010 ²	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BE-4	12/13/2011 ²	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BE-4	6/9/2011 ²	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BE-5	9/9/2009	<263	<526	<0.0952	<0.0952	<0.0952	0.184	0.217	0.194	0.166	0.174	0.216	<0.190	0.388	<0.0952	0.135	--	--	<0.238	<0.238	0.422
BE-5	12/15/2009	<236	<472	<0.0952	<0.0952	<0.0952	0.186	0.214	0.187	0.184	0.160	0.198	<0.190	0.352	<0.0952	0.152	--	--	<0.286	<0.238	0.382
BE-5	3/11/2010	<238	<476	<0.0952	<0.0952	<0.0952	<0.0952	0.102	<0.0952	<0.0952	<0.0952	0.098	<0.190	0.141	<0.0952	<0.0952	--	--	<0.0952	<0.0952	0.174
BE-5	6/8/2010	247 Q11	<472	<0.0952	<0.0952	<0.0952	0.151	0.175	0.147	0.141	0.129	0.175	<0.190	0.284	<0.0952	0.116	--	--	<0.0952	0.112	0.318
BE-5	9/16/2010	1,670 Q9	359 J	<0.0952	<0.0952	0.0963	0.214	0.274	0.252	0.226	0.203	0.259	<0.190	0.463	0.176	0.187	--	--	<0.143	0.316	0.499
BE-5	12/13/2010	659 Q12	354 J	<0.0952	<0.0952	<0.0952	0.163	0.223	0.203	0.184	0.165	0.211	<0.190	0.338	<0.0952	0.141	--	--	<0.0952	0.131	0.356
BE-5	6/9/2011	182 J	<400	<0.0943	<0.0943	<0.0943	<0.0943	<0.0943	<0.0943	<0.0943	<0.0943	<0.0943	<0.189	<0.0943	<0.0943	<0.0943	--	--	<0.0943	<0.0943	<0.0943
BE-5	12/1/2011	1,430 Q11	140 J	<0.118	<0.118	<0.118	<0.118	<0.118	<0.118	<0.118	<0.118	<0.118	<0.235	<0.118	<0.118	<0.118	--	--	<0.118	<0.118	0.155
BE-5	6/11/2012	610 Q11	<400	<0.095	<0.095	<0.095	0.16	0.21	0.19	0.16	0.18	0.20	<0.19	0.29	<0.095	0.13	--	--	<0.095	0.15	0.37
BE-5	12/19/2012	<400	<400	<0.098	<0.098	<0.098	0.26	0.31 B	0.25	0.28	0.19	0.27	<0.20	0.35	<0.098	0.33	--	--	<0.098	0.17	0.45
BE-5	12/17/2013	210 Y	<240	<0.095	<0.095	<0.14	<0.095	0.12	<0.095	<0.095	<0.095	<0.095	<0.19	<0.095	<0.14	0.11	--	--	<0.095	<0.095	0.12
BE-5	12/11/2014	2,700 Y	1,600 Y	0.042	0.020	0.058	0.16	0.20	0.260	0.180	0.100	0.190	0.043	0.290	0.037	0.22	--	--	0.11	0.12	0.31
BE-5	12/15/2015	150	<250	<0.020 H	<0.020 H	<0.020 H	0.049 H	0.042 H	0.10 H	0.070 H	0.029 H	0.062 H	<0.020 H	0.095 H	<0.020 H	0.059 H	--	--	0.022 H	0.040 H	0.10 H
BE-5	12/19/2016	770	450	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.03	<0.02	<0.02	<0.02	<0.02	<0.02	--	--	<0.04	<0.02	0.023 B
BE-5	12/14/2017	6,800 QP, R	4,800 QP, R	<0.041	<0.041	<0.10	<0.041	<0.041	<0.041	<0.041	<0.041	<0.041	<0.041	<0.041	<0.041	<0.041	--	--	<0.041	<0.041	<0.041
BE-5	2/14/2018	<110	<350	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BE-5	12/5/2018	6,000	3,100	<0.19 H	<0.19 H	<0.19 H	<0.19 H	<0.19 H	<0.19 H	<0.19 H	<0.19 H	<0.19 H	<0.19 H	<0.19 H	<0.19 H	<0.19 H	--	--	<0.19 H	<0.19 H	<0.19 H
BE-5	5/16/2019	3,800	840	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BE-5	12/9/2019	280	<340	0.019 J.B	<0.051	0.130	0.033 J	0.026 J	0.028 J	0.029 J	0.012 J	0.024 J	<0.10	<0.20	0.031 J.B	0.032 J	--	--	0.068 J	0.087 J	<0.10
BE-5	12/9/2020	240	<381	0.0836	0.0391	0.0966	0.463	0.697	0.892	0.537	0.263 J	0.566	0.0961	0.837	0.0552	0.524	--	--	0.0927	0.282	0.960
BE-5	12/22/2021	<93.5	<187	<0.0184	<0.0184	<0.0184	0.0170 J	0.0276 J+	0.0258	0.0207 J	0.00966 J	0.0124 J	<0.00920	0.0184 J+	<0.0184	0.0147 J	--	--	<0.0368	<0.0368	<0.0184
BE-5	4/26/2022	<211	<421	<0.135	<0.135	<0.135	<0.0673	<0.0673	<0.0673	<0.0673	<0.0673	<0.0673	<0.135	<0.135	<0.135	<0.135	<0.269	<0.269	<0.269	<0.269	<0.135
BE-5	8/15/2022	<192	<385	<0.0326	<0.0326	<0.0326	<0.0163	0.00857	0.016	<0.0326	<0.0163	<0.0163	<0.0163	<0.0326	<0.0714	0.0098	<0.102	<0.0653	0.182	<0.0816	0.024
BE-5	12/14/2022	<192	<385	<0.0329	<0.0329	<0.0329	<0.0165	<0.0165	<0.0165	<0.0165	<0.0165	<0.0165	<0.0165	<0.0329	<0.0329	<0.0329	<0.0659	<0.0659	0.231	<0.0659	<0.0329

Table C-3
Historical Groundwater Analytical Results
Terminal 4 Slip 3 Upland Facility
Port of Portland

Well ID	Date	TPH		Acenaph- thene	Acenaph- thylene	Anthracene	Benzo(a)- anthracene	Benzo(a)- pyrene	Benzo(b)- fluoranthene	Benzo(g,h,i)- perylene	Benzo(k)- fluoranthene	PAHs									
		Diesel-Range	Residual- Range									Chrysene	Dibenzo(a,h)- anthracene	Fluoranthene	Fluorene	Indeno(1,2,3- cd)pyrene	1-Methyl naphthalene	2-Methyl naphthalene	Naphthalene	Phenanthrene	Pyrene
HC-12D	11/13/1998	--	--	<1.00	<1.00	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	<0.100	<1.00	<0.100	--	--	<1.00	<0.500	<0.100
HC-12D	2/16/1999	--	--	<5.00	<1.00	<2.00	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	<1.00	5.210	<0.100	--	--	<1.00	8.190	<1.00
HC-12D	5/18/1999	--	--	0.31	<0.100	<1.00	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.200	<0.100	<10.0	<0.100	--	--	<1.00	<1.00	<0.100
HC-12D	8/25/1999	--	--	0.40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.200	<0.1	--	--	0.200	<0.1	<0.1
HC-12D	12/12/2014	2,200 Y	290 Y	0.50	<0.02	<0.02	0.020	<0.02	0.023	0.021	<0.02	0.021	0.021	<0.02	0.360	0.03	--	--	0.120	0.072	<0.02
HC-12D	12/16/2015	440	<250	0.22 H	<0.020 H	<0.020 H	<0.020 H	<0.020 H	<0.020 H	<0.020 H	<0.020 H	<0.020 H	<0.020 H	<0.020 H	<0.020 H	<0.020 H	--	--	<0.020 H	<0.020 H	<0.020 H
HC-12D	12/19/2016	1,200	<250	0.26	<0.02	<0.02	<0.02	<0.02	0.021	<0.02	<0.02	<0.03	<0.02	<0.02	0.049	<0.02	--	--	0.075	<0.02	0.052 B
HC-12D	12/13/2017	3,800 R	1,200 R	0.39	0.035	<0.047	<0.019	<0.019	<0.019	<0.019	<0.019	<0.019	<0.019	<0.019	0.091	<0.019	--	--	0.210	0.050	<0.019
HC-12D	2/14/2018	640	<350	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HC-12D	12/5/2018	2,600	<350	0.39 J-, H	<0.19 H	<0.19 H	<0.19 H	<0.19 H	<0.19 H	<0.19 H	<0.19 H	<0.19 H	<0.19 H	<0.19 H	<0.19 H	<0.19 H	--	--	<0.19 H	<0.19 H	<0.19 H
HC-12D	12/5/2018 DUP	2,000	<360	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HC-12D	12/5/2018	2,600	<350	0.39 J-, H	<0.19 H	<0.19 H	<0.19 H	<0.19 H	<0.19 H	<0.19 H	<0.19 H	<0.19 H	<0.19 H	<0.19 H	<0.19 H	<0.19 H	--	--	<0.19 H	<0.19 H	<0.19 H
HC-12D	12/5/2018 DUP	2,000	<360	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HC-12D	12/10/2019	780 D	<330	0.39	<0.047	0.081 J	0.018 J,B	0.017 J	0.018 J,B	0.016 J,B	0.015 J,B	0.018 J	<0.094	<0.19	<0.094	0.019 J,B	--	--	0.063 J	0.051 J	<0.094
HC-12D	12/10/19 DUP	500 D	<330	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HC-12D	12/9/2020	227	<381	0.375	<0.0400	<0.0500	<0.0400	<0.0400	<0.0400	<0.0400	<0.0400	<0.0400	<0.0400	<0.0400	<0.270	<0.0400	--	--	<0.160	<0.0400	<0.0400
HC-12D	12/9/20 DUP	218	<381	0.422	<0.0408	<0.0510	<0.0408	<0.0408	<0.0408	<0.0408	<0.0408	<0.0408	<0.0408	<0.224	<0.0408	--	--	<0.143	<0.0408	<0.0408	
HC-12D	12/22/2021	170 J	<189	0.417	<0.0739	<0.0739	<0.0369	<0.0369	<0.0369	<0.0369	<0.0369	<0.0369	<0.0369	<0.462	<0.0369	--	--	<0.296	<0.0739	<0.0739	
HC-12D	4/25/2022	<196	<392	0.779	<0.399	<0.399	<0.200	<0.200	<0.399	<0.200	<0.399	<0.200	<0.200	<0.399	<0.399	<0.200	<0.799	<0.799	<0.799	<0.799	<0.399
HC-12D	4/25/2022 DUP	<190	<381	0.738	<0.070	<0.128	<0.0187	<0.0187	<0.0187	<0.0374	<0.0187	<0.0187	<0.0187	<0.0374	<0.502	<0.0187	<0.0747	<0.0747	<0.467	<0.175	<0.0374
HC-12D	8/11/2022	209	<396	0.929	<0.0667	<0.356	<0.0178	<0.0178	<0.0356	<0.0178	<0.0178	<0.0178	<0.0356	<0.578	<0.0178	<0.156	<0.100	<0.656	<0.311	<0.0356	
HC-12D	11/17/2022	<190	<381	0.472	<0.0532	<0.177	<0.0198	<0.0198	<0.0198	<0.0396	<0.0198	<0.0198	<0.0396	<0.459	<0.0198	<0.0792	<0.0792	<0.404	<0.155	<0.0396	
ROD Compliance Criteria		1,000	1,000	520	--	--	0.027	0.014	--	--	--	--	--	6.16	3.9	--	--	--	620	6.3	--

Notes:

1. TPH = Total Petroleum Hydrocarbons
2. PAHs = Polycyclic Aromatic Hydrocarbons
3. µg/L = micrograms per liter
4. -- = Data not available or sample not analyzed for listed analyte.
5. < = Analyte not detected above method detection limit
6. **Bold** represents detected analyte concentrations exceeding compliance criteria; note, this is provided for information purposes only.
7. Well not sampled due to presence of LNAPL in well at time of sampling.
8. Sample did not include silica gel cleanup due to inadequate sample volume.
9. Sample lost during lab extraction.
10. ROD compliance criteria is for groundwater discharge at the Slip or river and is not applicable to monitoring well data.
11. J = Result is an estimated value.
12. O = The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
13. Y = The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard or resembles a hydrocarbon pattern for degraded fuel.
14. OP = Hydrocarbon result partly due to individual peak(s) in quantitation range.
15. O11 = Detected hydrocarbons in the diesel range do not have a distinct diesel pattern and may be due to heavily weathered diesel.
16. O9 = Hydrocarbon pattern most closely resembles weathered diesel.
17. B = Analyte was detected in the method blank.
18. Q12 = Detected hydrocarbons in the diesel range do not have a distinct diesel pattern and may be due to heavily weathered diesel or possibly biogenic interference.
19. H = Sample analysis re-run outside of the specified hold-time due to laboratory control issues with the initial analysis.
20. J = Result is estimated and may be biased low.
21. R = Data does not meet Data Quality Objectives and are unusable.
22. D = The RPD between the primary sample and field duplicated exceeded the control limit.

Table C-4
Groundwater Analytical Results – C10-C12 Aliphatic Hydrocarbons and Metals (Total and Dissolved)
Terminal 4 Slip 3 Upland Facility
Port of Portland

