

TERMINAL 30 2022 ANNUAL SITE PERFORMANCE REPORT – YEAR 3

Terminal 30 Site

February 2024



2022 Annual Terminal 30 Site Performance Report

Port of Seattle
Terminal 30 Site

Project number: 60681370

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Quality information

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Acronyms and Abbreviation

| | |
|-------------|--|
| µg/L | microgram per liter |
| AECOM | AECOM Technical Services, Inc. |
| AS | air sparging |
| BTEX | benzene, toluene, ethyl-benzene, and total xylenes |
| CAP | Cleanup Action Plan |
| CD | Consent Decree |
| CMP | Groundwater Compliance Monitoring Plan |
| cPAH | carcinogenic polynuclear aromatic hydrocarbon |
| CPOC | conditional point of compliance |
| COI | contaminant of interest |
| COC | contaminant of concern |
| CRETE | CRETE Consulting |
| CUL | cleanup level |
| DO | dissolved oxygen |
| DTW | depth to water |
| T30 or Site | Terminal 30 |
| EC | equivalent carbons |
| Ecology | Washington State Department of Ecology |
| EDR | Engineering Design Report |
| EPA | United States Environmental Protection Agency |
| ft | foot/feet |
| H2K | H2K Solutions Inc. |
| IHS | indicator hazardous substance |
| LCS/LCSD | laboratory control sample/ laboratory control sample duplicate |
| LNAPL | light non-aqueous phase liquid |
| MDL | method detection limit |
| MRL | method reporting limit |
| MS/MSD | matrix spike/ matrix spike duplicate |
| NAD83 | North American Datum of 1983 (horizontal) |
| NAVD88 | North American Vertical Datum of 1988 |
| NOAA | National Oceanic and Atmospheric Administration |
| NOC | notice of construction |
| ORP | oxidation-reduction potential |
| PID | photoionization detector |
| Port | Port of Seattle |
| PPMV | parts per million by volume |
| PSCAA | Puget Sound Clean Air Agency |
| QA | quality assurance |
| QAPP | Quality Assurance Project Plan |
| QC | quality control |
| RI/FS | Remedial Investigation/Feasibility Study |
| REL | remediation level |
| RPD | relative percent difference |
| scfm | standard cubic feet per minute |
| SOP | standard operating procedure |
| SVE | soil vapor extraction |
| TEF | toxicity equivalency factor |
| TEQ | toxic equivalent concentration |
| TPH | total petroleum hydrocarbons |
| TPH-Dx | total petroleum hydrocarbons – diesel and lube oil range |
| TPH-Gx | total petroleum hydrocarbons – gasoline range |
| VOC | volatile organic compound |
| WAC | Washington Administrative Code |

1. Introduction

In 2019 the Port of Seattle (Port), under the oversight of Washington State Department of Ecology (Ecology), completed construction of the selected cleanup action alternative at the Terminal 30 project site (T30, Site), located at 1901 East Marginal Way South in Seattle, Washington (Figure 1), to satisfy requirements of the Consent Decree (CD) between Ecology and the Port, filed July 19, 2017 (Ecology, 2017). Details of the construction action are documented in the Construction Completion Report (CRETE, 2020a). The selected cleanup action remedy for the T30 site includes an Air Sparging/Soil Vapor Extraction (AS/SVE) system, free product recovery, and compliance monitoring. The construction of the cleanup remedy was completed from July 6, 2019, through November 9, 2019, and cleanup elements included the installation of 3 horizontal SVE wells, 7 vertical SVE wells, 27 AS wells, 10 light non-aqueous phase liquid (LNAPL) recovery wells, an AS/SVE system, and a vapor treatment thermal oxidizer. The purpose of the AS/SVE system is to reduce contaminant mass in shallow groundwater within, and downgradient of, the sheen area. Groundwater flows generally west towards the East Waterway, as shown in Figure 1 of Pacific Groundwater Group's (PGG) 2016 Tidal Study, included as Appendix B of the RI/FS (PGG, 2016), and also included in Appendix A of the Groundwater Compliance Monitoring Plan (CMP) within Appendix E of the Engineering Design Report (EDR) (CRETE 2018). The purpose of free product recovery is to reduce free product thickness to a sheen (less than 0.01 feet). The footprint of the cleanup action is shown on Figure 2.

On September 17, 2021, remedial system operation and compliance monitoring were transferred from CRETE Consulting, Inc (CRETE) to AECOM Technical Services, Inc. (AECOM) by the Port. This annual report (Annual Report) was prepared by AECOM on behalf of the Port and was completed using data collected by AECOM in 2022. This represents the third year of monitoring, referenced as Year 3 in this Annual Report. This Annual Report is based on the monitoring requirements in the CMP and Quality Assurance Project Plan (QAPP) included as Appendix E of the Engineering Design Report (CRETE, 2018). This Annual Report provides the operation and monitoring results for site cleanup actions conducted during Year 3, including performance and confirmational sampling data associated with the operation and monitoring of the AS/SVE system. Groundwater data is compared against site cleanup levels (CULs) and remediation levels¹ (RELs), while AS/SVE system vapor data is compared against criteria identified in the Puget Sound Clean Air Agency (PSCAA) notice of construction (NOC) worksheet (Puget Sound Clean Air Agency, 2019).

¹ The EDR and CMP explain how groundwater CULs and RELs were developed for the site.

2. Site Monitoring

The site cleanup action monitoring plan is detailed in the CMP and summarized briefly in this section. Monitoring includes AS/SVE system performance monitoring, PSCAA vapor compliance sampling, free product gauging and removal, and groundwater sampling.

The AS/SVE system operation and maintenance activities include system checks and collection of PSCAA vapor samples to verify that oxidizer destruction efficiency is above the acceptable limits.

Free product-related activities in Year 3 included product thickness gauging at 19 wells and product removal at 8 wells across the site (Figure 3, Table 6). Groundwater monitoring was completed at 13 wells in Year 2 and included depth to water (DTW) gauging, free product gauging, and groundwater sampling. The groundwater monitoring wells are also shown on Figure 3 and are grouped as follows:

- **Performance Monitoring Wells** (within the AS/SVE field zones): MW-59, RW-11A, and MW-89
- **Performance Monitoring Wells** (downgradient of AS/SVE field zones): MW-36A, RW-9, MW-39A, and MW-42
- **Interior Monitoring Wells**²: RW-1, RW-5A, MW-93
- **Conditional Point of Compliance (CPOC) Monitoring Wells**: MW-45A, MW-46B, MW-58A, MW-86B, and MW-92
- **Shoreline Water Quality Monitoring Wells**: MW-84A, MW-85A, MW-86B, and MW-87A
- **Free Product Gauging**: MW-59, RW-12, RW-101-110, MW-36, MW-39A, MW-89, and MW-93
- **Interior Monitoring Wells** (Gauging Only): MW-35, MW-36, MW-54, and MW-64

Samples from groundwater monitoring wells are analyzed for the site Indicator Hazardous Substances (IHSs) (Table 1). Samples are collected from performance, select Interior, CPOC, and shoreline water quality monitoring wells according to the compliance monitoring phase and sampling plan. Water quality samples are not collected from free product gauging wells, monitoring wells with free product present, and interior monitoring wells listed above as gauged only. The frequency of groundwater monitoring varies by well group and by compliance monitoring phase (Table 2 and Table 3). Compliance monitoring is divided into three sequential phases:

- **Baseline Monitoring** – A full round of compliance well gauging and sampling that occurred shortly before or during start-up of the AS/SVE system and initiation of free product recovery activities (completed in October 2019 and summarized in the 2020 Annual Report).
- **Performance Monitoring** (current monitoring phase) – Compliance well gauging and sampling that occurs during and for 2 years following the completion of AS/SVE system operation and free product recovery, to determine whether rebound occurs and further cleanup actions are needed to achieve RELs.
- **Confirmational Monitoring** – Long-term compliance well gauging and sampling that occurs once RELs and CULs have been achieved in performance and CPOC monitoring wells.

Table 3 illustrates the monitoring schedule by compliance monitoring phase.

2.1 Site Monitoring Methods

Samples were collected in accordance with the CMP and QAPP (CRETE, 2018). This section provides an overview of sampling and product gauging and recovery methods and discusses any deviations from the CMP.

2.1.1 PSCAA Vapor Sampling Methods

Vapor samples are collected from two dedicated sampling ports on the treatment system. The influent port is located upstream of the thermal oxidizer and captures vapor concentrations prior to treatment. The effluent port is located on

² MW-38 was removed from the Interior Monitoring Well network due to subsurface blockage in 2020 and it was decommissioned in 2021. More information is included in Section 2.2.

the downstream side of the oxidizer and captures vapor concentrations after treatment is complete. Samples are collected with laboratory-provided summa canisters, which when opened create a negative pressure, drawing the sample stream into the sample canister. Tubing is utilized to connect the sampling port to the sample canister.

Data from the vapor samples are used to evaluate oxidizer performance and destruction efficiencies, which are calculated by comparing the pre- and post-treatment concentrations of total petroleum hydrocarbons (TPH) and volatile organic compounds (VOC) including benzene, toluene, ethylbenzene, and total xylenes (BTEX). The results of these sampling efforts are discussed in Section 3.2.

2.1.2 Free Product Gauging and Removal Methods

Free product removal is completed using a vacuum truck. The vacuum truck uses a multi-lobed positive displacement blower to create a vacuum in the attached holding tank. This tank vacuum in turn pulls fluids through the attached hoses and/or piping. During removal, a down-well “stinger” or pipe is inserted into the well to the target level just below the measured bottom of free product. Prior to 2021 a drum vacuum was used for these removals, but the method was revised to vacuum truck due to its increased efficiency removing fluids (oil and water) from the target wells. Free product removal activities completed during 2022 were in accordance with standard operating procedure (SOP) 505 from the Operation Maintenance & Monitoring Plan (CRETE, 2020b).

2.1.3 Groundwater Sampling Methods

Groundwater samples were collected using the Environmental Protection Agency (EPA) Low-Flow Groundwater Sampling Procedure (US EPA, 2017), detailed in the CMP. Groundwater wells were gauged prior to purging. This information was used to verify that no free product was present and to determine the inlet placement depth for the groundwater sampling tubing. The inlet was maintained near the mid-point of the saturated well screen interval. For wells with significant tidal influence, the inlet was placed at least 2 feet from the bottom of the well. During purging field parameters (temperature, specific conductance, and pH) were measured to determine when conditions had stabilized, indicated by recording three consecutive field parameter measurements measured in 2-minute intervals or greater. Groundwater samples were collected with low-flow pumping rates (~100 to 200 mL/min) to minimize volatilization of constituents. All water samples were collected from the pump discharge lines directly into appropriate laboratory-provided sample containers. Samples submitted for dissolved analyses were field filtered using a 0.45-micron in-line disposable filters. Sampling equipment was either decontaminated between monitoring wells (such as the water level tape) or new dedicated materials were used (such as tubing and gloves).

A subset of wells at T-30 are sufficiently tidally influenced that they require sampling at specific times to reduce tidal influence on groundwater chemistry. Best practice per the Tidal Study (PGG, 2016) includes sampling at the tidal lag times to ensure a representative sample. Below is a summary tidal lag times³. Note that the Shoreline Water Quality Monitoring Wells listed below were not required to be sampled during this reporting period:

- CPOC Monitoring Well MW-58A: between 70 and 130 minutes after low-low tide
- CPOC Monitoring Well MW-86B: between 130 and 190 minutes after low-low tide
- Performance Monitoring Well MW-89: between 130 and 190 minutes after low-low tide
- Shoreline Water Quality Monitoring Wells (MW-84A, MW-85A, MW- 87A): between 130 and 190 minutes after low-low tide
- All other CPOC, performance, and interior monitoring wells have limited tidal influence and do not require coordinating sampling time with tidal lag.

2.2 Site Monitoring Deviations from the CMP

Deviations from the groundwater CMP included the following:

- The CMP does not require LNAPL gauging outside of recovery and sampling events. LNAPL gauging was executed on a monthly basis throughout Year 3.

³ Low-low tide is as measured at National Oceanic and Atmospheric Administration (NOAA) Tide Station ID: 9447130

- LNAPL recovery events were executed on a bimonthly schedule from January through December, and a change to a quarterly recovery frequency was approved by Ecology via e-mail on December 7, 2022.

There were no other deviations from the CMP during the reporting period.

3. AS/SVE System Performance

This section summarizes the AS/SVE system performance for Year 3. The AS/SVE system equipment requires routine maintenance, which was performed by Port of Seattle Marine Maintenance staff (Marine Maintenance) on a monthly basis. The system also requires routine performance monitoring and adjustments to achieve optimal VOC removal and destruction. AECOM performed these on a biweekly basis throughout Year 3.

Performance monitoring field forms are included in Appendix A. A layout of the AS/SVE system components is included on Figure 2.

3.1 System Operation

The SVE system ran for 7,113 hours during this reporting period, an operation rate of 82%. Since startup, it operated for over 22,532 hours at year-end (Table 4). The AS system operated for 5,609 hours in Year 3, an operational rate of 65%. This was up from the previous annual record of 3,181 hours set in Year 2 (a 36% operational rate). As described in Section 3.4, resolving the faulty pressure sensor and determining the maximum operational pressure of the compressor were the primary reasons for this operational improvement. The sparge system has a cumulative total of 12,264 hours since startup.

3.2 System Performance – Field Data

The data from the biweekly system performance inspections are available in Table 4. The work performed include recording flow rates, operating temperatures, pressure and vacuum levels, and VOC concentrations in the oxidizer influent and effluent via photoionization detector (PID). Mass removal rates and estimate destruction efficiency were calculated based on PID readings and the SVE flowrate. The analytical data from Table 5 are used for the VOC concentrations for the days that a sample was taken; for the non-sampling site visits, the concentration is an adjustment of the PID reading based on the ratio of the most recent lab datum to its associated PID reading. This is further explained in Note 4 of Table 4.

For this reporting period, the influent removal rate ranged from 0.7 (January 21 and September 14, 2022) to 12.9 pounds (lb) per day (February 17, 2022) (see Table 4 and Figure 5). Figure 6 shows the cumulative VOC mass removal to the end of the reporting period and the beginnings of an asymptotic leveling out of VOC removal. In the three months of 2019 after system startup the average VOC removal was 423 lb/month. In the seven months of operation in 2020 the system averaged removals of 552 lb/month. In 2021, the average removals dropped to 280 lb/month. This year the average removal rate decreased further to 87.6 lb/month. Per Figure 5, with a few outlier exceptions, this downward trend has been in effect since mid-February of 2021. The cumulative VOC mass removal from startup through the end of this reporting period, as calculated with the field data, is 9,882 lb.

The PSCAA permit sets thresholds for the oxidizer destruction efficiency and SVE blower flowrate. The destruction efficiency requirements are applied to the laboratory results, but the field data are used to monitor operation between sampling events. The destruction efficiency should be at least 97% if the influent concentration is between 200 and 2,000 parts per million by volume (ppmv) TPH. If the concentration is less than 200 ppmv, then the destruction efficiency requirement reduces to $\geq 90\%$. Finally, if the oxidizer inlet concentration of TPH is below 10 ppmv, the destruction efficiency requirements are waived (Puget Sound Clean Air Agency, 2019). The system operated with an average destruction rate of 96% during Year 3, with only one lapse: on September 2, the influent was measured at 12.0 ppmv TPH, and the oxidizer effluent at 2.8 ppmv TPH, yielding a calculated destruction efficiency of 81%. As shown in Table 4, with the exception of this instance, all field measurements in the reporting period were above 92% destruction efficiency.

The SVE flowrate is not permitted to exceed 375 standard cubic feet per minute (scfm), and all readings from this reporting period fell below this limit (Puget Sound Clean Air Agency, 2019). The 2022 flow rates ranged from 161 scfm (March 31, 2022) to 262 scfm (October 13, 2022), with an average of 212 scfm (Table 4).

3.3 Soil Vapor Gas Sampling

Soil gas samples were collected on a quarterly basis throughout the reporting period. This was done to demonstrate compliance with PSCAA destruction efficiency requirements and to track system operation to optimize mass removal (Puget Sound Clean Air Agency, 2019). Gas samples were collected at both the thermal oxidizer inlet and outlet in 1-liter summa canisters. The samples were delivered to Friedman and Bruya, Inc., located in Seattle, Washington, for analysis of petroleum hydrocarbons by method MA-APH and BTEX by method TO15. The MA-APH method provides data for three petroleum subgroups (EC 5-8 aliphatics, EC 9-12 aliphatics, and EC 9-10 aromatics) that are summed for a TPH estimate. These are the TPH concentrations reported in Table 5. The destruction efficiency of the oxidizer is calculated by comparing the inlet and outlet TPH concentrations. The PSCAA permit requirements are outlined above in Section 3.2.

Soil vapor samples were collected on: 03/31/2022, 06/29/2022, 09/14/2021, and 12/09/2021. The analytical data for all samples are presented in Table 5 and are incorporated, with field data, in Figure 5 and Figure 6. Vapor sampling field forms are provided in Appendix B. Laboratory analytical reports are provided in Appendix C.

The destruction efficiencies in 2022, as calculated by analytical data, ranged from 93.6% (September 14, 2022) to 98.9% (June 29, 2022). The September 14 influent sample was 8 ppmv, and being below 10 ppmv, had no destruction efficiency requirement. The other three influent samples were below 200 ppmv and all exceeded the 90% destruction efficiency minimum.

Laboratory results for the influent samples indicate that 331 lb of TPH were extracted from the subsurface in 2022, with 7,707.6 lb extracted cumulatively since startup. These values are 66% and 22% lower, respectively, than the totals calculated with adjusted field data (Table 4). In the three months of operation in 2019 after system startup the average lab-analyzed TPH removal was 604 lb/month. In the seven months of operation in 2020 the system averaged removals of 412 lb/month. In 2021, removals to 223 lb/month. The average removal in 2022 dropped again to 34.5 lb/month.

The PSCAA permit dictates that a control device for extracted soil vapor is not needed once non-treated removal rates drop below contaminant of concern (COC) thresholds for two consecutive months (see Table 5). These thresholds, with the exception of TPH (2.74 lb/day), have been met for all COCs since system startup. During this reporting period, all four analytical calculations, and 12 of the 21 field calculations, resulted below that 2.74 lb/day TPH threshold.

3.3.1 Quality Assurance

All samples were delivered to Friedman & Bruya Inc. located in Seattle, Washington. Laboratory reports were reviewed and reporting flags, when applicable, were accepted and are included in Table 5. Per the Summary Data Quality Reviews in Appendix D, all laboratory quality assurance metrics were achieved for this project, the method reporting limits (MRLs) met the project needs for all analytes, and all data were determined to be usable. Laboratory reports and chain-of-custody forms are provided in Appendix C.

3.4 System Maintenance

Notable system maintenance performed during Year 3 are summarized below. They are documented in Table 4. Note that the thermal oxidizer was updated to a catalytic oxidizer on March 19, 2020, and was operating as such throughout this reporting period. Routine machinery maintenance was completed by Marine Maintenance, which included changing oil, greasing components, checking and replacing filters, checking and replacing belts, and checking levels in moisture separator tanks.

- Air sparge system:
 - The pressure switch replaced in November 2021 did not provide long-term resolution to the high-pressure alarm shutdowns occurring during normal-pressure scenarios. The issue was ultimately resolved at the end of March when the switch was taken offline and not replaced. Once done, the sparge system was able to operate as intended and zone sparging was re-instituted at 5- hour intervals to the five sparging zones. The system is still protected from high pressures with the mechanical pressure relief valve that was installed during initial system construction.

- Repeated sparge compressor motor overload alarms at relatively low pressures led to an analysis of amp draw by AECOM engineers. The results pointed to wear-down within the compressor motor. No further action was taken as the capability of the compressor was still acceptable.
- SVE system:
 - Extended freezing temperatures mid-December resulted in freezing pipes at both the moisture separator sight glass and the transfer pipe between the separator and the large water storage tank. A pipe union and float sensor broke as a result. The broken union was repaired the day it was discovered, but the replacement float sensor had still not arrived by the end of the reporting period.
- General:
 - The system was down for 19 days from April to May due to lapsed propane invoice payments and termination of deliveries. The lack of propane until resolved prevented operation of the oxidizer.
 - Alarm notifications ceased in early June due to a software update issue. H2K was not able to resolve the issue within the reporting period. The result was extended downtime following system shutdowns for the latter half of the year.
 - Various rotameters and gauges replaced throughout the year due to normal wear and tear.

4. Free Product Gauging and Recovery

Free product gauging and recovery events have been executed in accordance with the CMP since January 2020, shortly after system startup. Events were completed on a monthly schedule until November 2020, when the product recovery frequency was reduced from monthly to bimonthly. Product gauging has been maintained on a monthly schedule since then, with recovery events occurring on a bimonthly basis until October 2022, when they were adjusted to a quarterly schedule. Year 3 began with 19 wells in the gauging/recovery protocol and ended with nine. The other ten wells were terminated with data showing at least one year's worth of product gauging results at less than 0.01 ft.

4.1 Free Product Gauging

As shown in Figure 7 and Figure 8, LNAPL thickness trends in 2022 were generally stable or decreasing. LNAPL was thickest in the recovery wells at the southernmost end of the AS and SVE wellfield, farthest away from the remediation system (see Figure 2). Gauging was not completed in March due to scheduling conflicts, and the event was postponed until April. Free product thicknesses and maxima since startup are reported in Tables 6 and 7 and summarized below. See section 4.3 for further information of recovery well termination.

- MW-35 LNAPL thickness ranged from 0.0-0.05 ft (multiple and 2/17/22, respectively). This is down from a historical max of 0.52 ft on 10/8/20.
- MW-59 LNAPL thickness ranged from 0.0-1.36 ft (multiple and 2/17/22, respectively). This is down from a historical max of 2.19 ft on 1/9/20.
- RW-1 LNAPL thickness ranged from 0.03-0.10 ft (4/14/22 and 9/8/22, respectively). This is down from a historical max of 0.59 ft on 6/19/20.
- RW-12 LNAPL thickness ranged from 0.01-0.38 ft (6/20/22 and 12/8/22, respectively). This is down from a historical max of 0.78 ft on 3/12/20 and 5/16/20.
- RW-103 LNAPL thickness ranged from 0.00-0.60 ft (multiple and 4/14/22, respectively). This is down from a historical max of 1.74 ft on 9/10/20.
- RW-106 LNAPL thickness ranged from 0.00-2.09 ft (6/20/22 and 11/10/22 respectively). The 2022 maximum is also the historical maximum for the well (previously 1.55 ft on 9/10/20).
- RW-107 LNAPL thickness ranged from 0.00-1.45 ft (6/20/22 and 1/18/22, respectively). This is down from a historical max of 2.49 ft on 10/8/20.
- RW-110 LNAPL thickness ranged from 0.0-0.02 (multiple and 2/14/22, respectively). The prior historical max had been 0.46 ft on 7/28/20.

LNAPL was measured for, but not encountered in, the following wells during 2021:

- MW-36 (historical max of 1.0 ft on 6/19/20). This well was retired from regular gauging following the November event, with four consecutive quarters of LNAPL measurements less than 0.01 ft.
- MW-36A (historical max 0.04 ft during baseline sampling on 10/16/19). This well was retired from regular gauging following the September event, with over four consecutive quarters of LNAPL measurements less than 0.01 ft.
- MW-39A (historical max of 0.35 ft on 5/16/20). This well was retired from regular gauging following the September event, with over four consecutive quarters of LNAPL measurements less than 0.01 ft.
- MW-89 (historical max of 2.39 ft during baseline sampling on 10/16/21). This well was retired from regular gauging following the September event, with over four consecutive quarters of LNAPL measurements less than 0.01 ft.
- MW-93 (historical max of 1.04 ft during baseline sampling on 10/16/21). This well was retired from regular gauging following the September event, with over four consecutive quarters of LNAPL measurements less than 0.01 ft.
- RW-101 (historical max of 0.09 ft on 7/8/20). This well was retired from regular gauging following the September event, with over four consecutive quarters of LNAPL measurements less than 0.01 ft.

- RW-102 (historical max of <0.01 ft on 10/8/20). This well was retired from regular gauging following the September event, with over four consecutive quarters of LNAPL measurements less than 0.01 ft.
- RW-104 (historical max of .01 ft on 11/11/21).
- RW-105 (LNAPL has never been encountered). This well was retired from regular gauging following the September event, with over four consecutive quarters of LNAPL measurements less than 0.01 ft.
- RW-108 (LNAPL has never been encountered). This well was retired from regular gauging following the September event, with over four consecutive quarters of LNAPL measurements less than 0.01 ft.
- RW-109 (LNAPL has never been encountered). This well was retired from regular gauging following the September event, with over four consecutive quarters of LNAPL measurements less than 0.01 ft.

LNAPL thickness was also measured at each groundwater sampling well during the groundwater sampling events (discussed in Section 5).

4.2 Free Product Removal

LNAPL removal activities transitioned from bi-monthly to quarterly following the September 2022 recovery event. Throughout the reporting period, LNAPL removal was conducted using a vacuum truck as discussed in Section 2.1.2. Table 6 provides a summary of the data collected during the free product removal events since the baseline in October 2019. Approximately 115 gallons of free product were removed in the 5 bi-monthly/quarterly events executed in Year 3. Approximately 850 gallons of free product have been removed cumulatively since removals began in January 2020. These volumes are approximations due to the difficulties inherent in measuring a precise volume from the holding tank of the vacuum truck. Detailed gauging tables providing results of the removal events are included Appendix E.

As shown in Figure 9, the volume of LNAPL recovered varies from month to month and there were no clear trends in LNAPL removal from Year 2. The average removal volume was 23 gallons per event, with a range of 10-49 gallons (Table 6). The maximum removal occurred in December and the minimum was in July. The average removal volume for 2022 was down from the 2021 average of 45 gallons per event. Figure 10 shows the cumulative LNAPL recovery since system startup. The LNAPL thickness trends on a well-by-well basis are described above in Section 4.1 and shown in Figure 7 and Figure 8.

4.3 Free Product Recovery Termination

Free product recovery at an individual well can be terminated when product thickness has been reduced to less than a measurable thickness of 0.01 ft for a period of one year. This recovery termination criterion will result in sequential removal of recovery wells from recovery events as the area with measurable free product shrinks. Wells RW-101 through RW-110 will be left in place for one year after the last well meets the termination criteria, after which they will be decommissioned consistent with Washington Administrative Code (WAC) 173-160.

During 2022, several wells continued to be monitored on a monthly basis despite achieving the requisite year without measurable product. This included MW-36A, MW-39A, MW- 89, MW-93, RW-101, RW-105, RW-108, and RW-109. Each of these were terminated from the monitoring/recovery protocol in 2022 (see Section 4.1).

5. Groundwater Sampling

During Year 3, two groundwater performance monitoring events were conducted. The first performance monitoring event was completed on April 14, 2022, for the performance wells within AS/SVE system radius of influence. The second was on October 13, 2022, and included the performance wells both within and downgradient of the AS/SVE system radius of influence, the interior wells, and the CPOC wells. Table 2 includes a summary of the sampling program and Table 3 includes the monitoring schedule.

Groundwater samples were collected and analyzed consistent with the protocols outlined in the CMP. Water quality parameters including temperature, pH, specific conductance, turbidity, dissolved oxygen (DO) and oxidation-reduction potential (ORP) were measured and recorded continually during purging until stable, representative conditions were met prior to sampling.

This section provides an overview of groundwater sampling activities at the wells shown on Figure 3 and Figure 4. Construction information and all analytical results and field parameters since system startup are summarized in Tables 8 through 12.

5.1 Performance Monitoring Wells

Per Tables 2 and 3, the spring semiannual sampling event included Performance Monitoring Wells RW-11A, and MW-89. The fall annual sampling event included Performance Monitoring Wells RW-11A, MW-89, MW-36A, MW-39A, RW-9, and MW-42. The Performance Monitoring Wells were analyzed for TPH in the gasoline range (TPH-Gx) via NWTPH-Gx, TPH in the diesel and lube oil range (TPH-Dx) via NWTPH-Dx, and BTEX by EPA Methods 8021B and 8260. Groundwater results are summarized on Table 8 and Figure 4. TPH-Dx data are also shown on Figure 11. Copies of Year 3 sampling field notes are included in Appendix F and laboratory reports are provided in Appendix G.

MW-59 is also a Performance Monitoring Well, but per the CMP it only qualifies for sampling once four consecutive quarters of gauging data are collected free product detection <0.01 ft (Table 2, Note 2). The presence of free product is assumed to indicate TPH concentrations above site cleanup goals. As shown in Table 6, MW-59 continued to have free product detected >0.01 in Year 3 and was not sampled during the reporting period. On Figure 11, wells with free product encountered during sampling, or those not sampled due to recent LNAPL encounters, are shown with an arbitrary TPH-Dx concentration of 3,000 micrograms per liter ($\mu\text{g/L}$). This value is used only to represent free product and does not reflect actual TPH concentrations in these wells.

As shown in Table 8 and Figure 4, neither of the samples taken during the April 2022 event (RW-11A and MW-89) were found to have COC concentrations above CULs. COC concentrations also did not exceed CULs for any of the six Performance Monitoring wells sampled during the October 2022 event.

RW-11A had a TPH-Dx concentration above the CUL during baseline sampling (1,100 $\mu\text{g/L}$) but has not had a concentration in excess of the CUL since. It has not been above site CULs for any other COC.

MW-89 COC concentrations have not exceeded any CUL since the TPH-Dx rebound in October 2021. It has not exceeded site CULs for any other COC.

RW-9 concentrations exceeded the TPH-Dx CUL in 2019 (1,200 $\mu\text{g/L}$), stayed below in 2020 (450 $\mu\text{g/L}$), and rebounded above again in 2021 (1,590 $\mu\text{g/L}$). In 2022 it fell back below to 200 $\mu\text{g/L}$. It has not been above site CULs for any other COC.

MW-36A had free product present during baseline sampling and was not sampled until September 2020. At that event TPH-Dx was measured in excess of the CUL (560 $\mu\text{g/L}$). Results in 2021 were below the CUL (404 $\mu\text{g/L}$), and they stayed below in 2022 (180 $\mu\text{g/L}$). It has not been above site CULs for any other COC.

MW-39A had free product present during baseline sampling and was not sampled until September 2020. At that event TPH-Dx was measured in excess of both the CUL and REL (2,270 $\mu\text{g/L}$). TPH-Dx levels rose further during the 2021 sampling (3,520 $\mu\text{g/L}$). Results in 2022 dropped down below the CUL, at 110 $\mu\text{g/L}$.

MW-42 exceeded cleanup levels for both TPH-Gx and benzene during the baseline sampling. All COCs were measured below CULs during the September 2020 and October 2021 events. This trend continued through 2022.

5.2 Interior Monitoring Wells

The Interior monitoring wells are located upgradient (east) of the AS/SVE system, within the original “sheen area” with <0.1 ft product thickness (Figure 2 and Figure 3). Interior monitoring wells are sampled for TPH-Gx, -Dx, and BTEX, and are used to track long-term reductions in contaminant mass that are not associated with operation of the AS/SVE system. With MW-38 decommissioned in 2021 and RW-1 with continued LNAPL presence, the only Interior wells sampled in 2022 were MW-93 and RW-5A.