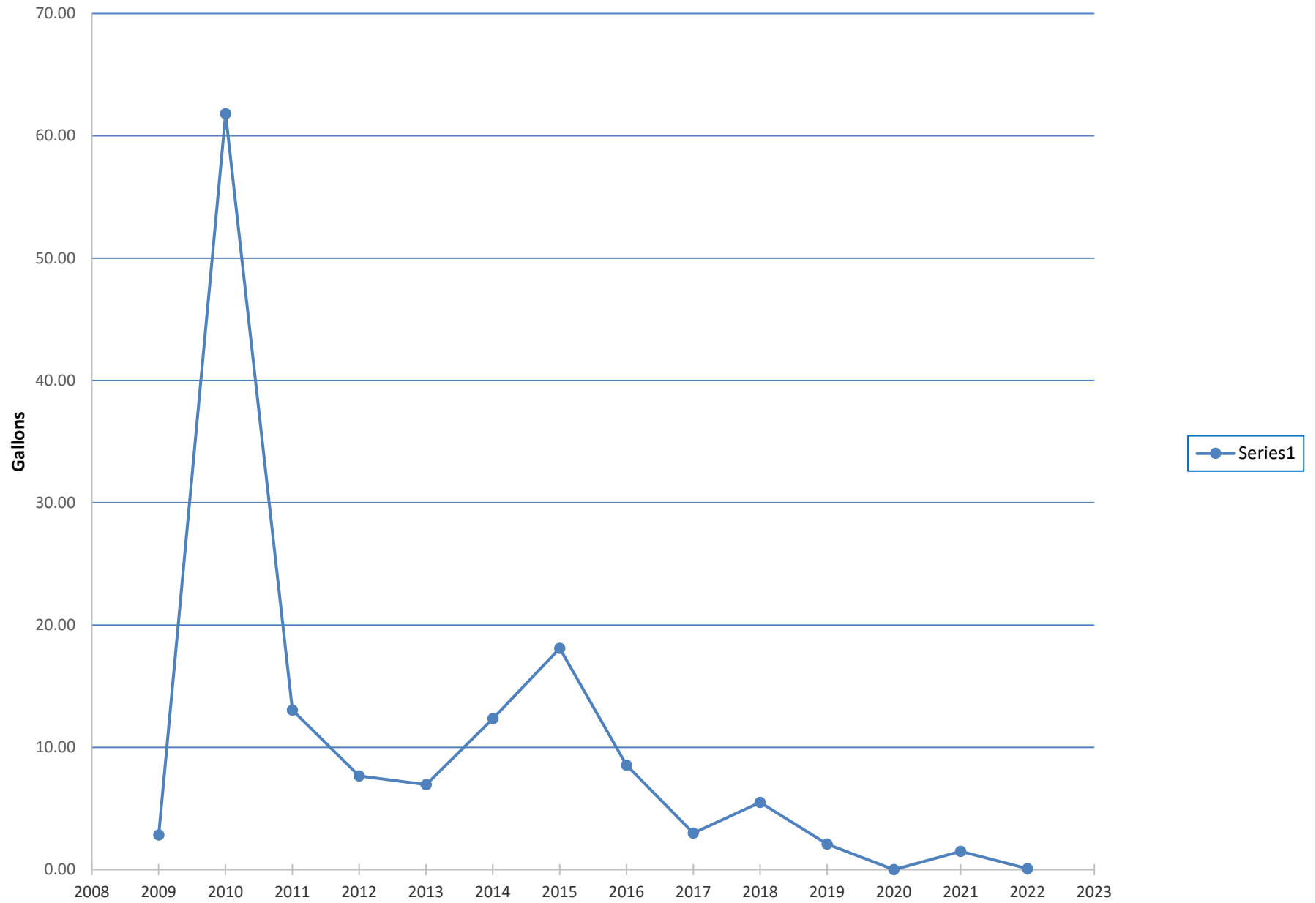
Sample ID	Sample Date	C10-C12 Aliphatic Hydrocarbons (µg/L)	Metals (µg/L)																	
			Arsenic		Cadmium		Chromium		Copper		Lead		Manganese		Mercury		Vanadium		Zinc	
			Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved
South Slip 3 Area																				
HC-2	4/25/2022	<0.13	<1.00	<1.00	<0.200	<0.200	<2.00	<2.00	<2.00	<2.00	0.308 J+	<0.200	53.8	48.9	<0.0800	<0.0800	<2.00	<2.00	211 J+	92.2
	8/11/2022	<20.5	<1.00	<1.00	0.216	<0.200	<2.00	<2.00	<2.00	<2.00	<0.200	<0.200	17.6	13.8	<0.0800	<0.0800	<2.00	<2.00	369	273
	11/17/2022	<39.5	1.640	1.570	0.395	0.342	<2.00	<2.00	<2.00	<2.00	<0.200	<0.200	69.8	72	<0.0800	<0.0800	<2.00	<2.00	90.9	93.5
HC-5	4/26/2022	0.88 J	1.58	1.55	<0.200	<0.200	<2.00	<2.00	4.37	<2.00	<0.200	<0.200	771	779	<0.0800	<0.0800	<2.00	<2.00	93.3	82.7
	8/11/2022	129	2.6	1.82	0.171	<0.200	<2.00	<2.00	3.35	2.31	0.339	0.14	1,790	1,780	<0.0800	<0.0800	4.86	1.82	390	187
	11/17/2022	137	2.13	1.93	<0.200	<0.200	<2.00	<2.00	<2.00	<2.00	0.235	<0.200	1,870	1,780	<0.0800	<0.0800	5.58	5.31	699	683
HC-6S	4/25/2022	<0.13	<1.00	<1.00	<0.200	<0.200	<2.00	<2.00	<2.00	<2.00	0.314 J+	<0.200	186	202	<0.0800	<0.0800	<2.00	<2.00	16.7	18.2
BEBRA Area																				
BE-1	4/26/2022	<0.15	6.24	10.9	<0.200	<0.200	<2.00	<2.00	2.00	<2.00	0.425 J+	<0.200	4,150	3,610	<0.0800	<0.0800	<2.00	<2.00	5.61	<4.00
	8/15/2022	<20.7	14.4	12.5	<0.200	<0.200	1.12	<2.00	1.28	3.36	0.715	0.113	4,050	3,560	<0.0800	<0.0800	4.17	<2.00	4.59	2.55
	12/14/2022	<39.6	4.99	6.85	<0.200	<2.00	<2.00	<2.00	<2.00	22.3	1.22	0.733	3,600	3,280	<0.0800	<0.0800	<2.00	<2.00	7.93	11.9
BE-5	4/26/2022	0.26 J	<1.00	<1.00	0.323	0.302	<2.00	<2.00	2.14	3.61	0.465 J+	<0.200	169	146	<0.0800	<0.0800	<2.00	<2.00	68.9	70.9
	8/11/2022	<20.6	7.52	3.06	<0.200	<0.200	<2.00	<2.00	1.41	5.78	0.858	0.175	3,290	3,000	<0.0800	<0.0800	3.2	1.89	6.69	3.75
	12/14/2022	<39.7	<1.00	<1.00	<0.200	0.258	<2.00	<2.00	19.3	3.59	0.567	4.56	16	89	<0.0800	<0.0800	<2.00	2.55	64.4	50.6
HC-12D	4/25/2022	6.6	17.2	17.6	2.38	0.253 J	<2.00	<2.00	<2.00	<2.00	0.557 J+	<0.200	13,100	12,600	<0.0800	<0.0800	<2.00	<2.00	<4.00	<4.00
	4/25/2022 (DUP-1)	4.9	18.0	16.9	3.56	0.347 J	<2.00	<2.00	<2.00	<2.00	0.556	<0.200	12,900	12,400	<0.0800	<0.0800	<2.00	<2.00	<4.00	<4.00
	8/11/2022	<20.6	19.6	19.8	4.94	<0.200	<2.00	<2.00	1.62	2.23	1.46	<0.200	12,700	11,400	<0.0800	<0.0800	2.87	<2.00	7.63	2.68
	11/17/2022	<39.8	18.1	18.3	3.2	3.110	<2.00	<2.00	<2.00	<2.00	1.25	1.230	14,600	14,900	<0.0800	<0.0800	<2.00	<2.00	5.58	8.81

- Notes:
- 1. < = Analyte was not detected above the minimum reporting limit.
 - 2. µg/L = Micrograms per liter.
 - 3. J = Result is estimated.
 - 4. J+ = Result is estimated and may be biased high.
 - 5. **Boldface** data represents detected analyte concentration.
 - 6. NA = No screening level is established.
 - 7. DUP = Field duplicate.
 - 8. -- = Analyte was not tested.