MW-93 did not have any COCs present above CULs in 2022. When it was last sampled in 2020, it had 8,600 µg/L of TPH-Dx, well above the CUL and REL.

RW-5A did not have any COCs present above CULs in 2022. It has not exceeded a CUL historically.

In addition to sampling the above wells, MW-35, MW-36, MW-54, MW-64 are Interior Monitoring Wells that are gauged, but not sampled, on a biannual basis. MW-35 and MW-36 have been gauged regularly as LNAPL-impacted wells, but MW-54 and MW-64 have not. There was no record of prior gauging of either well, in fact. Neither one had free product present on 10/13/22. MW-64 was also gauged on 6/20/22 and did not have product present then either.

5.3 CPOC Monitoring Wells

The CPOC monitoring wells are located downgradient of the Performance and Interior wells, between the source area and the East Waterway. CPOC wells are sampled for the full suite of IHSs (TPH-Gx, -Dx, BTEX, and PAHs) to monitor potential risk to the East Waterway. None of the five wells sampled in 2022 - MW-45A, MW-46B, MW-58A, MW-86B, and MW-92 - had COCs above their CULs. MW-86B is the only CPOC well to historically have a CUL exceedance, and it occurred during baseline sampling in 2019. All subsequent samples have been below the CULs. See Table 9 and Table 10.

5.4 Shoreline Water Quality Monitoring Wells

The Shoreline Water Quality Monitoring Wells are located along the T30 apron nearest to the East Waterway (Figure 3). During baseline sampling in 2019, these wells were sampled and analyzed for the full suite of IHSs listed in Table 1 (TPH-Gx, -Dx, BTEX, and PAHs). They are not a part of the ongoing sampling plan outside of contingent actions have not been sampled since (see Appendix I and CMP sections 6.5-6.6). The baseline analytical results are summarized in Tables 9 and 10.

5.5 Quality Assurance

The groundwater CMP includes quality assurance protocols, also detailed in the QAPP. For each groundwater sampling event, at least one duplicate sample and one set of MS/MSD samples were collected to assess field and laboratory precision. This precision is determined by the relative percent difference (RPD) between the original sample and it's duplicate, with an allowable tolerance of +/- 35%. As shown in the Summary Data Quality Reviews in Appendix H, the RPDs were within the project goals for all samples.

Laboratory reports and chain-of-custody forms are provided in Appendix G. The April 2022 samples were hand delivered to Friedman & Bruya Inc. located in Seattle, Washington. Laboratory reports were reviewed and reporting flags, when applicable, were accepted; these are included in Tables 8-10. Precision and accuracy were assessed during data validation using the MS/MSD results and were acceptable in each case. Sampling precision was assessed during data validation using the field duplicate results. Per the Summary Data Quality Reviews in Appendix H, laboratory quality assurance metrics were achieved for this project, the MRLs met the project needs for all COCs, and all data were determined to be usable.

6. Conclusion

This report presents the results of the third year of compliance monitoring at the T-30 Cleanup site. Key take-aways from the Year 3 reporting period include:

- As calculated with biweekly PID data from the field (Table 4), the AS/SVE system extracted over 964 lb TPH during the reporting period, for a cumulative total of 9,882 lb TPH removed since system startup. These values are lower when calculated with quarterly laboratory data (Table 5), which show the system extracted over 331 lb TPH during the reporting period and 7,708 lb TPH since system startup.
- LNAPL recovery events recovered an estimated 115 gallons of free product during the reporting period, continuing the downward trend year over year. Average removal volumes in Year 3 (23 gal per event) were nearly 50% lower than those of Year 2 (45 gallons per event). A cumulative total of 849 gallons have been recovered since removal activities began (Table 6).
- COCs were not measured above the CUL or REL at any well sampled in Year 3 (Table 8). Free product was still present in MW-59 and RW-1, preventing sampling.
- The SVE and oxidizer systems were successfully monitored and maintained through the reporting period (Table 4).
- The cleanup actions demonstrate significant mass recovery in soil vapor and free product removal and decreasing IHS concentrations in several monitoring wells. Similar cleanup actions will continue into Year 4.

6.1 CMP Modifications and Recommendations

Data collected from the performance monitoring wells were evaluated and used to make decisions regarding AS/SVE system operation. The flow chart in Figure 5 of the CMP (included for reference in Appendix I) provides guidance on decision making criteria. There are no planned modifications or recommendations to the CMP.

6.2 Recommended AS/SVE Adjustments for Year 4

As stated in the Cleanup Action Plan (CAP), the overall goal of the AS/SVE system is to reduce contaminant mass in the sheen area and downgradient of the sparge wells. The AS/SVE system is not intended to reduce contaminant concentrations in groundwater upgradient of the AS/SVE system. The AS/SVE system will be operated until performance monitoring wells within and downgradient of the AS/SVE field zones (RW-9, RW-11A, MW-42, MW-39A, MW-36A, MW-59, and MW-89) achieve RELs, or if the AS/SVE system is no longer significantly removing contaminant mass⁴. The two performance wells that exceeded RELs during 2021 (MW-39A and MW-59) have since been measured below the RELs and CULs, and the system removal rates look as if they are starting to taper off. Continued operation of the AS/SVE system is planned for Year 4 (2023). The following are recommendations to improve AS/SVE performance:

- Continue to monitor, analyze, and improve AS compressor operation (e.g., runtime and total flow).
- Monitor influent vapor concentrations and evaluate vapor emission control alternatives.
- Troubleshoot water entrapment in the SVE piping/manifold to improve vapor extraction performance.

6.3 Schedule and Reporting

The groundwater monitoring frequencies are provided on Tables 2 and 3. The monitoring schedule will be adjusted as needed based on the performance of the AS/SVE system and timeline of monitoring wells achieving COC remediation levels. Free product will be gauged at least quarterly until termination criteria are achieved. Schedule revisions will be documented in quarterly progress reports.

⁴ The statement “the AS/SVE system is no longer significantly removing contaminant mass” has not been defined. This standard will need to be negotiated, if necessary, at a future time. This could involve analysis of vapor extraction concentrations, groundwater dissolved oxygen concentrations, performance well groundwater concentrations, or other similar measure.

Annual reports will continue to be prepared for Years 4 and 5. Reports will be submitted to Ecology following the end of the annual monitoring cycle.

After 5 years of system operation, an evaluation report will be prepared that will include a summary of the five preceding annual reports and discussions about longer term trends in the groundwater data. The CMP will be reviewed and updated by addendum (with Ecology review) if changes to the monitoring program are appropriate.

7. References

CRETE (CRETE Consulting). 2018. Engineering Design Report. December 20, 2018.

CRETE. 2020a. Construction Completion Report, Terminal 30 Cleanup Project. February 27, 2020.

CRETE. 2020b. Terminal 30 Cleanup Project Operation Maintenance & Monitoring Plan. March 2020.

CRETE. 2021. Monitoring Well MW-38 Decommissioning. May 11, 2021.

Ecology (Washington State Department of Ecology). 2017. Consent Decree and Cleanup Action Plan. July 19, 2017.

PGG (Pacific Groundwater Group). 2016. Port of Seattle Terminal 30 Revised 2013 Remedial Investigation/Feasibility Study. January 11, 2016.

PSCAA (Puget Sound Clean Air Agency). 2019. Notice of Construction (NOC) Worksheet. NOC No. 11885. August 20, 2019.

US EPA (U.S. Environmental Agency). 2017. Low Stress (Low Flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells. September 19, 2017.

Tables

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Table 1

Indicator Hazardous Substances

| Constituent (BTEX, SVOC, TPH) | Constituent (PAH) |
|--|--|
| <i>BTEX Compounds</i> | <i>PAH Compounds (filtered)</i> |
| Benzene | Acenaphthene |
| Toluene | Acenaphthylene |
| Ethylbenzene | Anthracene |
| Xylenes (total) | Benzo[a]anthracene |
| <i>Semivolatile Organic Compounds</i> | Benzo[a]pyrene |
| 2-Methylnaphthalene | Benzo[b]fluoranthene |
| <i>Petroleum Hydrocarbons</i> | Benzo[g,h,i]perylene |
| TPH, gasoline range organics | Benzo[k]fluoranthene |
| TPH, diesel range organics | Chrysene |
| TPH, heavy oils | Dibenzo[a,h]anthracene |
| | Fluoranthene |
| | Fluorene |
| | Indeno[1,2,3-cd]pyrene |
| | Naphthalene |
| | Phenanthrene |
| | Pyrene |
| | Naphthalene |

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Table 2
Compliance Monitoring Frequency and Analytes

| Well Network | Compliance Monitoring Phase | | |
|---|--|--|---|
| | Baseline Sampling | Performance Monitoring* | Confirmational Monitoring |
| Groundwater Sampling (See Note 1) | | | |
| Performance Monitoring Wells – Within (MW-59**, RW-11A, MW-89** ^b) | Single Event - <u>Sampled: 10/2019</u> (NWTPH-G/BTEX, NWTPH-Dx) | Every 6 Months - <u>Sampled: 4/2020, 9/2020, 4/2021, 10/2021, 4/2022, & 10/2022</u> (NWTPH-G/BTEX, NWTPH-Dx) | None Scheduled |
| Performance Monitoring Wells – Downgradient (MW-36A, RW-9, MW-39A** ^b , MW-42) | | Every Year - <u>Sampled: 9/2020, 10/2021, & 10/2022</u> (NWTPH-G/BTEX, NWTPH-Dx) | |
| Interior Monitoring Wells - (MW-38 ^a , MW-93, RW-1, RW-5A) | Single Event - <u>Sampled: 10/2019</u> (NWTPH-G/BTEX, NWTPH-Dx) | Every 2 Years - <u>Sampled: 9/2020 & 10/2022</u> (NWTPH-G/BTEX, NWTPH-Dx) | Every 5 Years (NWTPH-G/BTEX, NWTPH-Dx) |
| Interior Monitoring Wells, Gauging Only - (MW-35, MW-36, MW-54, MW-64) | Single Event - <u>Gauged: 10/2019</u> (Free Product Gauging) | Every 2 Years - <u>Gauged: 9/2020 & 10/2022</u> (Free Product Gauging) | Every 5 Years (Free Product Gauging) |
| CPOC Monitoring Wells (MW-45A, MW-46B, MW-58A, MW-86B***, MW-92) | Single Event - <u>Sampled: 10/2019</u> (NWTPH-G/BTEX, NWTPH-Dx, PAHs, 2-methylnaphthalene) | Every 2 Years - <u>Sampled: 9/2020 & 10/2022</u> (NWTPH-G/BTEX, NWTPH-Dx, PAHs, 2-methylnaphthalene) | Varies – See Table 3 (NWTPH-G/BTEX, NWTPH-Dx, PAHs, 2-methylnaphthalene) |
| Shoreline Water Quality Monitoring Wells (MW-84A, MW-85A, MW-86B***, MW-87A) | Single Event - <u>Sampled: 10/2019</u> (NWTPH-G/BTEX, NWTPH-Dx, PAHs, 2-methylnaphthalene) | None Scheduled | None Scheduled |
| Free Product Recovery and Gauging (See Note 2) | | | |
| Free Product Gauging Wells (MW-59**, RW-12, New Recovery Wells [RW-101 to 110], MW-36, MW-39A**, MW-89**, MW-93) | Single Event (Free Product Gauging) | Quarterly at minimum (Free Product Gauging) | None Scheduled |

Notes:

- This schedule can be modified based on data collected during system performance.
 - For all monitoring wells, the measurement of free product in a well will trigger free product removal activities. Free product gauging (and removal, if free product is present) will occur quarterly for a minimum of 4 consecutive quarters.^c
- * Performance monitoring will continue for the duration of AS/SVE system operation plus 2 years, at which time confirmational monitoring will be initiated.
- ** MW-59, MW-39A, and MW-89 will become Performance Monitoring Wells once free product has not been present for four consecutive quarters.^{b,d}
- ***MW-86B is both a CPOC Well and a Shoreline Water Quality Well.
- ^a A below-grade obstruction was observed in MW-38 on 9/18/20 and the well was decommissioned on May 6, 2021.
- ^b MW-89 qualified in October of 2020. MW-39A qualified in August of 2021.
- ^c Per the CMPT, wells qualify for performance monitoring analyses once 4 quarters of free product gauging result in product thicknesses of <0.01 ft. If product is encountered during sampling, the well is not to be sampled.
- ^c The original version of Table 2 in the CMP had a typo in the ** note, stating that only two quarters of clean data were required to transition to Performance Monitoring Wells. The text of the CMP stated the duration as four quarters, and the note has been revised.

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TABLE 3

Compliance Monitoring Schedule

| Post AS/SVE Startup Years: | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 22 | 27 | 32 | |
|---------------------------------|----------|-------------------------------|----|----|----|----|----|----|----------------------------------|---|----|----|----------|----|----|----|---------------|----|----|----|----|---|
| Post AS/SVE Shutdown Years: | | | | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 17 | 22 | 27 | |
| Confirmational Monitoring Years | | | | | | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 15 | 20 | 25 | |
| | Baseline | Performance Monitoring Period | | | | | | | Confirmational Monitoring Period | | | | | | | | | | | | | |
| CPOC Wells | Once | Biannual | | | | | | | Annual | | | | Biannual | | | | Every 5 years | | | | | |
| MW-45A | X | X | | X | | X | | X | X | X | X | X | X | X | | X | | X | X | X | X | |
| MW-46B | X | X | | X | | X | | X | X | X | X | X | X | X | | X | | X | X | X | X | |
| MW-58A | X | X | | X | | X | | X | X | X | X | X | X | X | | X | | X | X | X | X | |
| MW-86B | X | X | | X | | X | | X | X | X | X | X | X | X | | X | | X | X | X | X | |
| MW-92 | X | X | | X | | X | | X | X | X | X | X | X | X | | X | | X | X | X | X | |
| Performance Wells | | | | | | | | | | | | | | | | | | | | | | |
| Within | Once | Semiannual | | | | | | | None | | | | | | | | | | | | | |
| MW-59 | X | XX | XX | XX | XX | XX | XX | XX | | | | | | | | | | | | | | |
| MW-89 | X | XX | XX | XX | XX | XX | XX | XX | | | | | | | | | | | | | | |
| RW-11A | X | XX | XX | XX | XX | XX | XX | XX | | | | | | | | | | | | | | |
| Downgradient | Once | Annual | | | | | | | None | | | | | | | | | | | | | |
| MW-36A | X | X | X | X | X | X | X | X | | | | | | | | | | | | | | |
| MW-39A | X | X | X | X | X | X | X | X | | | | | | | | | | | | | | |
| MW-42 | X | X | X | X | X | X | X | X | | | | | | | | | | | | | | |
| RW-9 | X | X | X | X | X | X | X | X | | | | | | | | | | | | | | |
| Interior Wells | Once | Biannual | | | | | | | Every 5 years | | | | | | | | | | | | | |
| MW-38 ¹ | X | X | | X | | X | | X | | | | | | X | | | | | X | X | X | X |
| MW-93 | X | X | | X | | X | | X | | | | | | X | | | | | X | X | X | X |
| RW-1 | X | X | | X | | X | | X | | | | | | X | | | | | X | X | X | X |
| RW-5A | X | X | | X | | X | | X | | | | | | X | | | | | X | X | X | X |

Notes:

The monitoring frequency for the Shoreline water quality monitoring wells and free product gauging wells are not shown on this table.

1. A below-grade obstruction was observed in MW-38 on 9/18/20 and the well was decommissioned on May 6, 2021.

Abbreviations and Formatting:

AS/SVE = air sparge/soil vapor extraction

CPOC = Conditional Point of Compliance

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Table 4
AS/SVE and Oxidizer Operational Data

| Date | Time | Operating Parameters | | | | | | | | Mass Removal | | | | | Mass Removal | | | Comments/Notes | | |
|------------|-------|--|---|---|---|--|---|---|---------------------------|---|--|--|---|--|---|------|--|----------------|---|--|
| | | SVE Blower Hr Meter ² (Hours) | Calculated | | | | SVE Inlet Vacuum (In. H ₂ O) | SVE Inlet ΔP (In. H ₂ O) | SVE Inlet Temp (°F) | SVE Inlet Flow Rate ³ (scfm) | SVE Discharge Total VOC PID (ppmv) | Calculated | | Oxidizer Discharge Total VOC PID ² (ppmv) | Calculated | | Mass Removal Rate ² (Lb/Day) | | Period Mass Removal ² (Lb) | Cumulative Mass Removal ² (Lb) |
| | | | Cumulative SVE Blower Runtime ² (Hours) | Cumulative SVE Blower Runtime (Days) | Period SVE Blower Runtime (Days) | SVE Discharge Total VOCs ^{1,4} (µg/m ³) | | | | | | Oxidizer Fire Box Temp ² (F) | Oxidizer Discharge Total VOCs ^{1,4,5} (µg/m ³) | | Period Destruction Efficiency ⁷ (%) | | | | | |
| 1/21/2022 | 13:47 | 9,005.0 | 15,807.9 | 658.2 | 12.8 | 85.0 | 1.5 | 54 | 227.9 | 16.3 | 32,335 | 672 | 0.3 | 536 | 98 | 0.7 | 8.5 | 8,932.5 | New AS PAH alarm on 1/12/22, the first since the pressure switch replacement. AS bleed valve opened up to relieve pressure on 1/13/22. Despite that, PAH alarms continue to shut down the AS system. | |
| 2/17/2022 | 20:20 | 9,499.3 | 16,302.2 | 678.8 | 20.6 | 80.0 | 1.0 | 50 | 188.2 | 383.2 | 760,163 | 675 | 7.9 | 14,107 | 98 | 12.9 | 264.9 | 9,197.5 | Last AECOM visit under the initial short term service directive. PAH alarms continue to shut down the AS system. | |
| 3/31/2022 | 11:50 | 10,460.2 | 17,263.1 | 718.9 | 40.0 | 78.0 | 0.8 | 63 | 161.5 | 17.0 | 101,000 | 697 | 0.4 | 1,900 | 98 | 1.5 | 58.7 | 9,256.2 | First AECOM visit under the new service directive. Oxidizer and SVE ON on arrival but AS system OFF due to a PAH alarm. Alarm cleared and AS restarted at 10:50. Collected lab gas samples. AS pressure switch tested and determined to be malfunctioning. Switch taken offline to prevent further false alarm shut-downs. | |
| 4/12/2022 | 15:45 | 10,736.6 | 17,539.5 | 730.4 | 11.5 | 82.0 | 1.0 | 52 | 187.3 | 10.5 | 62,382 | 708 | 0.3 | 1,425 | 98 | 1.1 | 12.1 | 9,268.3 | AS Compressor working as desired since disconnection of pressure switch. Zone sparging re-instituted at 5/5/5/4.5/4.5-hr intervals. | |
| 4/28/2022 | 15:59 | 11,021.7 | 17,824.6 | 742.3 | 11.9 | 74.0 | 1.0 | 60 | 188.1 | 38.5 | 228,735 | 670 | 0.7 | 3,325 | 99 | 3.9 | 46.0 | 9,314.2 | 4.15.22 - Rotameters cleaned for improved reading and operation; vacuum gauges replaced on SVE-4, -5, -7, -8, -9, and -10 (gauges should have been 0" H ₂ O with system off but were reading from 7-27" H ₂ O). 4.18.22 - Oxidizer magnetic gauge replaced. | |
| 5/13/2022 | 15:11 | 11,337.5 | 18,140.4 | 755.4 | 13.2 | 78.0 | 1.5 | 60 | 229.0 | 34.7 | 206,159 | 668 | 0.4 | 1,900 | 99 | 4.2 | 55.8 | 9,370.1 | 4.28.22 - Systems ON on arrival operating with zone sparging. Water continues to impede accurate readings of several SVE rotameters. | |
| 6/21/2022 | 17:55 | 11,824.4 | 18,627.3 | 775.7 | 20.3 | 74.0 | 1.3 | 72 | 212.0 | 24.3 | 144,371 | 672 | 1.6 | 7,600 | 95 | 2.8 | 55.8 | 9,425.9 | System down 5/25/22-6/13/22 due to lapsed invoices and lack of propane. Water continues to impede accurate readings of several SVE rotameters. SVE-5 rotameter gets stuck and needs replacing. AS VFD had a motor overload error code flashing (A2010), but the system was operational. AS zone runtimes were adjusted at EOD to add a 30-minute overlap during each transition. If the VFD motor overloads were happening during the zone transitions, this should help avoid them moving forward. Alarm notifications went inactive ~6/8/22 due to outdated telemetry software, fix pending. | |
| 7/7/2022 | 17:09 | 12,206.1 | 19,009.0 | 791.6 | 15.9 | 76.0 | 1.0 | 64 | 186.8 | 13.0 | 77,235 | 625 | 1.0 | 4,750 | 94 | 1.3 | 20.6 | 9,446.5 | 6/29/22 - Collected lab gas samples. No other system readings taken. 7/7/22 - Systems were ON on arrival operating with zone sparging. No system downtime this period. Sparge VFD had the motor overload error code flashing again (A2010) but the system was still running. AS Zones 2 and 4 were analyzed for breakthrough pressures and valves positions were adjusted for optimal flow distribution. At EOD, PLC was rewired so that the zones on the HMI control the same-named zones in the field. Zone 1 and 2 runtimes swapped at EOD. Alarm notifications have been inactive since ~6/8/22 due to outdated telemetry software, fix pending. | |
| 7/22/2022 | 16:10 | 12,556.2 | 19,359.1 | 806.2 | 14.6 | 74.0 | 1.0 | 78 | 184.9 | 12.1 | 71,888 | 681 | 0.9 | 4,275 | 94 | 1.2 | 17.4 | 9,464.0 | Systems were ON on arrival operating with zone sparging. No system downtime this period. Rotameters for several SVE wells have observable signs of usage wear and tear. Water in the SVE lines continues to make accurate readings difficult. Alarm notifications have been inactive since ~6/8/22 due to outdated telemetry software, fix pending. | |
| 8/5/2022 | 14:45 | 12,679.6 | 19,482.5 | 811.4 | 5.1 | 85.0 | 1.0 | 80 | 181.5 | 49.6 | 294,682 | 677 | 2.5 | 11,875 | 96 | 4.8 | 24.7 | 9,488.7 | Systems ON on arrival operating with zone sparging. The systems only operated for ~1/3 of the period due to several Oxidizer alarms that did not trigger notifications due to the telemetry software issue (fix pending). Rotameters for several SVE wells have observable signs of usage wear and tear. Water in the SVE lines continues to make accurate readings difficult. | |
| 8/19/2022 | 15:15 | 13,014.8 | 19,817.7 | 825.3 | 14.0 | 74.0 | 1.0 | 82 | 184.2 | 29.3 | 174,076 | 695 | 2.7 | 12,825 | 93 | 2.9 | 40.3 | 9,529.0 | Systems were ON on arrival operating with zone sparging. No system downtime this period. Alarm notifications have been inactive since ~6/8/22 due to outdated telemetry software, fix pending. Rotameters for several SVE wells have observable signs of usage wear and tear. Water in the SVE lines continues to make accurate readings difficult. AS Zone 1 well valve positions were optimized for desired flow distribution. | |
| 9/2/2022 | 14:55 | 13,294.7 | 20,097.6 | 837.0 | 11.7 | 72.0 | 1.5 | 82 | 226.3 | 12.0 | 71,294 | 661 | 2.8 | 13,300 | 81 | 1.5 | 16.9 | 9,545.9 | Oxidizer and SVE systems ON upon arrival. Sparge system was OFF on arrival due to a Sparge Blower TAH alarm from 14:48 on 8/31/22. Alarm notifications have been inactive since ~6/8/22 due to outdated telemetry software, fix pending. AS system restarted at 15:00. Water in the SVE lines continues to make accurate readings difficult. | |
| 9/14/2022 | 9:54 | 13,567.8 | 20,370.7 | 848.4 | 11.4 | 72.0 | 1.5 | 84 | 225.9 | 4.5 | 32,570 | 664 | 0.5 | 2,070 | 94 | 0.7 | 7.5 | 9,553.4 | Systems ON on arrival operating with zone sparging. No alarms triggered this period (no downtime), but alarm notifications were inactive. During O&M, the AS bleed valve was closed to vent excess air through the pressure relief valve on an as-needed basis instead. SVE-5, 6, and 8 were pumped out until dry using a peristaltic pump; ~4 gallons total extracted from the manifold and stub ups. | |
| 09/30/2022 | 13:10 | 13,953.2 | 20,756.1 | 864.4 | 16.1 | 78.0 | 1.5 | 72 | 226.4 | 56.5 | 408,934 | 694 | 5.7 | 23,598 | 94 | 8.3 | 133.7 | 9,687.1 | Systems ON on arrival operating with zone sparging. Sparge TAH alarms occurred on 9/14, 9/15, and 9/20, likely due to the bleed valve adjustment made on 9/14/22. Alarm notifications have been inactive since ~6/8/22 due to outdated telemetry software, fix pending. The PRV discharges hotter air into the AS enclosure than the bleed valve does, likely impacting the compressed air temperatures. The bleed valve was re-opened ~1/2-turn on 9/20/22, resolving the issue for the rest of the period. Water was once again visible in SVE-6 and -8, despite dewatering last visit. Water also visible in SVE-9 (not dewatered last visit). | |
| 10/13/2022 | 15:13 | 14,261.6 | 21,064.5 | 877.3 | 12.9 | 78.0 | 2.0 | 68 | 262.4 | 9.3 | 67,311 | 667 | 0.7 | 2,898 | 96 | 1.6 | 20.4 | 9,707.5 | SVE ON on arrival, but AS OFF due to a VFD motor overtemp fault. The fault occurred on 10/4/22 but was not resolved prior to the 10/13 site visit. System was shut down after O&M for the groundwater sampling event in the evening of October 13, 2022. Both systems were restarted following sampling at 00:15 on 10/14/22. Alarm notifications have been inactive since ~6/8/22 due to outdated telemetry software, fix pending. | |
| 10/26/2022 | 16:00 | 14,564.8 | 21,367.7 | 889.9 | 12.6 | 83.0 | 1.5 | 58 | 227.7 | 21.6 | 156,336 | 682 | 0.7 | 2,898 | 98 | 3.2 | 40.4 | 9,747.9 | 10/17/22 - AS VFD motor overtemp alarm, triggered 10/14/22, was resolved by MM and the system was restarted. 10/19/22 - AS VFD motor overtemp alarm, triggered 10/18/22, was resolved by AECOM during VFD troubleshooting. If backpressure is too high, the VFD sends excessive amps to the motor and faults out. Bleed valve increased to 1 full turn open to relieve pressure. 10/26/22 - Systems ON on arrival. Measured amps in each wire in and out of the VFD. Based on results, ABB tech support believes the motor is having issues, not the VFD. Alarm notifications have been inactive since ~6/8/22 due to outdated telemetry software, fix pending. | |

PORT OF SEATTLE - TERMINAL 30
Table 4
AS/SVE and Oxidizer Operational Data

| Date | Time | Operating Parameters | | | | | | | | Mass Removal | | | | | | | Comments/Notes | | | |
|----------|-------|--|---|---|---|--|--|------------------------------|--|--|--|--|---|--|---|--|----------------|--|---|--|
| | | SVE Blower Hr Meter ² (Hours) | Calculated | | | SVE Inlet Vacuum (In. H ₂ O) | SVE Inlet ΔP (In. H ₂ O) | SVE Inlet Temp (°F) | SVE Inlet Flow Rate ² (scfm) | SVE Discharge Total VOC PID (ppmv) | Calculated SVE Discharge Total VOCs ^{3,4} (µg/m ³) | Oxidizer Fire Box Temp ⁵ (F) | Oxidizer Discharge Total VOC PID ⁶ (ppmv) | Calculated | | | | Mass Removal | | |
| | | | Cumulative SVE Blower Runtime ² (Hours) | Cumulative SVE Blower Runtime (Days) | Period SVE Blower Runtime (Days) | | | | | | | | | Oxidizer Discharge Total VOCs ^{3,4,5,6} (µg/m ³) | Period Destruction Efficiency ⁷ (%) | Mass Removal Rate ⁸ (Lb/Day) | | Period Mass Removal ⁸ (Lb) | Cumulative Mass Removal ⁸ (Lb) | |
| 11/10/22 | 15:05 | 14,923.3 | 21,726.2 | 904.8 | 14.9 | 85.0 | 1.5 | 53 | 228.1 | 42.6 | 308,329 | 681 | 0.8 | 3,312 | 99 | 6.3 | 94.4 | 9,842.4 | All systems ON on arrival. Sparge Zone 5 active. Systems ran continuously since last visit. Alarm notifications have been inactive since ~6/8/22 due to outdated telemetry software, fix pending. | |
| 11/23/22 | 15:35 | 15,228.3 | 22,031.2 | 917.6 | 12.7 | 86.0 | 1.8 | 53 | 246.0 | 8.8 | 63,692 | 669 | 1.1 | 4,554 | 93 | 1.4 | 17.9 | 9,860.3 | All systems ON on arrival. Sparge Zone 5 active. Systems ran nearly continuously since last visit. Pilot SVE dewatering piping upgrade was successfully used to dewater SVE-8. SVE header PID readings taken for the first time with new brake bleeder mini knockout tank. ~68% of total mass removal due to HSVE-2 via PID measurements. Alarm notifications have been inactive since ~6/8/22 due to outdated telemetry software, fix pending. | |
| 12/09/22 | 10:45 | 15,572.4 | 22,375.3 | 931.9 | 14.3 | 96.0 | 1.8 | 50 | 242.8 | 11.8 | 49,650 | 685 | 1.0 | 660 | 99 | 1.1 | 15.5 | 9,875.8 | 12/8/22: System restarted following LNAPL recovery event and storage tank vac-out. System had shut down due to a Moisture Separator high level alarm at 14:22 on 12/7/22. 12/9/22: All systems ON on arrival. Sparge Zone 4 active. ~74% of total mass removal due to HSVE-2 via PID measurements. | |
| 12/29/22 | 15:47 | 15,730.0 | 22,532.9 | 938.5 | 6.6 | >100 | 1.7 | <50 | 237.8 | 10.1 | 42,497 | 670 | 1.2 | 792 | 98 | 0.9 | 6.0 | 9,881.8 | 12/19/22: System restarted following vac-out of the storage tank by MM. System had shut down on 12/15/22 at 21:03 due to a Moisture Separator high level alarm. 12/28/22: System restarted at 16:00 by MM. System was down due to an oxidizer alarm triggered at 9:40 on 12/21/22. Cause unknown. 12/29/22: System OFF on arrival due to a Moisture Separator high level alarm triggered at 18:26 on 12/28/22. A broken union was discovered on the water transfer pipe, presumed due to the freezing temperatures on 12/22/22. Union repaired while on site. Bottom moisture separator float switch also discovered to be broken, also likely due to freezing. Immediate repair not possible, and normal automatic draining capability disabled as a result. The system was run for several hours under supervision to collect readings but was shut down prior to departure. | |

Footnotes:

1. Standard flow (scfm) is calculated using differential pressure, pressure, and temperature as recorded in the field per the equation below (as identified with green highlighting in the table). The PSCAA permit requires the SVE flowrate to be less than or equal to 375 scfm.

Plant Tube Flow Equation for Any Gas

| Q (SCFM) = 128.8 x K x D ^{2.5} x SQRT((P x delta P)/(T x Sg)) | Notes: |
|--|---|
| Q | Flow in standard cubic feet per minute |
| K | 0.67 Flow Coefficient for 3 and 4-inch pipe |
| D | 3.79 Inside Diameter of Pipe measured in inches |
| T | 50 Degrees Fahrenheit |
| delta P | 0.4 Differential Pressure read on Magnetic Gauge |
| V | -3.0 Pressure (vacuum psig) inside pipe |
| P | 11.7 Static Line Pressure (psia) = 14.7 + V |
| Sg | 1.00 Specific Gravity (SG) of Air at 60 degrees F |

- On 12/02/20, the blower hour meter was reset after an extended power outage and changeover to generator power.
- The TPH concentration is the sum of APH EC5-8 aliphatics, APH EC9-12 aliphatics, and APH EC9-10 aromatics. If one of these was not detected, a conservative approach of 1x the reporting limit was used in the calculation.
- For dates with laboratory data, the Total VOC Concentration equals the laboratory TPH concentration. For dates without laboratory data, the Total VOC Concentration is calculated by adjusting the PID measurement with a correction factor. This correction factor is calculated by dividing the laboratory-measured TPH concentration from the most recent sampling event by the field-collected PID measurement from the same day.
- Removal rates are calculated via:

$$Q_c \approx \frac{(C_c) \times (F) \times (0.02832 \text{ m}^3/\text{ft}^3) \times (60 \text{ min}/\text{hr}) \times (24 \text{ hrs}/\text{day}) \times (2.205 \text{ lb}/\text{kg})}{(10^6 \mu\text{g} \cdot \text{m}^3/\text{L} \cdot \text{kg})}$$

Where:
 Q_c = Mass Emission Rate of Contaminant c, Ibs/day
 C_c = Concentration of Contaminant c, µg/L
 F = Vapor flow, scfm

- Unless otherwise indicated, all data from before 9/30/2021 was collected by CRETE and was not reviewed or validated by AECOM.
- Destruction efficiency is calculated with the Total VOC Oxidizer Outlet Concentration and the Total VOC Oxidizer Inlet Concentration. The PSCAA permit dictates that: *At all times during operation of the SVE system, the abatement device shall meet the following requirements, as applicable:*
 - ≥98.5% control efficiency if inlet TPH ≥2,000 ppmv, measured as hexane or its equivalent; or
 - ≥97% control efficiency if inlet TPH ≥200 ppmv and <2,000 ppmv, measured as hexane or its equivalent; or
 - ≥90% control efficiency if inlet TPH <200 ppmv, measured as hexane or its equivalent; or
 - ≤10 ppmv at the outlet of the control device, measured as hexane or its equivalent.
- The PSCAA permit states that: *The minimum operating temperature at the fire box of the thermal oxidizer shall be at least 1,400°F, on an hourly average.* When the thermal oxidizer was retrofitted to a catalytic oxidizer on 3/19/20, the minimum operating temperature became 600°F. The hourly requirement is met by the shut-down alarm programmed if the temperature drops below the permitted threshold.
- This calculation was revised by AECOM to use the mass removal rate from the single day's data rather than the average with the previous visit as CRETE had done.

Abbreviations, Symbols, and Notes:

- = not analyzed or not applicable
- ΔP = Differential Pressure
- H₂O = Water
- Hr = Hour
- °F = Degrees Fahrenheit
- In. = Inch
- Lb = pound
- ppmv = Parts per million volume
- scfm = Standard Cubic Feet Per Minute
- µg/m³ = micrograms per cubic meter

Red values indicate approximated values or averaged values as placeholder for data not recorded in the field.
 Blue values indicate data collected by CRETE but input by AECOM, or calculated by AECOM with data previously collected by CRETE.

PORT OF SEATTLE - TERMINAL 30
Table 6
LNAPL Gauging and Recovery Results

| Date | Time of Fieldwork | Tidal Position | | Average DTW (FT) | Period Product Removed ^L (Gal) | Cumulative Product Removed (Gal) | MW-35 ^{KM} | | MW-36 ^M | | MW-36A ^M | | MW-39A | |
|-------------------------|-------------------|---------------------------------------|--|------------------|---|----------------------------------|-------------------------|------------------------------------|-------------------------|------------------------------------|-------------------------|------------------------------------|-------------------------|------------------------------------|
| | | Time of Nearest Low Tide ^F | Time of Nearest High Tide ^F | | | | Initial LNAPL Thickness | Final LNAPL Thickness ^H | Initial LNAPL Thickness | Final LNAPL Thickness ^H | Initial LNAPL Thickness | Final LNAPL Thickness ^H | Initial LNAPL Thickness | Final LNAPL Thickness ^H |
| Baseline ^J | NA | --- | --- | --- | NA | NA | NM | --- | 0.18 | --- | 0.04 | --- | 0.05 | --- |
| 01/09/2020 | NM | --- | --- | --- | 46.7 | 46.7 | NM | NM | 0.14 | 0.00 | <0.01 | --- | <0.01 | --- |
| 02/13/2020 | NM | --- | --- | --- | 21.3 | 68 | NM | NM | 0.00 | --- | <0.01 | --- | <0.01 | --- |
| 03/12/2020 | NM | --- | --- | --- | 48.4 | 116.4 | NM | NM | 0.00 | --- | <0.01 | --- | <0.01 | --- |
| 05/16/2020 | NM | --- | --- | --- | 20 | 136.4 | NM | NM | 0.04 | 0.00 | 0.00 | --- | 0.35 | 0.00 |
| 06/19/2020 | NM | --- | --- | --- | 156 | 292.4 | NM | NM | 1.00 | 0.01 | 0.00 | --- | 0.16 | <0.01 |
| 07/28/2020 | NM | --- | --- | --- | 35 | 327.4 | NM | NM | 0.95 | <0.01 | 0.00 | --- | 0.10 | 0.01 |
| 08/21/2020 | NM | --- | --- | --- | 32 | 359.4 | NM | NM | 0.16 | 0.00 | <0.01 | --- | 0.04 | <0.01 |
| 09/10/2020 | NM | --- | --- | --- | 16.4 | 375.8 | NM | NM | 0.00 | --- | 0.00 | --- | TRACE | --- |
| 10/08/2020 | 15:30-21:51 | 20:24 | 14:24 | --- | 35.1 | 410.9 | 0.52 | 0.00 | 0.00 | --- | 0.00 | --- | 0.00 | --- |
| 11/11/2020 | 07:50-14:45 | 05:48 | 12:18 | --- | 99 | 509.9 | 0.19 | DRY | 0.00 | --- | 0.00 | --- | 0.00 | --- |
| 12/10/2020 ^C | 16:12-17:46 | 17:24 | 12:12 | --- | NA | 509.9 | 0.02 | --- | 0.00 | --- | 0.00 | --- | 0.00 | --- |
| 01/15/2021 | 07:53-16:02 | 07:42 | 15:06 | --- | 39 | 548.9 | 0.28 | 0.00 | 0.00 | --- | 0.00 | --- | 0.00 | --- |
| 2/12/2021 ^{CJ} | 08:07-10:07 | 11:49 | 06:09 | --- | NA | 548.9 | 0.06 | --- | 0.00 | --- | 0.00 | --- | 0.00 | --- |
| 03/05/2021 | 07:15-13:14 | 11:00 | 05:54 | --- | 39 ^D | 587.9 | 0.10 | 0.00 | 0.00 | --- | 0.00 | --- | 0.00 | --- |
| 4/15/2021 ^C | 16:33-18:35 | 20:42 | 13:54 | --- | NA | 587.9 | 0.42 | --- | 0.00 | --- | 0.00 | --- | 0.00 | --- |
| 05/13/2021 | 16:01-20:39 | 19:30 | 13:00 | --- | 24 | 611.9 | 0.04 | 0.00 | 0.00 | --- | 0.00 | --- | 0.00 | --- |
| 6/10/2021 ^C | 15:05-17:29 | 18:36 | 11:48 | --- | NA | 611.9 | 0.02 | --- | 0.00 | --- | 0.00 | --- | 0.00 | --- |
| 08/12/2021 | 16:31-20:26 | 21:03 | 14:50 | --- | 78 | 689.9 | 0.02 | 0.00 | 0.02 | 0.00 | 0.00 | --- | TRACE | --- |
| 11/11/2021 ^G | 15:25-21:20 | 11:18 | 19:06 | 8.77 | 44.3 | 734.2 | 0.00 | --- | 0.00 | --- | 0.00 | --- | 0.00 | --- |
| 1/18/2022 ^C | 16:37-17:57 | 19:54 | 14:30 | 7.87 | NA | 734.2 | NM | NM | 0.00 | --- | NM | NM | 0.00 | --- |
| 02/17/2022 | 16:42-19:08 | 19:48 | 14:06 | 8.65 | 31.48 | 765.68 | 0.05 | 0.00 | 0.00 | --- | 0.00 | --- | 0.00 | --- |
| 4/14/2022 ^C | 18:27-19:57 | 17:48 | 23:24 | 8.74 | NA | 765.68 | 0.00 | --- | 0.00 | --- | 0.00 | --- | 0.00 | --- |
| 05/12/2022 | 16:30-21:05 | 16:24 | 22:18 | 9.10 | 13.3 | 778.98 | 0.00 | --- | 0.00 | --- | 0.00 | --- | 0.00 | --- |
| 6/20/2022 ^C | 08:31-10:14 | 05:25 | 10:07 | 9.01 | NA | 778.98 | 0.00 | --- | 0.00 | --- | 0.00 | --- | 0.00 | --- |
| 07/14/2022 | 16:29-20:48 | 11:55 | 19:33 | 8.83 | 10.12 | 789.1 | 0.00 | --- | 0.00 | --- | 0.00 | --- | 0.00 | --- |
| 08/11/2022 ^C | 16:40-17:23 | 18:00 | 11:00 | 8.98 | NA | 789.1 | 0.01 | --- | 0.00 | --- | 0.00 | --- | 0.00 | --- |
| 09/08/2022 | 16:40-17:49 | 22:47 | 17:13 | 9.53 | 11.14 | 800.24 | TRACE | --- | 0.00 | --- | 0.00 | --- | 0.00 | --- |
| 10/13/2022 ^C | 17:19-18:12 | 19:11 | 14:04 | 9.44 | NA | 800.24 | 0.02 | --- | 0.00 | --- | NA ^O | NA ^O | NA ^O | NA ^O |
| 11/10/2022 ^C | 18:00-18:49 | 23:54 | 16:51 | 8.68 | NA | 800.24 | <0.01 | --- | 0.00 | --- | NA | NA | NA | NA |
| 12/08/2022 | 16:51-20:30 | 22:55 | 15:45 | 8.79 | 48.55 | 848.79 | 0.03 | --- | NA ^O | NA ^O | NA | NA | NA | NA |

PORT OF SEATTLE - TERMINAL 30
Table 6
LNAPL Gauging and Recovery Results

| Date | MW-59 | | MW-89 | | MW-93 ^M | | RW-1 ^M | | RW-12 | | | RW-101 | |
|--------------------------|-------------------------|------------------------------------|-------------------------|------------------------------------|-------------------------|------------------------------------|-------------------------|------------------------------------|-------------------------|------------------------------------|---------------|-------------------------|------------------------------------|
| | Initial LNAPL Thickness | Final LNAPL Thickness ^H | Initial LNAPL Thickness | Final LNAPL Thickness ^H | Initial LNAPL Thickness | Final LNAPL Thickness ^H | Initial LNAPL Thickness | Final LNAPL Thickness ^H | Initial LNAPL Thickness | Final LNAPL Thickness ^H | DTW (Ft BTOC) | Initial LNAPL Thickness | Final LNAPL Thickness ^H |
| Baseline ^J | 0.90 | --- | 2.39 | --- | 1.04 | --- | 0.55 | --- | 0.00 | --- | --- | 0.02 | --- |
| 01/09/2020 | 2.19 | 0.00 | <0.01 ^A | --- | <0.01 | --- | 0.03 | 0.01 ^B | 0.71 | 0.03 ^B | --- | 0.02 | <0.01 |
| 02/13/2020 | 0.23 | 0.10 ^B | <0.01 | --- | <0.01 | --- | 0.01 | <0.01 | 0.25 | 0.03 ^B | --- | <0.01 | NM |
| 03/12/2020 | 0.09 | <0.01 | <0.01 | --- | <0.01 | --- | 0.05 | <0.01 | 0.78 | 0.08 ^B | --- | 0.03 | <0.01 |
| 05/16/2020 | 1.06 | 0.00 | 0.00 | --- | 0.10 | 0.00 | 0.56 | 0.22 ^B | 0.78 | 0.05 ^B | --- | 0.08 | --- |
| 06/19/2020 | 0.93 | <0.01 | 0.00 | --- | 0.18 | <0.01 | 0.59 | 0.08 ^B | 0.59 | 0.00 | --- | 0.07 ^B | 0.05 ^B |
| 07/28/2020 | 0.76 | 0.01 | 0.00 | --- | 0.18 | 0.00 | 0.47 | 0.02 ^B | 0.60 | 0.00 | --- | 0.09 | 0.00 |
| 08/21/2020 | 1.12 | <0.01 | 0.00 | --- | 0.05 | <0.01 | 0.32 | 0.01 ^B | 0.35 | 0.02 ^B | --- | 0.00 | --- |
| 09/10/2020 | 0.00 | NM | 0.00 | --- | TRACE | TRACE | 0.20 | <0.01 | 0.24 | 0.02 ^B | --- | 0.00 | --- |
| 10/08/2020 | <0.01 | 0.00 | 0.00 | --- | 0.00 | --- | 0.11 | 0.01 ^B | 0.45 | 0.02 ^B | --- | 0.05 | 0.00 |
| 11/11/2020 | 0.00 | --- | 0.00 | --- | 0.00 | --- | 0.28 | 0.09 ^B | 0.43 | NM | --- | <0.01 | 0.00 |
| 12/10/2020 ^C | 0.00 | --- | 0.00 | --- | 0.00 | --- | 0.04 | --- | 0.16 | --- | --- | 0.00 | --- |
| 01/15/2021 | 0.00 | --- | 0.00 | --- | 0.00 | --- | 0.06 | 0.01 ^B | 0.18 | 0.01 ^B | --- | 0.00 | --- |
| 2/12/2021 ^{C,I} | 0.00 | --- | 0.00 | --- | 0.00 | --- | 0.03 | --- | 0.03 | --- | --- | 0.00 | --- |
| 03/05/2021 | 0.09 | 0.00 | 0.00 | --- | 0.00 | --- | 0.17 | 0.01 ^B | 0.05 | 0.00 | --- | 0.00 | --- |
| 4/15/2021 ^C | 0.01 | --- | 0.00 | --- | 0.00 | --- | 0.11 | --- | 0.25 | --- | --- | 0.00 | --- |
| 05/13/2021 | 0.62 | 0.00 | 0.00 | --- | 0.00 | --- | 0.17 | 0.02 ^B | >0.10 | 0.00 | --- | WI | WI |
| 6/10/2021 ^C | 0.86 | --- | 0.00 | --- | 0.00 | --- | 0.26 | --- | 0.21 | --- | --- | 0.01 | --- |
| 08/12/2021 | WI | WI | 0.00 | --- | 0.00 | --- | 0.27 | 0.1 ^B | 0.31 | 0.01 ^B | --- | 0.00 | --- |
| 11/11/2021 ^G | 0.20 | 0.00 | 0.00 | --- | 0.00 | --- | 0.15 | 0.00 | 0.30 | 0.00 | 9.43 | 0.00 | --- |
| 1/18/2022 ^C | 0.39 | --- | NM | NM | 0.00 | --- | NM | NM | 0.07 | --- | 8.28 | 0.00 | --- |
| 02/17/2022 | 1.36 | 0.00 | 0.00 | --- | 0.00 | --- | 0.06 | 0.01 | 0.05 | 0.01 | 9.16 | 0.00 | --- |
| 4/14/2022 ^C | 0.00 | --- | 0.00 | --- | 0.00 | --- | 0.03 | --- | 0.06 | --- | 9.06 | 0.00 | --- |
| 05/12/2022 | 0.00 | --- | 0.00 | --- | 0.00 | --- | 0.08 | <0.01 | 0.09 | 0.00 | 9.51 | 0.00 | --- |
| 6/20/2022 ^C | 0.12 | --- | 0.00 | --- | 0.00 | --- | 0.08 | --- | 0.01 | --- | 9.20 | 0.00 | --- |
| 07/14/2022 | 0.00 | --- | 0.00 | --- | 0.00 | --- | 0.09 | 0.00 | 0.13 | 0.00 | 9.49 | 0.00 | --- |
| 08/11/2022 ^C | 0.00 | --- | 0.00 | --- | 0.00 | --- | 0.06 | --- | 0.17 | --- | 9.47 | 0.00 | --- |
| 09/08/2022 | 0.19 | 0.01 | 0.00 | --- | 0.00 | --- | 0.10 | 0.01 | 0.32 | TRACE | 9.64 | 0.00 | --- |
| 10/13/2022 ^C | 0.00 | --- | NA ^O | NA ^O | NA ^O | NA ^O | 0.06 | --- | 0.29 | --- | 9.79 | NA ^O | NA ^O |
| 11/10/2022 ^C | 0.00 | --- | NA | NA | NA | NA | 0.07 | --- | 0.33 | --- | 9.25 | NA | NA |
| 12/08/2022 | 0.05 | 0.00 | NA | NA | NA | NA | 0.04 | 0.00 | 0.38 | <0.01 | 9.35 | NA | NA |

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Table 6
LNAPL Gauging and Recovery Results

| Date | RW-102 | | RW-103 | | RW-104 | | RW-105 | | RW-106 | | | RW-107 | | |
|--------------------------|-------------------------|------------------------------------|-------------------------|------------------------------------|-------------------------|------------------------------------|-------------------------|------------------------------------|-------------------------|------------------------------------|-----------|-------------------------|------------------------------------|-----------|
| | Initial LNAPL Thickness | Final LNAPL Thickness ^H | Initial LNAPL Thickness | Final LNAPL Thickness ^H | Initial LNAPL Thickness | Final LNAPL Thickness ^H | Initial LNAPL Thickness | Final LNAPL Thickness ^H | Initial LNAPL Thickness | Final LNAPL Thickness ^H | DTW | Initial LNAPL Thickness | Final LNAPL Thickness ^H | DTW |
| | (Ft) | (Ft) | (Ft) | (Ft) | (Ft) | (Ft) | (Ft) | (Ft) | (Ft) | (Ft) | (Ft BTOC) | (Ft) | (Ft) | (Ft BTOC) |
| Baseline ^J | 0.00 | --- | 1.16 | --- | 0.00 | --- | 0.00 | --- | 1.00 | --- | --- | 0.98 | --- | --- |
| 01/09/2020 | 0.00 | NM | 1.16 | <0.01 | 0.00 | NM | 0.00 | NM | 1.00 | <0.01 | --- | 0.98 | <0.01 | --- |
| 02/13/2020 | WI | WI | WI | WI | NM | NM | NM | NM | 1.40 | <0.01 | --- | 0.34 | 0.09 ^B | --- |
| 03/12/2020 | 0.00 | NM | 0.71 | 0.01 ^B | 0.00 | NM | 0.00 | NM | 1.05 | 0.06 ^B | --- | 1.37 | <0.01 | --- |
| 05/16/2020 | 0.00 | --- | 0.45 | 0.01 ^B | 0.00 | --- | 0.00 | --- | 1.10 | 0.00 | --- | 0.84 | 0.00 | --- |
| 06/19/2020 | 0.00 | --- | 0.29 | 0.01 ^B | 0.00 | --- | 0.00 | --- | 1.01 | 0.00 | --- | 1.09 | 0.27 ^B | --- |
| 07/28/2020 | 0.00 | --- | 0.31 ^B | --- | 0.00 | --- | 0.00 | --- | 0.77 | <0.01 | --- | 1.19 | <0.01 | --- |
| 08/21/2020 | 0.00 | --- | 0.23 | 0.01 ^B | 0.00 | --- | 0.00 | --- | 0.73 | 0.00 | --- | 1.41 | 0.00 | --- |
| 09/10/2020 | 0.00 | --- | 1.74 | 0.00 | 0.00 | --- | 0.00 | --- | 1.55 | 0.00 | --- | 2.17 | 0.00 | --- |
| 10/08/2020 | <0.01 ^B | --- | 0.86 | 0.00 | 0.00 | --- | 0.00 | --- | 0.73 | 0.00 | --- | 2.49 | NM | --- |
| 11/11/2020 | 0.00 | --- | 1.01 | 0.00 | 0.00 | --- | 0.00 | --- | 0.80 | 0.00 | --- | 1.83 | 0.00 | --- |
| 12/10/2020 ^C | 0.00 | --- | 0.40 | --- | 0.00 | --- | 0.00 | --- | 0.84 | --- | --- | 1.05 | --- | --- |
| 01/15/2021 | 0.00 | --- | 0.75 | 0.00 | 0.00 | --- | 0.00 | --- | 1.13 | 0.00 | --- | 0.78 | 0.00 | --- |
| 2/12/2021 ^{C,I} | 0.00 | --- | 0.87 | --- | 0.00 | --- | 0.00 | --- | 1.19 | --- | --- | 1.00 | --- | --- |
| 03/05/2021 | 0.00 | --- | 0.49 | 0.00 | 0.00 | --- | 0.00 | --- | 1.08 | 0.00 | --- | 0.96 | 0.00 | --- |
| 4/15/2021 ^C | 0.00 | --- | 0.31 | --- | 0.00 | --- | 0.00 | --- | 0.78 | --- | --- | 0.74 | --- | --- |
| 05/13/2021 | 0.00 | --- | 0.23 | 0.00 | 0.00 | --- | 0.00 | --- | 0.71 | 0.00 | --- | 0.59 | 0.00 | --- |
| 6/10/2021 ^C | WI | WI | WI | WI | 0.00 | --- | 0.00 | --- | 0.58 | --- | --- | 0.61 | --- | --- |
| 08/12/2021 | WI | WI | WI | WI | 0.00 | --- | 0.00 | --- | 0.59 | 0.00 | --- | 0.72 | 0.02 ^B | --- |
| 11/11/2021 ^G | 0.00 | --- | 0.61 | 0.00 | 0.01 | 0.00 | 0.00 | --- | 1.05 | 0.00 | 8.53 | 0.02 | 0.00 | 9.05 |
| 1/18/2022 ^C | NM | NM | 1.29 | --- | 0.00 | --- | 0.00 | --- | 1.85 | --- | 7.76 | 1.45 | --- | 7.95 |
| 02/17/2022 | 0.00 | --- | NM | NM | 0.00 | --- | 0.00 | --- | 0.92 | 0.02 | 8.28 | 0.65 | 0.02 | 8.58 |
| 4/14/2022 ^C | 0.00 | --- | 0.60 | --- | 0.00 | --- | 0.00 | --- | 1.12 | --- | 8.36 | 0.80 | --- | 8.58 |
| 05/12/2022 | 0.00 | --- | 0.29 | 0.00 | 0.00 | --- | 0.00 | --- | 0.38 | 0.00 | 8.72 | 0.75 | 0.00 | 9.02 |
| 6/20/2022 ^C | 0.00 | --- | 0.00 | --- | 0.00 | --- | 0.00 | --- | 0.00 | --- | 8.76 | 0.00 | --- | 9.03 |
| 07/14/2022 | 0.00 | --- | 0.27 | 0.00 | 0.00 | --- | 0.00 | --- | 0.82 | 0.00 | 8.67 | 0.61 | 0.00 | 8.95 |
| 08/11/2022 ^C | 0.00 | --- | 0.00 | --- | 0.00 | --- | 0.00 | --- | 0.05 | --- | 9.04 | 0.49 | --- | 9.44 |
| 09/08/2022 | 0.00 | --- | 0.00 | --- | 0.00 | --- | 0.00 | --- | 0.04 | 0.01 | 9.16 | 0.49 | 0.37 ^N | 9.54 |
| 10/13/2022 ^C | NA ^O | NA ^O | 0.00 | --- | 0.00 | --- | NA ^O | NA ^O | 0.01 | --- | 9.27 | 0.41 | --- | 9.66 |
| 11/10/2022 ^C | NA | NA | 0.28 | --- | 0.00 | --- | NA | NA | 2.09 | --- | 7.68 | 0.18 | --- | 8.65 |
| 12/08/2022 | NA | NA | 0.15 | 0.00 | 0.00 | --- | NA | NA | 0.32 | 0.00 | 8.59 | 0.44 | 0.00 | 8.86 |



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Table 6
LNAPL Gauging and Recovery Results

| Date | RW-108 | | RW-109 | | RW-110 | |
|--------------------------|-------------------------|------------------------------------|-------------------------|------------------------------------|-------------------------|------------------------------------|
| | Initial LNAPL Thickness | Final LNAPL Thickness ^H | Initial LNAPL Thickness | Final LNAPL Thickness ^H | Initial LNAPL Thickness | Final LNAPL Thickness ^H |
| | (Ft) | (Ft) | (Ft) | (Ft) | (Ft) | (Ft) |
| Baseline ^J | 0.00 | --- | 0.00 | --- | 0.02 | --- |
| 01/09/2020 | 0.00 | NM | 0.00 | NM | 0.02 | <0.01 |
| 02/13/2020 | 0.00 | NM | 0.00 | NM | 0.09 | <0.01 |
| 03/12/2020 | 0.00 | NM | 0.00 | NM | 0.04 | <0.01 |
| 05/16/2020 | 0.00 | --- | 0.00 | --- | 0.10 | 0.00 |
| 06/19/2020 | 0.00 | --- | 0.00 | --- | 0.34 | 0.00 |
| 07/28/2020 | 0.00 | --- | 0.00 | --- | 0.46 | <0.01 |
| 08/21/2020 | 0.00 | --- | 0.00 | --- | 0.30 | 0.00 |
| 09/10/2020 | 0.00 | --- | 0.00 | --- | 0.00 | --- |
| 10/08/2020 | 0.00 | --- | 0.00 | --- | 0.01 | <0.01 |
| 11/11/2020 | 0.00 | --- | 0.00 | --- | 0.02 | 0.00 |
| 12/10/2020 ^C | 0.00 | --- | 0.00 | --- | 0.00 | --- |
| 01/15/2021 | 0.00 | --- | 0.00 | --- | 0.00 | --- |
| 2/12/2021 ^{C,I} | 0.00 | --- | 0.00 | --- | 0.19 | --- |
| 03/05/2021 | 0.00 | --- | 0.00 | --- | 0.17 | 0.00 |
| 4/15/2021 ^C | 0.00 | --- | 0.00 | --- | 0.10 | --- |
| 05/13/2021 | 0.00 | --- | 0.00 | --- | 0.20 | 0.00 |
| 6/10/2021 ^C | 0.00 | --- | 0.00 | --- | 0.25 | --- |
| 08/12/2021 | 0.00 | --- | 0.00 | --- | 0.48 | 0.00 |
| 11/11/2021 ^G | 0.00 | --- | 0.00 | --- | 0.01 | 0.00 |
| 1/18/2022 ^C | 0.00 | --- | 0.00 | --- | 0.00 | --- |
| 02/17/2022 | 0.00 | --- | 0.00 | --- | 0.02 | Trace |
| 4/14/2022 ^C | 0.00 | --- | 0.00 | --- | 0.00 | --- |
| 05/12/2022 | 0.00 | --- | 0.00 | --- | 0.00 | --- |
| 6/20/2022 ^C | 0.00 | --- | 0.00 | --- | 0.00 | --- |
| 07/14/2022 | 0.00 | --- | 0.00 | --- | 0.00 | --- |
| 08/11/2022 ^C | 0.00 | --- | 0.00 | --- | 0.00 | --- |
| 09/08/2022 | 0.00 | --- | 0.00 | --- | 0.00 | --- |
| 10/13/2022 ^C | NA ^O | NA ^O | NA ^O | NA ^O | 0.00 | --- |
| 11/10/2022 ^C | NA | NA | NA | NA | 0.00 | --- |
| 12/08/2022 | NA | NA | NA | NA | 0.00 | --- |

Abbreviations, Symbols, and Formatting:

Ft = Feet
Gal = Gallon
LNAPL = Light Non-Aqueous Phase Liquid
NM = Not Measured
NA = Well not intended to be gauged/vacuumed
WI = Well inaccessible

--- = Data not needed/relevant
Red values = approximated values or averaged values as placeholder for data not recorded in the field.
Blue values = data collected by CRETE but input by AECOM, or calculated by AECOM with data previously collected by CRETE.

 = Interior Monitoring Well
 = Performance Monitoring well

Notes:

- A. Approximately 4 gallons of LNAPL and water were previously removed from this well (MW-89) on November 14, 2019.
- B. Vacuum removal was not executed.
- C. LNAPL gauging event; no LNAPL removal.
- D. Measurement not taken. The total volume extracted was similar to the prior removal event, so the prior product volume was repeated as an estimate.
- E. MW-38 was found to be obstructed during during field activities on 09/18/2020. It was not monitored thereafter and was decommissioned on 05/06/2021.
- F. Tidal information source: <https://tidesandcurrents.noaa.gov/stationhome.html?id=9447130>
- G. Unless otherwise indicated, all data prior to 10/14/2021 was collected by CRETE and was not reviewed or validated by AECOM.
- H. The final LNAPL thickness is the value measured after the final recovery cycle at a well is complete. Recovery is determined complete when the LNAPL thickness is reduced to <0.01 ft or three recovery cycles have been executed within a single event.
- I. The data previously entered for the 2/12/21 gauging event did not match the field notes. Values have been updated by AECOM as needed.
- J. Baseline LNAPL data was collected during the 10/16/19-10/18/19 gauging and sampling event and during to the first LNAPL recovery event on 1/9/20. AECOM reviewed the historical field notes and revised all wells that had non-detect LNAPL thicknesses to 0.0 ft from the previously reported values of <0.01 ft. Depth to product was not successfully measured/recorded at MW-35 prior to gauging on 10/8/20.
- K. MW-35 was initially identified as a biannual gauging well in the CMP. After LNAPL was measured in the well on 10/9/20 it entered into the monthly gauging/removal protocol.
- L. Product volume estimated by the vac truck contractor after allowing the water and free product in the truck tank to separate out over night.
- M. These monitoring wells temporarily became recovery wells when product was encountered during gauging activities. The CMP dictates that they be monitored at least quarterly after product is encountered, and sample data cannot be used for performance monitoring purposes until 4 consecutive quarters occur with measurements of ≤0.01 ft.
- N. RW-107 was extracted by vac truck 3 times for a total of 110 minutes with little impact on LNAPL thickness. The vac truck was confirmed to be working.
- O. The prior results marked at least 1 year of measurements < 0.01 ft, resulting in the removal of the well from the product monitoring/recovery protocol.
- P. Vacuum recovery performed 3 times for 20, 50, and 60 minutes, per SOP. Cause of LNAPL thickness increase unknown.