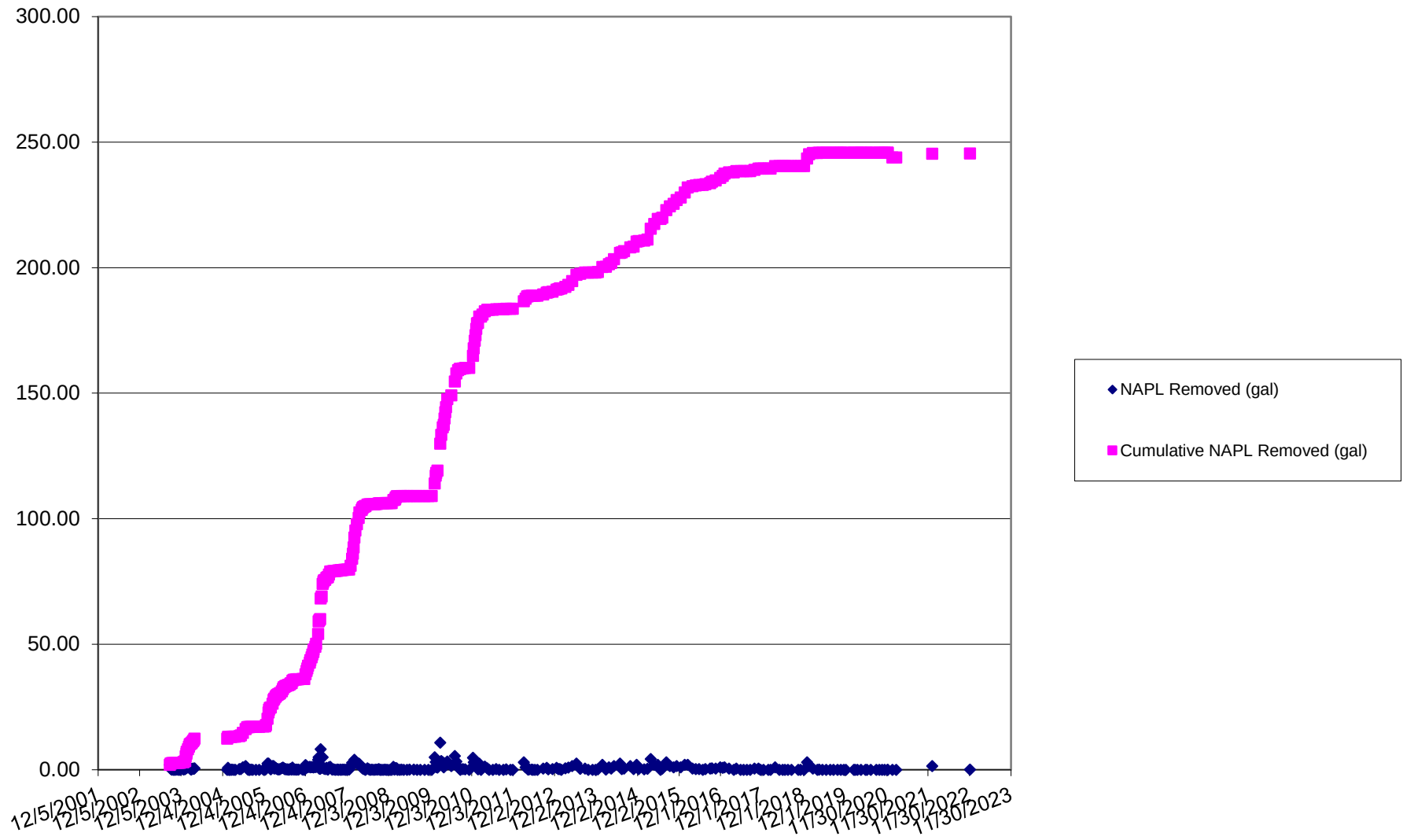
Appendix D

LNAPL Thickness and Recovery Trend Plots

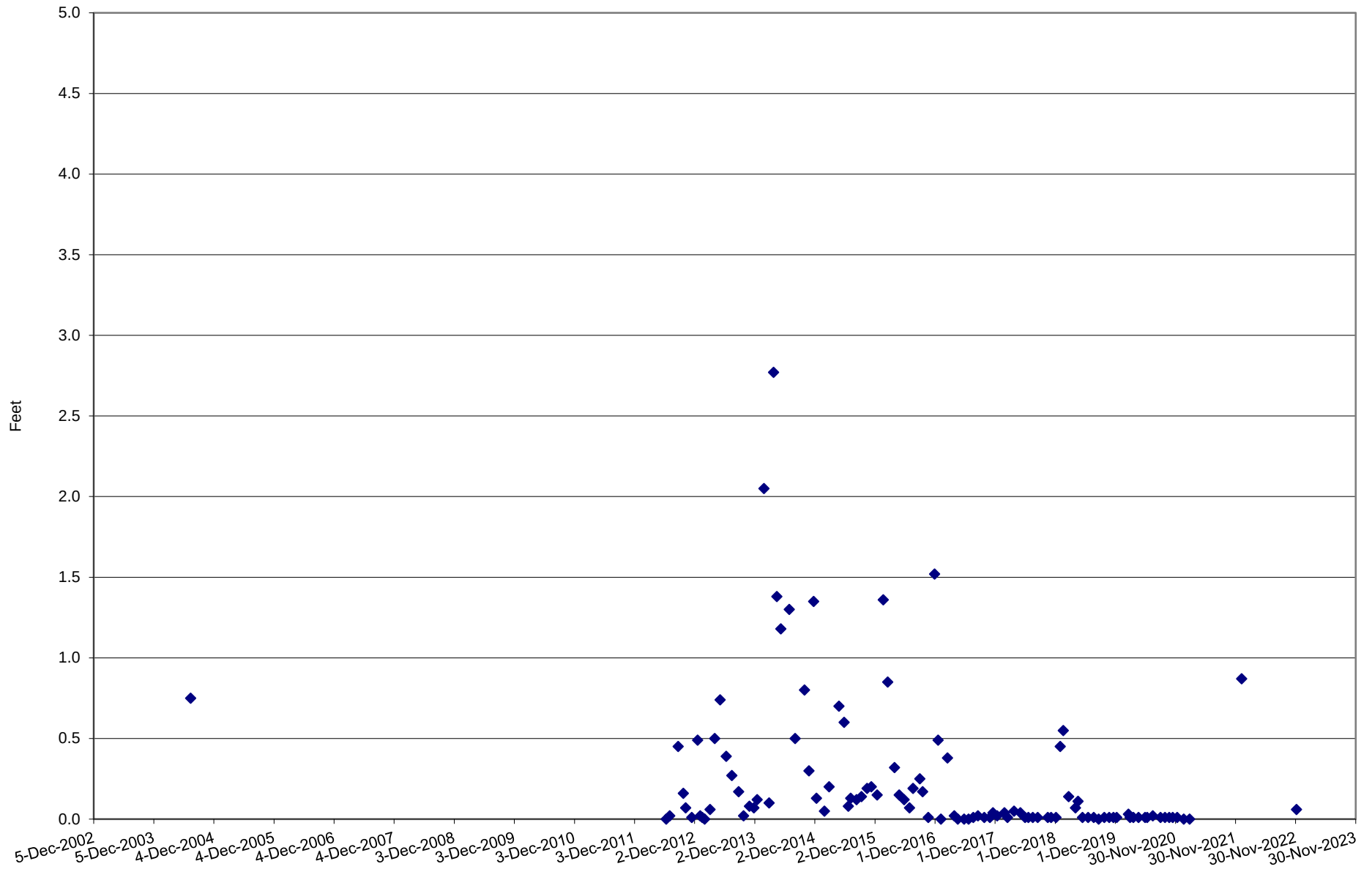
MW-19



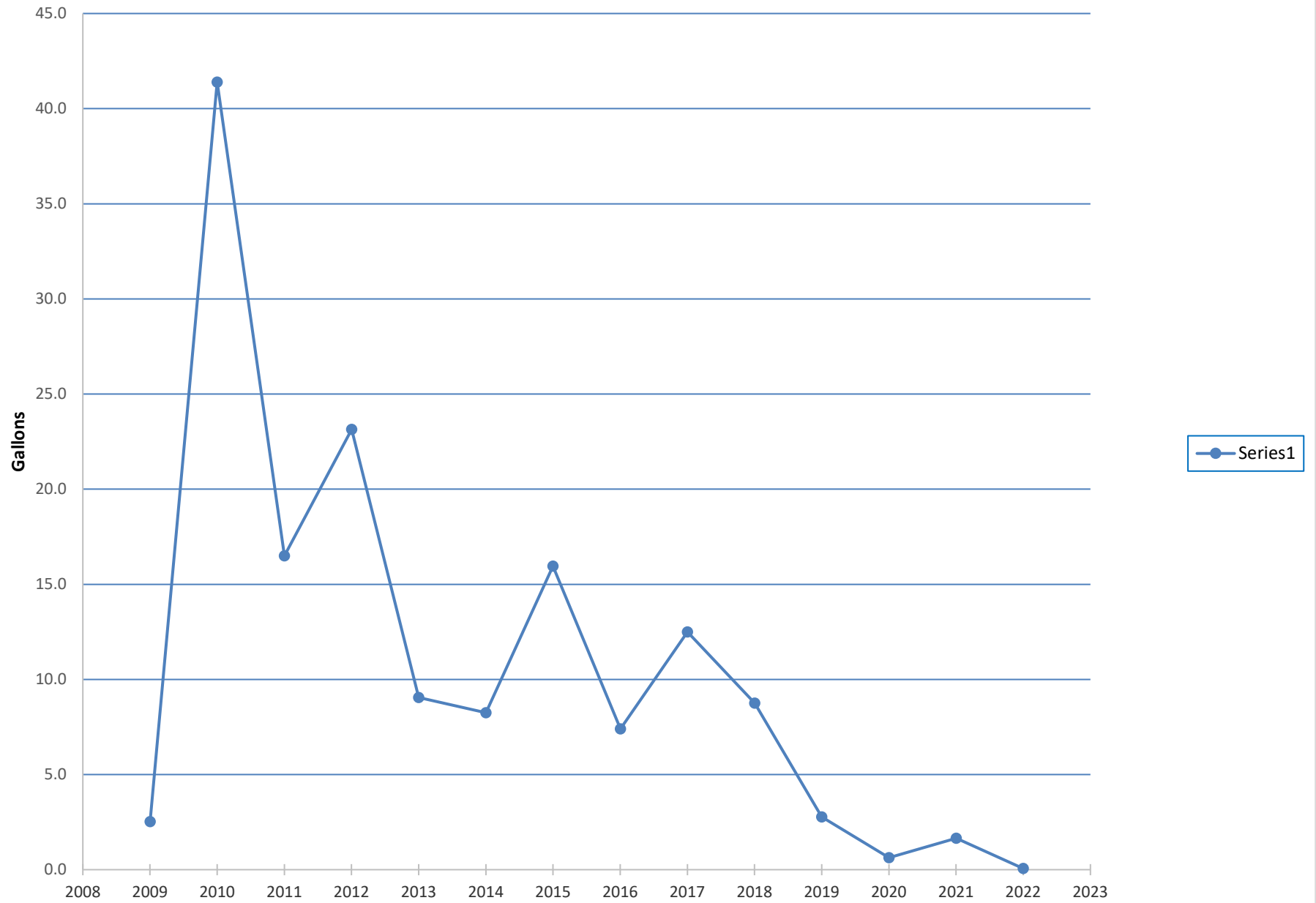
MW-19



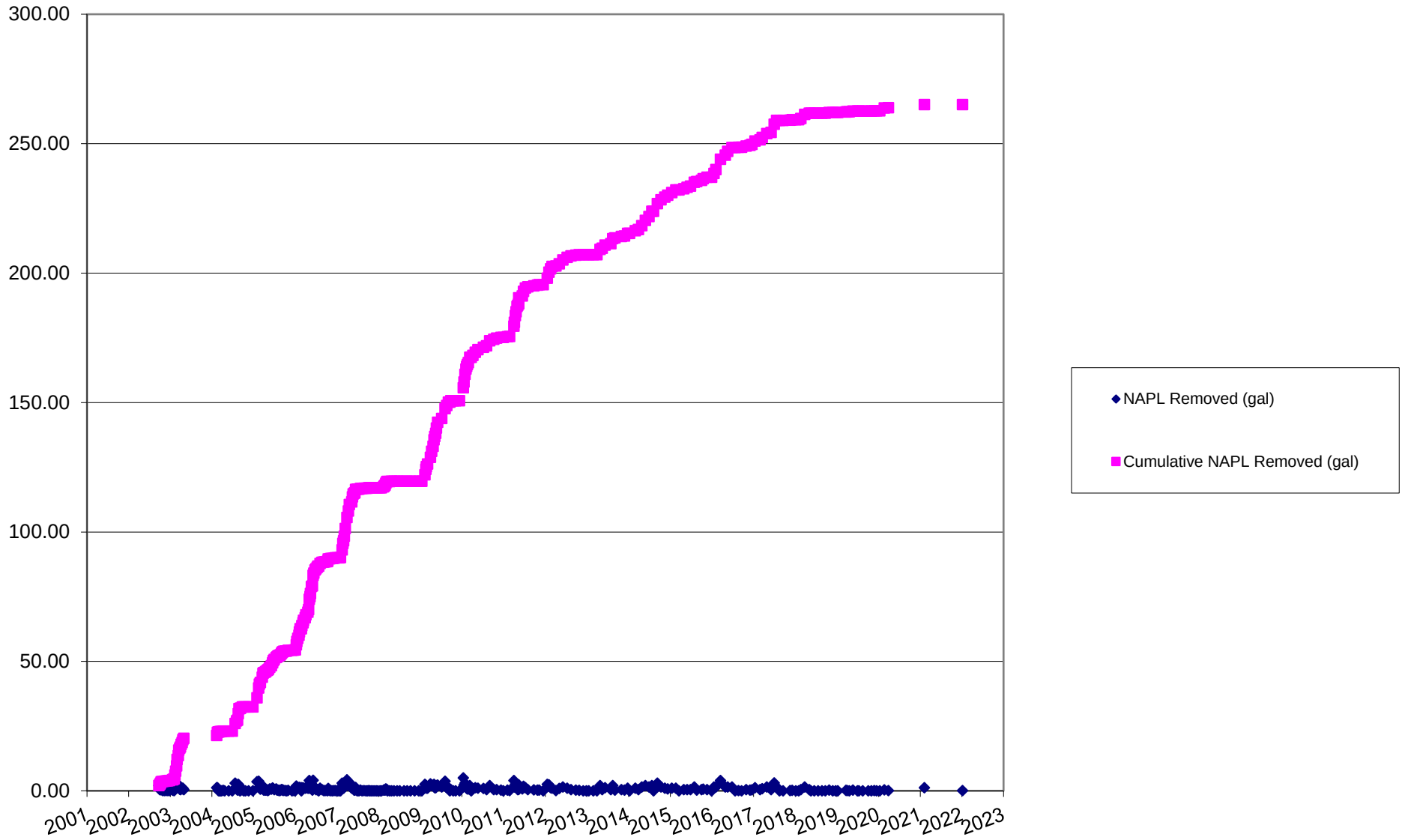
MW-19 NAPL Thickness (ft)



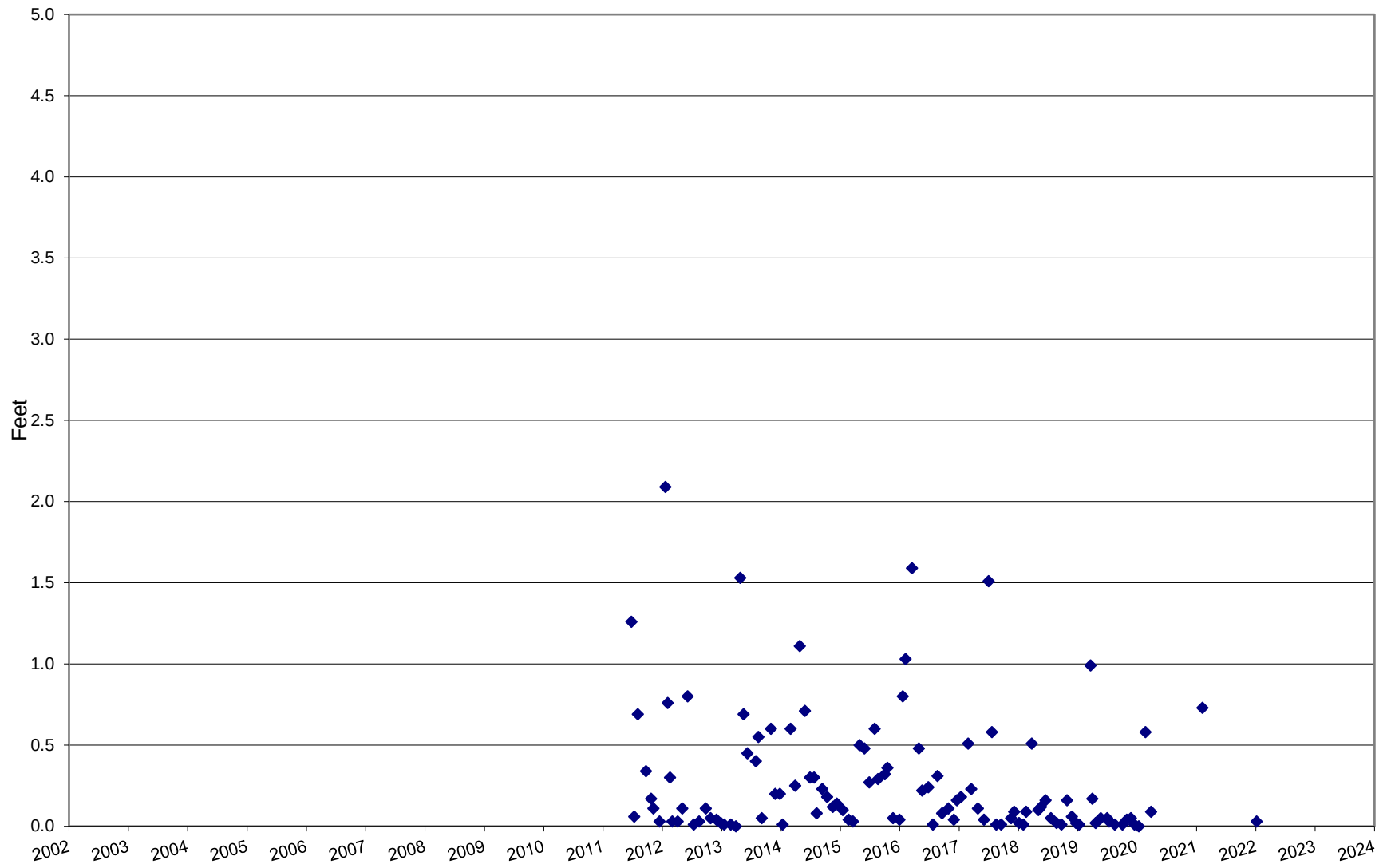
MW-20



MW-20



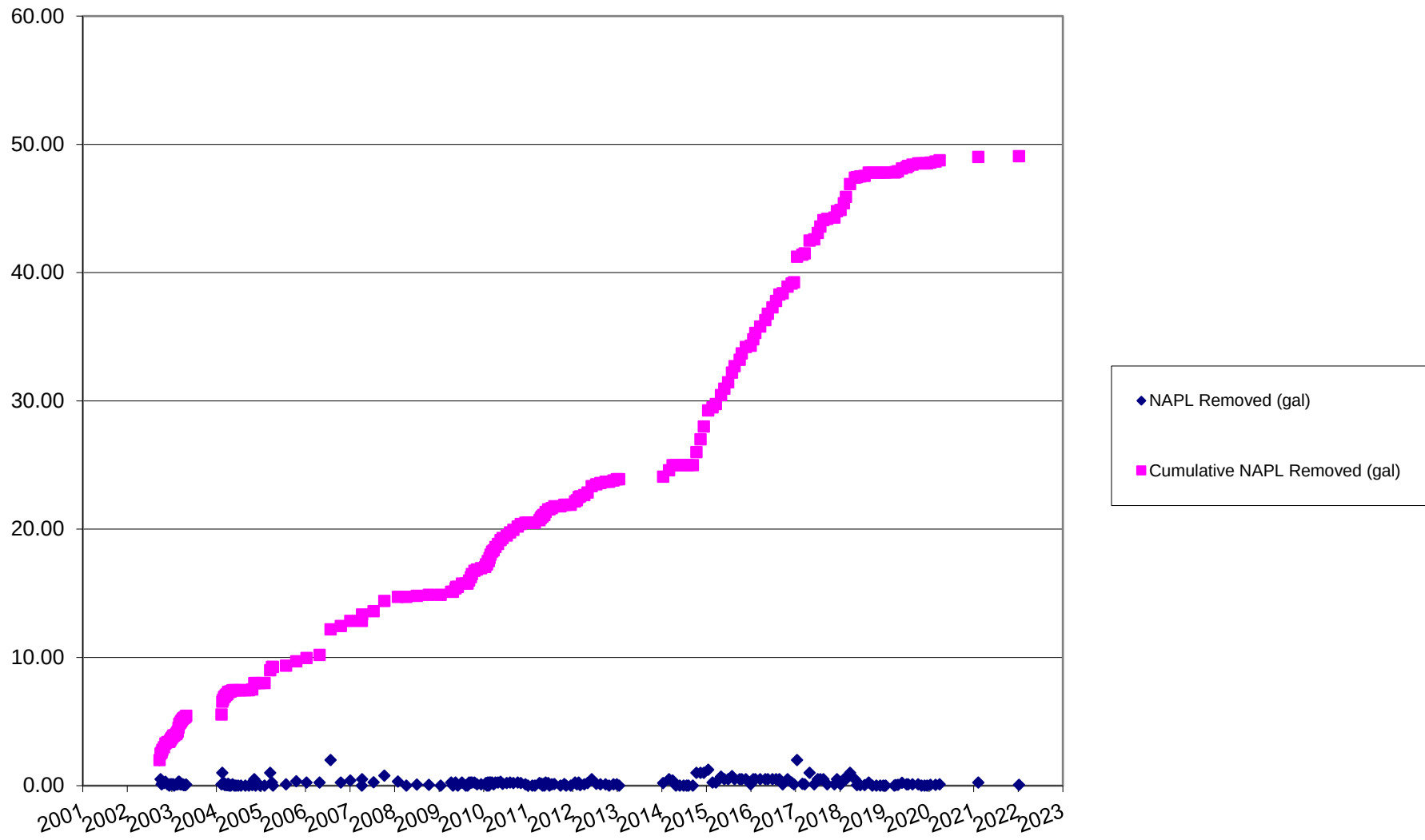
MW-20 NAPL Thickness (ft)



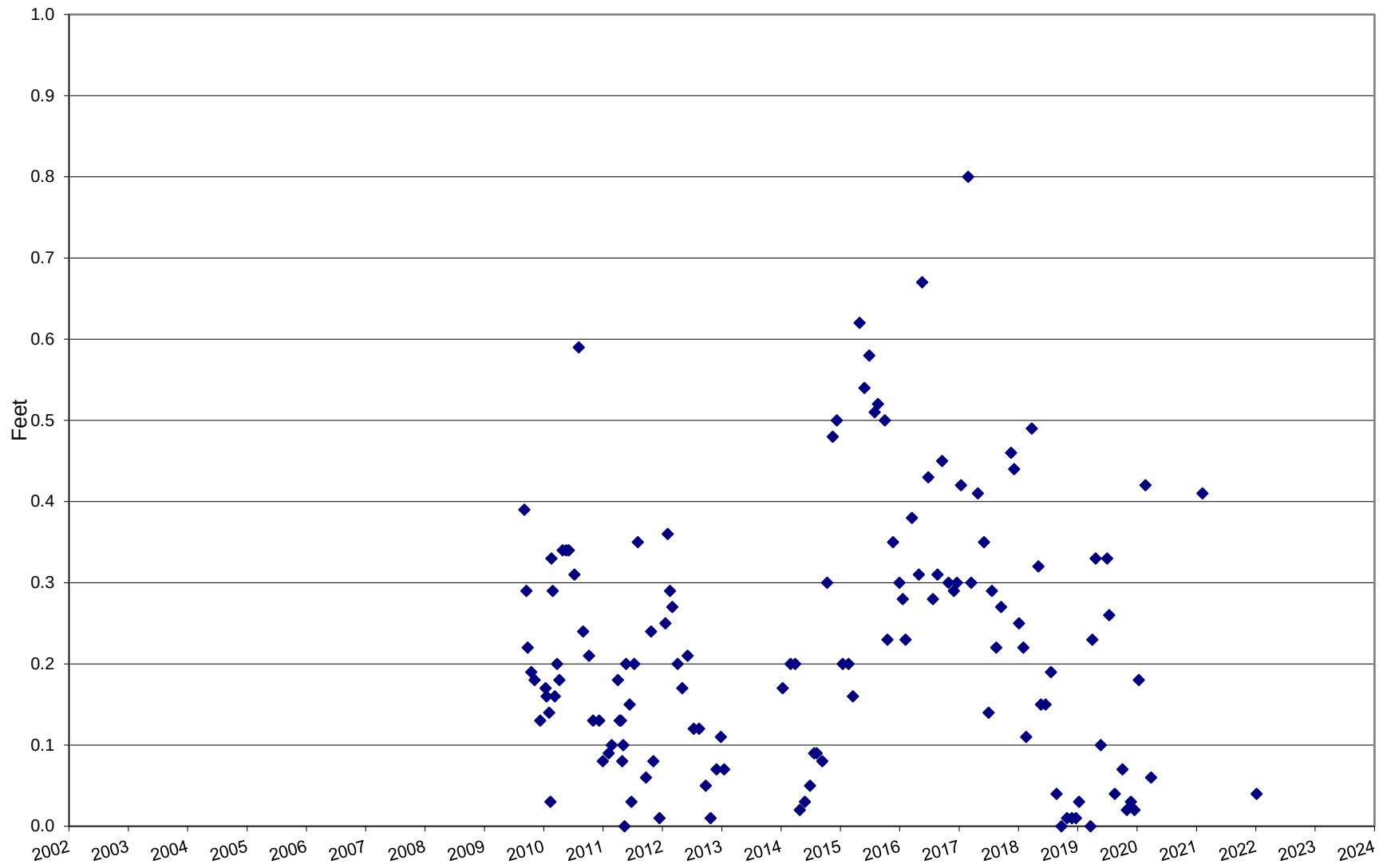
HC-10



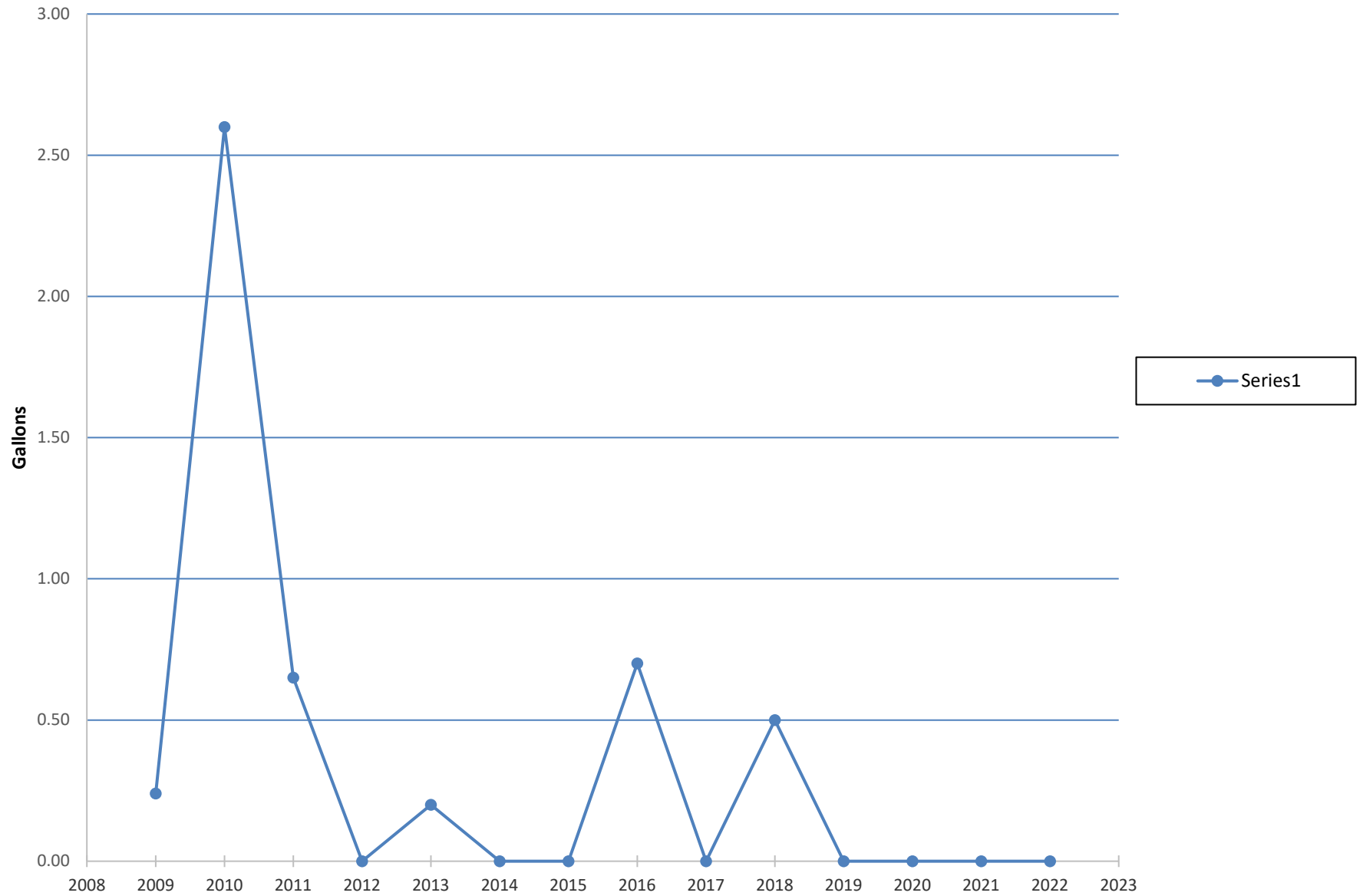
HC-10



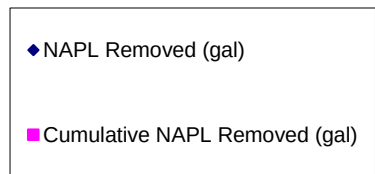
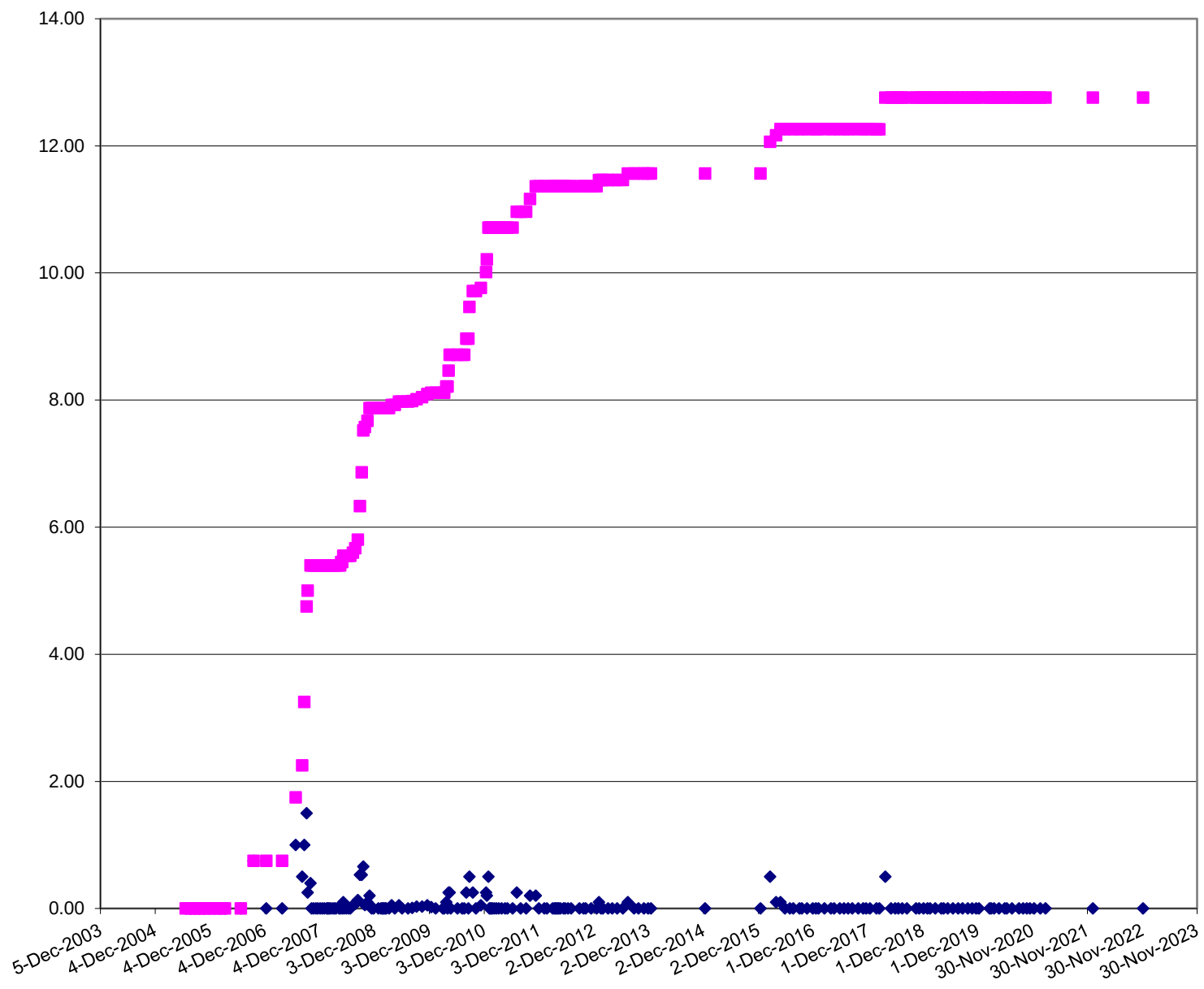
HC-10 NAPL Thickness (ft)



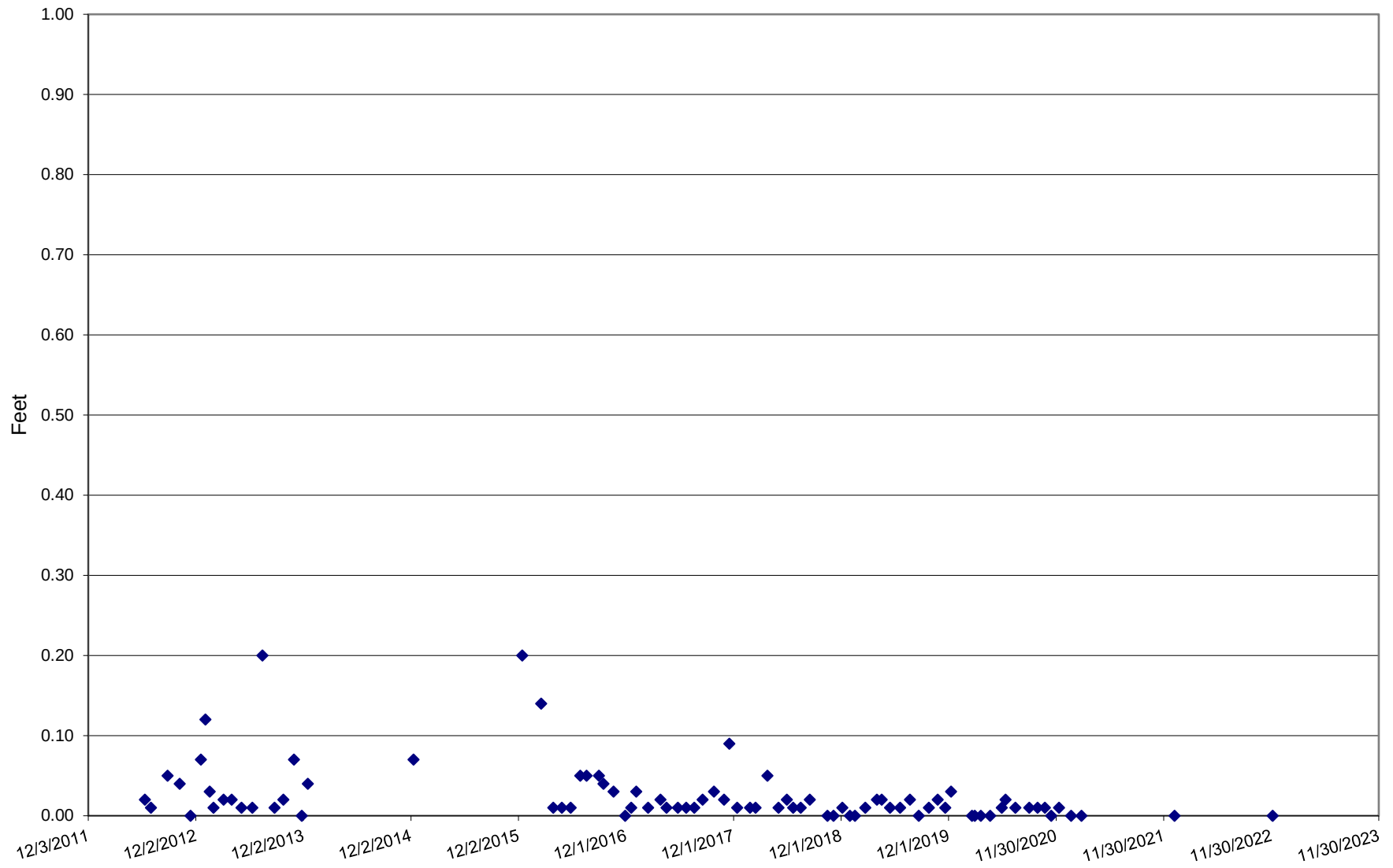
BE-4



BE-4



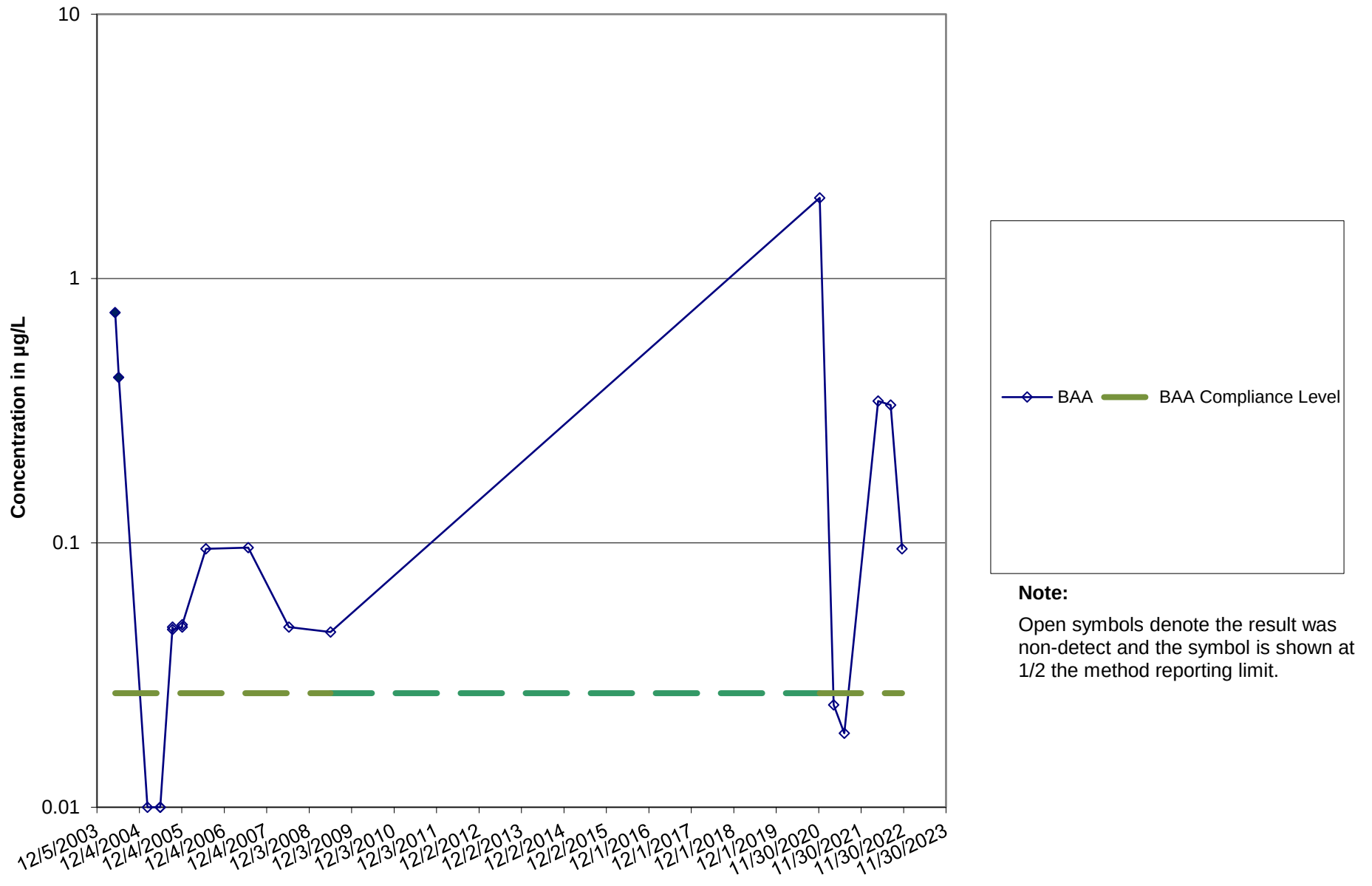
BE-4 NAPL Thickness (ft)