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Table 7
LNAPL Gauging Results in Monitoring Wells

| Date | Time of Fieldwork | Tidal Position | | MW-35 | MW-36 | MW-38 ^B | MW-42 | MW-45A | MW-46B | MW-54 | MW-58A | MW-64 | MW-84A |
|-------------------------|-------------------|---------------------------------------|--|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| | | Time of Nearest Low Tide ^A | Time of Nearest High Tide ^A | LNAPL Thickness (Ft) | LNAPL Thickness (Ft) | LNAPL Thickness (Ft) | LNAPL Thickness (Ft) | LNAPL Thickness (Ft) | LNAPL Thickness (Ft) | LNAPL Thickness (Ft) | LNAPL Thickness (Ft) | LNAPL Thickness (Ft) | LNAPL Thickness (Ft) |
| | | | | | | | | | | | | | |
| Baseline ^C | NA | --- | --- | NM | 0.18 | 0.0 | 0.0 | 0.0 | 0.0 | NM | 0.0 | NM | 0.0 |
| 10/8/2020 ^D | NM | --- | --- | 0.52 ^E | 0.00 | NA | NA | NA | NA | NM | NA | NM | NA |
| 6/20/2022 ^F | 09:38 | 05:25 | 10:07 | NA | NA | NA | NA | NA | NA | NA | NA | 0.0 | NA |
| 10/13/2022 ^D | 17:33 | 19:11 | 14:04 | 0.02 | 0.00 | NA | NA | NA | NA | 0.0 | NA | 0.0 | NA |

Abbreviations, Symbols, and Formatting:

Ft = Feet

LNAPL = Light Non-Aqueous Phase Liquid

NM = Not Measured





NA = Well not intended to be gauged/vacuumed

WI = Well inaccessible

--- = Data not needed/relevant

Blue values = data collected by CRETE

but input by AECOM

| | |
|---|-------------------------------|
|  | = Interior Monitoring Well |
|  | = Performance Monitoring well |
|  | = CPOC Monitoring Well |
|  | = Shoreline Monitoring Well |

Notes:

A. Tidal information sourced from <https://tidesandcurrents.noaa.gov/stationhome.html?id=9447130>

B. MW-38 was found to be obstructed during during field activities on 09/18/2020. It was not monitored thereafter and was decommissioned on 05/06/2021.

C. Baseline LNAPL data was collected during the gauging and sampling event from 10/16/19-10/18/19. Depth to product was not successfully measured/recorded at MW-54 or MW-64. All wells with thicknesses of 0.0 were corrected from the previously reported values of <0.01 ft after a review of the field notes. Depth to product was not successfully measured/recorded at MW-35 prior to the gauging on 10/8/20.

D. Biannual gauging event for MW-35, MW-36, MW-54, and MW-64.

E. MW-35 was initially identified as a biannual gauging well in the CMP. After LNAPL was measured in the well on 10/9/20 it entered into the product gauging/removal protocol. That data is shown in Table 6.

F. MW-64 was added to the 6/20/22 routine LNAPL gauging event when AECOM discovered that it had not been previously gauged as planned in the CMP schedule.

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Table 7
LNAPL Gauging Results in Monitoring Wells

| | MW-85A | MW-86B | MW-87A | MW-92 | RW-5A | RW-9 | RW-11A |
|-------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| | LNAPL Thickness | LNAPL Thickness | LNAPL Thickness | LNAPL Thickness | LNAPL Thickness | LNAPL Thickness | LNAPL Thickness |
| Date | (Ft) | (Ft) | (Ft) | (Ft) | (Ft) | (Ft) | (Ft) |
| Baseline ^c | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 10/8/2020 ^d | NA | NA | NA | NA | NA | NA | NA |
| 6/20/2022 ^f | NA | NA | NA | NA | NA | NA | NA |
| 10/13/2022 ^d | NA | NA | NA | NA | NA | NA | NA |

Abbreviations, Symbols, and Formatting:

Ft = Feet

LNAPL = Light Non-Aqueous Phase Liquid





NM = Not Measured

NA = Well not intended to be gauged/vacuumed

WI = Well inaccessible

--- = Data not needed/relevant

Blue values = data collected by CRETE but input by AECOM

| | |
|---|-------------------------------|
|  | = Interior Monitoring Well |
|  | = Performance Monitoring well |
|  | = CPOC Monitoring Well |
|  | = Shoreline Monitoring Well |

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Table 8

Performance and Interior Groundwater Analytical Data

| Well Type | Well ID | Sample Date | Diesel Range Organics (µg/L) | Lube Oil (µg/L) | Diesel Range Organics SGC (µg/L) | Lube Oil SGC (µg/L) | TPH-Dx (Diesel + Lube Oil) ^a (µg/L) | Gasoline Range Organics (µg/L) | Benzene (µg/L) | Toluene (µg/L) | Ethylbenzene (µg/L) | Total Xylenes (µg/L) | |
|-------------------|----------------|------------------------|---|--------------------|----------------------------------|---------------------|--|--------------------------------|----------------|----------------|---------------------|----------------------|--|
| | GW CULs (µg/L) | | -- | -- | -- | -- | 500 | 1,000/800 ^e | 23 | 15,000 | 2,100 | 1,000 | |
| | GW RELs (µg/L) | | -- | -- | -- | -- | 2,085 | 2,085 | 47 | 30,000 | 4,200 | 2,000 | |
| Performance Wells | RW-11A | 10/17/19 | 5,600 | 1,100 ^b | 1,100 | 250 U | 1,100 | 260 | 1 U | 1 U | 1 U | 3.0 | |
| | | 4/11/20 | 3,700 ^b | 440 ^b | 140 | 250 U | 140 | 100 U | 1 U | 1 U | 1 U | 3 U | |
| | | 4/11/20 DUP | 4,400 ^b | 480 ^b | 160 | 250 U | 160 | 100 U | 1 U | 1 U | 1 U | 3 U | |
| | | 9/18/20 | 2,800 | 330 ^b | 98 | 250 U | 98 | 100 U | 1 U | 1 U | 1 U | 3 U | |
| | | 4/3/21 | NAn | NAn | 50 U | 250 U | 250 U | 100 U | 1 U | 1 U | 1 U | 3 U | |
| | | 10/14/21 | 1,230 | 163 U | 133 ^d | 157 U | 133 | 100 U | 0.200 U | 1.00 U | 0.500 U | 1.50 U | |
| | | 4/14/22 | 1,700 ^b | 440 ^b | 50 U | 250 U | 250 U | 100 U | 1 U | 1 U | 1 U | 3 U | |
| | | 10/13/22 | 4,800 | 410 ^b | 50 U | 250 U | 250 U | 100 U | 0.35 U | 1 U | 1 U | 3 U | |
| | 10/13/22 DUP | 4,900 | 510 ^b | 50 U | 250 U | 250 U | 100 U | 0.35 U | 1 U | 1 U | 3 U | | |
| | MW-59 | 10/17/19 | Well not sampled; free product encountered | | | | | | | | | | |
| | | 4/11/20 | Well not sampled; free product encountered | | | | | | | | | | |
| | | 9/29/2020 ^f | 1,600 | 250 U | 830 | 250 U | 830 | 100 U | 1 U | 1 U | 1 U | 3 U | |
| | | 4/3/21 | Well not sampled; free product encountered | | | | | | | | | | |
| | | 10/14/21 | Well not sampled; free product encountered | | | | | | | | | | |
| | | 4/14/22 | Well not sampled per CMP; free product encountered within the preceding four quarters | | | | | | | | | | |
| | | 10/13/22 | Well not sampled per CMP; free product encountered within the preceding four quarters | | | | | | | | | | |
| | MW-89 | 10/18/19 | Well not sampled; free product encountered | | | | | | | | | | |
| | | 4/11/2020 ^f | 1,500 ^b | 420 ^b | 50 U | 250 U | 250 U | 100 U | 1 U | 1 U | 1 U | 3 U | |
| | | 9/29/2020 ^f | 6,000 | 540 ^b | 550 | 250 U | 550 | 140 ^b | 1 U | 1 U | 1 U | 3 U | |
| | | 4/3/21 | NAn | NAn | 93 | 250 U | 93 | 100 U | 1 U | 1 U | 1 U | 3 U | |
| | | 4/3/21 DUP | NAn | NAn | 88 | 250 U | 88 | 100 U | 1 U | 1 U | 1 U | 3 U | |
| | | 10/14/21 | 827 | 334 | 410 ^d | 265 | 675 | 100 U | 0.200 U | 1.00 U | 0.500 U | 1.50 U | |
| | | 4/15/22 | 780 ^b | 440 ^b | 54 | 250 U | 54 | 100 U | 1 U | 1 U | 1 U | 3 U | |
| | | 4/15/22 DUP | 910 ^b | 480 ^b | 50 U | 250 U | 250 U | 170 | 1 U | 6.8 J | 1.4 | 7.7 | |
| | 10/19/22 | 550 ^b | 250 U | 61 | 250 U | 61 | 100 U | 0.35 U | 1 U | 1 U | 3 U | | |

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Table 8

Performance and Interior Groundwater Analytical Data

| Well Type | Well ID | Sample Date | Diesel Range Organics (µg/L) | Lube Oil (µg/L) | Diesel Range Organics SGC (µg/L) | Lube Oil SGC (µg/L) | TPH-Dx (Diesel + Lube Oil) ^a (µg/L) | Gasoline Range Organics (µg/L) | Benzene (µg/L) | Toluene (µg/L) | Ethylbenzene (µg/L) | Total Xylenes (µg/L) | |
|----------------------------|----------------|--|---|----------------------|----------------------------------|---------------------|--|--------------------------------|----------------|----------------|---------------------|----------------------|--|
| | GW CULs (µg/L) | | -- | -- | -- | -- | 500 | 1,000/800 ^e | 23 | 15,000 | 2,100 | 1,000 | |
| | GW RELs (µg/L) | | -- | -- | -- | -- | 2,085 | 2,085 | 47 | 30,000 | 4,200 | 2,000 | |
| Performance Wells (Cont'd) | RW-9 | 10/17/19 | 3,100 | 750 b | 1200 | 250 U | 1,200 | 720 | 1 U | 1 U | 1.6 | 3.9 | |
| | | 9/18/20 | 3,300 | 440 b | 450 | 250 U | 450 | 430 | 1 U | 1.4 | 1 U | 3 U | |
| | | 10/14/21 | 6,360 | 150 U | 1,590 | 165 U | 1,590 | 227 | 0.200 U | 1.00 U | 0.500 U | 1.50 U | |
| | | 10/13/22 | 9,500 J ^b | 2,000 J ^b | 200 | 250 U | 200 | 100 U | 0.35 U | 1 U | 1 U | 3 U | |
| | MW-36A | 10/17/19 | Well not sampled; free product encountered | | | | | | | | | | |
| | | 9/19/2020 ^f | 3,100 | 360 ^b | 560 | 250 U | 560 | 120 | 1 U | 1 U | 1 U | 3 U | |
| | | 10/14/21 | 2,610 | 178 U | 404 | 167 U | 404 | 100 U | 0.200 U | 1.00 U | 0.500 U | 1.50 U | |
| | | 10/13/22 | 4,900 | 460 ^b | 180 | 250 U | 180 | 100 U | 0.35 U | 1 U | 1 U | 3 U | |
| | MW-39A | 10/17/19 | Well not sampled; free product encountered | | | | | | | | | | |
| | | 9/19/2020 ^f | 3,100 | 1,100 | 1,500 | 770 | 2,270 | 160 | 1 U | 1 U | 1 U | 3 U | |
| | | 10/14/21 | 2,870 | 1,760 | 1,980 ^d | 1,540 | 3,520 | 100 U | 0.200 U | 1.00 U | 0.500 U | 1.50 U | |
| | | 10/13/22 | 6,800 ^b | 1,200 ^b | 110 | 250 U | 110 | 100 U | 0.35 U | 1 U | 1 U | 3 U | |
| | MW-42 | 10/17/19 | 6,600 | 2,600 ^b | 330 ^b | 250 U | 330 ^b | 2,100 | 37 | 17 | 5.1 | 16 | |
| | | 9/18/20 | 5,500 | 1,300 ^b | 110 ^b | 250 U | 110 ^b | 620 | 5.2 | 3.5 | 1 U | 7.4 | |
| | | 10/14/21 | 4,780 | 165 U | 315 ^c | 150 U | 315 ^c | 248 | 1.31 | 1.00 U | 0.500 U | 1.50 U | |
| | | 10/13/22 | 5,600 ^b | 1,400 ^b | 120 | 250 U | 120 | 260 | 0.35 | 1 U | 1 U | 3 U | |
| Interior Wells | RW-1 | 10/17/19 | Well not sampled; free product encountered | | | | | | | | | | |
| | | 9/19/20 | Well not sampled; free product encountered | | | | | | | | | | |
| | | 10/13/22 | Well not sampled per CMP; free product encountered within the preceding four quarters | | | | | | | | | | |
| | RW-5A | 10/17/19 | 1,300 | 810 ^b | 290 ^b | 250 U | 290 ^b | 190 | 1 U | 1 U | 1 U | 3 U | |
| | | 9/18/20 | 1,700 | 330 ^b | 120 ^b | 250 U | 120 ^b | 230 | 1 U | 1 U | 1 U | 3 U | |
| | | 10/13/22 | 1,400 ^b | 310 ^b | 84 | 250 U | 84 | 110 | 0.35 U | 1 U | 1 U | 3 U | |
| | MW-38 | 10/16/19 | Well not sampled; water volume insufficient. | | | | | | | | | | |
| 9/18/20 | | Well observed broken below grade, not sampled. Well decommissioned on May 6, 2021. | | | | | | | | | | | |

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Table 8

Performance and Interior Groundwater Analytical Data

| Well Type | Well ID | Sample Date | Diesel Range Organics | Lube Oil | Diesel Range Organics SGC | Lube Oil SGC | TPH-Dx (Diesel + Lube Oil) ^a | Gasoline Range Organics | Benzene | Toluene | Ethylbenzene | Total Xylenes |
|-----------|--------------|------------------------|--|------------------|---------------------------|--------------|---|-------------------------|---------|---------|--------------|---------------|
| | | | (µg/L) | (µg/L) | (µg/L) | (µg/L) | (µg/L) | (µg/L) | (µg/L) | (µg/L) | (µg/L) | (µg/L) |
| | | GW CULs (µg/L) | -- | -- | -- | -- | 500 | 1,000/800 ^e | 23 | 15,000 | 2,100 | 1,000 |
| | | GW RELs (µg/L) | -- | -- | -- | -- | 2,085 | 2,085 | 47 | 30,000 | 4,200 | 2,000 |
| | MW-93 | 10/17/19 | Well not sampled; free product encountered | | | | | | | | | |
| | | 9/19/2020 ^f | 8,700 | 4,100 | 5,400 | 3,200 | 8,600 | 280 | 1 U | 1 U | 1 U | 3 U |
| | | 10/13/22 | 2,300 ^b | 590 ^b | 50 U | 250 U | 250 U | 100 U | 0.35 U | 1 U | 1 U | 3 U |

Notes:

^a Total TPH D + lube oil is the sum of the Silica Gel Cleanup results.

^b The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

^c Result is estimated due to overlap from Gasoline Range Organics or other VOCs.

^d The sample chromatographic pattern indicates possible weathered diesel, mineral oil, or a contribution from a related component

^e If benzene is present below method detection limits, the TPH-Gx cleanup level is 1000 µg/L. If not, the TPH-Gx cleanup level is 800 µg/L.

^f Data is not to be used for performance monitoring purposes. Free product was present in excess of 0.01 ft during the four quarters prior to the sampling event, rendering the well ineligible per CMP guidance on qualification for performance monitoring sampling.

Abbreviations and Formatting:

BOLD = result was detected above the CUL

BOLD = result was detected above the REL

µg/L = micrograms per liter

CUL = cleanup level

GW = groundwater

J = estimated value

NR = not reported

NAn = not analyzed (analysis was not requested)

REL = remediation level

SGC = silica gel cleanup

U = not detected above the value shown

PORT OF SEATTLE - TERMINAL 30

Table 9

CPOC and Shoreline Groundwater Analytical Data - TPH and BTEX

| Well Type | Well ID | Sample Date | Diesel Range | Lube Oil | Diesel Range | Lube Oil | TPH-Dx | Gasoline Range | Benzene (µg/L) | Toluene (µg/L) | Ethyl-benzene (µg/L) | Total Xylenes (µg/L) |
|-------------------------------|----------|--------------------|----------------------|--------------------|------------------------|------------------|---|-----------------|----------------|----------------|----------------------|----------------------|
| | | | Organics (µg/L) | (µg/L) | Organics w/ SGC (µg/L) | w/ SGC (µg/L) | (Diesel + Lube Oil) ^a (µg/L) | Organics (µg/L) | | | | |
| | | | GW CULs (ug/L) | -- | -- | -- | -- | 500 | | | | |
| GW RELs (ug/L) | -- | -- | -- | -- | 2085 | 2085 | 47 | 30,000 | 4,200 | 2,000 | | |
| CPOC Wells | MW-45A | 10/21/19 | 610 ^b | 250 U | 71 ^b | 250 U | 71 ^b | 100 U | 1 U | 1 U | 1 U | 3 U |
| | | 10/21/19 DUP | 600 ^b | 250 U | 66 ^b | 250 U | 66 ^b | 100 U | 1 U | 1 U | 1 U | 3 U |
| | | 9/18/20 | 490 | 250 U | 54 ^b | 250 U | 54 ^b | 100 U | 1 U | 1 U | 1 U | 3 U |
| | | 10/13/22 | 1,100 ^b | 300 U | 72 | 300 U | 72 | 100 U | 0.35 U | 1 U | 1 U | 3 U |
| | MW-46B | 10/16/19 | 1,500 | 380 ^b | 150 ^b | 250 U | 150 ^b | 100 U | 1 U | 1 U | 1 U | 3 U |
| | | 9/18/20 | 1,300 | 250 U | 81 ^b | 250 U | 81 ^b | 110 | 1 U | 1 U | 1 U | 3 U |
| | | 10/13/22 | 890 ^b | 250 U | 73 | 250 U | 73 | 100 U | 0.35 U | 1 U | 1 U | 3 U |
| | MW-58A | 10/17/19 | 1,900 | 610 ^b | 280 ^b | 250 U | 280 ^b | 360 | 1 U | 1 U | 1 U | 3 U |
| | | 9/24/20 | 3,000 | 320 ^b | 420 | 250 U | 420 | 390 | 1 U | 1 U | 1 U | 4.7 |
| | | 10/19/22 | 6,300 J ^b | 900 J ^b | 240 | 250 U | 240 | 130 | 0.35 U | 1 U | 1 U | 3 U |
| | MW-86B | 10/17/19 | 1,500 | 610 ^b | 1600 | 250 U | 1600 | 360 | 1 U | 1 U | 1 U | 3 U |
| | | 9/24/20 | 650 | 250 U | 95 | 250 U | 95 | 130 | 1 U | 1 U | 1 U | 3 U |
| | | 9/24/20 DUP | 890 | 250 U | 94 | 250 U | 94 | 100 | 1 U | 1 U | 1 U | 3 U |
| 10/19/22 | | 1,600 ^b | 400 ^b | 63 | 250 U | 63 | 100 U | 0.35 U | 1 U | 1 U | 3 U | |
| 10/19/22 DUP | | 1,600 ^b | 420 ^b | 89 | 250 U | 89 | 100 U | 0.35 U | 1 U | 1 U | 3 U | |
| MW-92 | 10/16/19 | 5,200 | 1100 ^b | 120 ^b | 250 U | 120 ^b | 250 | 1 U | 1 U | 1.2 | 3 U | |
| | 9/18/20 | 4,800 | 720 ^b | 75 ^b | 250 U | 75 ^b | 200 | 1 U | 1 U | 1 U | 3 U | |
| | 10/19/22 | 2,400 ^b | 410 ^b | 81 | 250 U | 81 | 100 U | 0.35 U | 1 U | 1 U | 3 U | |
| Shoreline Water Quality Wells | MW-84A | 10/17/19 | 1,100 | 250 U | 410 ^b | 250 U | 410 ^b | 100 U | 1 U | 1 U | 1 U | 3 U |
| | MW-85A | 10/18/19 | 130 ^b | 250 U | 50 U | 250 U | 250 U | 100 U | 1 U | 1 U | 1 U | 3 U |
| | | 10/18/19 DUP | 130 ^b | 250 U | 50 U | 250 U | 250 U | 100 U | 1 U | 1 U | 1 U | 3 U |
| | MW-87A | 10/18/19 | 420 ^b | 570 ^b | 50 U | 250 U | 250 U | 100 U | 1 U | 1 U | 1 U | 3 U |

Notes :

^a Total TPH (Diesel + lube oil) is the sum of the Silica Gel Cleanup results.

^b The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

Abbreviations/formatting

BOLD = result was detected above the CUL

BOLD = result was detected above the REL

ug/L = micrograms per liter

CPOC = Conditional Point of Compliance

CUL = cleanup level

GW = groundwater

REL = remediation level

SGC = silica gel cleanup

U - not detected above the laboratory reporting limit

PORT OF SEATTLE - TERMINAL 30
Table 10
CPOC and Shoreline Groundwater Analytical Data - PAHs

| Well Type | Well ID | Sample Date | Naphthalene (µg/L) | Acenaphthylene (µg/L) | Acenaphthene (µg/L) | Fluorene (µg/L) | Phenanthrene (µg/L) | Anthracene (µg/L) | Fluoranthene (µg/L) | Pyrene (µg/L) | Benzo (g,h,i) perylene (µg/L) | 1-Methyl naphthalene (µg/L) | 2-Methyl naphthalene (µg/L) | Benzo[a] anthracene (µg/L) | Chrysene (µg/L) | Benzo[a] pyrene (µg/L) | Benzo[b] fluoranthene (µg/L) | Benzo[k] fluoranthene (µg/L) | Indeno [1,2,3-cd] pyrene (µg/L) | Dibenzo [a,h] anthracene (µg/L) | Total cPAH TEQ ^a (µg/L) | | |
|-------------------------------|----------|----------------|--------------------|-----------------------|---------------------|-----------------|---------------------|-------------------|---------------------|---------------|-------------------------------|-----------------------------|-----------------------------|----------------------------|-----------------|------------------------|------------------------------|------------------------------|---------------------------------|---------------------------------|------------------------------------|-------|-----|
| | | GW CULs (µg/L) | 4,940 | -- | 643 | 3,460 | -- | 25,900 | 90 | 2,590 | -- | -- | -- | | | | | | | | | 0.018 | |
| CPOC Wells | MW-45A | 10/21/19 | 0.1 U | 0.039 | 4.0 | 0.35 | 0.77 | 0.01 U | 0.032 | 0.017 | 0.01 U | NR | 0.1 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.008 | |
| | | 10/21/19 DUP | Nan | NAn | NAn | Nan | NAn | NAn | NAn | NAn | NAn | NAn | NAn | NAn | NAn | NAn | NAn | NAn | NAn | NAn | NAn | NAn | NAn |
| | | 9/18/20 | 0.11 | NAn | 4.3 | 0.17 | 0.21 | 0.022 | 0.014 | 0.012 | 0.02 U | 0.11 | 0.1 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.008 | |
| | MW-46B | 10/16/19 | 0.1 U | NAn | 3.1 | 0.036 | 0.080 | 0.01 U | 0.049 | 0.035 | 0.01 U | NR | 0.1 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.008 | |
| | | 9/18/20 | 0.1 U | NAn | 2.3 | 0.01 U | 0.052 J | 0.013 | 0.017 | 0.017 | 0.02 U | 0.1 U | 0.1 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.008 | |
| | | 10/13/22 | 0.2 U | 0.02 U | 3.7 J | 0.039 | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.04 U | 0.2 U | 0.2 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.015 | |
| | MW-58A | 10/17/19 | 0.96 | NAn | 5.8 | 1.3 | 4.2 | 0.34 | 1.0 | 0.51 | 0.01 U | NR | 0.52 | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.008 | |
| | | 9/24/20 | 0.65 | NAn | 6.0 | 2.1 | 0.054 | 0.33 | 0.52 | 0.26 | 0.02 U | 0.24 | 0.1 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.008 | |
| | | 10/19/22 | 0.2 U | 0.02 U | 2.8 | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.04 U | 0.2 U | 0.2 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.015 | |
| | MW-86B | 10/17/19 | 0.1 U | NAn | 3.2 | 0.079 | 0.17 | 0.15 | 0.51 | 0.26 | 0.01 U | NR | 0.1 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.008 | |
| | | 9/24/20 | 0.1 U | NAn | 1.9 | 0.01 U | 0.016 | 0.041 | 0.49 | 0.31 | 0.02 U | 0.1 U | 0.1 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.008 | |
| | | 9/24/20 DUP | 0.1 U | NAn | 2.2 | 0.01 U | 0.012 | 0.048 | 0.53 | 0.38 | 0.02 U | 0.1 U | 0.1 U | 0.011 | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.008 | |
| | | 10/19/22 | 0.2 U | 0.02 U | 0.96 J | 0.02 U | 0.02 U | 0.02 U | 0.084 | 0.060 | 0.04 U | 0.2 U | 0.2 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.015 | |
| | MW-92 | 10/19/22 DUP | 0.2 U | 0.02 U | 2.6 J | 0.02 U | 0.02 U | 0.02 U | 0.041 | 0.028 | 0.04 U | 0.2 U | 0.2 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.015 | |
| | | 10/16/19 | 0.1 U | NAn | 0.071 | 0.027 | 0.029 | 0.01 U | 0.01 U | 0.01 U | 0.01 U | NR | 0.1 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.008 | |
| 9/18/20 | | 0.1 U | NAn | 0.087 | 0.01 U | 0.02 J | 0.013 | 0.01 U | 0.01 U | 0.02 U | 0.1 U | 0.1 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.008 | | |
| Shoreline Water Quality Wells | MW-84A | 10/17/19 | 0.1 U | NAn | 64 | 0.74 | 1.3 | 0.05 | 0.031 | 0.033 | 0.01 U | NR | 0.1 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.008 | | |
| | | 10/18/19 | 0.1 U | NAn | 49 | 0.51 | 0.90 | 0.034 | 0.018 | 0.018 | 0.01 U | NR | 0.1 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.008 | | |
| | MW-85A | 10/18/19 DUP | NAn | NAn | NAn | NAn | NAn | NAn | NAn | NAn | NAn | NAn | NAn | NAn | NAn | NAn | NAn | NAn | NAn | NAn | NAn | NAn | |
| MW-87A | 10/18/19 | 0.1 U | NAn | 0.14 | 0.015 | 0.019 | 0.01 U | 0.01 U | 0.01 U | 0.01 U | NR | 0.1 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.008 | | |

Notes:
^a cPAH TEQ values are calculated by multiplying the laboratory concentrations by the TEFs provided in MTCA Table 708-2 (WAC 173- 340-900). For ND values, 1/2 of the reporting limit is used as the concentration.