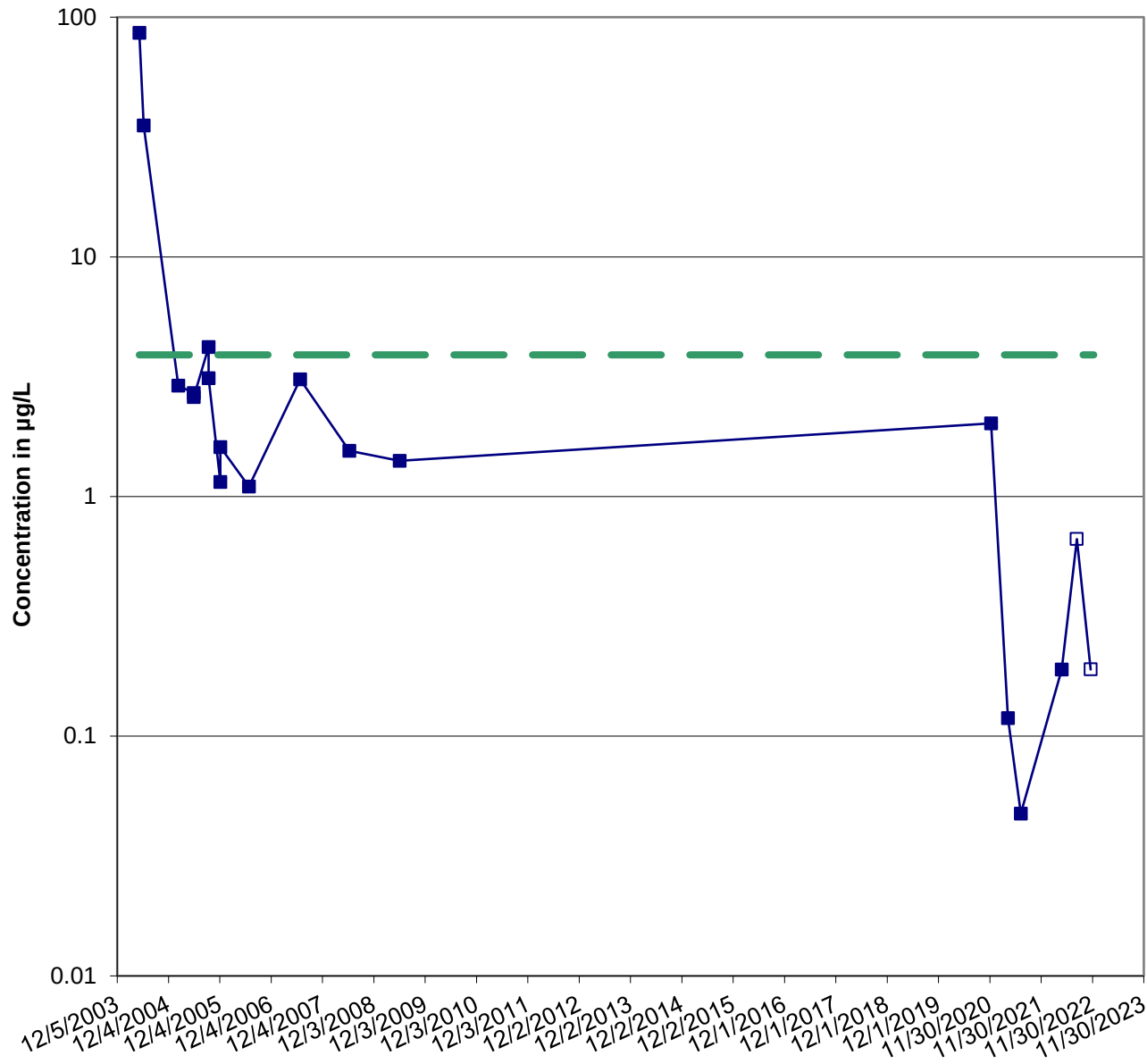
Appendix E

Chemical Concentration Versus Time Plots

HC-5



HC-5



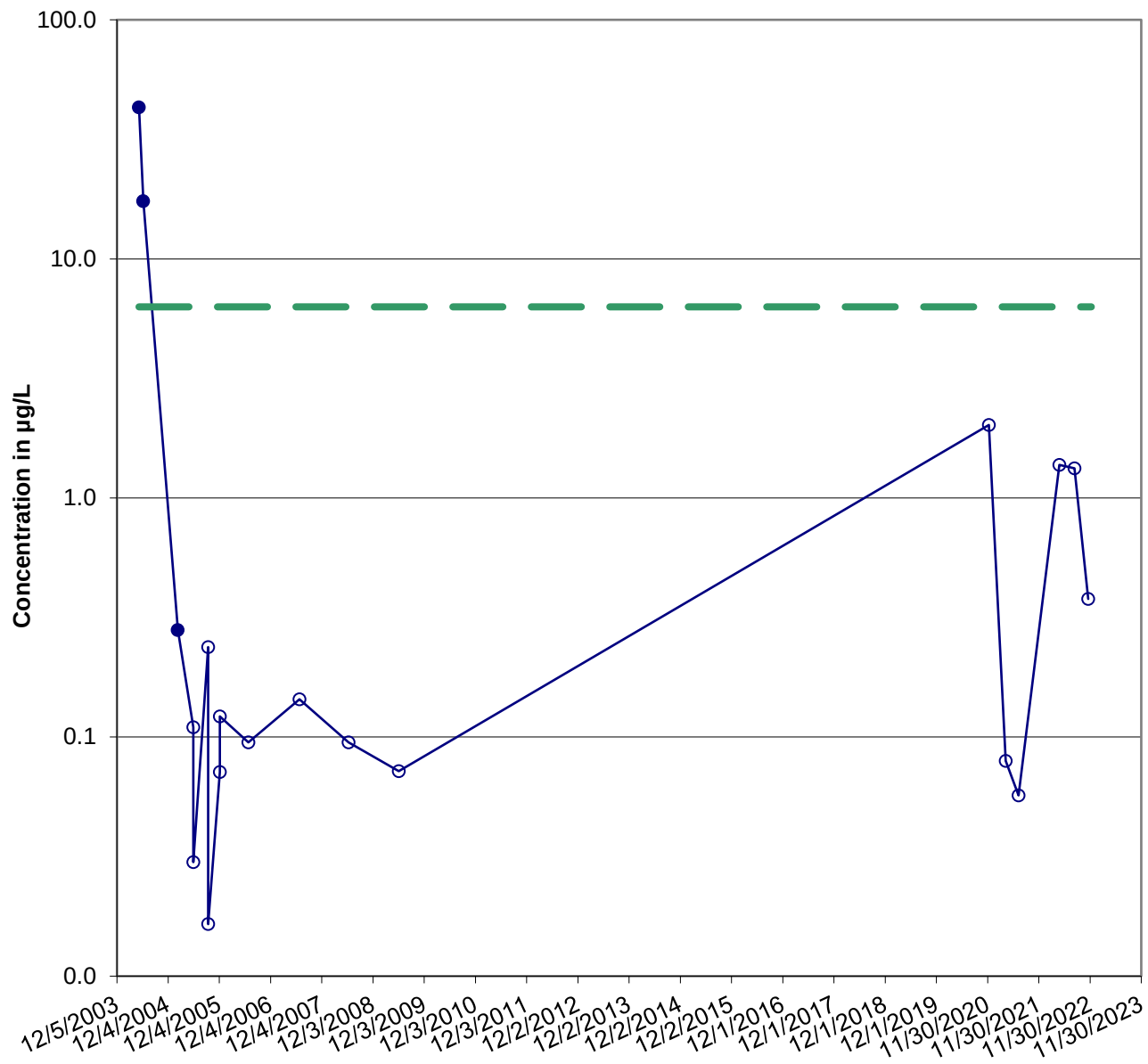
Fluorene

Fluorene Compliance Level

Note:

Open symbols denote the result was non-detect and the symbol is shown at 1/2 the method reporting limit.

HC-5



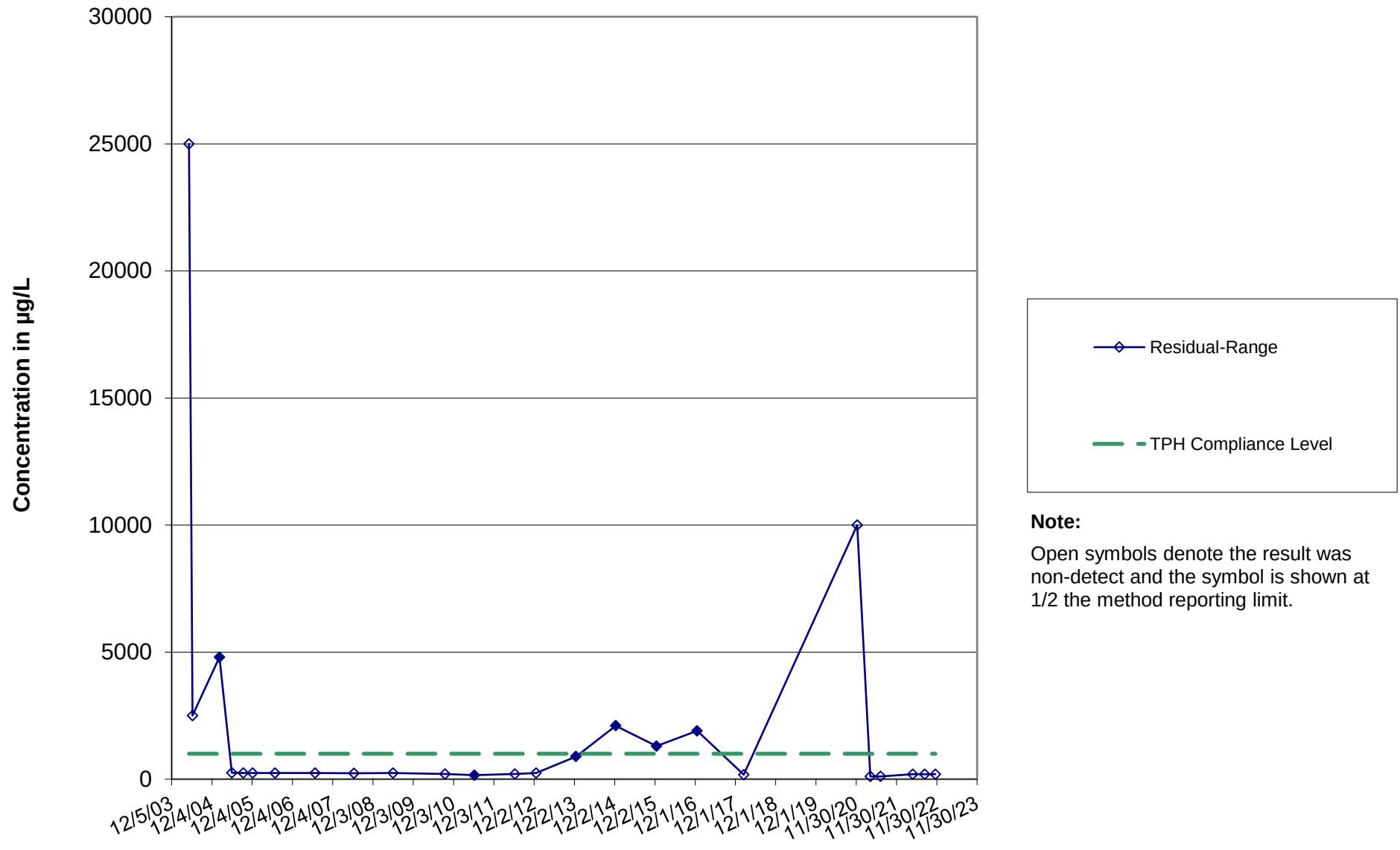
○ Phenanthrene

— Phenanthrene Compliance Level

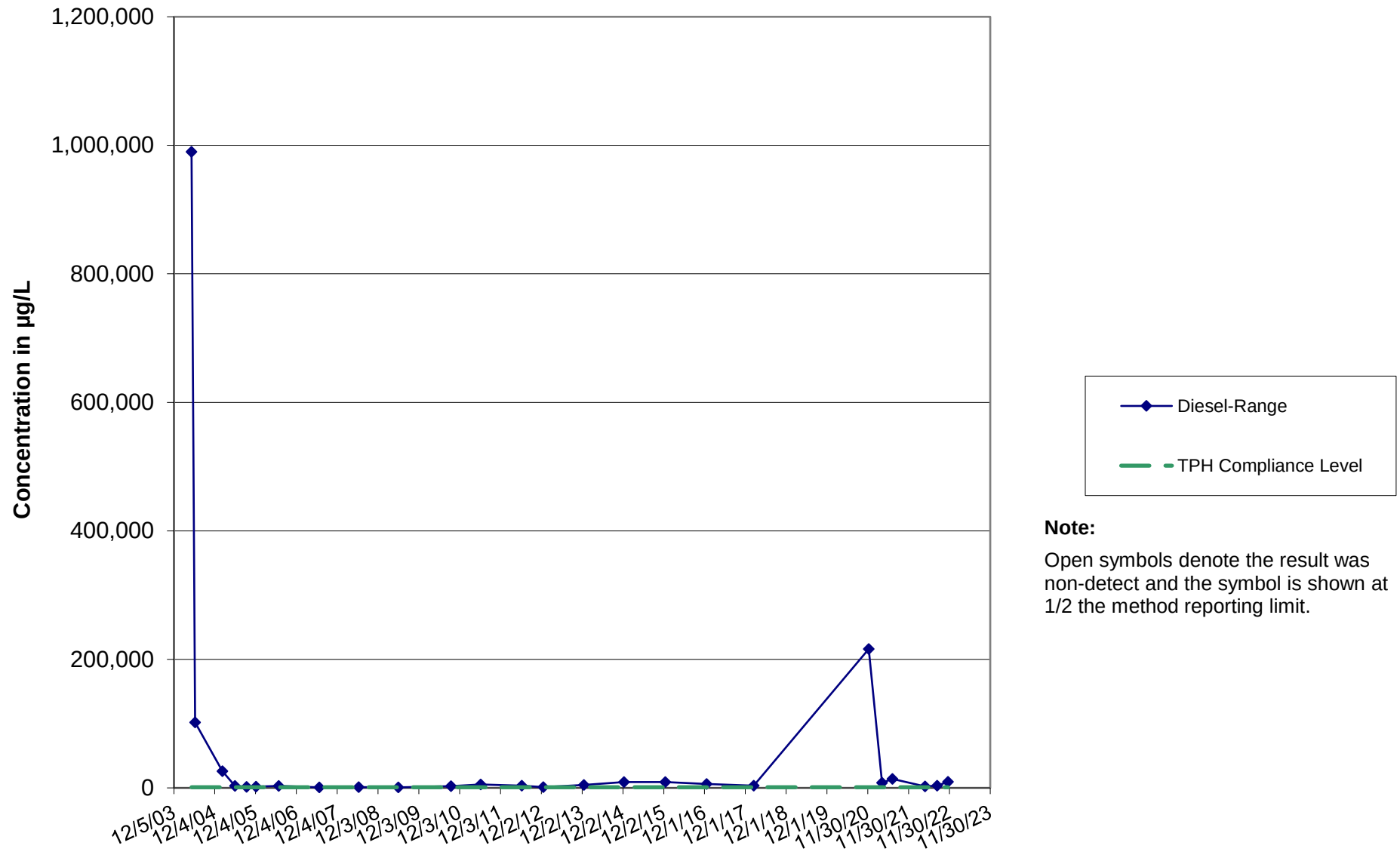
Note:

Open symbols denote the result was non-detect and the symbol is shown at 1/2 the method reporting limit.