^b Individual cPAH compounds do not have remediation levels

Abbreviations/Formatting:

BOLD = result was detected above the CUL
 -- = No Value
 µg/L = micrograms per liter
 cPAH = carcinogenic polyaromatic hydrocarbon
 CPOC = Conditional Point of Compliance
 CUL = cleanup level
 GW = groundwater
 J = estimated value

MTCA = Model Toxics Control Act
 NAn = not analyzed (analysis was not requested)
 NR = not reported
 PAH = polyaromatic hydrocarbon
 TEF = toxicity equivalency factor
 TEQ = toxic equivalent concentration
 U = not detected above the laboratory reporting limit
 WAC = Washington Administrative Code

PORT OF SEATTLE - TERMINAL 30
Table 11
Monitoring Well Groundwater Sampling Parameters

| | Well ID | Total Well Depth (ft) | MP Elevation (ft NAD 83) | MP Elevation (ft NAVD 88) | Sample Date | Depth to LNAPL (ft BTOC) | Depth to Groundwater (ft BTOC) | Groundwater Elevation (ft NAD 83) | Groundwater Elevation (ft NAVD 88) | LNAPL Thickness (ft) | TEMP (°F) | TEMP (°C) | pH | Conductivity (µS/cm) | Specific Conductance (µS/cm) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | ORP (mV) | | | | | | |
|-------------------|---------|-----------------------|--------------------------|---------------------------|-------------|--|--------------------------------|-----------------------------------|------------------------------------|--|---|---|-------|----------------------|--|-----------------|-------------------------|----------|--------|----|----|--|--|--|
| Performance Wells | RW-11A | 20 | 18.02 | -- | 10/17/19 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | | | | | | |
| | | | | | 04/11/20 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | | | | | |
| | | | | | 09/18/20 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | | | |
| | | | | | 04/03/21 | ND | 9.37 | 8.65 | -- | 0 | 64.0 | 17.8 | 6.47 | 1.03 | -- | 6.6 | 0.03 | -33 | | | | | | |
| | | | | | 10/14/21 | ND | 9.7 | 8.32 | -- | 0 | 70.2 | 21.2 | 7.42 | 1.28 | -- | 7.3 | 0.97 | 27 | | | | | | |
| | | | | | 04/14/22 | ND | 9.38 | 8.64 | -- | 0 | 60.4 | 15.79 | 6.66 | 1.21 | -- | 3.6 | 2.58 | 49 | | | | | | |
| | | | | | | 10/13/22 | ND | 9.9 | 8.12 | -- | 0 | 70.2 | 21.2 | 6.92 | -- | 1,390 | 3.45 | 0.22 | -29.4 | | | | | |
| | MW-59 | -- | -- | -- | -- | 10/17/19 | -- | -- | -- | -- | -- | Well not sampled due to free product encountered | | | | | | | | | | | | |
| | | | | | | 04/11/20 | -- | -- | -- | -- | -- | Well not sampled due to free product encountered | | | | | | | | | | | | |
| | | | | | | 9/29/20 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | | | | | |
| | | | | | | 04/03/21 | -- | -- | -- | -- | -- | -- | -- | -- | Well not sampled due to free product encountered | | | | | | | | | |
| | | | | | | 10/14/21 | 9.31 | 10.70 | -- | -- | 1.39 | Well not sampled per CMP; free product encountered within the preceding four quarters | | | | | | | | | | | | |
| | | | | | | 04/14/22 | 9.24 | 9.25 | -- | -- | 0.01 | Well not sampled per CMP; free product encountered within the preceding four quarters | | | | | | | | | | | | |
| | | | | | | 10/13/22 | ND | 9.40 | -- | -- | 0 | Well not sampled per CMP; free product encountered within the preceding four quarters | | | | | | | | | | | | |
| | MW-89 | 20 | 17.91 | -- | -- | 10/18/19 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | | | | | |
| | | | | | | 04/11/20 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | | | | | | |
| | | | | | | 09/29/20 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | | | | | |
| | | | | | | 04/03/21 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | | | | | |
| | | | | | | 10/14/21 | ND | 9.87 | 8.04 | -- | 0 | 69.7 | 20.94 | 4.37 | 4.56 | -- | 38.1 | 3.6 | 460 | | | | | |
| | | | | | | 04/15/22 | ND | 10.22 | 7.69 | -- | 0 | 64.9 | 18.29 | 4.72 | 1.50 | -- | 4.8 | 7.43 | 150 | | | | | |
| | | | | | | 10/19/22 | ND | 10.7 | 7.21 | -- | 0 | 72.3 | 22.4 | 3.48 | -- | 2,947 | 1.2 | 5.26 | 227 | | | | | |
| | RW-9 | -- | -- | -- | -- | 10/17/19 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | | | | | |
| | | | | | | 09/18/20 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | | | | | | |
| | | | | | | 10/14/21 | ND | 9.33 | -- | -- | 0 | 73.9 | 23.26 | 7.13 | 1.10 | -- | 5.1 | 0 | -107 | | | | | |
| | | | | | | 10/13/22 | ND | 9.33 | -- | -- | 0 | 73.6 | 23.1 | 6.94 | -- | 1,072.00 | 0.86 | 0.13 | -127.5 | | | | | |
| | MW-36A | 20.5 | NM | NM | NM | 10/17/19 | -- | -- | -- | -- | -- | Well not sampled due to free product encountered | | | | | | | | | | | | |
| | | | | | | 09/19/20 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | | | | | | |
| 10/14/21 | | | | | | ND | 10.05 | -- | -- | 0 | 66.5 | 19.18 | 7.73 | 2.61 | -- | 12.8 | 0.54 | -318 | | | | | | |
| 10/13/22 | | | | | | ND | 11.7 | -- | -- | 0 | 66.9 | 19.4 | 6.99 | -- | 1,902.00 | 73.0 | 0.19 | -139 | | | | | | |
| MW-39A | 20.5 | NM | NM | NM | 10/17/19 | -- | -- | -- | -- | -- | Well not sampled due to free product encountered | | | | | | | | | | | | | |
| | | | | | 09/19/20 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | | | | | | | |
| | | | | | 10/14/21 | ND | 9.4 | -- | -- | 0 | 68.8 | 20.44 | 7.25 | 1.12 | -- | 3.8 | 0.13 | -142 | | | | | | |
| | | | | | 10/13/22 | ND | 9.25 | -- | -- | 0 | 69.4 | 20.8 | 6.92 | -- | 1,426.00 | 9.5 | 0.1 | -141.8 | | | | | | |
| MW-42 | -- | -- | -- | -- | 10/17/19 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | | | | | | |
| | | | | | 09/18/20 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | | | | | | | |
| | | | | | 10/14/21 | ND | 10.08 | -- | -- | 0 | 67.1 | 19.51 | 7.55 | 1.87 | -- | 1.4 | 0.3 | -168 | | | | | | |
| | | | | | 10/13/22 | ND | 10.85 | -- | -- | 0 | 66.4 | 19.1 | 6.73 | -- | 1,496.00 | 51.9 | 0.23 | -115.8 | | | | | | |
| Interior Wells | RW-1 | -- | -- | -- | 10/17/19 | -- | -- | -- | -- | -- | Well not sampled due to free product encountered | | | | | | | | | | | | | |
| | | | | | 09/19/20 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | | | | | | | |
| | | | | | 10/13/22 | 9.13 | 9.19 | -- | -- | 0.06 | Well not sampled per CMP; free product encountered within the preceding four quarters | | | | | | | | | | | | | |
| | RW-5A | 20 | 18.07 | -- | -- | 10/17/19 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | | | | | |
| | | | | | | 09/18/20 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | | | | | | |
| | | | | | | 10/13/22 | ND | 8.88 | 9.19 | -- | 0 | 61.88 | 16.6 | 6.80 | -- | 878 | 60 | 0.20 | -138.6 | | | | | |
| MW-38 | -- | -- | -- | -- | -- | -- | -- | -- | -- | Well not sampled; water volume insufficient. | | | | | | | | | | | | | | |
| | | | | | 9/18/20 | Well observed broken below grade, not sampled. Well decommissioned on May 6, 2021. | | | | | | | | | | | | | | | | | | |
| MW-93 | 20.5 | NM | NM | NM | 10/17/19 | -- | -- | -- | -- | -- | Well not sampled due to free product encountered | | | | | | | | | | | | | |
| | | | | | 09/19/20 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | | | | | | |
| | | | | | 10/13/22 | ND | 9.74 | -- | -- | 0 | 68.9 | 20.5 | 6.44 | -- | 1,198 | 103.8 | 0.68 | -71.6 | | | | | | |
| CPOC Wells | MW-45A | 20.1 | -- | 16.52 | 10/21/19 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | | | | | | |
| | | | | | 09/18/20 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | | | | | | | |
| | | | | | 10/13/22 | ND | 10.51 | -- | -- | 6.01 | 63.7 | 17.6 | 6.73 | -- | 876 | 6.45 | 0.19 | -95.1 | | | | | | |

PORT OF SEATTLE - TERMINAL 30
Table 11
Monitoring Well Groundwater Sampling Parameters

| | Well ID | Total Well Depth (ft) | MP Elevation (ft NAD 83) | MP Elevation (ft NAVD 88) | Sample Date | Depth to LNAPL (ft BTOC) | Depth to Groundwater (ft BTOC) | Groundwater Elevation (ft NAD 83) | Groundwater Elevation (ft NAVD 88) | LNAPL Thickness (ft) | TEMP (°F) | TEMP (°C) | pH | Conductivity (µS/cm) | Specific Conductance (µS/cm) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | ORP (mV) | | |
|--------------------------------------|---------|-----------------------|--------------------------|---------------------------|-------------|--------------------------|--------------------------------|-----------------------------------|------------------------------------|----------------------|-----------|-----------|------|----------------------|------------------------------|-----------------|-------------------------|----------|--------|----|
| CPOC Wells Cont'd | MW-46B | 20.3 | -- | 16.07 | 10/16/19 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | | |
| | | | | | 09/18/20 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | 10/13/22 | ND | 10.64 | -- | 5.43 | 0 | 63.9 | 17.7 | 6.71 | -- | 1,080 | 6.45 | 1.01 | -- | -63.5 | |
| | MW-58A | 25 | NM | NM | 10/17/19 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| | | | | | 09/24/20 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| | | | | | 10/19/22 | ND | 11.02 | -- | -- | 0 | 66.6 | 19.2 | 6.76 | -- | 1,157 | 17.5 | 0.12 | -- | -124.2 | |
| | MW-86B | 20 | 18.28 | -- | 10/17/19 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| | | | | | 09/24/20 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| | | | | | 10/19/22 | ND | 12.48 | 5.8 | -- | 0 | 65.5 | 18.6 | 7.13 | -- | 1,917 | 1.07 | 0.15 | -- | -116.8 | |
| | MW-92 | 20 | NM | NM | 10/16/19 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| | | | | | 09/18/20 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| | | | | | 10/13/22 | ND | 9.93 | -- | -- | 0 | 64.0 | 17.8 | 6.60 | -- | 933 | 253.1 | 0.20 | -- | -132.6 | |
| Shoreline Water Quality Wells | MW-84A | 40 | NM | NM | 10/17/19 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | | | |
| MW-85A | 20 | 18.09 | -- | 10/18/19 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | | | |
| MW-87A | 20 | 17.98 | -- | 10/18/19 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | | | |

Notes:

All gw parameter data presented in this table was recorded at the time of sampling after stabilization was achieved in accordance with EPA's low-flow sampling procedures.

This table was created by AECOM in October 2021. Any water quality parameters collected by CRETE prior to AECOM involvement are not included, but are available in the relevant historical field forms.

Abbreviations/Formatting:

- Data irrelevant/not available mg/L = milligram per liter
- µS/cm = microsiemens per centimeter MP = monitoring point
- BTOC = below top of casing mV = millivolt
- CPOC = Conditional Point of Compliance NM = Not Measured
- Ft = Feet NTU = Nephelometric Turbidity unit
- Gal = Gallon ORP = oxidation-reduction potential
- LNAPL = Light Non-Aqueous Phase Liquid

PORT OF SEATTLE - TERMINAL 30

Table 12

Well Construction Information

| | Well Identification | Date of Installation | Casing Diameter (inch) | Well Screen Interval (ft BGS) | Well Depth (ft BGS) | Northing (ft) | Easting (ft) | MP Elevation (ft NAD83/NAVD88) |
|-------------------------------|---------------------|----------------------|------------------------|-------------------------------|---------------------|---------------|--------------|--------------------------------|
| Performance Wells | RW-9 | -- | 6 | -- | | -- | -- | -- |
| | RW-11A | 04/24/08 | 4 | 5 - 20 | 20.0 | 216683.94 | 1268216.99 | 18.02 ^a |
| | MW-36A | 10/15/16 | 2 | 5 - 20 | 20.5 | NM | NM | NM |
| | MW-39A | 10/15/17 | 2 | 5 - 20 | 20.5 | NM | NM | NM |
| | MW-42 | -- | 2 | -- | -- | -- | -- | -- |
| | MW-59 | -- | 2 | -- | -- | -- | -- | -- |
| | MW-89 | 04/22/08 | 2 | 5 - 20 | 20.0 | 217003.93 | 1268079.62 | 17.91 ^a |
| Interior Wells | RW-1 | -- | -- | -- | -- | -- | -- | -- |
| | RW-5A | 04/25/08 | 4 | 5 - 20 | 20.0 | 216931.12 | 1268445.78 | 18.07 ^a |
| | MW-38 ^c | -- | -- | -- | -- | -- | -- | -- |
| | MW-93 | 10/15/17 | 2 | 5 - 20 | 20.5 | NM | NM | NM |
| CPOC Wells | MW-45A | 11/17/16 | 2 | 5.1 - 20.1 | 20.1 | 216490.82 | 1268124.80 | 16.52 ^b |
| | MW-46B | 11/14/16 | 2 | 5.3 - 20.3 | 20.3 | 216602.90 | 1268114.90 | 16.07 ^b |
| | MW-58A | 08/29/13 | 2 | 5 - 25 | 25.0 | NM | NM | NM |
| | MW-86B | 04/22/08 | 2 | 5 - 20 | 20.0 | 216946.15 | 126807.76 | 18.28 ^a |
| | MW-92 | 08/30/13 | 2 | 5 - 20 | 20.0 | NM | NM | NM |
| Shoreline Water Quality Wells | MW-84A | 04/29/09 | 2 | 30-40 | 40.0 | NM | NM | NM |
| | MW-85A | 04/24/08 | 2 | 5 - 20 | 20.0 | 216682.46 | 1268002.20 | 18.09 ^a |
| | MW-87A | 04/22/08 | 2 | 5 - 20 | 20.0 | 217186.75 | 1268010.28 | 17.98 ^a |

Notes:

- ^a Monitoring Point (MP) and water table elevations in ft (NAD 83)
- ^b Monitoring Point (MP) and water table elevations in ft (NAVD 88)
- ^c MW-38 decommission May 6, 2021 due to a subsurface obstruction.

Abbreviations/Formatting:

- = data not available
- BGS = below ground surface
- CPOC = Conditional Point of Compliance
- MP = monitoring point
- NM - not measured

Figures

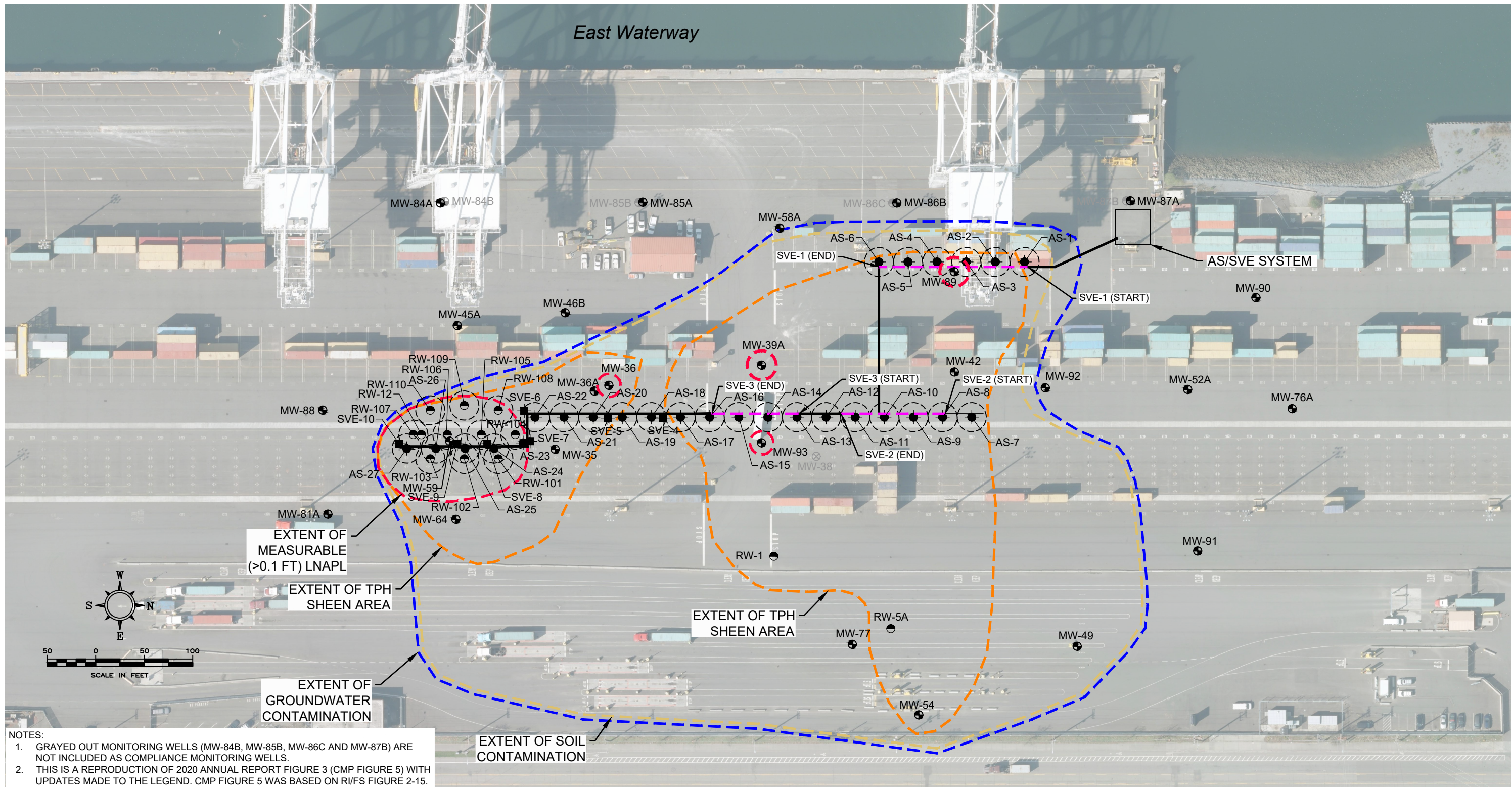


SITE LOCATION

PORT OF SEATTLE
TERMINAL 30 CLEANUP ACTION
SEATTLE, WASHINGTON

FIGURE 1

East Waterway



NOTES:
 1. GRAYED OUT MONITORING WELLS (MW-84B, MW-85B, MW-86C AND MW-87B) ARE NOT INCLUDED AS COMPLIANCE MONITORING WELLS.
 2. THIS IS A REPRODUCTION OF 2020 ANNUAL REPORT FIGURE 3 (CMP FIGURE 5) WITH UPDATES MADE TO THE LEGEND. CMP FIGURE 5 WAS BASED ON RI/FS FIGURE 2-15.

LEGEND

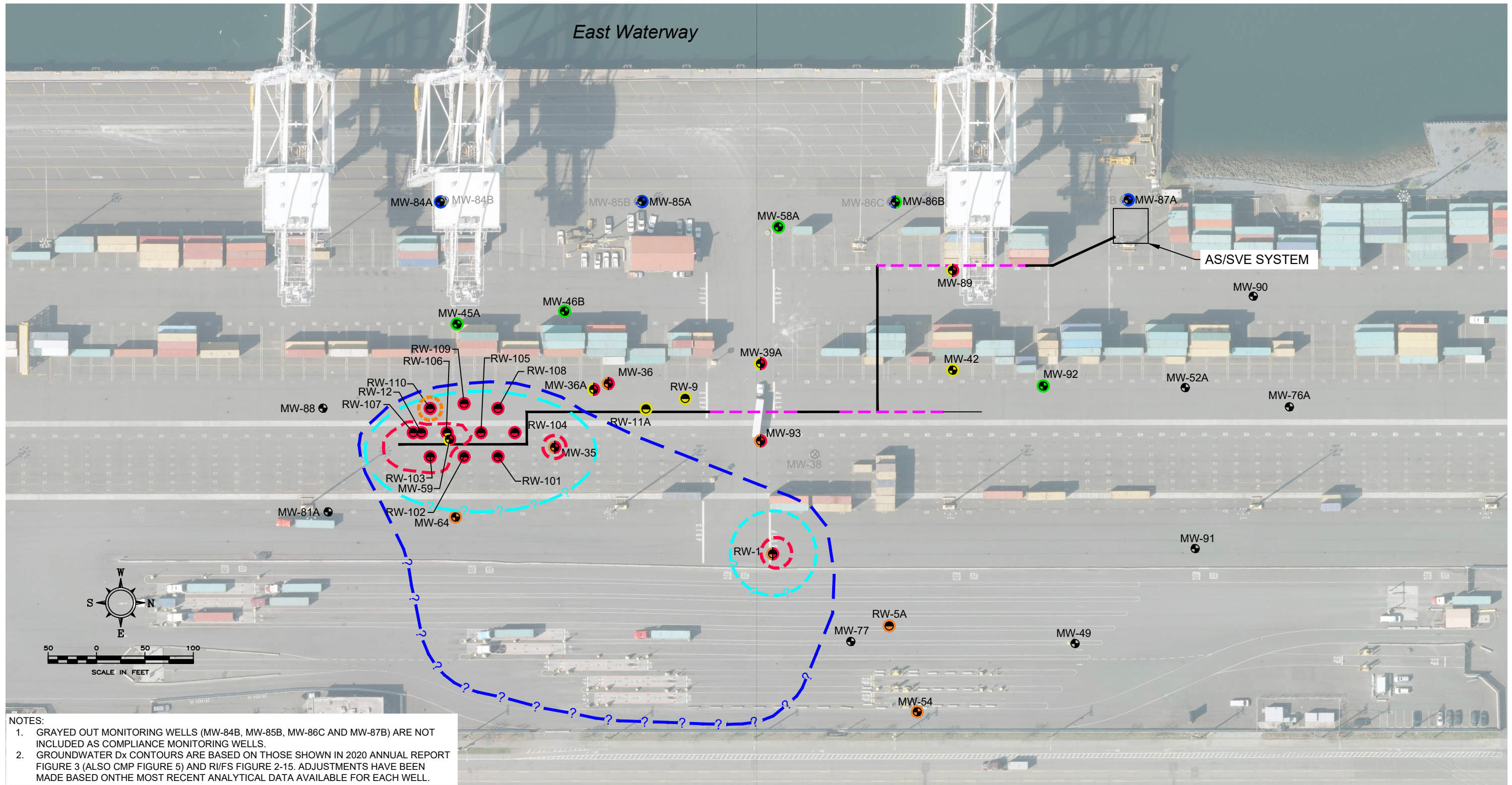
- AS WELL
- SVE WELL (VERTICAL)
- PRODUCT RECOVERY WELL
- MONITORING WELL
- ⊗ DECOMMISSIONED MONITORING WELL
- HORIZONTAL SVE SCREEN
- AS & SVE PIPING
- - - EXTENT OF BASELINE GROUNDWATER TPH/BTEX CONTAMINATION ABOVE CUL (2017 AND EARLIER)
- - - EXTENT OF BASELINE SOIL TPH/BTEX CONTAMINATION ABOVE CUL (2017 AND EARLIER)
- - - EXTENT OF BASELINE MEASURABLE LNAPL (>0.1 FT)(2017 AND EARLIER)
- - - EXTENT OF BASELINE TPH SHEEN (2017 AND EARLIER)



BASELINE EXTENT OF IMPACTS AND LOCATION OF CLEANUP ACTION

PORT OF SEATTLE
 TERMINAL 30 CLEANUP ACTION
 SEATTLE, WASHINGTON

FIGURE 2



NOTES:

1. GRAYED OUT MONITORING WELLS (MW-84B, MW-85B, MW-86C AND MW-87B) ARE NOT INCLUDED AS COMPLIANCE MONITORING WELLS.
2. GROUNDWATER Dx CONTOURS ARE BASED ON THOSE SHOWN IN 2020 ANNUAL REPORT FIGURE 3 (ALSO CMP FIGURE 5) AND RI/FS FIGURE 2-15. ADJUSTMENTS HAVE BEEN MADE BASED ON THE MOST RECENT ANALYTICAL DATA AVAILABLE FOR EACH WELL.

LEGEND

- | | | |
|--|-----------------------------|--|
| ● MONITORING WELL | ● CPOC MONITORING WELL | --- EXTENT OF GROUNDWATER Dx CONTAMINATION ABOVE REL (OCT 2022) ² |
| ⊗ DECOMMISSIONED MONITORING WELL | ● SHORELINE MONITORING WELL | --- EXTENT OF GROUNDWATER Dx CONTAMINATION ABOVE CUL (OCT 2022) ² |
| ● PRODUCT RECOVERY WELL | ● FREE PRODUCT GAUGING WELL | --- EXTENT OF MEASURABLE LNAPL (>0.01 FT) ON DEC 8, 2022 |
| ● PERFORMANCE MONITORING WELL | --- HORIZONTAL SVE SCREEN | --- EXTENT OF MEASURABLE LNAPL (>0.01 FT) IN 2021 (PRIOR TO DEC 8, 2022) |
| ● INTERIOR MONITORING WELL (MW-35, MW-36, MW-54, and MW-64 are gauging only) | — AS & SVE PIPING | |

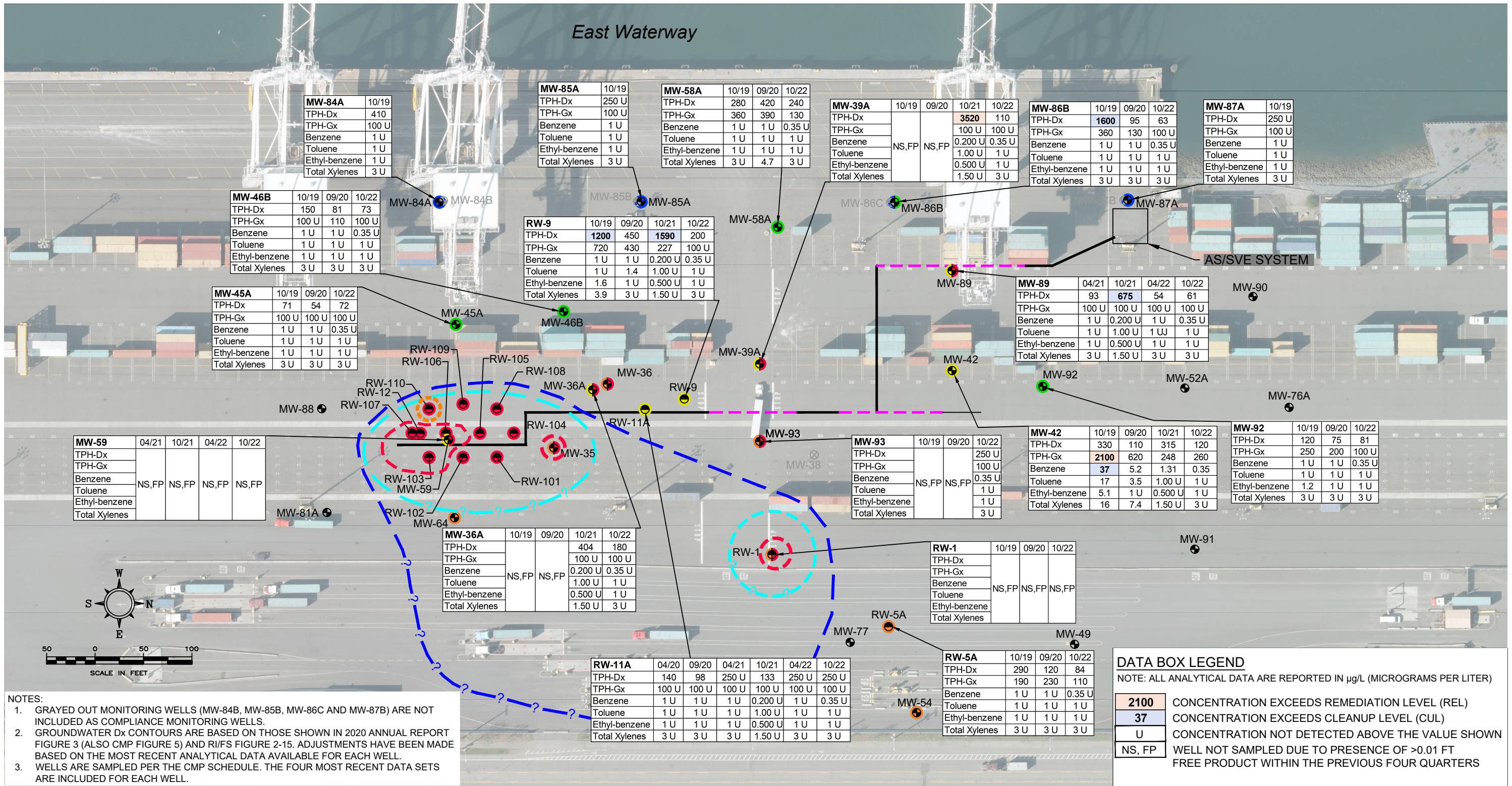
COMPLIANCE MONITORING NETWORK WITH FINAL 2022 GROUNDWATER CONDITIONS

PORT OF SEATTLE
 TERMINAL 30 CLEANUP ACTION
 SEATTLE, WASHINGTON



FIGURE 3

C:\Users\pallenup\AECOM\GIS Services - GIS CAD PROJECTS\DCS AMERICUS\REMIEST\FB15A\Port of Seattle\Work\20240208\Terminal 30\CAD\Fig 4 End of 2021 Compliance Monitoring Analytical Results.dwg Feb 08, 2024 - 3:10pm



NOTES:

1. GRAYED OUT MONITORING WELLS (MW-84B, MW-85B, MW-86C AND MW-87B) ARE NOT INCLUDED AS COMPLIANCE MONITORING WELLS.
2. GROUNDWATER Dx CONTOURS ARE BASED ON THOSE SHOWN IN 2020 ANNUAL REPORT FIGURE 3 (ALSO CMP FIGURE 5) AND RI/FS FIGURE 2-15. ADJUSTMENTS HAVE BEEN MADE BASED ON THE MOST RECENT ANALYTICAL DATA AVAILABLE FOR EACH WELL.
3. WELLS ARE SAMPLED PER THE CMP SCHEDULE. THE FOUR MOST RECENT DATA SETS ARE INCLUDED FOR EACH WELL.