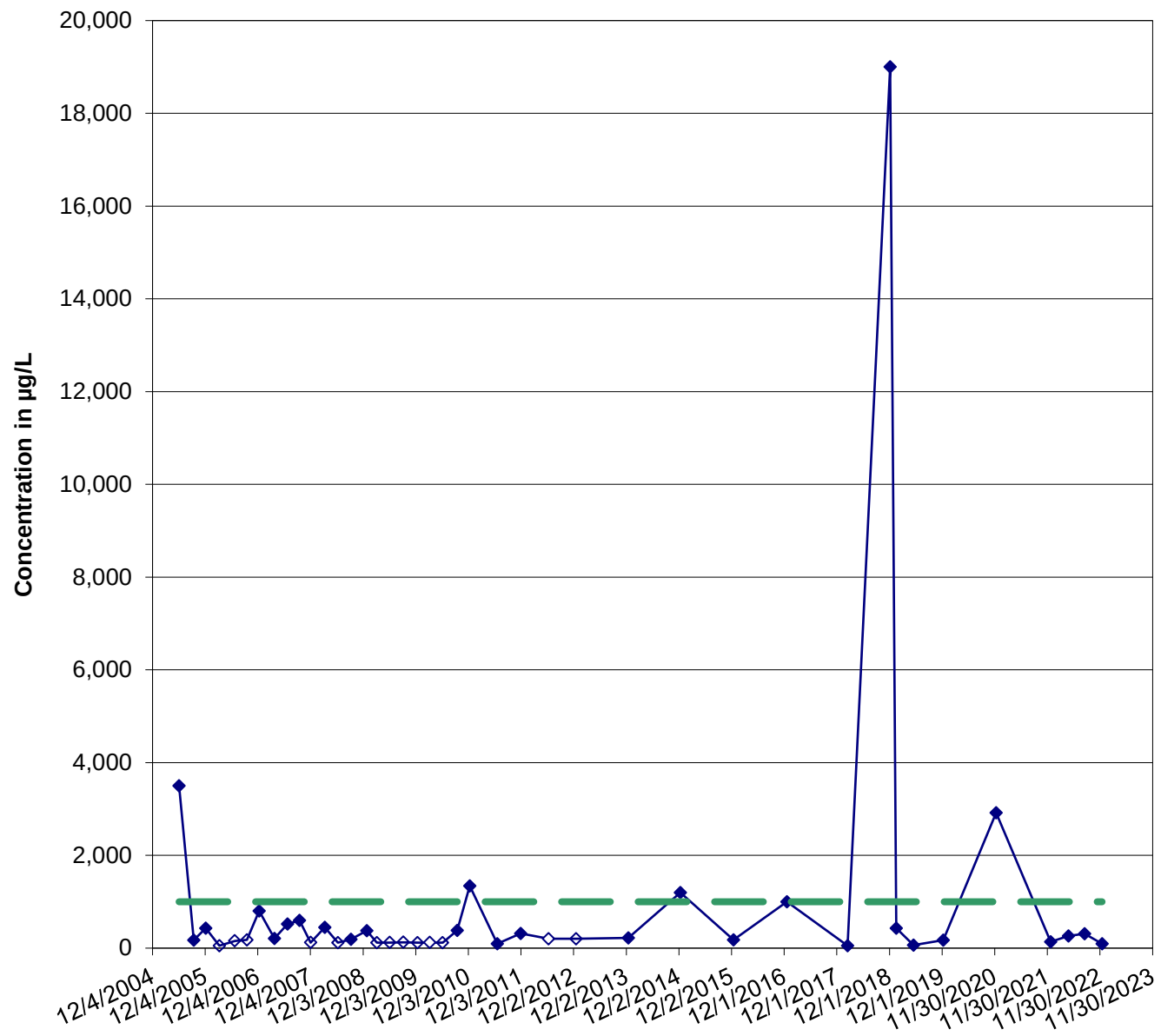
HC-5



HC-5



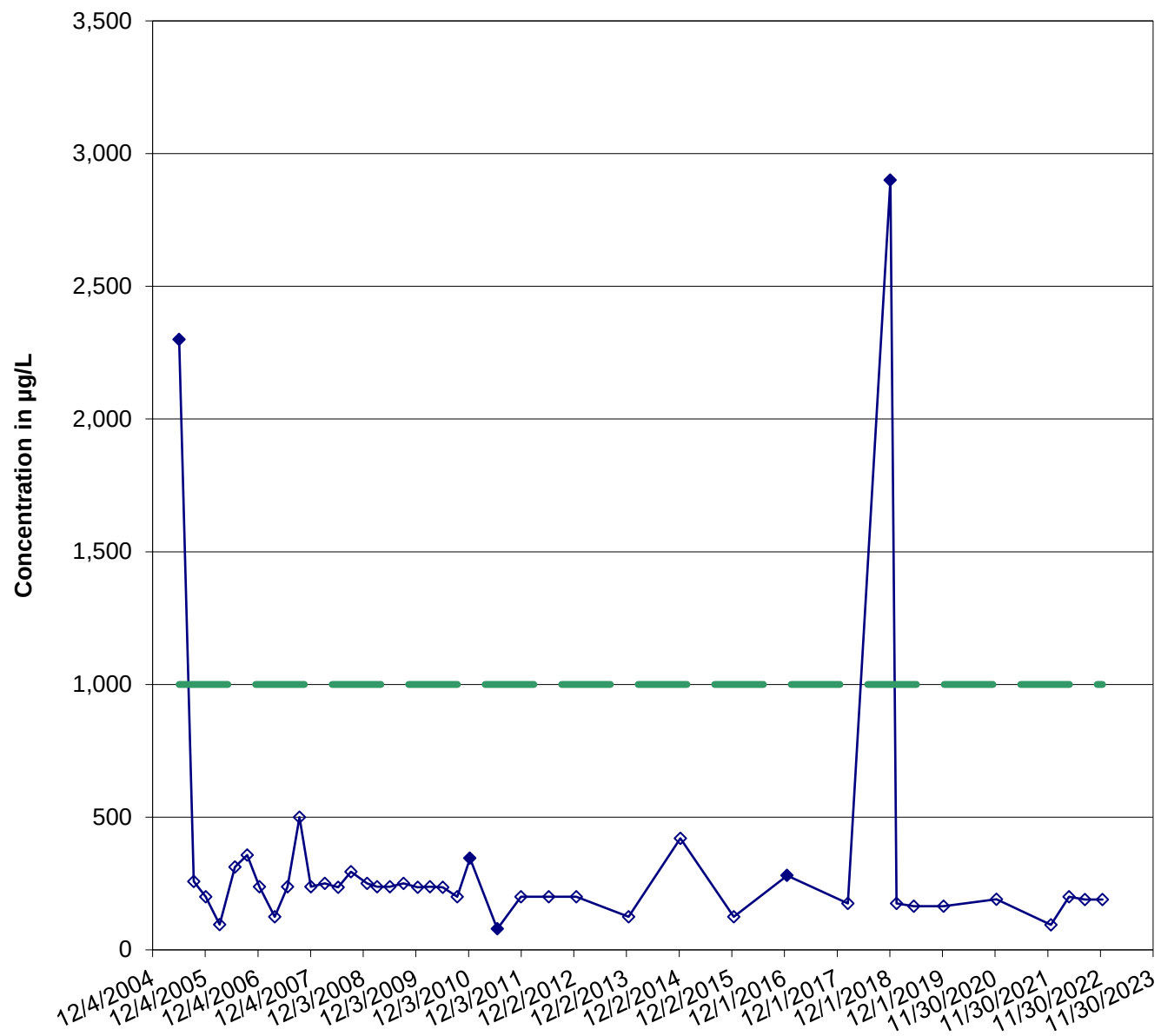
BE-1



Note:

Open symbols denote the result was non-detect and the symbol is shown at 1/2 the method reporting limit.

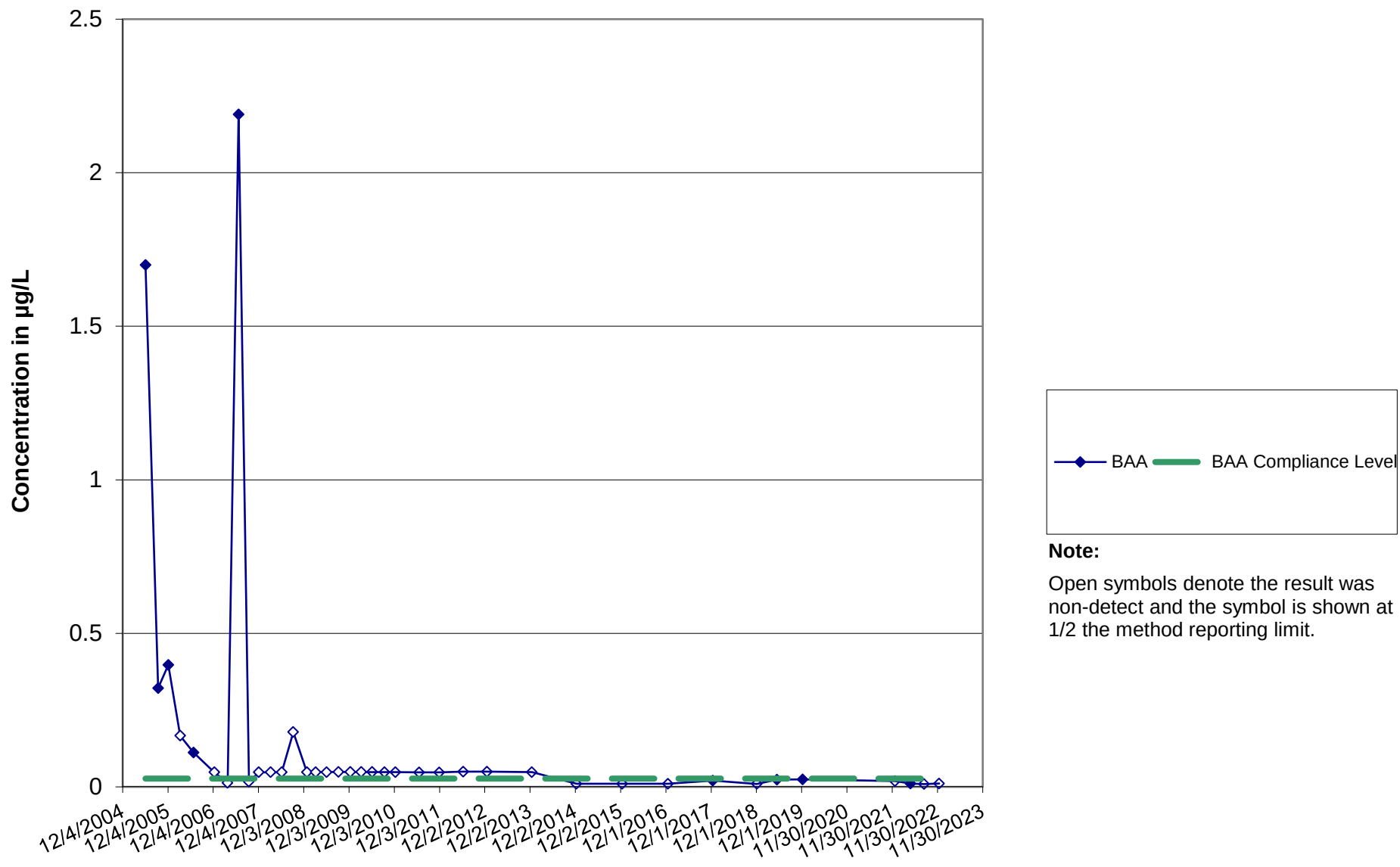
BE-1



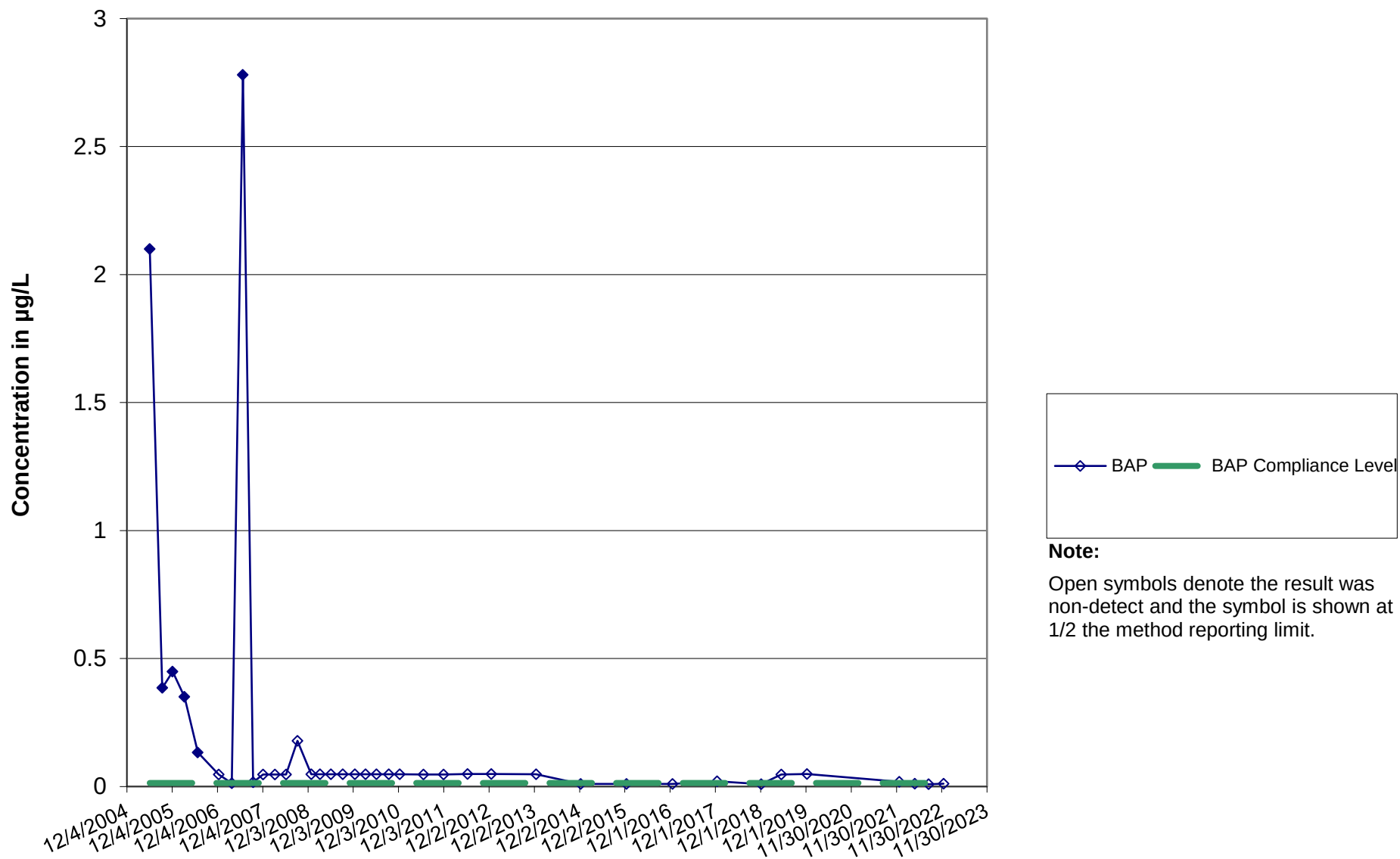
Note:

Open symbols denote the result was non-detect and the symbol is shown at 1/2 the method reporting limit.