LEGEND

- MONITORING WELL
- ⊗ DECOMMISSIONED MONITORING WELL
- PRODUCT RECOVERY WELL
- PERFORMANCE MONITORING WELL
- INTERIOR MONITORING WELL (MW-35, MW-35, MW-54, and MW-64 are gauging only)
- CPOC MONITORING WELL
- SHORELINE MONITORING WELL
- FREE PRODUCT GAUGING WELL
- HORIZONTAL SVE SCREEN
- AS & SVE PIPING
- EXTENT OF GROUNDWATER Dx CONTAMINATION ABOVE REL (OCT 2022)?
- EXTENT OF GROUNDWATER Dx CONTAMINATION ABOVE CUL (OCT 2022)?
- EXTENT OF MEASURABLE LNAPL (>0.01 FT) ON DEC 8, 2022
- EXTENT OF MEASURABLE LNAPL (>0.01 FT) IN 2021 (PRIOR TO DEC 8, 2022)

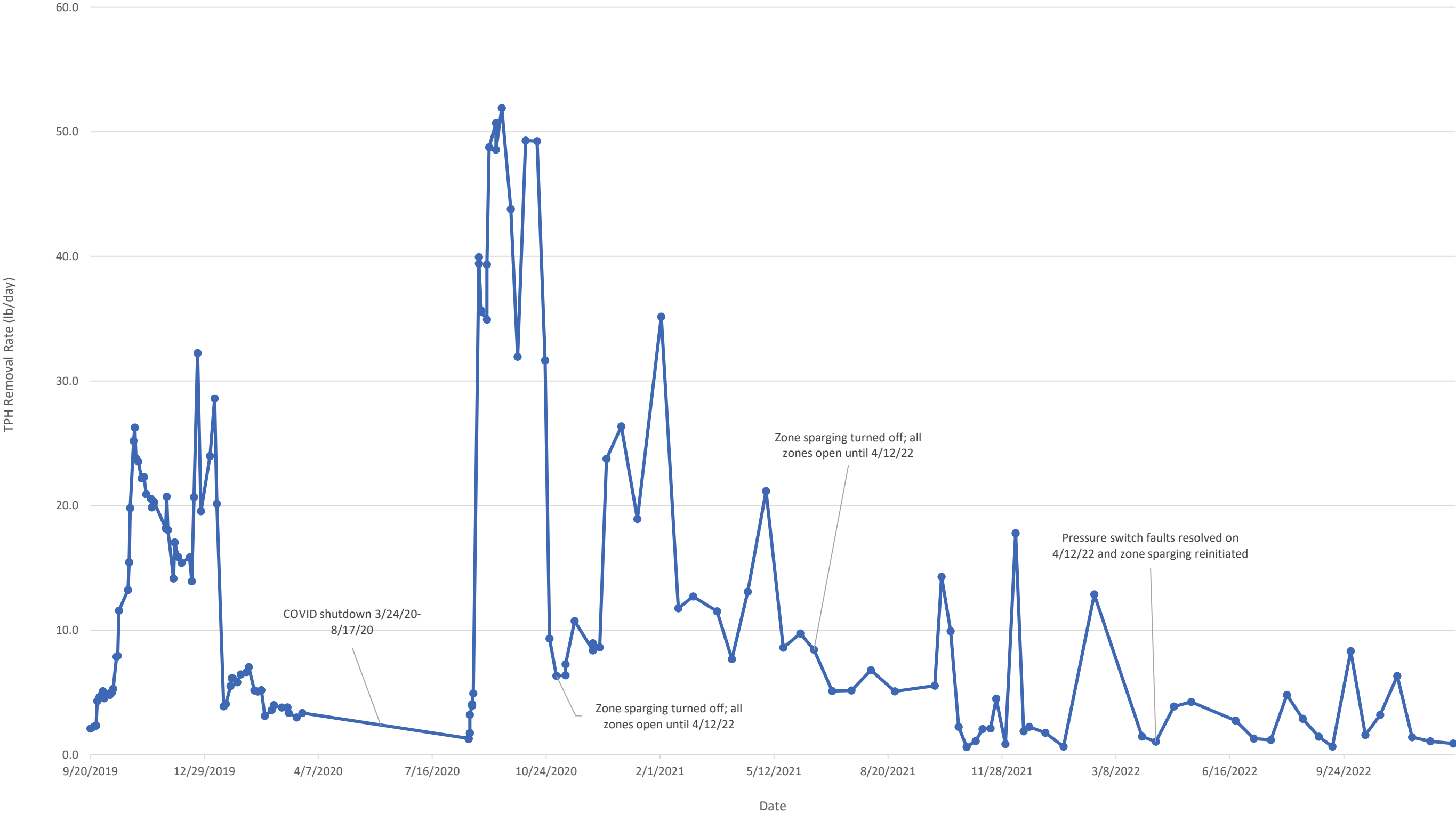


END OF 2022 COMPLIANCE MONITORING ANALYTICAL RESULTS

PORT OF SEATTLE
TERMINAL 30 CLEANUP ACTION
SEATTLE, WASHINGTON

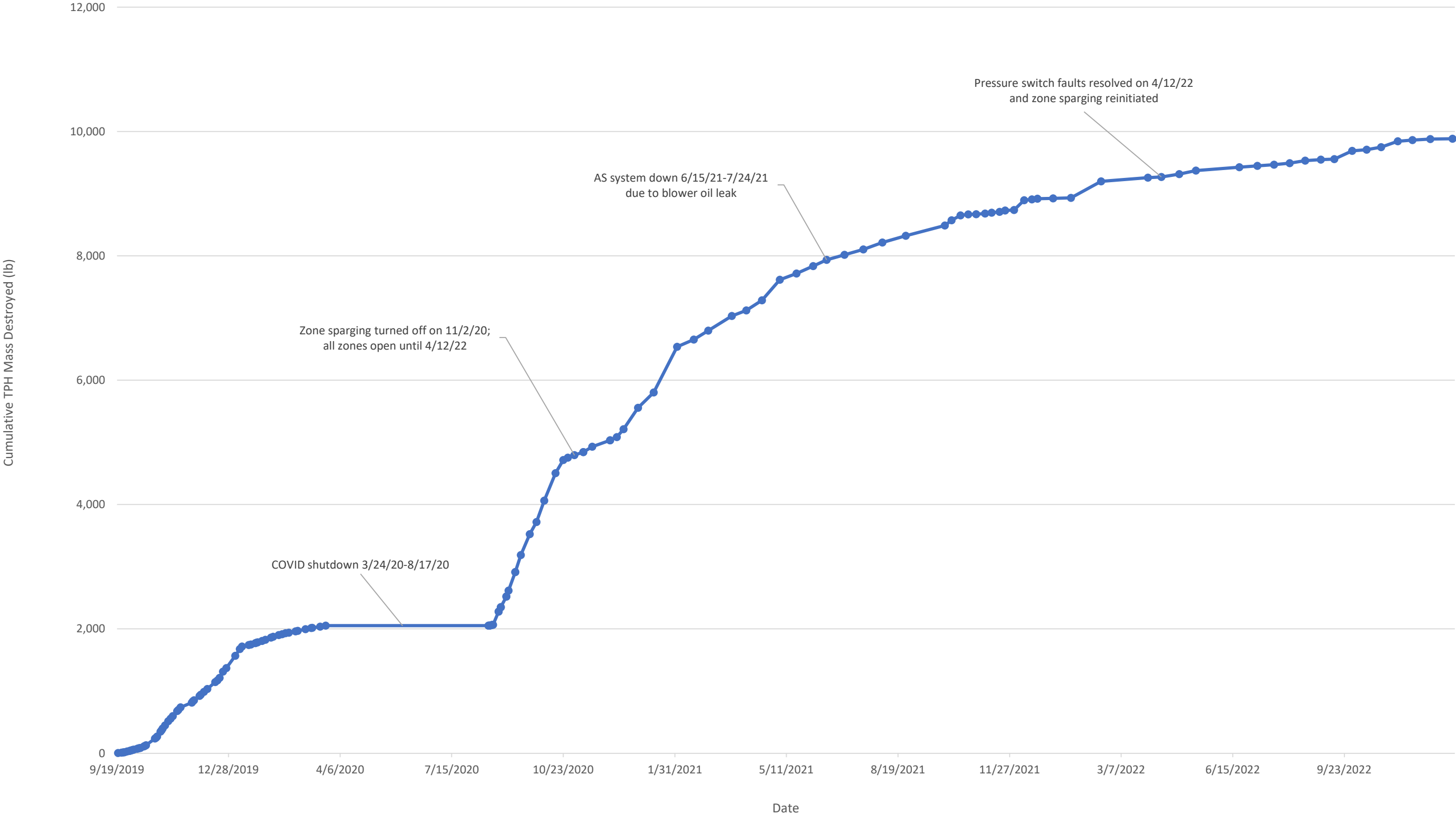
FIGURE 4

Figure 5 - Period VOC Removal Rates



Notes:
1. Data shown is a combination of PID field data and laboratory-analyzed vapor data.

Figure 6 - Cumulative VOC Mass Removal



Notes:
1. Data shown is a combination of PID field data and laboratory-analyzed vapor data.

Figure 7 - LNAPL Thickness in Recovery Wells

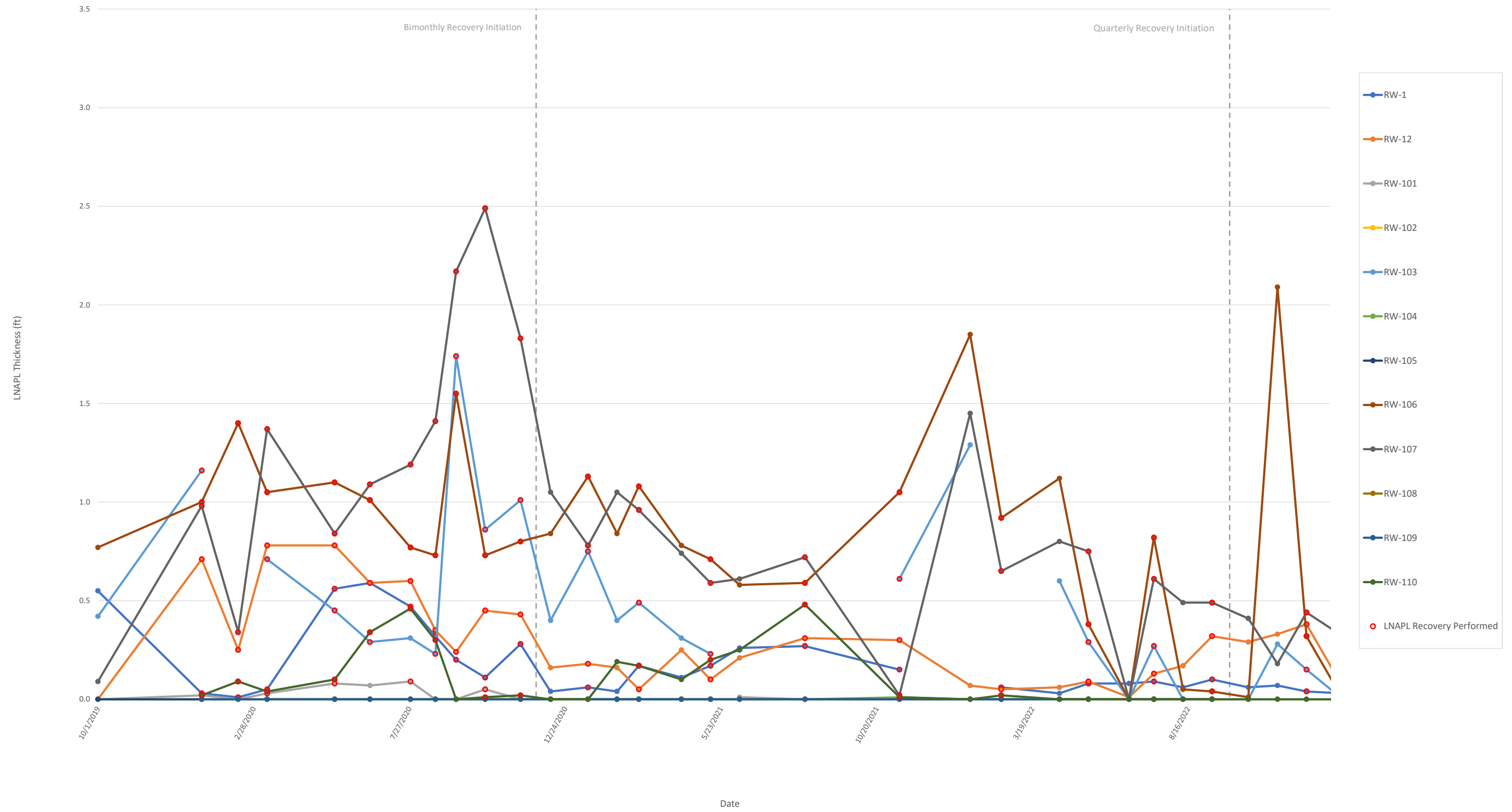


Figure 9 - LNAPL Recovery Volumes

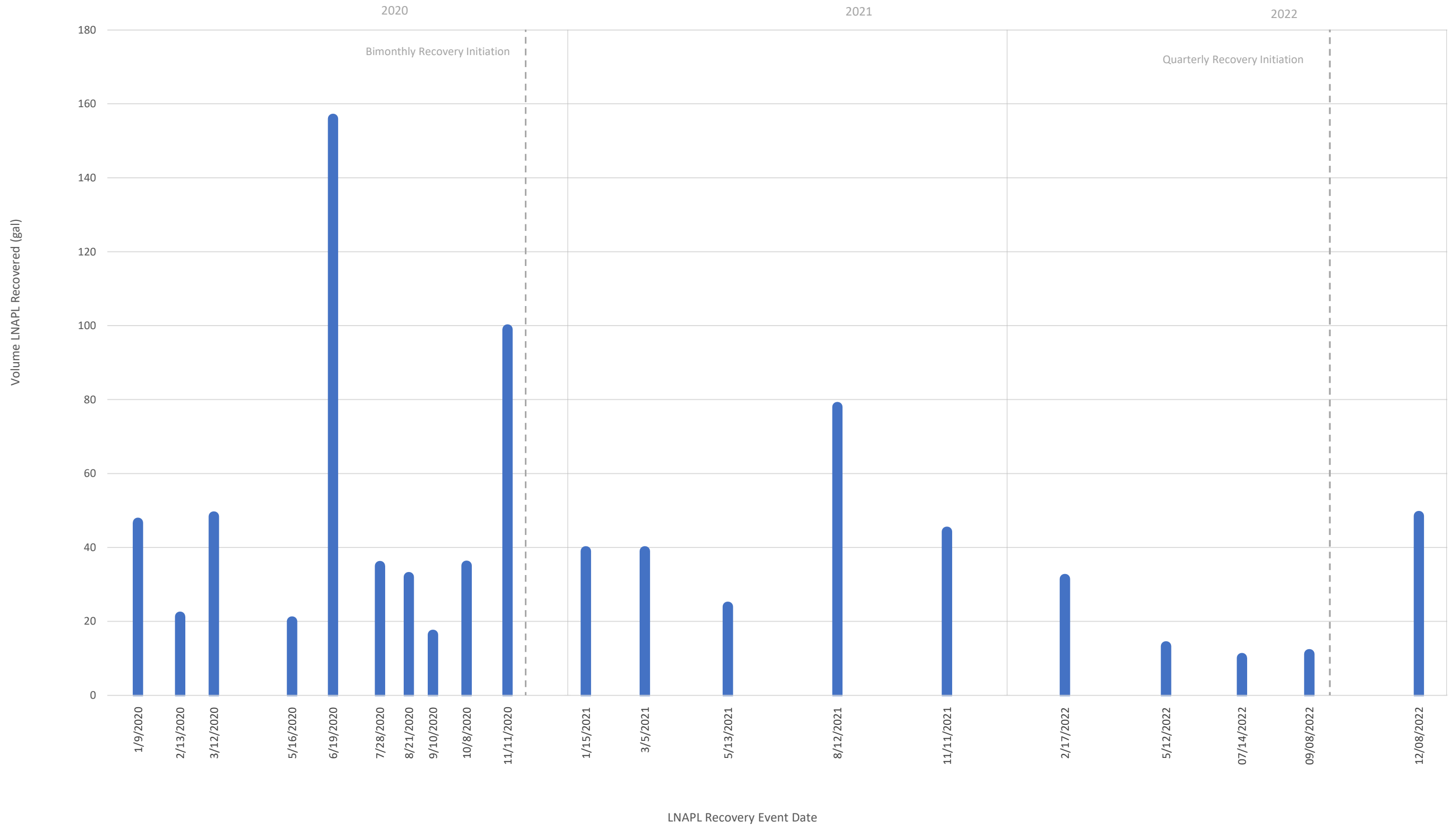


Figure 10 - Cumulative LNAPL Recovery Volume

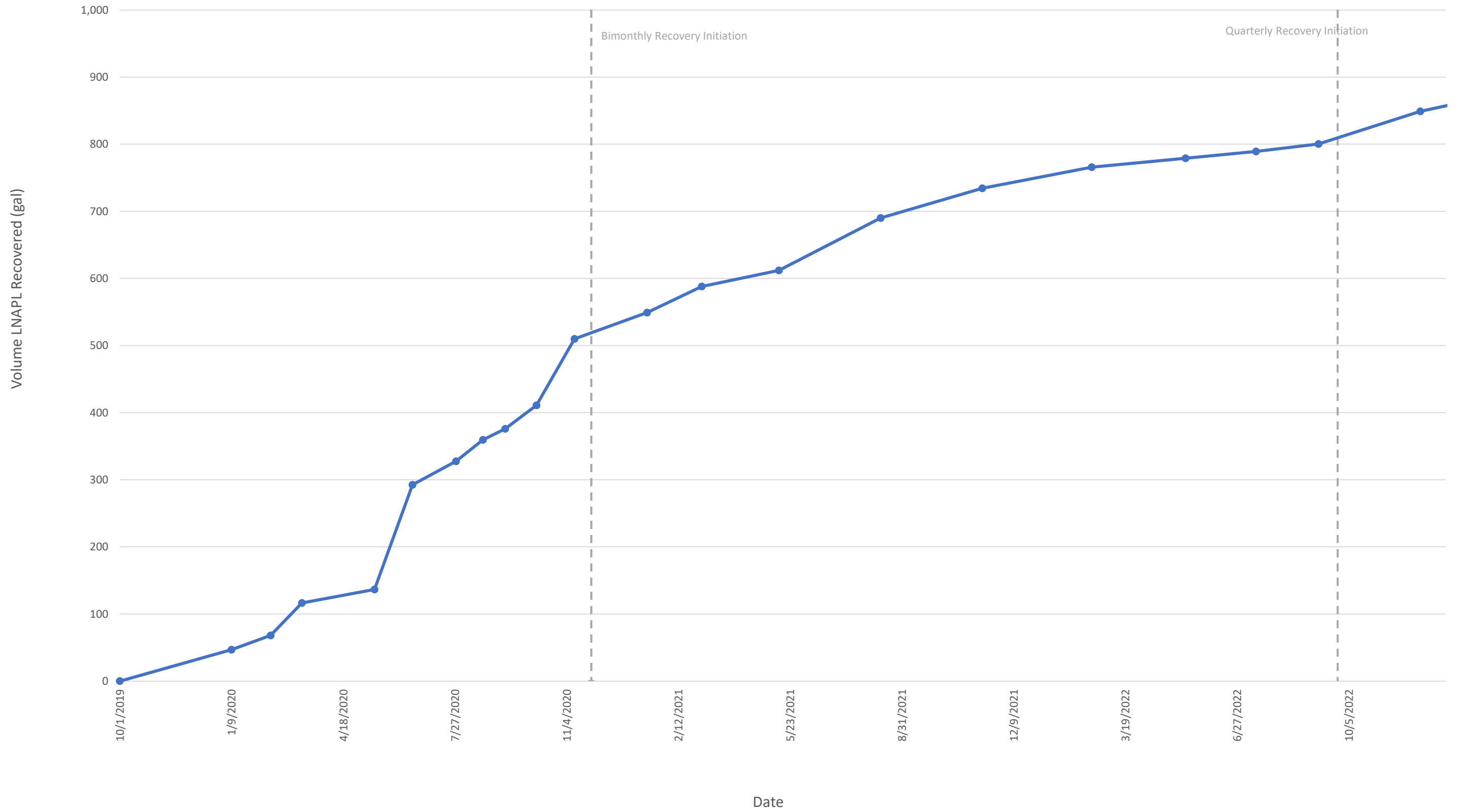
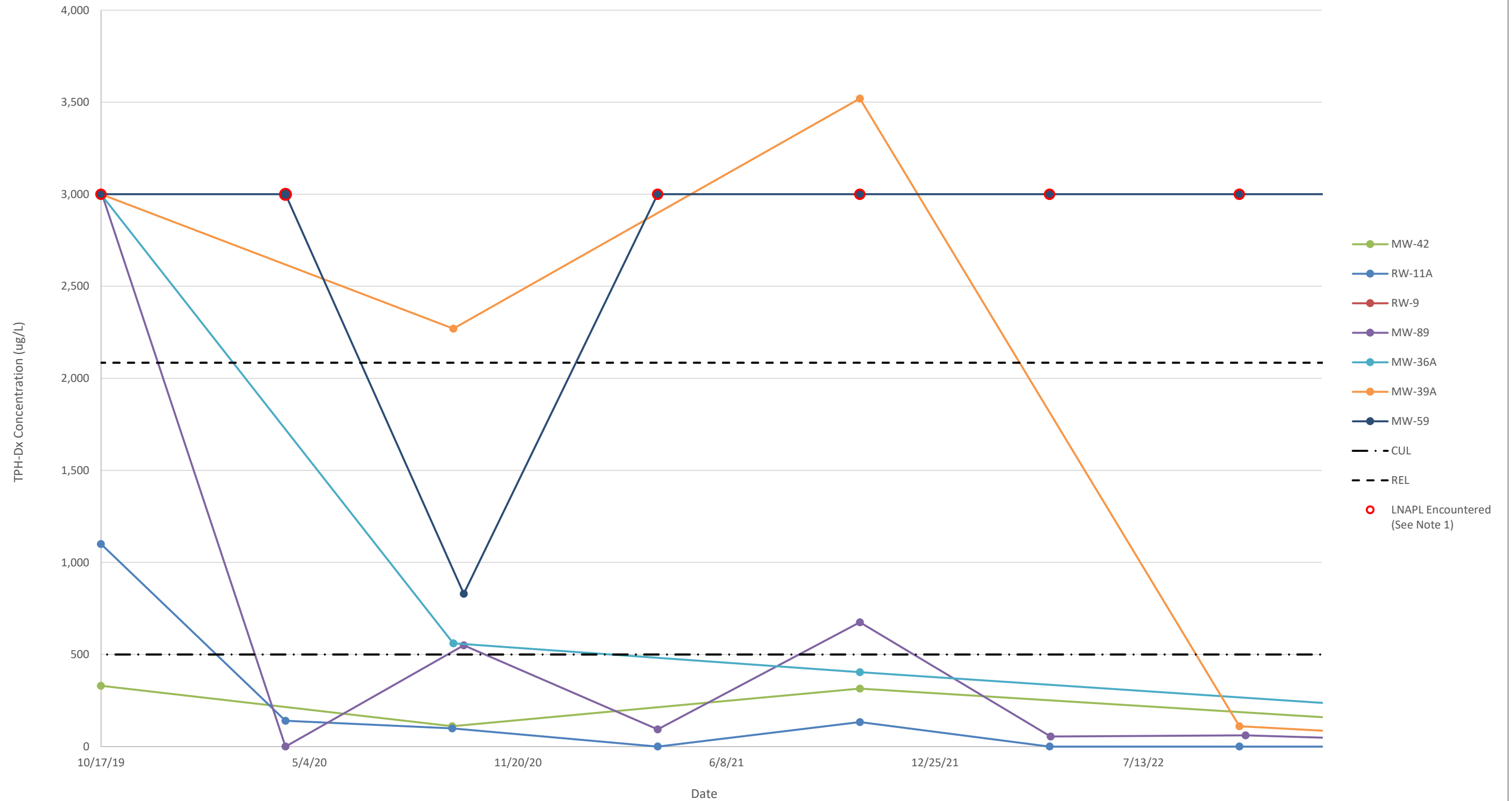


Figure 11 - Performance Monitoring Well TPH-Dx Concentrations



Notes:
 1. Wells with free product present at the time of sampling, or not sampled due to free product measurements within the preceding four quarters, are shown with a TPH concentration of 3,000 µg/L. This value is used only to represent free product and does not reflect actual TPH concentrations.

Appendix A
O&M Field Forms

PROJECT T-30

COMPLETED BY LP

JOB NO. _____

APPROVED BY _____

DAY & DATE Wed 1/5/77

SHEET 1 OF 1

**FIELD ACTIVITY SUBJECT:
DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:**

| TIME | |
|-------|--|
| 14:35 | Arrive on site |
| 14:38 | Take HIM readings |
| 14:50 | Oxidizer readings |
| 14:50 | SVE well head reading |
| 15:00 | ASE well head readings |
| 15:15 | PID readings Eff In P |
| 15:29 | Sent Paul photos of field sheets Missed Burner Chamber temp and Burner Chamber inlet diff pressure (gauge on top of gray cylinder). Filled hose in. |
| 15:51 | Anders called to tell me where Inlet Diff pressure was at. He had me close the valve above PI-500. |
| 16:05 | Leaving site to return equip to office |
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|---------------------|--|--|--|
| VISITORS ON SITE: | | CHANGES FROM PLANS OR IMPORTANT DECISIONS: | |
| WEATHER CONDITIONS: | | IMPORTANT TELEPHONE CALLS: | |
| PERSONNEL ON SITE: | | | |

PORT OF SEATTLE - TERMINAL 30

Field Tech: *Pantelero* Date: *1/5/22* Equipment I.D. #: *17227 PID*
 SVE Discharge VOC (ppm) PID: *52.8*
 SVE Discharge LEL (%):
 Oxygen (%):
 SVE System Inlet Vacuum (" H₂O):
 SVE System Inlet ΔP (" H₂O):
 Oxidizer Discharge VOC (ppm) PID: *1.2*

SVE Wells

| Location | Time | Vacuum ("H ₂ O) | Flow (SCFM) | Valve Position (% Open/Closed) | Location | Time | Vacuum ("H ₂ O) | Flow (SCFM) | Valve Position (% Open/Closed) |
|----------|-------------|----------------------------|-------------|--------------------------------|----------|-------------|----------------------------|-------------|--------------------------------|
| HSVE-2 | <i>1456</i> | <i>32</i> | <i>72</i> | | HSVE-10 | <i>1458</i> | <i>7100</i> | <i>15</i> | |
| HSVE-3 | | <i>42</i> | <i>72</i> | | HSVE-9 | | <i>93</i> | <i>0</i> | |
| HSVE-4 | | <i>82</i> | <i>0</i> | <i>bouncy water</i> | HSVE-8 | | <i>84</i> | <i>2</i> | |
| HSVE-5 | | <i>19</i> | <i>0</i> | <i>dirty</i> | HSVE-6 | | <i>76</i> | <i>12</i> | |
| HSVE-7 | | <i>90</i> | <i>15</i> | <i>bouncy</i> | HSVE-10 | | <i>15</i> | <i>78</i> | |

AS Wells

| Location | Time | Pressure (PSI) | Flow (SCFM) | Valve Position (% Open/Closed) | Location | Time | Pressure (PSI) | Flow (SCFM) | Valve Position (% Open/Closed) |
|----------|-------------|----------------|-------------|--------------------------------|----------|-------------|----------------|-------------|--------------------------------|
| AS-7 | <i>1500</i> | <i>7.5</i> | <i>2.5</i> | | AS-17 | <i>1504</i> | <i>8.0</i> | <i>1.3</i> | |
| AS-8 | | <i>7.0</i> | <i>2.4</i> | | AS-18 | | <i>7.0</i> | <i>0</i> | |
| AS-9 | | <i>7.0</i> | <i>3.4</i> | | AS-19 | | <i>7.0</i> | <i>5.2</i> | |
| AS-10 | | <i>7.5</i> | <i>3.2</i> | | AS-20 | | <i>7.0</i> | <i>2.1</i> | |
| AS-11 | | <i>8.0</i> | <i>2.8</i> | | AS-21 | | <i>7.0</i> | <i>0</i> | |
| AS-12 | <i>1502</i> | <i>7.5</i> | <i>2.0</i> | | AS-22 | | <i>7.0</i> | <i>1.4</i> | |
| AS-13 | | <i>7.0</i> | <i>2.8</i> | | AS-1 | <i>1505</i> | <i>7.5</i> | <i>3.1</i> | |
| AS-14 | | <i>6.5</i> | <i>3.3</i> | | AS-2 | | <i>7.0</i> | <i>8.5</i> | |
| AS-15 | | <i>7.5</i> | <i>1.3</i> | | AS-3 | | <i>7.0</i> | <i>0</i> | |
| AS-16 | | <i>7.5</i> | <i>1.6</i> | | AS-4 | | <i>7.0</i> | <i>12.9</i> | |
| AS-23 | <i>1503</i> | <i>7.0</i> | <i>0</i> | | AS-5 | | <i>7.5</i> | <i>4.0</i> | |
| AS-24 | | <i>6.5</i> | <i>2.4</i> | | AS-6 | | <i>6.5</i> | <i>3.4</i> | |
| AS-25 | | <i>6.8</i> | <i>1.3</i> | | Notes: | | | | |
| AS-26 | | <i>7.5</i> | <i>0</i> | | | | | | |
| AS-27 | | <i>6.5</i> | <i>3.2</i> | | | | | | |

Abbreviations:

ppm = Parts per Million
 % = Percent
 deg F - degrees Fahrenheit

" H₂O = Inches of Water
 SCFM = Standard Cubic Feet per Minute
 PSI = Pounds per Square Inch



PORT OF SEATTLE - TERMINAL 30
SVE/AS System Field Data Collection Form

| | | | |
|--|--------------------------|---|---------------|
| Date: <u>1/5/22</u> | | | |
| Watch Time: <u>12:41</u> | | | |
| Screen Time: | | | |
| SVE/AS System Location | | | |
| SVE Blower Speed (Hertz) VFD | <u>54.0</u> | Sparge Blower Speed (Hertz) VFD | <u>52.0</u> |
| SVE Blower Runtime (Hours) | <u>8697.9</u> | AS Blower Runtime (Hours) Sparge Blower | <u>3779.6</u> |
| Transfer Pump Runtime (Hours) MS Pump | <u>2.6</u> | Sparge Heat Exchanger Runtime (Hours) | <u>3778.8</u> |
| Sparge Heat Exchanger Discharge Temperature (°F) TI-500 | <u>52</u> | Transfer Pump Discharge Pressure (PSI) PI-300 | <u>0</u> |
| AS Blower Pressure (PSI) PI-500 | <u>6.5</u> | SVE Blower Discharge Pressure (PSI) PI-400 | <u>0</u> |
| AS Blower Flow (" H ₂ O) DPI-500 | <u>1.0</u> | SVE Blower Discharge Temperature (°F) TI-400 | <u>92</u> |
| SVE Blower Inlet Temperature (°F) TI-200 <i>behind well head</i> | <u><50</u> | Sparge Zone 1 Operating Cycle Open Interval(s) | <u>100</u> |
| SVE Blower Inlet Vacuum (" H ₂ O) VI-200 | <u>84</u> | Sparge Zone 2 Operating Cycle Open Interval(s) | <u> </u> |
| SVE Blower Filter Differential Pressure (" H ₂ O) DPI-200 | <u>0.5</u> | Sparge Zone 3 Operating Cycle Open Interval(s) | <u> </u> |
| SVE Blower Inlet Differential Pressure (" H ₂ O) FI-200 | <u>1.0</u> | Sparge Zone 4 Operating Cycle Open Interval(s) | <u> </u> |
| | | Sparge Zone 5 Operating Cycle Open Interval(s) | <u> </u> |
| Oxidizer System Location | | | |
| Inlet Temperature (°F) | <u>681</u> | Process Blower Runtime (Hours) | <u>15515</u> |
| Burner Chamber Temperature (°F) | <u>684</u> | Combustion Fan Runtime (Hours) | <u>15515</u> |
| Outlet Temperature (°F) | <u>615</u> | Burner Runtime (Hours) | <u>15505</u> |
| Inlet Limit Controller Temperature (°F) | <u>678</u> | Processing Vapors Runtime (Hours) | <u>15492</u> |
| Outlet Limit Controller Temperature (°F) | <u>615</u> | Panel Temperature (oF) | <u>61</u> |
| Process Fan Valve Position (Open/Closed) | <u>open</u> | Flame Signal (Volts) | <u>5.0</u> |
| Dilution Valve Position (%) | <u>0.0</u> | Burner Chamber Inlet Differential Pressure (" H ₂ O) | <u>0</u> |
| Combustion Valve Position (%) | <u>11.3%</u> | <i>System Stats on Main Menu ↑</i> | |
| Moisture Separator Level (% Full) | | <i>(Blue caps)</i> | |
| Water Storage Tank Level (DTF, TD from MP; inches) | <u>Empty today</u> | Propane Tank A Level (%) | <u>75</u> |
| NOTES: | Propane Tank B Level (%) | | <u>80</u> |
| <p align="center"><u>PI-1=1 PI-2=0</u></p> | | | |

on top of gray cylinder magle...