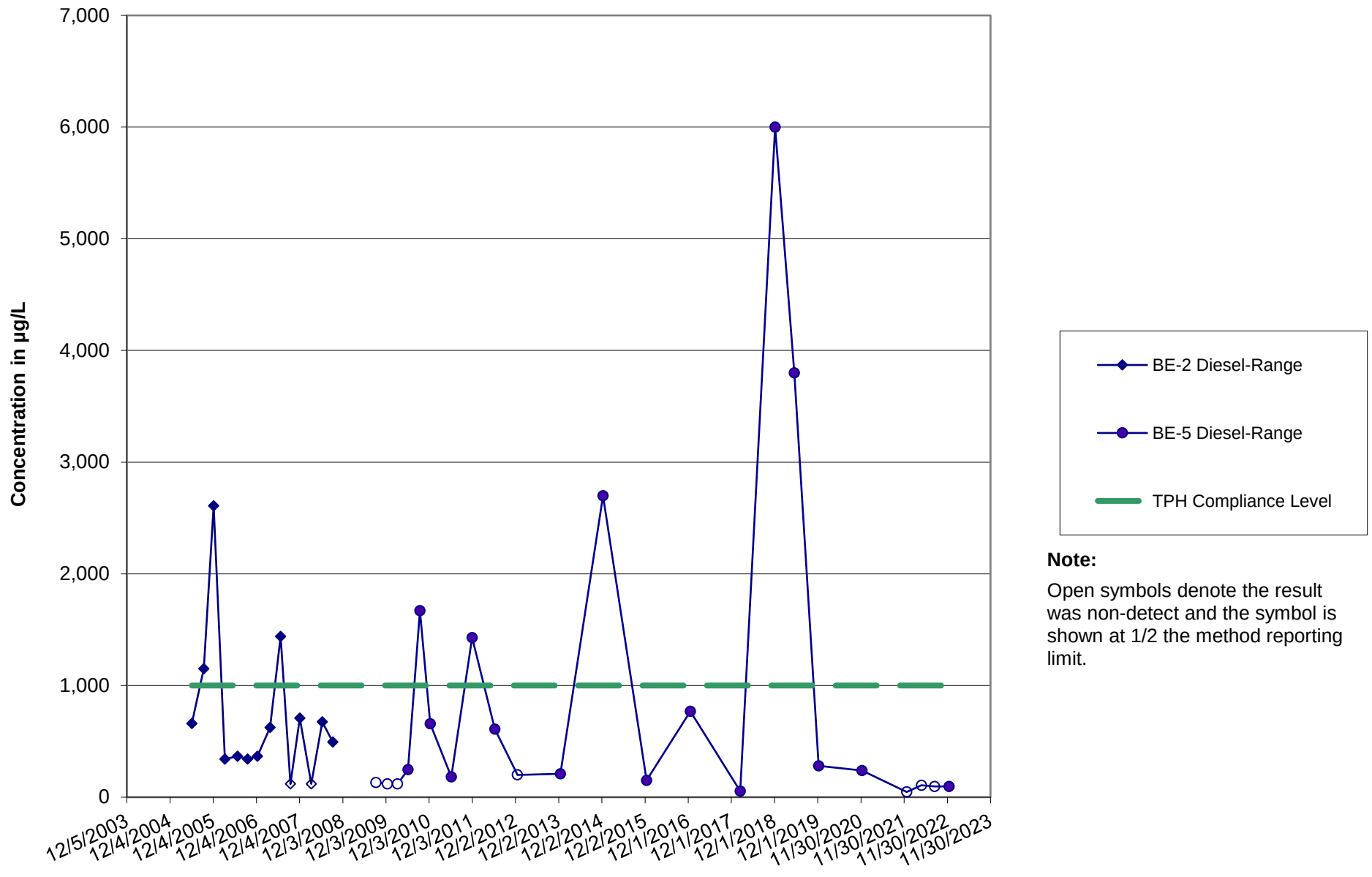
BE-1



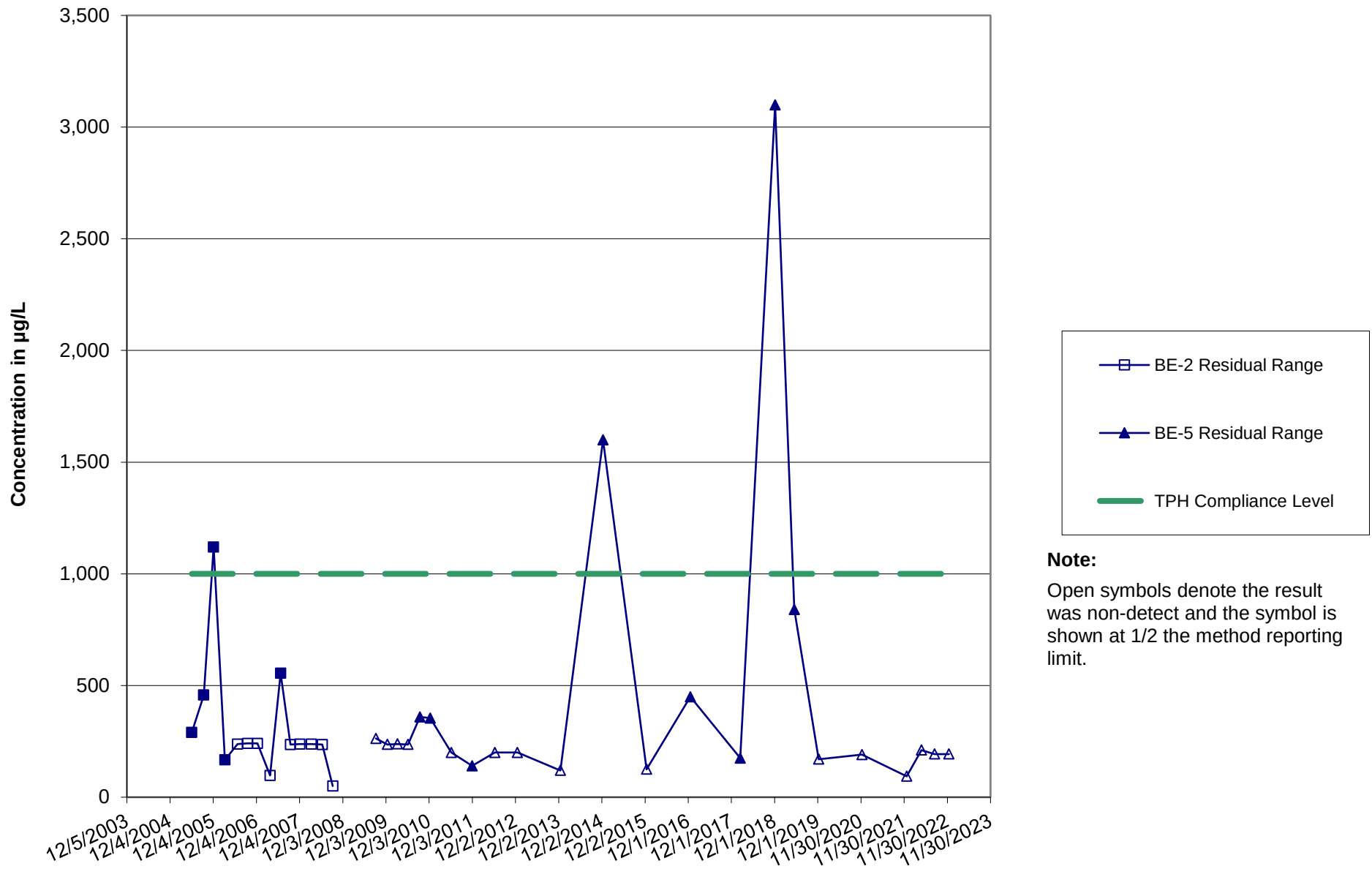
BE-1



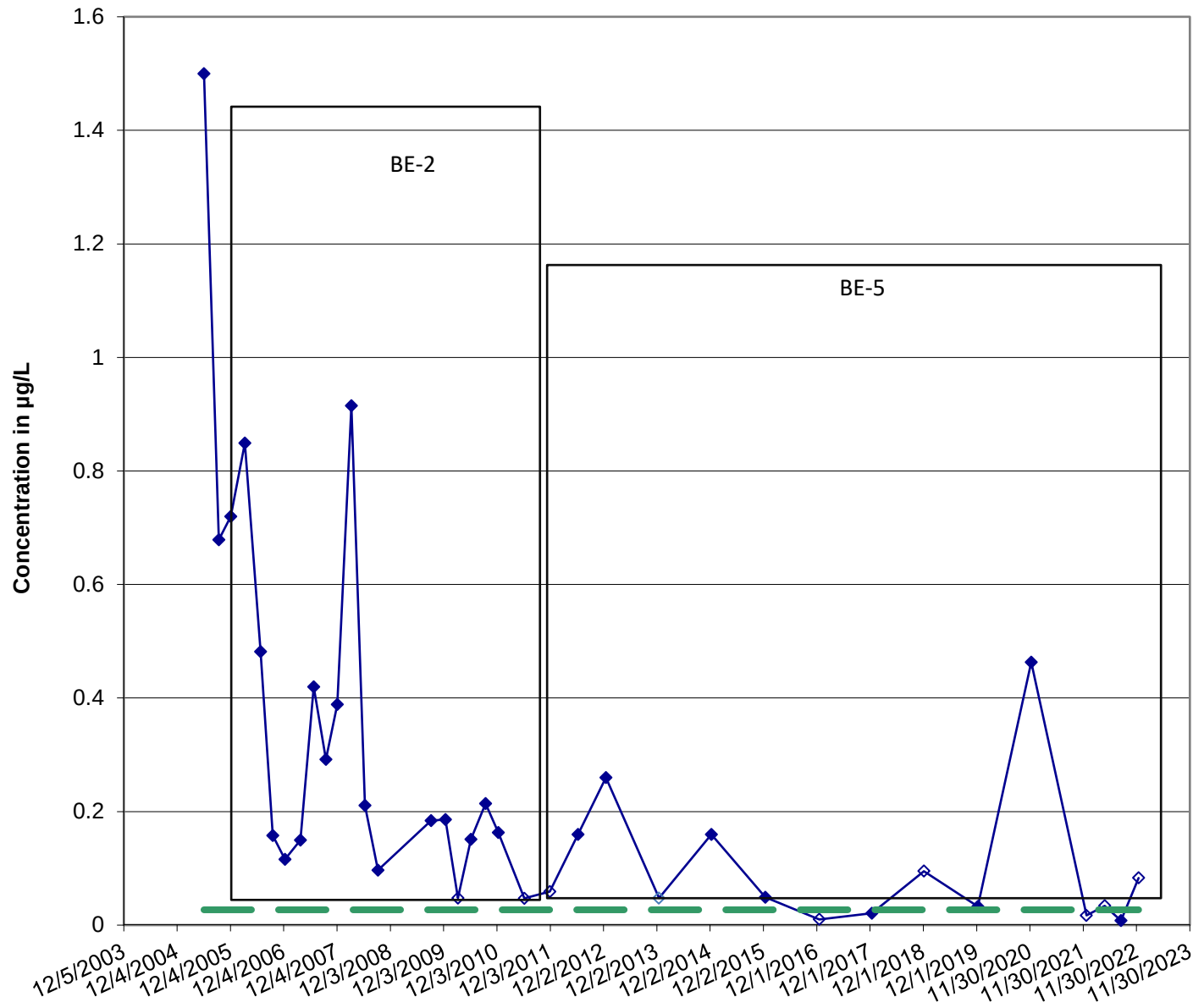
BE-2 and BE-5



BE-2 and BE-5



BE-2 and BE-5



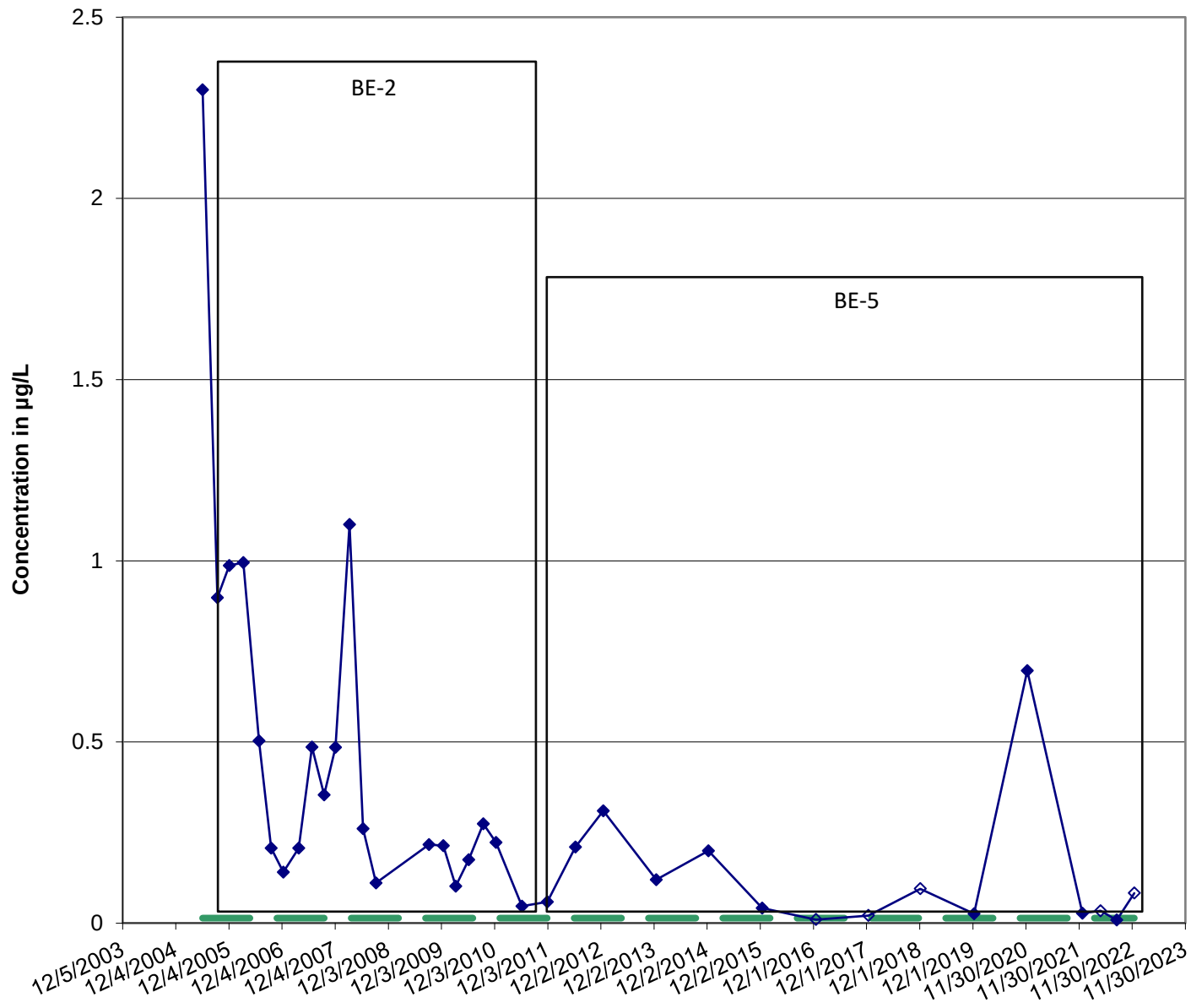
—◆— BAA

— BAA Compliance Level

Note:

Open symbols denote the result was non-detect and the symbol is shown at 1/2 the method reporting limit.