Abbreviations:

1. " H₂O = Inches of Water
2. °F = Degrees Fahrenheit
3. PSI = Pounds per Square Inch
4. % = Percent
5. DTF - Depth to Fluid, TD - Total Depth, MP - Measuring Point



PROJECT T-30

COMPLETED BY _____

JOB NO. _____

APPROVED BY _____

DAY & DATE Friday 11/21/22

SHEET 1 OF 1

FIELD ACTIVITY SUBJECT:
DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

| TIME | |
|-------|---|
| 12:40 | Arrived on site |
| 13:00 | Finally got in gate. Had trouble with lock. |
| 13:03 | HMI Readings and temps/pressures, flows |
| 13:10 | Oxidized HMI readings |
| 13:40 | Flows, pressures, vac at wells |
| 14:00 | checked liquid. I could see from the outside the level 6-8 inches in bottom of storage tank |
| 14:25 | Leaving to take equipment to office |
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|--|--|
| VISITORS ON SITE: | CHANGES FROM PLANS OR IMPORTANT DECISIONS: |
| WEATHER CONDITIONS: <u>cloudy 450</u> | IMPORTANT TELEPHONE CALLS: |
| PERSONNEL ON SITE: <u>LP</u> | |

Date: 1/20/22
 Watch Time: 13:04
 Screen Time: 13:47

SVE/AS System Location

| | | | |
|--|--------|--|--------|
| SVE Blower Speed (Hertz) VFD | 54.0 | Sparge Blower Speed (Hertz) VFD | 52.0 |
| SVE Blower Runtime (Hours) | 9005.0 | AS Blower Runtime (Hours) Sparge Blower | 3994.0 |
| Transfer Pump Runtime (Hours) MS Pump | 2.6 | Sparge Heat Exchanger Runtime (Hours) | 3993.2 |
| Sparge Heat Exchanger Discharge Temperature (°F) TI-500 | 62 | Transfer Pump Discharge Pressure (PSI) PI-300 | 0 |
| AS Blower Pressure (PSI) PI-501 | 5.0 | SVE Blower Discharge Pressure (PSI) PI-400 | 0 |
| AS Blower Flow (" H ₂ O) DPI-500 | 1.0 | SVE Blower Discharge Temperature (°F) TI-400 | 102 |
| SVE Blower Inlet Temperature (°F) TI-200 | 54 | Sparge Zone 1 Operating Cycle Open Interval(s) | 100 |
| SVE Blower Inlet Vacuum (" H ₂ O) VI-200 | 85 | Sparge Zone 2 Operating Cycle Open Interval(s) | |
| SVE Blower Filter Differential Pressure (" H ₂ O) DPI-200 | 0.5 | Sparge Zone 3 Operating Cycle Open Interval(s) | |
| SVE Blower Inlet Differential Pressure (" H ₂ O) FI-200 | 1.5 | Sparge Zone 4 Operating Cycle Open Interval(s) | |
| | | Sparge Zone 5 Operating Cycle Open Interval(s) | |

Oxidizer System Location

System STOP on Menu

| | | | |
|--|-------------------------|---|-------|
| Inlet Temperature (°F) | 689 | Process Blower Runtime (Hours) | 15823 |
| Burner Chamber Temperature (°F) | 672 | Combustion Fan Runtime (Hours) | 15824 |
| Outlet Temperature (°F) | 628 | Burner Runtime (Hours) | 15813 |
| Inlet Limit Controller Temperature (°F) | 672 | Processing Vapors Runtime (Hours) | 15800 |
| Outlet Limit Controller Temperature (°F) | 624 | Panel Temperature (°F) | 70 |
| Process Fan Valve Position (Open/Closed) | #7 Open | Flame Signal (Volts) | 5.0 |
| Dilution Valve Position (%) | 0.0 | Burner Chamber Inlet Differential Pressure (" H ₂ O) | 0 |
| Combustion Valve Position (%) | 11.1 | | |
| Moisture Separator Level (% Full) | 80 | Propane Tank A Level (%) | 60 |
| Water Storage Tank Level (DTF, TD from MP; inches) | could see 6in in bottom | Propane Tank B Level (%) | 35 |

NOTES:

PI-2 = 0
 PI-1 = 0.5

Abbreviations:

- " H₂O = Inches of Water
- °F = Degrees Fahrenheit
- PSI = Pounds per Square Inch
- % = Percent
- DTF - Depth to Fluid, TD - Total Depth, MP - Measuring Point



Field Tech: Larry Powell Date: 1/21/20 Equipment I.D. #: 48808

SVE Discharge VOC (ppm) PID 16.4

SVE Discharge LEL (%)

Oxygen (%)

SVE System Inlet Vacuum (" H₂O)

SVE System Inlet ΔP (" H₂O)

Oxidizer Discharge VOC (ppm) PID 0.3

SVE Wells

| Location | Time | Vacuum ("H2O) | Flow (SCFM) | Valve Position (% Open/Closed) | Location | Time | Vacuum ("H2O) | Flow (SCFM) | Valve Position (% Open/Closed) |
|----------|-------|---------------|-------------|--------------------------------|----------|-------|---------------|-------------|--------------------------------|
| HSVE-2 | 13:41 | 32 | 73 | | HSVE-10 | 13:43 | 7100 | 10-15 | Flow bearing broken? |
| HSVE-3 | | 38 | 73 | | HSVE-9 | | 94 | 0 | |
| HSVE-4 | | 82 | 0 | broken/water | HSVE-8 | | 88 | 0 | |
| HSVE-5 | | 20 | 0 | broken? | HSVE-6 | | 78 | 0-10 | Flow with bearing |
| HSVE-7 | | 92 | 0.6 | | HSVE-10 | | 16 | 78 | |

AS Wells

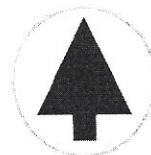
| Location | Time | Pressure (PSI) | Flow (SCFM) | Valve Position (% Open/Closed) | Location | Time | Pressure (PSI) | Flow (SCFM) | Valve Position (% Open/Closed) |
|----------|-------|----------------|-------------|--------------------------------|----------|-------|----------------|-------------|--------------------------------|
| AS-7 | 13:45 | 6.5 | 0 | | AS-17 | 13:48 | 5.2 | 0 | |
| AS-8 | | 6.0 | 1.0 | | AS-18 | | 6.0 | 0 | |
| AS-9 | | 5.5 | 2.6 | | AS-19 | | 5.7 | 5.2 | |
| AS-10 | | 6.5 | 7.4 | | AS-20 | | 5.7 | 2.0 | |
| AS-11 | | 6.5 | 2.6 | | AS-21 | | 5.5 | 0 | |
| AS-12 | 13:46 | 6.5 | 2.0 | | AS-22 | | 5.5 | 2.0 | |
| AS-13 | | 6.2 | 0 | | AS-1 | 13:50 | 6.6 | 1.4 | |
| AS-14 | | 5.0 | 0 | | AS-2 | | 5.6 | 8.3 | |
| AS-15 | | 6.4 | 0 | | AS-3 | | 5.9 | 0 | |
| AS-16 | | 6.5 | 3.0 | | AS-4 | | 5.4 | 13 | |
| AS-23 | 13:47 | 6.0 | 0 | | AS-5 | | 6.5 | 1.0 | |
| AS-24 | | 5.5 | 2.2 | | AS-6 | | 6.0 | 0 | |
| AS-25 | | 5.5 | 0 | | Notes: | | | | |
| AS-26 | | 6.5 | 0 | | | | | | |
| AS-27 | | 4.5 | 2.6 | | | | | | |

Abbreviations:

ppm = Parts per Million
 % = Percent
 deg F - degrees Fahrenheit

" H₂O = Inches of Water
 SCFM = Standard Cubic Feet per Minute
 PSI = Pounds per Square Inch





INSTRUMENT CALIBRATION REPORT

Pine Environmental Services LLC

3225 South 116th St.
Building 1 Suite 181
Tukwila, WA 98168
425-285-9102

Pine Environmental Services, Inc.

Instrument ID 48808
Description MiniRAE 3000
Calibrated 1/19/2022 3:16:32PM

Manufacturer Rac Systems **State Certified**
Model Number PGM 7320 **Status** Pass
Serial Number/ Lot 592-600846 **Temp °C** 16
Number
Location Seattle **Humidity %** 53
Department

Calibration Specifications

Group # 1 **Range Acc %** 0.0000
Group Name VOC **Reading Acc %** 3.0000
Stated Accy Pct of Reading **Plus/Minus** 0.0

| <u>Nom In Val / In Val</u> | <u>In Type</u> | <u>Out Val</u> | <u>Out Type</u> | <u>Fnd As</u> | <u>Lft As</u> | <u>Dev%</u> | <u>Pass/Fail</u> |
|----------------------------|----------------|----------------|-----------------|---------------|---------------|-------------|------------------|
| 100.0 / 100.0 | PPM | 100.0 | PPM | 99.9 | 100.0 | 0.00% | Pass |

Test Instruments Used During the Calibration

| <u>Test Standard ID</u> | <u>Description</u> | <u>Manufacturer</u> | <u>Model Number</u> | <u>Serial Number / Lot Number</u> | <u>(As Of Cal Entry Date)</u> | |
|---|-------------------------------|---------------------|---------------------|---------------------------------------|---------------------------------------|--|
| | | | | | <u>Last Cal Date/ Opened Date</u> | <u>Next Cal Date / Expiration Date</u> |
| SEA ISO 100 PPM 304-402150198- 1 | Isobutylene (C4H8) 100 PPM | Airgas | x02ai99cp342066 | 304-402150198 -1 | | 6/23/2025 |

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Jose Arroyo

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment
Please call 800-301-9663 for Technical Assistance

PORT OF SEATTLE - TERMINAL 30

| Field Tech: | | Date: | | Equipment I.D. #: | | | | | |
|--|------|----------------------------|-------------|--------------------------------|----------|------|----------------------------|-------------|--------------------------------|
| SVE Discharge VOC (ppm) PID | | 383.2 ppm | | 179.8 ppm | | | | | |
| SVE Discharge LEL (%) | | — | | — | | | | | |
| Oxygen (%) | | — | | — | | | | | |
| SVE System Inlet Vacuum (" H ₂ O) | | — | | — | | | | | |
| SVE System Inlet ΔP (" H ₂ O) | | — | | — | | | | | |
| Oxidizer Discharge VOC (ppm) PID | | *10.1 ppm | | 7.9 ppm | | | | | |
| SVE Wells | | | | | | | | | |
| Location | Time | Vacuum ("H ₂ O) | Flow (SCFM) | Valve Position (% Open/Closed) | Location | Time | Vacuum ("H ₂ O) | Flow (SCFM) | Valve Position (% Open/Closed) |
| HSVE-2 | | 26 | 72 | | HSVE-10 | | 100 | 20 | |
| HSVE-3 | | 34 | 72 | | HSVE-9 | | 90 | 0 | |
| HSVE-4 | | 80 | 10 | | HSVE-8 | | 84 | 0 | |
| HSVE-5 | | 14 | 0 | | HSVE-6 | | 70 | 10 | |
| HSVE-7 | | 86 | 15 | | HSVE-10 | | 14 | 76 | |
| AS Wells | | | | | | | | | |
| Location | Time | Pressure (PSI) | Flow (SCFM) | Valve Position (% Open/Closed) | Location | Time | Pressure (PSI) | Flow (SCFM) | Valve Position (% Open/Closed) |
| AS-7 | | 6 | 0 | | AS-17 | | 6 | 0 | |
| AS-8 | | 6 | 0 | | AS-18 | | 6 | 0 | |
| AS-9 | | 6 | 2.2 | | AS-19 | | 6.5 | 5.2 | |
| AS-10 | | 6 | 0 | | AS-20 | | 6 | 0 | |
| AS-11 | | 6.5 | 2.8 | | AS-21 | | 5.5 | 0 | |
| AS-12 | | 6.5 | 3.4 | | AS-22 | | 6 | 2 | |
| AS-13 | | 6 | 0 | | AS-1 | | 6.5 | 0 | |
| AS-14 | | 5 | 0 | | AS-2 | | 5 | 8.6 | |
| AS-15 | | 6 | 0 | | AS-3 | | 5.5 | 0 | |
| AS-16 | | 6.5 | 0 | | AS-4 | | 5 | 13 | |
| AS-23 | | 6 | 0 | | AS-5 | | 6.5 | 0 | |
| AS-24 | | 5.5 | 0 | | AS-6 | | 5.5 | 1.8 | |
| AS-25 | | 5.5 | 0 | | Notes: | | | | |
| AS-26 | | 6 | 0 | | | | | | |
| AS-27 | | 4.5 | 1.4 | | | | | | |

Abbreviations:

ppm = Parts per Million
 % = Percent
 deg F - degrees Fahrenheit

" H₂O = Inches of Water
 SCFM = Standard Cubic Feet per Minute
 PSI = Pounds per Square Inch



**PORT OF SEATTLE - TERMINAL 30
SVE/AS System Field Data Collection Form**

| | | | | |
|---|---------|-------------------|--|--|
| Date: | 2/17/22 | | | |
| Watch Time: | 2130 | | | |
| Screen Time: | | | | |
| SVE/AS System Location | | | | |
| SVE Blower Speed (Hertz) <i>VFD</i> | 54.0 | | | |
| SVE Blower Runtime (Hours) | 9499.3 | | | |
| Transfer Pump Runtime (Hours) <i>MS Pump</i> | 2.6 | | | |
| Sparge Blower Speed (Hertz) <i>VFD</i> | 52.0 | | | |
| AS Blower Runtime (Hours) <i>Sparge Blower</i> | 4321.9 | | | |
| Sparge Heat Exchanger Runtime (Hours) | 4321.1 | | | |
| Sparge Heat Exchanger Discharge Temperature (°F) <i>TI-500</i> | 50.0 | | | |
| AS Blower Pressure (PSI) <i>PI-501</i> | 5.5 | | | |
| AS Blower Flow (" H ₂ O) <i>DPI-500</i> | 1.0 | | | |
| SVE Blower Inlet Temperature (°F) <i>TI-200</i> | 50 | | | |
| SVE Blower Inlet Vacuum (" H ₂ O) <i>VI-200</i> | 80 | | | |
| SVE Blower Filter Differential Pressure (" H ₂ O) <i>DPI-200</i> | 0.5 | | | |
| SVE Blower Inlet Differential Pressure (" H ₂ O) <i>FI-200</i> | 1.0 | | | |
| Transfer Pump Discharge Pressure (PSI) <i>PI-300</i> | 0 | | | |
| SVE Blower Discharge Pressure (PSI) <i>PI-400</i> | 0 | | | |
| SVE Blower Discharge Temperature (°F) <i>TI-400</i> | 96 | | | |
| Sparge Zone 1 Operating Cycle - Open Interval(s) | Open | | | |
| Sparge Zone 2 Operating Cycle - Open Interval(s) | | | | |
| Sparge Zone 3 Operating Cycle - Open Interval(s) | | | | |
| Sparge Zone 4 Operating Cycle - Open Interval(s) | | | | |
| Sparge Zone 5 Operating Cycle - Open Interval(s) | | | | |
| Moisture Separator Level (% Full) | | 75 ^{oil} | | |
| Water Storage Tank Level (DTF, TD from MP; inches) | 0" | | | |
| NOTES: | | | | |

Notes:

1. " H₂O = Inches of Water
2. °F = Degrees Fahrenheit
3. PSI = Pounds per Square Inch
4. % = Percent
5. DTF - Depth to Fluid, TD - Total Depth, MP - Measuring Point

AECOM



| Oxidizer System Location | | Open Interval(s) | |
|--|------|--|-------|
| Inlet Temperature (°F) | 675 | Process Blower Runtime (Hours) | 16319 |
| Burner Chamber Temperature (°F) | 675 | Combustion Fan Runtime (Hours) | 16320 |
| Outlet Temperature (°F) | 608 | Burner Runtime (Hours) | 16310 |
| Inlet Limit Controller Temperature (°F) | 675 | Processing Vapors Runtime (Hours) | 16296 |
| Outlet Limit Controller Temperature (°F) | 609 | Panel Temperature (oF) | 64 |
| Process Fan Valve Position (Open/Closed) | Open | Flame Signal (Volts) | 5.0 |
| Dilution Valve Position (%) | 0 | Burner Chamber Inlet Differential Pressure (" H2O) | |
| Combustion Valve Position (%) | 17.7 | | |
| Moisture Separator Level (% Full) | 75% | Propane Tank A Level (%) | 85 |
| Water Storage Tank Level (DTF, TD from MP; inches) | 0.0' | Propane Tank B Level (%) | 85 |

NOTES:

Abbreviations:

1. " H₂O = Inches of Water
2. °F = Degrees Fahrenheit
3. PSI = Pounds per Square Inch
4. % = Percent
5. DTF - Depth to Fluid, TD - Total Depth, MP - Measuring Point



INSTRUMENT CALIBRATION REPORT



Pine Environmental Services LLC

3225 South 116th St.
Building 1 Suite 181
Tukwila, WA 98168
425-285-9102

Pine Environmental Services, Inc.

Instrument ID 17227
Description MinRae 3000
Calibrated 2/16/2022 12:06:32PM

Manufacturer Rae Systems
Model Number PGM-7320
Serial Number/ Lot Number 592-000396
Location Seattle
Department

State Certified
Status Pass
Temp °C 15
Humidity % 48

Calibration Specifications

Group # 1
Group Name Isobutylene
Stated Accy Pct of Reading

Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.0

| <u>Nom In Val / In Val</u> | <u>In Type</u> | <u>Out Val</u> | <u>Out Type</u> | <u>End As</u> | <u>Lft As</u> | <u>Dev%</u> | <u>Pass/Fail</u> |
|----------------------------|----------------|----------------|-----------------|---------------|---------------|-------------|------------------|
| 100.0 / 100.0 | PPM | 100.0 | PPM | 100.0 | 100.0 | 0.00% | Pass |

Test Instruments Used During the Calibration

| <u>Test Standard ID</u> | <u>Description</u> | <u>Manufacturer</u> | <u>Model Number</u> | <u>Serial Number / Lot Number</u> | <u>(As Of Cal Entry Date)</u> | |
|------------------------------------|----------------------------|---------------------|---------------------|-----------------------------------|--|--|
| | | | | | <u>Last Cal Date / Expiration Date</u> | <u>Next Cal Date / Expiration Date</u> |
| SEA ISO 100 PPM 304-402162466-1 | Isobutylene (C4H8) 100 PPM | Airgas | x02ai99cp342066 | 304-402162466-1 | 8/11/2025 | |

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Stethan Holmes

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment
Please call 800-301-9663 for Technical Assistance

Americas

Daily Tailgate Meeting

S3AM-209-FM5

Instructions: Conduct meeting prior to sending crews to individual tasks. Require attendance of all AECOM employees and subcontractors. Invite personnel from simultaneous operations for coordination purposes. Review scope of work and briefly discuss required and applicable topics. **This meeting is a daily refresher, not a full orientation.** Task-specific discussions associated with Task Hazard Assessment (THA) follow this meeting at the task location immediately before individual task is started.

AECOM Supervisor Name: Paul Kalina
Phone Number:
AECOM SH&E Rep. Name: Andrew Puynter
Phone Number:
Meeting Leader: Gus Friedman

Date: 3/31/22 **Project Name/Location:** T-30 **Project Number:**

Today's Scope of Work:
 Binarily O+M, 1Q Jupa Samples, pressure switch troubleshoot

Muster Point Location: **First Aid Kit Location:** **Fire Extinguisher Location:** **Spill Kit Location:**

| 1. Required Topics | 2. Discuss if Applicable to Today's Work |
|---|---|
| <input checked="" type="checkbox"/> Fitness for Duty requirements, all sign in / sign out <input checked="" type="checkbox"/> Required training (incl. task specific) completed and current <input checked="" type="checkbox"/> SH&E Plan onsite - understood, reviewed, signed by all (incl. scope, preplanning hazard assessments / risk registers, controls, procedures, requirements, etc.) <input type="checkbox"/> Task Hazard Assessments (THAs) are to be reviewed and completed for each task immediately prior to conducting <input checked="" type="checkbox"/> STOP WORK Right & Responsibility- all task changes/changed conditions re-assess with THA <input checked="" type="checkbox"/> Requirement to report to supervisor any injury, illness, damage, near miss, unsafe act / condition <input checked="" type="checkbox"/> Emergency Response Plan – including muster point, first aid kit, fire extinguisher, clinic/hospital location <input checked="" type="checkbox"/> Personal Protective Equipment (PPE) - Required items per hazard assessments in good condition / in use by all <input checked="" type="checkbox"/> Equipment/machinery inspected (documented as required) and in good condition - operators properly trained/certified <input checked="" type="checkbox"/> Work area set up and demarcation/ barricades in place to protect workers, site staff, and the public <input checked="" type="checkbox"/> Required checklists/records available, understood (describe): <input checked="" type="checkbox"/> Lessons Learned / SH&E improvements (describe): | <input checked="" type="checkbox"/> <input type="checkbox"/> Check <input checked="" type="checkbox"/> as reviewed or mark <input type="checkbox"/> as not applicable <input type="checkbox"/> <input checked="" type="checkbox"/> Biological/ Chemical / Electrical Hazards <input type="checkbox"/> <input checked="" type="checkbox"/> Ergonomics - Lifting, Body Position <input type="checkbox"/> <input checked="" type="checkbox"/> Lock Out/ Tag Out Short Service Employees - visual identifier and mentor/ oversight assignment <input type="checkbox"/> <input checked="" type="checkbox"/> Simultaneous/ Neighbouring Operations <input checked="" type="checkbox"/> <input type="checkbox"/> Slip/ Trip/ Fall Hazards <input type="checkbox"/> <input checked="" type="checkbox"/> Specialized PPE Needs <input type="checkbox"/> <input checked="" type="checkbox"/> Traffic Control <input type="checkbox"/> <input checked="" type="checkbox"/> Waste Management/ Decontamination <input type="checkbox"/> <input checked="" type="checkbox"/> Weather Hazards / Heat Stress / Cold Stress <input type="checkbox"/> <input checked="" type="checkbox"/> Subcontractor Requirements (e.g., JHAs, THAs, procedures, reporting, etc.) <input type="checkbox"/> <input checked="" type="checkbox"/> Work Permits / Plans required (e.g., Fall Protection, Confined Space, Hot Work, Critical Lifts, etc.); in place, understood (identify/attach): <input type="checkbox"/> <input checked="" type="checkbox"/> Other Topics (describe/attach): <input type="checkbox"/> <input checked="" type="checkbox"/> Client specific requirements (describe): |

3. Daily Check Out by Site Supervisor

| | |
|--|---|
| Describe incidents, near misses, observations or Stop Work interventions from today: | Describe Lessons Learned/ Improvement Areas from today: |
|--|---|

The site is being left in a safe condition and work crew checked out as fit unless otherwise specified as above.

| | | |
|---|----------------------|---|
| Site Supervisor Name Gus Friedman | Signature | Date 3/31/22 Time (at end of day / shift) 1645 |
|---|----------------------|---|

Worker Acknowledgement / Sign In Sign Out sheets applicable to this meeting are on reverse and, if applicable, attached.

All employees:



- **STOP WORK** if concerned / uncertain about safety / hazard or additional precaution is not recorded on the THA.
- **Be alert and communicate any changes in personnel or conditions at the worksite to the supervisor.**
- **Reassess task, hazards, & mitigations on an ongoing basis; amend the THA if needed.**

SITE WORKERS (including AECOM Contractors and Subcontractors): Your signature below means that you understand:

- * The requirement to participate in creating, reviewing, & updating hazard assessments (THA) applicable to your task(s).
- * The hazards & control measures associated with each task you are about to perform.
- * The permit to work requirements applicable to the work you are about to perform (if it includes permitted activities).
- * That no tasks or work is to be performed without a hazard assessment.
- * Your authority & obligation to "Stop Work" intervene, speak up/ listen up.

Your initials (right columns) certify that you arrived & departed fit for duty, & have reported all incidents/near misses; meaning:

- * You are physically and mentally fit for duty and have inspected your required PPE to ensure satisfactory condition.
- * You are not under the influence of any type of medication, drugs, or alcohol that could affect your ability to work safely.
- * You are aware of your responsibility to immediately report any illness, injury (regardless of where or when it occurred), or impairment/fatigue issue to the AECOM Supervisor.
- * You signed out as fit / uninjured unless you have otherwise informed the AECOM Supervisor.

| Print Name & Company | Signature | Initials & Sign In Time | Initials & Sign Out Time |
|----------------------|---|-------------------------|-----------------------------|
| Gus Friedman AECOM |  | In & Fit GF 1000 | Out & Fit 1645 GF |
| Nik Guyer AECOM |  | In & Fit NG 1000 | Out & Fit 1345 GF for NG |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |

(Attach additional Site Worker sign-in/out sheets if needed) Identify number of attached sheets: _____

| SITE VISITOR / SITE REPRESENTATIVE | | | | |
|------------------------------------|--------------|--------------|----------------|-----------|
| Name | Company Name | Arrival Time | Departure Time | Signature |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

DAILY FIELD LOG

Project Information

Page 1 of 4

| | |
|---------------------------|--------------------------|
| Project Name: <u>T-30</u> | Location: <u>Seattle</u> |
| Project/Task No.: _____ | Weather: _____ |
| Date: <u>3/31/22</u> | Personnel: <u>GF, NG</u> |

Observations

| Time | Observation Description |
|------|---|
| 1 | 1000 GF, NG on site |
| 2 | Scope: biweekly O+M, 1Q vapor samples, pressure switch troubleshooting |
| 3 | |
| 4 | |
| 5 | Safety tailgate: Traffic hazards, beware crane training next to system |
| 6 | → Attempted the tailgate app but it malfunctioned & wouldn't submit |
| 7 | |
| 8 | 1030 System tour & touch-up for NG |
| 9 | 1100 Collect system readings |
| 10 | → high pressure alarm active on arrival. Cleared ~ 1050 & Spurge restarted. SUE stayed on. |
| 11 | |
| 12 | 1215 Start collecting vapor samples |
| 13 | • GF calls CB to discuss pressure switch troubleshooting. |
| 14 | System is currently running at 4.5 PSI and few AS wells are registering flows (though many appear stuck). The ones that show flows are 25 & 6mg. |
| 15 | |
| 16 | |
| 17 | • It is our understanding the switch set screw is all the way down & at its highest threshold (~15 psi). GF will confirm. |
| 18 | |
| 19 | It should be 32 revolutions from lowest pressure to highest. Ideally it is set to trip ~10 psi, and we leave the system running ~7 psi at end of day. Then increase operational pressure on subsequent visits as the system allows. |
| 20 | |
| 21 | |
| 22 | |
| 23 | |
| 24 | 1300 GF confirmed the pressure switch set point is all the way to the right corrected Broked off bleed valve to get |
| 25 | |

Comments / Site Activities / Personnel Tracking

DAILY FIELD LOG

Project Information

Page 2 of 4

| | |
|---------------------------|--------------------------|
| Project Name: <u>T-30</u> | Location: _____ |
| Project/Task No.: _____ | Weather: _____ |
| Date: <u>3/31/22</u> | Personnel: <u>GF, NG</u> |

Observations

| Time | Observation Description |
|------|--|
| 1 | a pressure of 6 psi. at the compressor gauge. Flows |
| 2 | indicated on many rotameters at this setpoint that |
| 3 | were previously zero. Oddly, manifold pressures don't |
| 4 | seem significantly changed |
| 5 | 1315 call PK to discuss. |
| 6 | → system pressure setpoint (design) is 6 psi |
| 7 | → design sparge flowrates is 7 cfm to each well |
| 8 | → fear of damaging wells if we push system to 10 psi |
| 9 | to set re set screw. |
| 10 | → pressure switch should have one port open to atmosphere, |
| 11 | which still had a blue factory plug in it. GF removed |
| 12 | it, but CB doesn't think it was affecting things. |
| 13 | → At 1323, system shut down. Lasted ~20 min at |
| 14 | 6 psi. |
| 15 | → recommendation is to leave both switch ports open |
| 16 | to atmosphere to remove switch functionality |
| 17 | 1345 1320 call NG offsite |
| 18 | 1400 GF disengages high pressure line from pressure switch. |
| 19 | Installs an old gauge in its place to plug up the tee it |
| 20 | had connected to. |
| 21 | → System restarted, but only ran ~30 seconds before |
| 22 | shutting down due to a blower pressure alarm. Got to ~5 psi |
| 23 | 1415 Restart system again, same thing happens |
| 24 | • Call PK, says maybe the switch is wired backwards or broken. |
| 25 | • Call CB, says same thing. Recommends replacing |

Comments / Site Activities / Personnel Tracking

PROJECT T-30 Stella Jones

COMPLETED BY GF, NG

JOB NO. _____

APPROVED BY _____

DAY & DATE 3/31/22

SHEET 3 OF 4

**FIELD ACTIVITY SUBJECT:
DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:**

| TIME | |
|------|--|
| | high pressure tubing & setting the set screw all the way out to see if that makes any difference. → 13.5 revolutions on set screw. |
| 1445 | System restarted; lasted ~10 sec, shut down at 2 psi. • Set screw adjusted to 15 revolutions down. System restarted. Lasted 40 sec, got to 5.5 psi. • Set screw adjusted another 10 revolutions (~8 from max). System restarted; lasted 37 sec, got to 5.0 psi. Worse than previous • Set screw adjusted all the way down to max, 8 more revolutions. System restarted; did not shut down when held at 5.25. Shut down at ~7 psi when adjusted with the idled valve. • System restarted, but quickly shut down at 5 psi without any adjustment to Set Screw. |
| 1500 | • Call CB, he isn't sure. System won't even stay on now. He wants a photo of the switch wiring. |
| 1510 | Matt from the Part onsite to check on things. Ok's taking a photo of the wiring. Turns system back on & it stays on @ 15 psi. Flow not registering on rotameters at this pressure. |
| 1524 | System shuts down again. |

VISITORS ON SITE:

CHANGES FROM PLANS OR IMPORTANT DECISIONS:

WEATHER CONDITIONS:

IMPORTANT TELEPHONE CALLS:

PERSONNEL ON SITE:

PROJECT T-30 ~~Stella Jones~~

COMPLETED BY GF

JOB NO. _____

APPROVED BY _____

DAY & DATE 3/31/22

SHEET 4 OF 4

**FIELD ACTIVITY SUBJECT:
DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:**

| TIME | |
|------|--|
| 1530 | <p>Call CB again. Remove switch faceplate. Wires are set to "Normally Closed". Swap the bottom lead to the "Normally open" terminal to try to bypass. System can't turn on - maybe bc it is now a low-pressure switch & the system can't overcome the initial low pressures to turn on.</p> <ul style="list-style-type: none"> • Swap lead from "Normally open" so that they are both on the top "Common" terminal. This should truly bypass the switch. |
| 1545 | <ul style="list-style-type: none"> • Restart system successfully. Increase pressure to 6 psi & successfully. Movement at ~half the rotameters. Bump up to 6.5 psi. Max header/well pressure is 7.25 psi. Max flow is ~4 cfm. ~half are still at zero or stuck. |
| 1630 | <ul style="list-style-type: none"> • Retake PID measurements to check for 90% destruction. 17.9 ppm inlet / 0.4 ppm discharge ✓ • Clean up, lock up. • Call PK, update, get the OK. |
| 1645 | <ul style="list-style-type: none"> • OFFsite |

GF

| | |
|-----------------------------------|--|
| <p>VISITORS ON SITE:</p> | <p>CHANGES FROM PLANS OR IMPORTANT DECISIONS:</p> |
| <p>WEATHER CONDITIONS:</p> | <p>IMPORTANT TELEPHONE CALLS:</p> |
| <p>PERSONNEL ON SITE:</p> | |

PORT OF SEATTLE - TERMINAL 30

| | | |
|---|-----------------------------|----------------------------------|
| Field Tech: GF/NG | Date: 3/31/22 | Equipment I.D. #: 1219214 |
| SVE Discharge VOC (ppm) PID | 18.6 ppm GF 17.9 ppm | |
| SVE Discharge LEL (%) | | |
| Oxygen (%) | | |
| SVE System Inlet Vacuum ("H ₂ O) | 83 | |
| SVE System Inlet ΔP ("H ₂ O) | 1.0 | |
| Oxidizer Discharge VOC (ppm) PID | 2.1 ppm GF 0.4 ppm | |