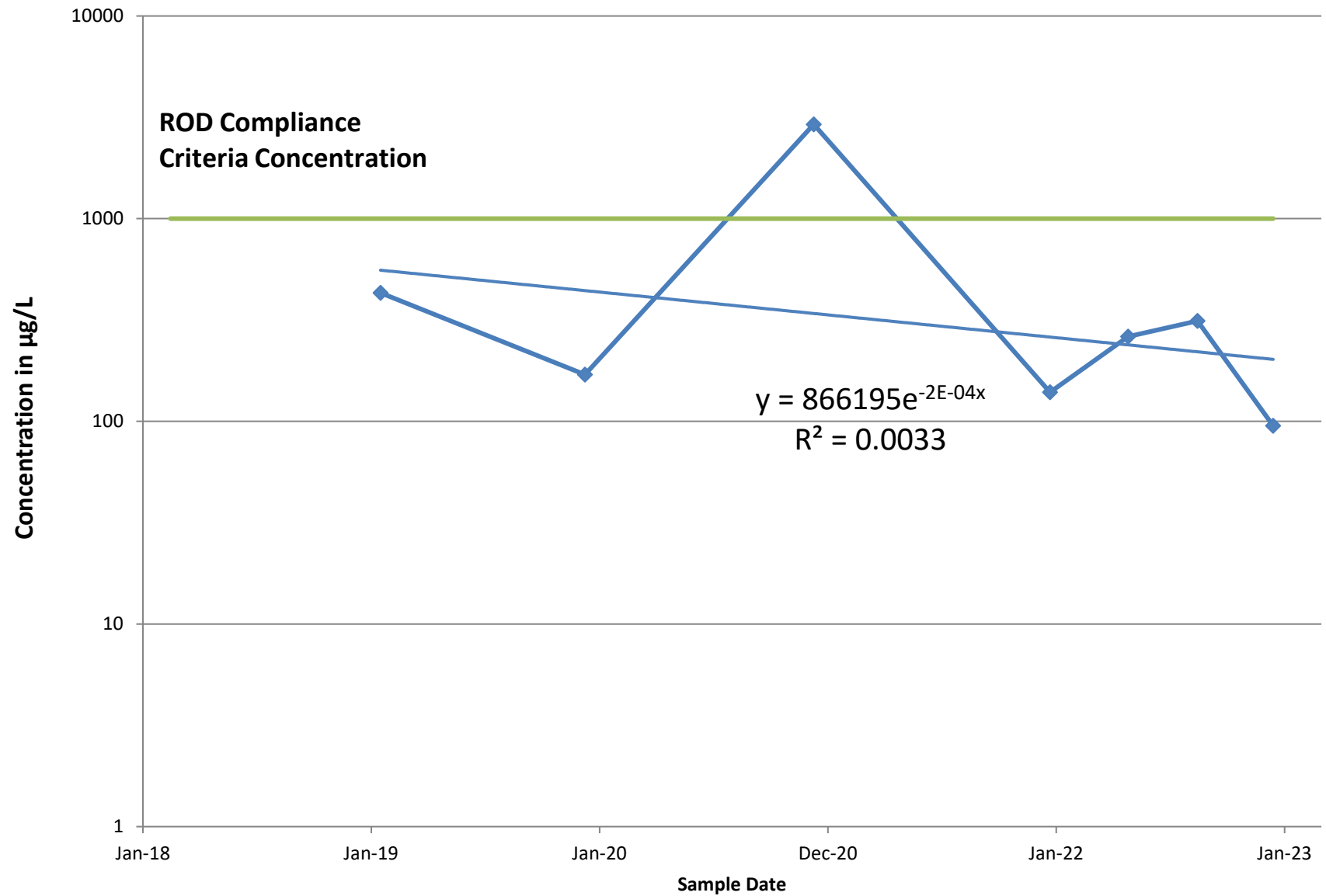
BE-2 and BE-5



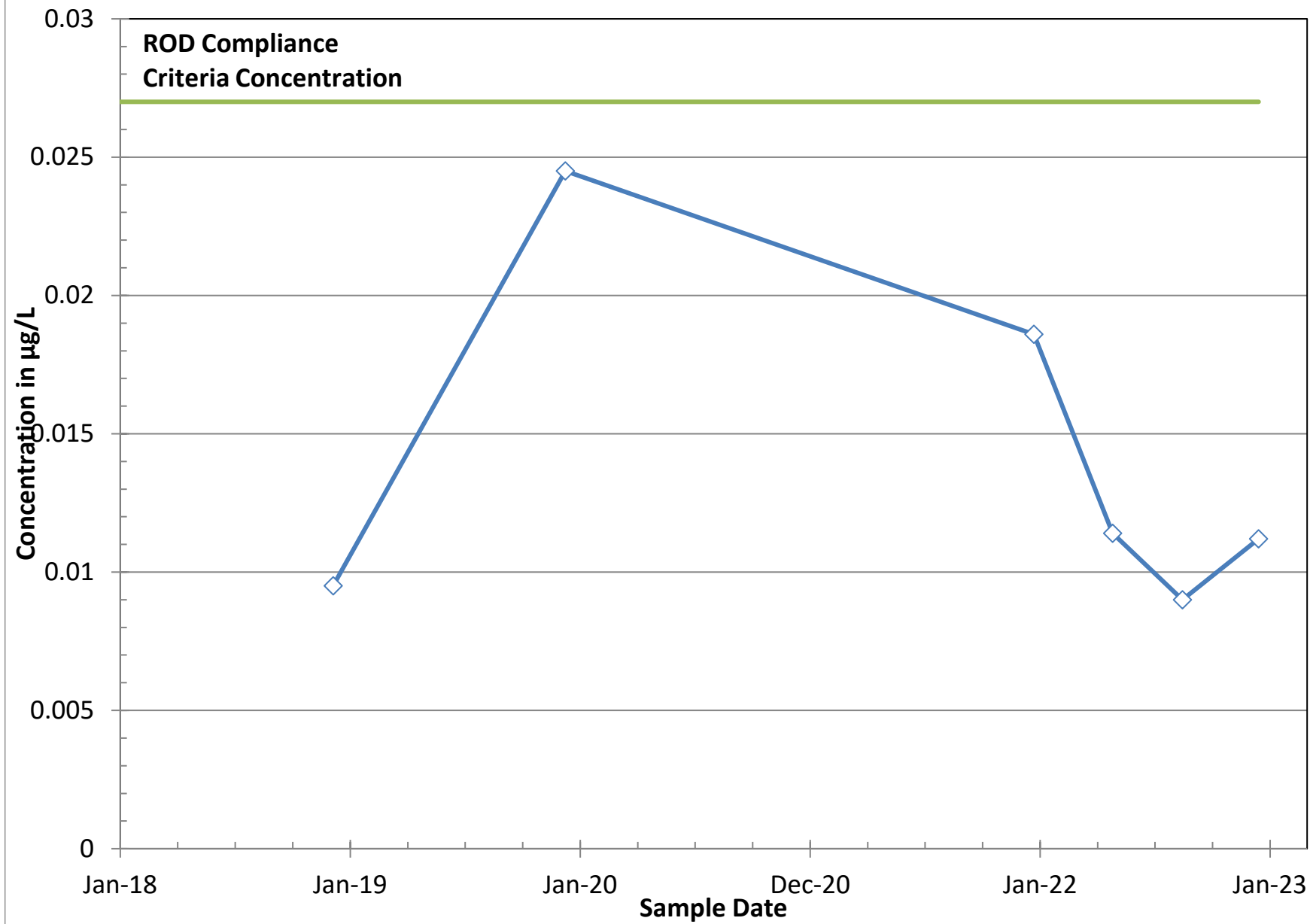
Appendix F

Four-Year Chemical Concentration Trend Plots

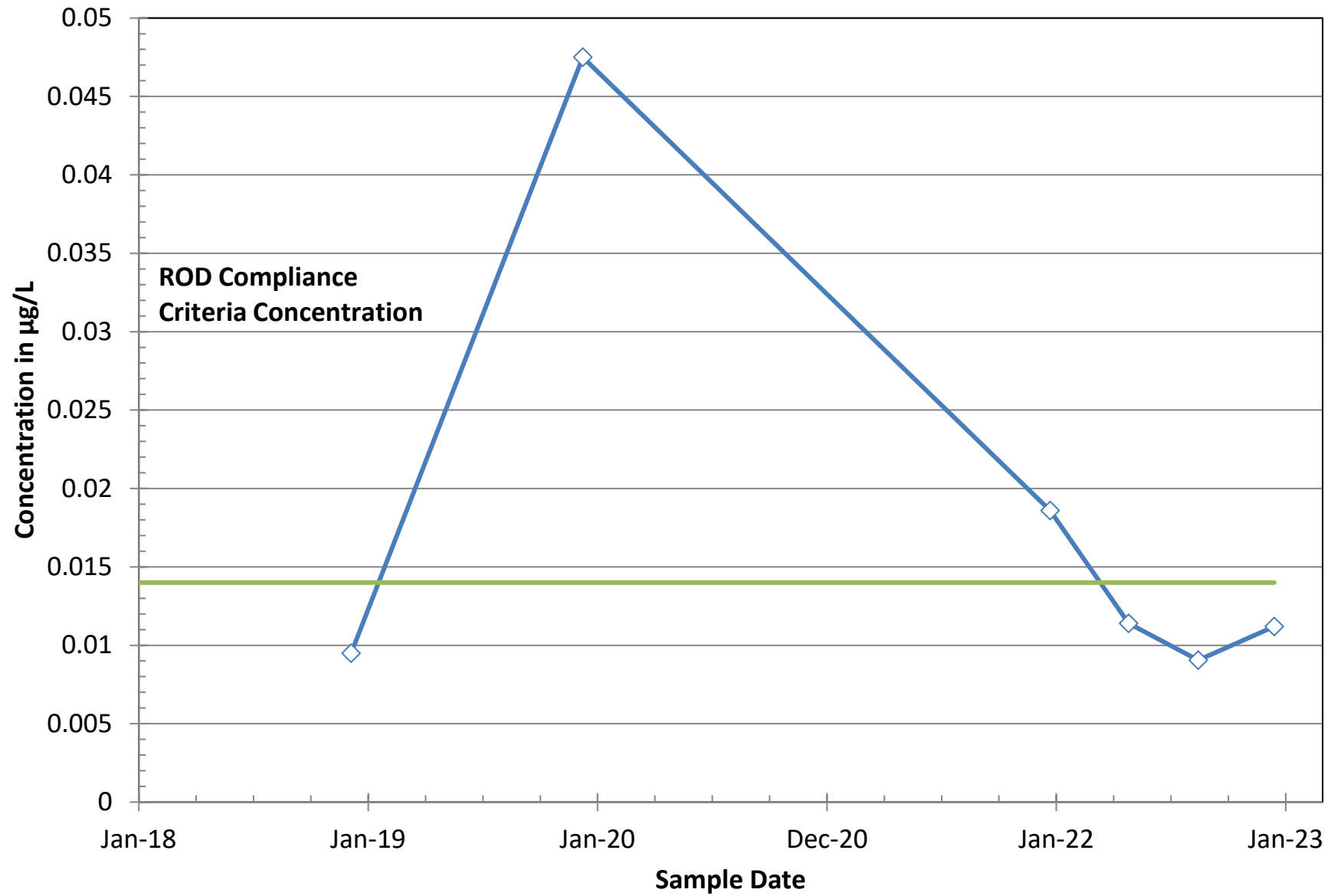
BE-1 TPH



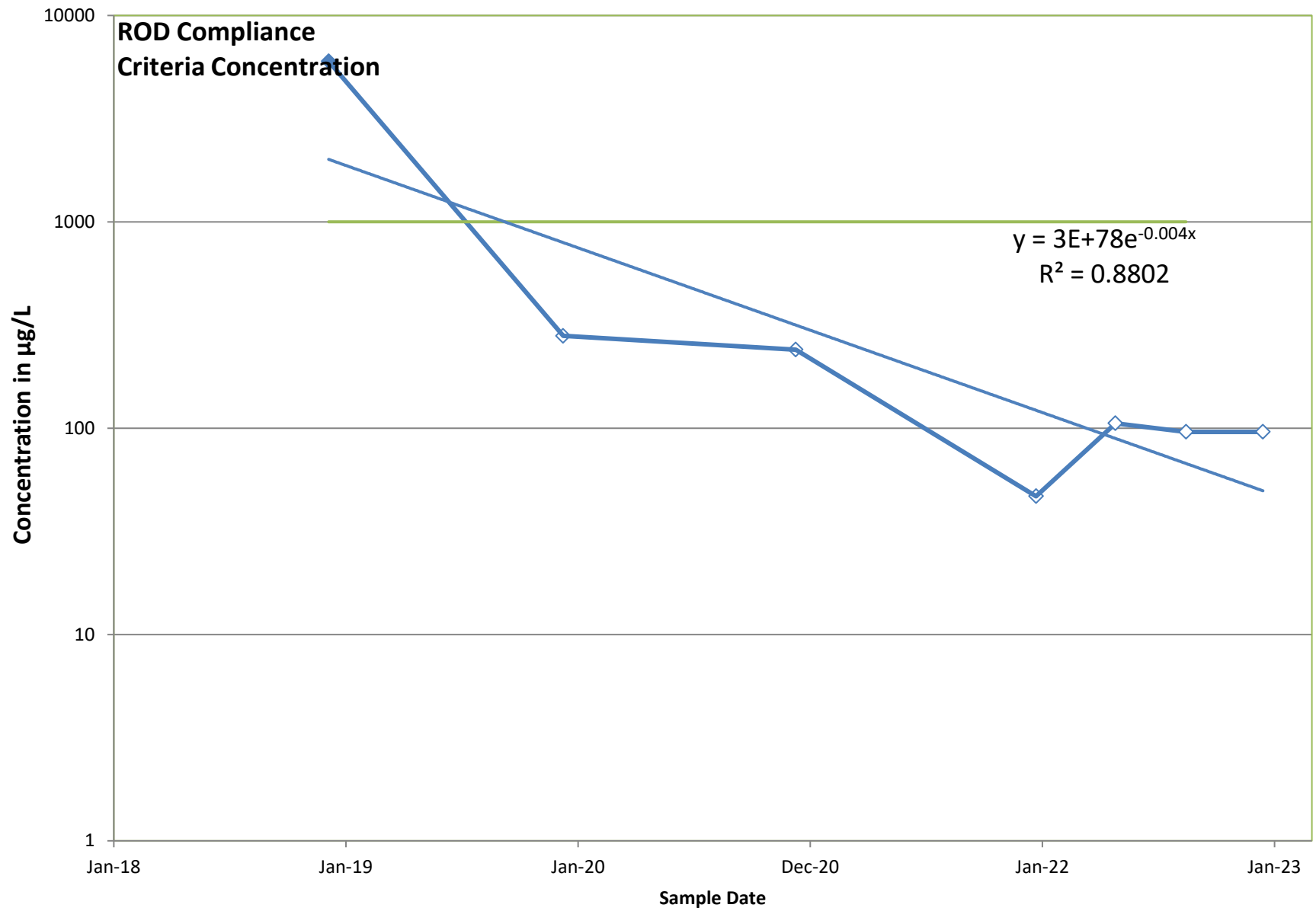
BE-1 BAA



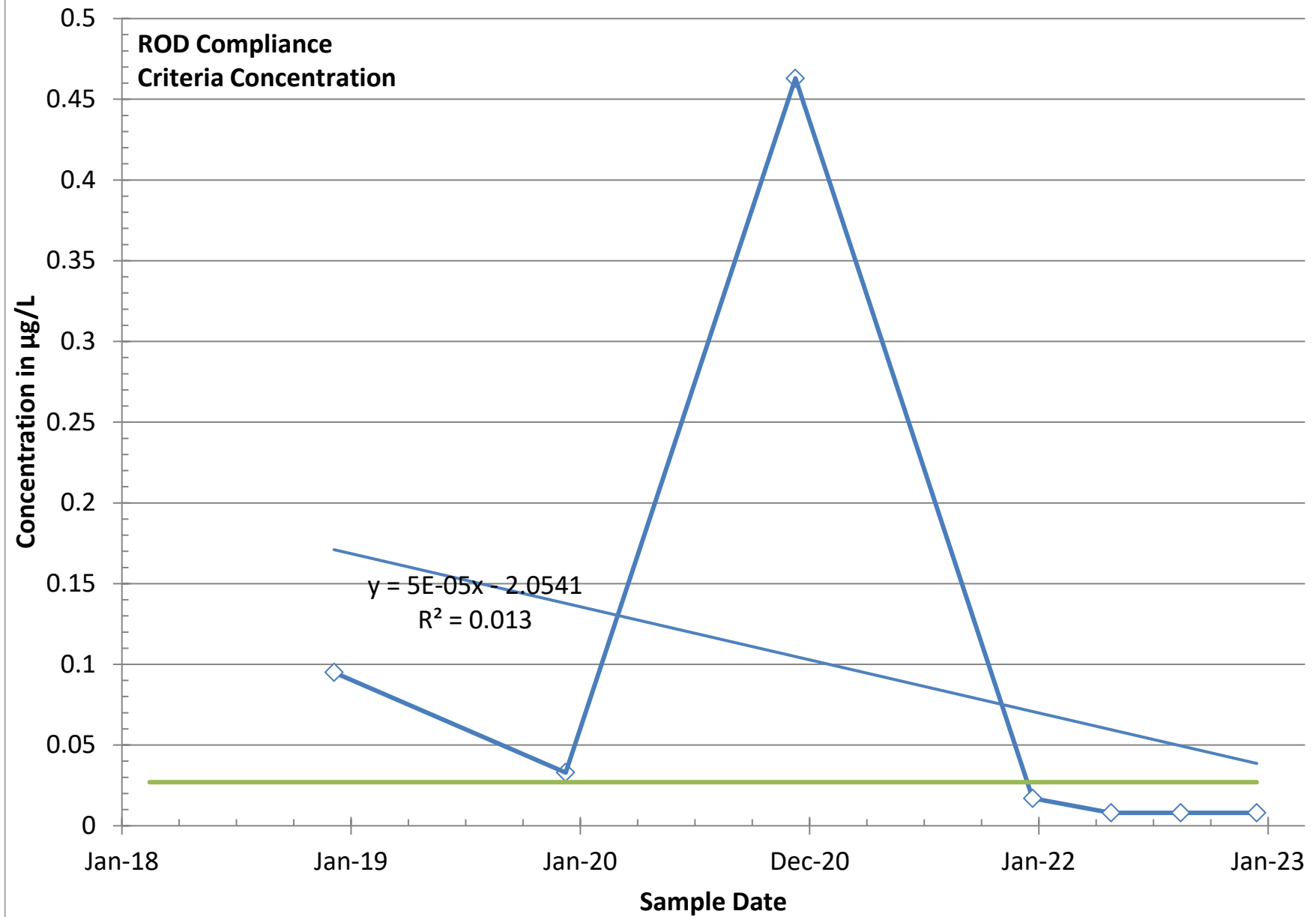
BE-1 BAP



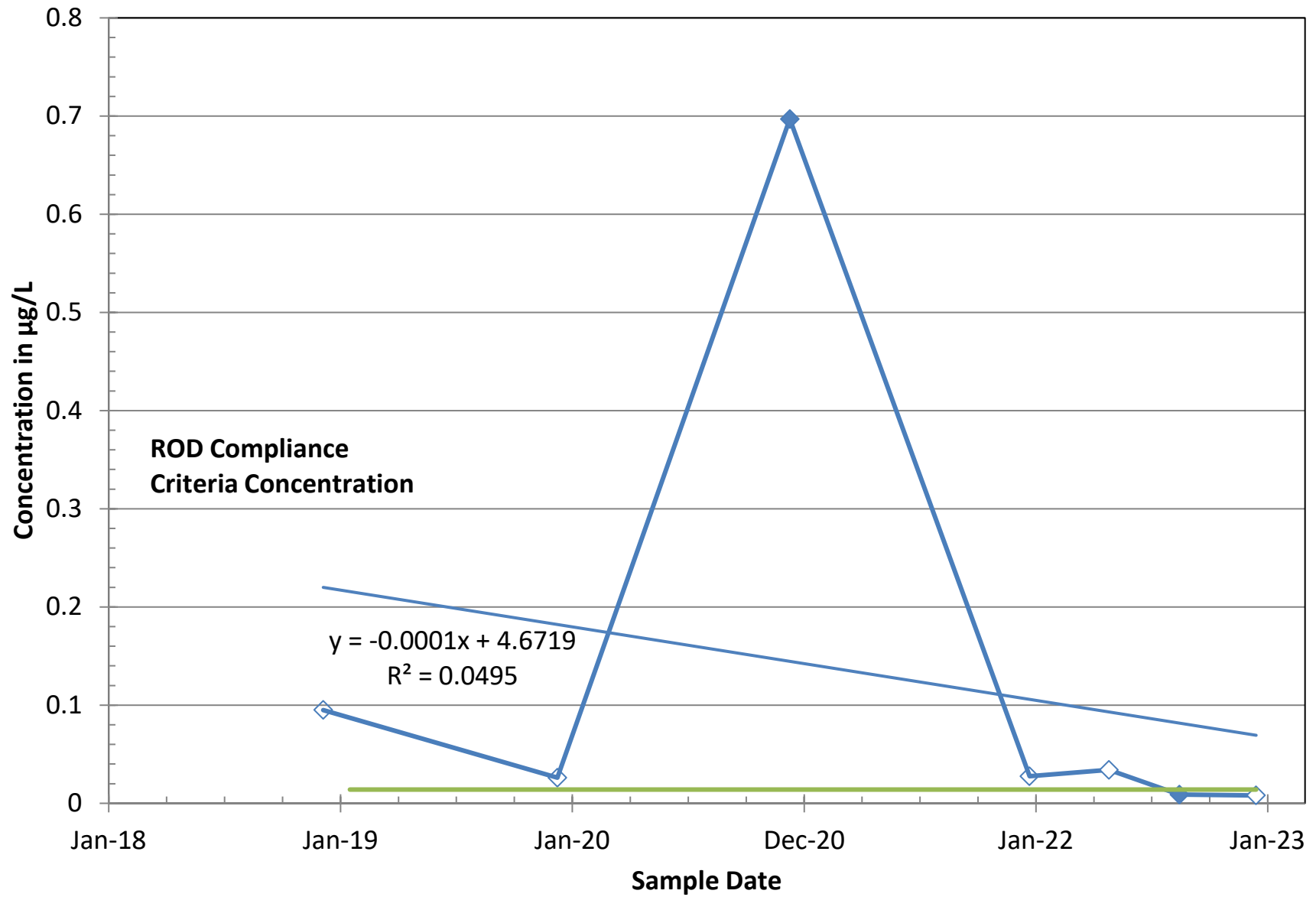
BE-5 TPH



BE-5 BAA



BE-5 BAP



HC-5 TPH-D