SVE Wells

| Location | Time | Vacuum ("H ₂ O) | Flow (SCFM) | Valve Position (% Open/Closed) | Location | Time | Vacuum ("H ₂ O) | Flow (SCFM) | Valve Position (% Open/Closed) |
|----------|------|----------------------------|------------------|--------------------------------|----------|------|----------------------------|-------------|--------------------------------|
| HSVE-2 | 1118 | 28 | 72 | < 100% | HSVE-10 | 1120 | >100 | 10 | 100% |
| HSVE-3 | 1118 | 39 | 72 | 100% | HSVE-9 | 1121 | 86 | < 5 | < 100% |
| HSVE-4 | 1119 | 80 | 5 | 100% | HSVE-8 | 1121 | 84 | Stuck/0 | 100% |
| HSVE-5 | 1119 | 18 | 20 sticky filter | 100% | HSVE-6 | 1122 | 78 | 10 | 100% |
| HSVE-7 | 1120 | 88 | 15 | 100% | HSVE-10 | 1117 | 14 | 76 | < 100% |

AS Wells

| Location | Time | Pressure (PSI) | Flow (SCFM) | Valve Position (% Open/Closed) | Location | Time | Pressure (PSI) | Flow (SCFM) | Valve Position (% Open/Closed) | |
|----------|------|----------------|-------------|--------------------------------|----------|------|----------------|-------------|--------------------------------|------|
| AS-17 | 1103 | 6.25 | 0 | 100% | AS-17 | 1103 | 5.75 | Stuck/0 | 100% | |
| AS-8 | | 6.0 | 0 | ↓ | AS-18 | | 6.0 | Stuck/0 | ↓ | |
| AS-9 | | 5.75 | Stuck | | AS-19 | | 6.75 | Stuck | | |
| AS-10 | | 6.25 | Stuck | | AS-20 | | 6.0 | 0 | | |
| AS-11 | | 6.5 | Stuck | | AS-21 | | 5.25 | Stuck/0 | | |
| AS-12 | 1108 | 6.25 | Stuck | | AS-22 | | 6.25 | 1.0 | | |
| AS-13 | | 6.0 | Stuck | | AS-1 | 1100 | 6.5 | 1.0 | | 100% |
| AS-14 | | 5.0 | Stuck | | AS-2 | | 5.75 | Stuck | | |
| AS-15 | | 6.0 | Stuck | | AS-3 | | 6.0 | Stuck | | |
| AS-16 | | 6.5 | Stuck | | AS-4 | | 5.0 | 2.5 | | |
| AS-23 | 1106 | 6.0 | Stuck | | AS-5 | | 6.5 | 1.5 | | ↓ |
| AS-24 | | 5.5 | 0 | AS-6 | | 6.0 | 1.5 | | | |
| AS-25 | | 5.5 | Stuck | Notes: | | | | | | |
| AS-26 | | 6.5 | Stuck | | | | | | | |
| AS-27 | | 4.0 | 1.5 | | | | | | | |

updates based on 4.12.22 breakthrough pressure findings - GF

Abbreviations:

ppm = Parts per Million
 % = Percent
 deg F - degrees Fahrenheit

" H₂O = Inches of Water
 SCFM = Standard Cubic Feet per Minute
 PSI = Pounds per Square Inch



PORT OF SEATTLE - TERMINAL 30
SVE/AS System Field Data Collection Form

| | | | |
|---|----------------|--|---------------------|
| | | Date: <u>3/31/22</u> | |
| | | Watch Time: <u>1150</u> | |
| | | Screen Time: | |
| SVE/AS System Location | | | |
| SVE Blower Speed (Hertz) VFD | <u>54.0</u> | Sparge Blower Speed (Hertz) VFD | <u>52.0</u> |
| SVE Blower Runtime (Hours) | <u>10460.2</u> | AS Blower Runtime (Hours) Sparge Blower | <u>4851.2</u> |
| Transfer Pump Runtime (Hours) MS Pump | <u>2.6</u> | Sparge Heat Exchanger Runtime (Hours) | <u>4850.3</u> |
| Sparge Heat Exchanger Discharge Temperature (°F) TI-500 | <u>66</u> | Transfer Pump Discharge Pressure (PSI) PI-300 | <u>0</u> |
| AS Blower Pressure (PSI) PI-501 | <u>4.75</u> | SVE Blower Discharge Pressure (PSI) PI-400 | <u>4.75</u> |
| AS Blower Flow (" H2O) DPI-500 | <u>1.0</u> | SVE Blower Discharge Temperature (°F) TI-400 | <u>108</u> |
| SVE Blower Inlet Temperature (°F) TI-200 | <u>63</u> | Sparge Zone 1 Operating Cycle Open Interval(s) | <u>N/A</u> |
| SVE Blower Inlet Vacuum (" H2O) VI-200 | <u>78</u> | Sparge Zone 2 Operating Cycle Open Interval(s) | <u>↓</u> |
| SVE Blower Filter Differential Pressure (" H2O) DPI-200 | <u>0.75</u> | Sparge Zone 3 Operating Cycle Open Interval(s) | <u>↓</u> |
| SVE Blower Inlet Differential Pressure (" H2O) FI-200 | <u>1.0</u> | Sparge Zone 4 Operating Cycle Open Interval(s) | <u>↓</u> |
| | | Sparge Zone 5 Operating Cycle Open Interval(s) | <u>↓</u> |
| Oxidizer System Location | | | |
| Inlet Temperature (°F) | <u>670</u> | Process Blower Runtime (Hours) | <u>17285</u> |
| Burner Chamber Temperature (°F) | <u>697</u> | Combustion Fan Runtime (Hours) | <u>17285</u> |
| Outlet Temperature (°F) | <u>615</u> | Burner Runtime (Hours) | <u>17275</u> |
| Inlet Limit Controller Temperature (°F) | <u>678</u> | Processing Vapors Runtime (Hours) | <u>17261</u> |
| Outlet Limit Controller Temperature (°F) | <u>620</u> | Panel Temperature (oF) | <u>78</u> |
| Process Fan Valve Position (Open/Closed) | <u>Open</u> | Flame Signal (Volts) | <u>5</u> |
| Dilution Valve Position (%) | <u>0%</u> | Burner Chamber Inlet Differential Pressure (" H2O) | <u>Broken Gauge</u> |
| Combustion Valve Position (%) | <u>14%</u> | | |
| Moisture Separator Level (% Full) <u>? Needs cleaned</u> | | Propane Tank A Level (%) | <u>55%</u> |
| Water Storage Tank Level (DTF, TD from MP; inches) <u>Dry</u> | | Propane Tank B Level (%) | <u>60%</u> |
| NOTES: | | | |
| Abbreviations: | | | |
| 1. " H ₂ O = Inches of Water | | | |
| 2. °F = Degrees Fahrenheit | | | |
| 3. PSI = Pounds per Square Inch | | | |
| 4. % = Percent | | | |
| 5. DTF - Depth to Fluid, TD - Total Depth, MP - Measuring Point | | | |



SAMPLE CHAIN OF CUSTODY

Report To Paul Kalina
 Company AECOM
 Address 1111 3rd Ave Suite 1600
 City, State, ZIP Seattle, WA 98101
 Phone 206 438 2700 Email Paul.Kalina@Aecom.com

| | |
|---|----------------------------|
| SAMPLERS (signature) <u>N. Gwyn</u> | |
| PROJECT NAME & ADDRESS <u>T-30 Port of Seattle</u> | PO # |
| NOTES: | INVOICE TO <u>Aecom</u> |

Page # 1 of 1

| |
|--|
| <input checked="" type="checkbox"/> TURNAROUND TIME <input checked="" type="checkbox"/> Standard <input type="checkbox"/> RUSH Rush charges authorized by: |
| <input checked="" type="checkbox"/> SAMPLE DISPOSAL <input checked="" type="checkbox"/> Default: Clean after 3 days <input type="checkbox"/> Archive (Fee may apply) |

SAMPLE INFORMATION

| Sample Name | Lab ID | Canister ID | Flow Cont. ID | Reporting Level: IA=Indoor Air SG=Soil Gas (Circle One) | Date Sampled | Initial Vac. ("Hg) | Field Initial Time | Final Vac. ("Hg) | Field Final Time | ANALYSIS REQUESTED | | | | | Notes |
|--------------------|--------|-------------|---------------|--|--------------|--------------------|--------------------|------------------|------------------|--------------------|------------|------------|-----|--------|-------|
| | | | | | | | | | | TO15 Full Scan | TO15 BTEXN | TO15 cVOCs | APH | Helium | |
| Inlet - 033122 | | 8394 | 18 | IA / <u>SG</u> | 3/31/22 | >30 | 1242 | -50 | 1253 | | X | | X | | |
| Discharge - 033122 | | 8538 | 01 | IA / <u>SG</u> | 3/31/22 | -29.5 | 1248 | -50 | 1254 | | X | | X | | |
| | | | | IA / SG | | | | | | | | | | | |
| | | | | IA / SG | | | | | | | | | | | |
| | | | | IA / SG | | | | | | | | | | | |
| | | | | IA / SG | | | | | | | | | | | |
| | | | | IA / SG | | | | | | | | | | | |
| | | | | IA / SG | | | | | | | | | | | |

Friedman & Bruya, Inc.
 3012 16th Avenue West
 Seattle, WA 98119-2029
 Ph. (206) 285-8282
 Fax (206) 283-5044

| SIGNATURE | PRINT NAME | COMPANY | DATE | TIME |
|------------------------------------|-----------------------|--------------|----------------|-------------|
| Relinquished by: <u>Nate Gwyn</u> | <u>Nate Gwyn</u> | <u>Aecom</u> | <u>3/31/22</u> | <u>1710</u> |
| Received by: <u>Yelena Aravkin</u> | <u>Yelena Aravkin</u> | <u>FFB</u> | <u>3/31/22</u> | <u>1710</u> |
| Relinquished by: | | | | |
| Received by: | | | | |

Americas

Daily Tailgate Meeting

S3AM-209-FM5

Instructions: Conduct meeting prior to sending crews to individual tasks. Require attendance of all AECOM employees and subcontractors. Invite personnel from simultaneous operations for coordination purposes. Review scope of work and briefly discuss required and applicable topics. **This meeting is a daily refresher, not a full orientation.** Task-specific discussions associated with Task Hazard Assessment (THA) follow this meeting at the task location immediately before individual task is started.

AECOM Supervisor Name: *Paul Kalika*
 Phone Number:
 AECOM SH&E Rep. Name: *Andrew Paynter*
 Phone Number:
 Meeting Leader: *Gus Friedman*

Date: *4/12/22* Project Name/Location: *T-30 Seattle* Project Number:

Today's Scope of Work:
*Biweekly O&M
 set up zone sparging
 show Marina + Amy Spenberg around*

Muster Point Location: *Front gate* First Aid Kit Location: *Cerex* Fire Extinguisher Location: Spill Kit Location:

| 1. Required Topics | 2. Discuss if Applicable to Today's Work |
|--|---|
| <input checked="" type="checkbox"/> Fitness for Duty requirements, all sign in / sign out <input checked="" type="checkbox"/> Required training (incl. task specific) completed and current <input type="checkbox"/> SH&E Plan onsite - understood, reviewed, signed by all (incl. scope, preplanning hazard assessments / risk registers, controls, procedures, requirements, etc.) <input checked="" type="checkbox"/> Task Hazard Assessments (THAs) are to be reviewed and completed for each task immediately prior to conducting <input type="checkbox"/> STOP WORK Right & Responsibility- all task changes/changed conditions re-assess with THA <input checked="" type="checkbox"/> Requirement to report to supervisor any injury, illness, damage, near miss, unsafe act / condition <input checked="" type="checkbox"/> Emergency Response Plan – including muster point, first aid kit, fire extinguisher, clinic/hospital location <input type="checkbox"/> Personal Protective Equipment (PPE) - Required items per hazard assessments in good condition / in use by all <input checked="" type="checkbox"/> Equipment/machinery inspected (documented as required) and in good condition - operators properly trained/certified <input checked="" type="checkbox"/> Work area set up and demarcation/ barricades in place to protect workers, site staff, and the public <input type="checkbox"/> Required checklists/records available, understood (describe): <input checked="" type="checkbox"/> Lessons Learned / SH&E improvements (describe): | <input checked="" type="checkbox"/> <input type="checkbox"/> Check <input checked="" type="checkbox"/> as reviewed or mark <input type="checkbox"/> as not applicable <input type="checkbox"/> <input checked="" type="checkbox"/> Biological/ Chemical / Electrical Hazards <input checked="" type="checkbox"/> <input type="checkbox"/> Ergonomics - Lifting, Body Position <input type="checkbox"/> <input checked="" type="checkbox"/> Lock Out/ Tag Out Short Service Employees - visual identifier and mentor/ oversight assignment <input type="checkbox"/> <input checked="" type="checkbox"/> Simultaneous/ Neighbouring Operations <input type="checkbox"/> <input checked="" type="checkbox"/> Slip/ Trip/ Fall Hazards <input type="checkbox"/> <input checked="" type="checkbox"/> Specialized PPE Needs <input type="checkbox"/> <input checked="" type="checkbox"/> Traffic Control <input type="checkbox"/> <input checked="" type="checkbox"/> Waste Management/ Decontamination <input type="checkbox"/> <input checked="" type="checkbox"/> Weather Hazards / Heat Stress / Cold Stress <input type="checkbox"/> <input checked="" type="checkbox"/> Subcontractor Requirements (e.g., JHAs, THAs, procedures, reporting, etc.) <input type="checkbox"/> <input checked="" type="checkbox"/> Work Permits / Plans required (e.g., Fall Protection, Confined Space, Hot Work, Critical Lifts, etc.); in place, understood (identify/attach): <input type="checkbox"/> <input checked="" type="checkbox"/> Other Topics (describe/attach): <input type="checkbox"/> <input checked="" type="checkbox"/> Client specific requirements (describe): |

| 3. Daily Check Out by Site Supervisor | |
|--|---|
| Describe incidents, near misses, observations or Stop Work interventions from today: | Describe Lessons Learned/ Improvement Areas from today: |

The site is being left in a safe condition and work crew checked out as fit unless otherwise specified as above.

| | | |
|---|----------------------------------|--|
| Site Supervisor Name <i>Gus Friedman</i> | Signature <i>Gus Friedman</i> | Date 4/12/22 <i>4/12/22</i> Time (at end of day / shift) <i>1830</i> |
|---|----------------------------------|--|

Worker Acknowledgement / Sign In Sign Out sheets applicable to this meeting are on reverse and, if applicable, attached.

Daily Tailgate Meeting (S3AM-209-FM5)
 Revision 9 January 15, 2019

PRINTED COPIES ARE UNCONTROLLED. CONTROLLED COPY IS AVAILABLE ON COMPANY INTRANET.

All employees:


- **STOP WORK** if concerned / uncertain about safety / hazard or additional precaution is not recorded on the THA.
- **Be alert and communicate any changes in personnel or conditions at the worksite to the supervisor.**
- **Reassess task, hazards, & mitigations on an ongoing basis; amend the THA if needed.**

SITE WORKERS (Including AECOM Contractors and Subcontractors): Your signature below means that you understand:

- * The requirement to participate in creating, reviewing, & updating hazard assessments (THA) applicable to your task(s).
- * The hazards & control measures associated with each task you are about to perform.
- * The permit to work requirements applicable to the work you are about to perform (if it includes permitted activities).
- * That no tasks or work is to be performed without a hazard assessment.
- * Your authority & obligation to "Stop Work" intervene, speak up/ listen up.

Your initials (right columns) certify that you arrived & departed fit for duty, & have reported all incidents/near misses; meaning:

- * You are physically and mentally fit for duty and have inspected your required PPE to ensure satisfactory condition.
- * You are not under the influence of any type of medication, drugs, or alcohol that could affect your ability to work safely.
- * You are aware of your responsibility to immediately report any illness, injury (regardless of where or when it occurred), or impairment/fatigue issue to the AECOM Supervisor.
- * You signed out as fit / uninjured unless you have otherwise informed the AECOM Supervisor.

| Print Name & Company | Signature | Initials & Sign In Time | Initials & Sign Out Time |
|----------------------|---|-------------------------|--------------------------|
| Guy Friedman AECOM |  | In & Fit 1345 GF | Out & Fit 1530 GF |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |

(Attach additional Site Worker sign-in/out sheets if needed) Identify number of attached sheets: _____

| SITE VISITOR / SITE REPRESENTATIVE | | | | |
|------------------------------------|--------------|--------------|----------------|-----------|
| Name | Company Name | Arrival Time | Departure Time | Signature |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

DAILY FIELD LOG

Project Information

Page 1 of 3

| | |
|---------------------------|--------------------------|
| Project Name: <u>T-30</u> | Location: <u>Seattle</u> |
| Project/Task No.: _____ | Weather: <u>SO</u> |
| Date: <u>4/12/22</u> | Personnel: <u>GF</u> |

Observations

| # | Time | Observation Description |
|----|------|--|
| 1 | 1345 | Onsite, meeting Marina + Amy Sponberg (part) |
| 2 | | Safety tailgate: Practice crane is nearby but not active |
| 3 | | No ship in port, but lots of truck traffic + moving |
| 4 | | containers. |
| 5 | | Scope: biweekly O+M, plus showing Marina + Amy |
| 6 | | around. |
| 7 | | → Also set up zone sparging? |
| 8 | | * Amy Sponberg @ <u>astmarine.com</u> |
| 9 | 1400 | Meet Marina, open up system, discuss responsibilities |
| 10 | | → Are there any alarms that are emergencies they need |
| 11 | | to respond to? |
| 12 | | → They are not currently adjusting the system at all. Just |
| 13 | | monitoring prepake, Poly tank, restarting after alarms, |
| 14 | | + making sure nothing looks out of place. Was Rob |
| 15 | | doing more than that? |
| 16 | 1415 | Amy Sponberg joins, gets oriented, GF + AS leave to see |
| 17 | | the wellfield + Marina heads offsite. |
| 18 | | - With notice, she will be able to keep LNAK wells clear for |
| 19 | | gauging / vacing in the future. One is currently blocked |
| 20 | | that she will try to resolve. |
| 21 | | - If there is not a ship in port, there is no work after |
| 22 | | 4:20 here no matter the day. That also applies to the |
| 23 | | second Thursday of each month. |
| 24 | | - If there isn't a boat, accessing the wells closer to shore |
| 25 | | should not be an issue. No containers go there, so should |

Comments / Site Activities / Personnel Tracking

DAILY FIELD LOG

Project Information

| | |
|---------------------------|------------------|
| Project Name: <u>T-30</u> | Location: _____ |
| Project/Task No.: _____ | Weather: _____ |
| Date: <u>4/12/22</u> | Personnel: _____ |

Observations

| Time | Observation Description |
|------|---|
| 1 | be clear minus through traffic. |
| 2 | - Good to have flashing lights on car roofs. might be |
| 3 | part policy. |
| 4 | - AS will put together a well map with their container |
| 5 | stalls added / overlaid. |
| 6 | - AS didn't think the online vessel schedule was reliable. |
| 7 | Things change a lot, best just to contact her. week-of |
| 8 | is best. |
| 9 | 1545 • Back at system for atm readings |
| 10 | • highest AS pressure gauge is reading 6 psi (near bleed) while lower |
| 11 | are reads 7 psi. |
| 12 | - AS well pressures 5-7.5 psi |
| 13 | - SVE rotameters need draining & scrubbing. How do they detach? |
| 14 | in • bucket of soapy water? working model |
| 15 | conex • scrub brush → in conex. Just need soap. Alconox? |
| 16 | - AS rotameters seem to have built in unions for removal? |
| 17 | 1620 • PID readings taken, 790 to destruction |
| 18 | 1635 • Spurge zone testing w/ CSB approval |
| 19 | • Zone 1: avg flow ~ 8 cfm, 6-7.75 psi |
| 20 | 1645 • Zone 2: 3/6 stroke?, high pressures, 8.5-10 psi. 3.8 cfm max |
| 21 | For the rotameters working, not a huge change in flow from |
| 22 | no-zones. |
| 23 | 1650 Zone 3: flow started, max 4.9. 7.25-9.5 psi. |
| 24 | → Spurge pressure was reading 9.5, need to lower |
| 25 | until we decide otherwise. Call CSB. Agree to |

Comments / Site Activities / Personnel Tracking

DAILY FIELD LOG

Project Information

Page 3 of 3

| | |
|---------------------------|----------------------|
| Project Name: <u>T-30</u> | Location: _____ |
| Project/Task No.: _____ | Weather: _____ |
| Date: <u>4/12/22</u> | Personnel: <u>GF</u> |

Observations

| Time | Observation Description |
|------|---|
| 1 | aim for 8 psi at the compressor for the zone with highest backpressure. |
| 2 | |
| 3 | |
| 4 | → Mechanical PRV is labeled to pop at 8.5 psi. Is it mis-labeled? Mis-set? Did not go off. |
| 5 | - Zone 3 gets air to 4/5 wells at 8 psi on the comp. |
| 6 | max flow ~ 2 cfmg |
| 7 | 1720 - Zone 4: great zone Breakthrough pressures are 6 psi or below at all 8 wells. At 8 psi @ comp flow is 3.7-7.5 |
| 8 | cfmg |
| 9 | |
| 10 | 1725 - Zone 5: higher back pressure than zone 4. At same bleed set point, it is at 8.5 psi @ comp. |
| 11 | |
| 12 | 1730 - Zone 1 again. Much lower back pressure than zone 5. |
| 13 | 6.5 psi equivalent. |
| 14 | - Zone 2 - Similar BP to zone 5 Tied for most conserv. |
| 15 | - Zone 3 - lower BP, 7 psi equiv. so |
| 16 | *Conclusion: use zone 2 as the compressor pressure set point. |
| 17 | |
| 18 | 1745 - set compressor pressure to 8 psi on zone 2, then took |
| 19 | pressure & flow readings for ^{each} zones without adjusting it |
| 20 | → Only 3 wells had no flow |
| 21 | → 5 or 6 wells might have been stuck or have very high |
| 22 | breakthrough pressures |
| 23 | → max flow = 8.4; most btw 1-4 cfmg |
| 24 | - leaving system at this set point. Zones set to run 4.5-5 hrs each |
| 25 | 1830 - Clean up / Mock up / off site |

Comments / Site Activities / Personnel Tracking

PORT OF SEATTLE - TERMINAL 30

AS & SVE Manifold Readings

| | | | |
|--|-----|-------------------|--|
| Date: | | Time: | |
| Field Tech(s): | GF | Equipment I.D. #: | |
| SVE Discharge VOC (ppm) PID | 4.5 | 10.5 | (PID not zeroed 2.5 baseline from poly tube) |
| SVE Discharge LEL (%) | | | |
| Oxygen (%) | | | |
| SVE System Inlet Vacuum (" H ₂ O) | 82 | | |
| SVE System Inlet ΔP (" H ₂ O) | 1 | | |
| Oxidizer Discharge VOC (ppm) PID | 0.3 | | |

SVE Wells

| Location | Vacuum ("H ₂ O) | Flow (SCFM-G) | Valve Pos. (% Open) | Comments | Location | Vacuum ("H ₂ O) | Flow (SCFM-G) | Valve Pos. (% Open) | Comments |
|----------|----------------------------|---------------|---------------------|---------------|----------|----------------------------|---------------|---------------------|------------------|
| HSVE-2 | 29 | 76 | 100 | | SVE-10 | 7100 | 15 | 100 | |
| HSVE-3 | 42 | 74 | 100 | | SVE-9 | 82 | 7 | 100 | junky, no vented |
| SVE-4 | 81 | 10 | 100 | very junky | SVE-8 | 84 | 0 | 100 | stuck? |
| SVE-5 | 11 | 0 | 100 | junky, stuck? | SVE-6 | 80 | 10 | 100 | launcing |
| SVE-7 | 89 | 12 | 100 | looks sticky | HSVE-1 | 12 | 72 | 7100 | |

AS Wells

| pressure | | | | pressure | | | | | | |
|----------|----------------------------|---------------|---------------------|----------|------|----------|----------------------------|---------------|---------------------|----------|
| Location | Vacuum ("H ₂ O) | Flow (SCFM-G) | Valve Pos. (% Open) | Comments | zone | Location | Vacuum ("H ₂ O) | Flow (SCFM-G) | Valve Pos. (% Open) | Comments |
| AS-7 | 7.0 | 1.2 | 100 | | | AS-17 | 7.0 | 0 | 100 | |
| AS-8 | 7.0 | 0 | 100 | | | AS-18 | 6.75 | 0 | | |
| AS-9 | 7.0 | 0 | 100 | | | AS-19 | 7.5 | 5.1 | | Stuck |
| AS-10 | 7.0 | 0 | 100 | | | AS-20 | 7.0 | 1.8 | | |
| AS-11 | 7.25 | broken | 100 | | | AS-21 | 6.0 | 0 | | |
| AS-12 | 7.0 | 1.75 | 100 | | | AS-22 | 7.0 | 0 | | |
| AS-13 | 6.75 | 2.2 | | | 1 | AS-1 | 7.5 | 3.5 | 100 | |
| AS-14 | 6.5 | 1.4 | | | 1 | AS-2 | 6.5 | 8.4 | | |
| AS-15 | 7.0 | 1.75 | | | 1 | AS-3 | 6.5 | 0 | | Juck |
| AS-16 | 7.25 | 1.8 | | | 1 | AS-4 | 5.5 | 6.3 | | |
| AS-23 | 7.0 | 1.3 | 100 | | 1 | AS-5 | 7.25 | 5.4 | | |
| AS-24 | 6.25 | 0 | | | 1 | AS-6 | 6.5 | 4.4 | | |
| AS-25 | 6.5 | 0 | | | | | | | | |
| AS-26 | 7.0 | 0 | | | | | | | | |
| AS-27 | 5.5 | 2.1 | | stuck? | | | | | | |

Notes:

[Faint handwritten notes and bleed-through from the reverse side of the page are visible in this section.]

Abbreviations:

ppm = Parts per Million
 % = Percent
 deg F - degrees Fahrenheit

" H₂O = Inches of Water
 SCFM-G = Standard Cubic Feet per Minute - Gauge
 PSI = Pounds per Square Inch



PORT OF SEATTLE - TERMINAL 30

SVE/AS & Oxidizer System Data Collection Form

Date: 4/12/22 Field Tech(s): GF
 Watch Time: 1545 Screen Time: 1527

| SVE/AS System | | | |
|---|---------|---|--------|
| SVE Blower Speed (Hertz) - VFD | 54 VFD | Sparge Blower Speed (Hertz) - VFD | 52 VFD |
| SVE Blower Runtime (Hours) | 10726.6 | AS Blower Runtime (Hours) - Sparge Blower | 916.8 |
| Transfer Pump Runtime (Hours) - MS Pump | 2.0 HMI | Sparge Heat Exchanger Runtime (Hours) | 5125.8 |
| Sparge Zone 1 Operating Cycle Open Interval(s) | - HMI | Sparge Zone 4 Operating Cycle Open Interval(s) | - HMI |
| Sparge Zone 2 Operating Cycle Open Interval(s) | - HMI | Sparge Zone 5 Operating Cycle Open Interval(s) | - HMI |
| Sparge Zone 3 Operating Cycle Open Interval(s) | - HMI | | |
| Sparge Heat Exchanger Discharge Temperature (°F) - TI-500 | 83 | SVE Blower Filter Differential Pressure (" H2O) - DPI-200 | 0.25 |
| AS Blower Pressure (PSI) - PI-501 | 6* | SVE Blower Inlet Differential Pressure (" H2O) - FI-200 | 1 |
| AS Blower Flow (" H2O) - DPI-500 | 1 | Transfer Pump Discharge Pressure (PSI) - PI-300 | 0 |
| SVE Blower Inlet Temperature (°F) - TI-200 | 52 | SVE Blower Discharge Pressure (PSI) - PI-400 | 0? |
| SVE Blower Inlet Vacuum (" H2O) - VI-200 | 82 | SVE Blower Discharge Temperature (°F) - TI-400 | 94 |

| Oxidizer System | | | |
|--|----------|--|-----------|
| Inlet Temperature (°F) | 692 HMI | Process Blower Runtime (Hours) | 17562 HMI |
| Burner Chamber Temperature (°F) | 708 HMI | Combustion Fan Runtime (Hours) | 17563 HMI |
| Outlet Temperature (°F) | 615 HMI | Burner Runtime (Hours) | 17552 HMI |
| Inlet Limit Controller Temperature (°F) | 682 HMI | Processing Vapors Runtime (Hours) | 17538 HMI |
| Outlet Limit Controller Temperature (°F) | 609 HMI | Panel Temperature (°F) | 64 HMI |
| Process Fan Valve Position (Open/Closed) | Open HMI | Flame Signal (Volts) | 5 HMI |
| Dilution Valve Position (%) | 0 HMI | Burner Chamber Inlet Differential Pressure (" H2O) | broken |
| Combustion Valve Position (%) | 15.4 HMI | | |

| Other Components | | | |
|--|-------|--------------------------|----|
| Moisture Separator Level (% Full) | NM | Propane Tank A Level (%) | 60 |
| Water Storage Tank Level (DTF, TD from MP; inches) | empty | Propane Tank B Level (%) | 57 |

NOTES:
 * As gauge near bleed reads 6 psi, gauge at bottom reads 7 psi.

Abbreviations:
 1. " H₂O = Inches of Water
 2. °F = Degrees Fahrenheit
 3. PSI = Pounds per Square Inch
 4. % = Percent
 5. DTF - Depth to Fluid
 6. TD - Total Depth
 7. MP - Measuring Point



PORT OF SEATTLE - TERMINAL 30

AS & SVE Manifold Readings

Date: 4/12/22 Time: _____
 Field Tech(s): GF Equipment I.D. #: _____
 SVE Discharge VOC (ppm) PID _____
 SVE Discharge LEL (%) _____
 Oxygen (%) _____
 SVE System Inlet Vacuum (" H₂O) _____
 SVE System Inlet ΔP (" H₂O) _____
 Oxidizer Discharge VOC (ppm) PID _____

Zone Sparging
Optimizations

SVE Wells

| Location | Vacuum ("H ₂ O) | Flow (SCFM-G) | Valve Pos. (% Open) | Comments |
|----------|----------------------------|---------------|---------------------|----------|
| HSVE-2 | | | | |
| HSVE-3 | | | | |
| SVE-4 | | | | |
| SVE-5 | | | | |
| SVE-6 | | | | |
| SVE-7 | | | | |

TAKEAWAY:
 With compressor pressure at 8 PSI during zone 2, broken/high backpressure wells are:
 AS-3, -11, -18, -19, and -21

NOTE:
 AS-18, -19, and -21 registered flow on 5/13 (9.5, 10, and 8 PSI pressures) after rotameter cleanings on 4/15. No flow at AS-21 at 8 PSI, but float not stuck.

Pressure

breakthrough pressures

Pressure

AS Wells

| Location | Vacuum ("H ₂ O) | Flow (SCFM-G) | Valve Pos. (% Open) | Comments | Zone | Location | Vacuum ("H ₂ O) | Flow (SCFM-G) | Valve Pos. (% Open) | Comments |
|----------|----------------------------|---------------|---------------------|---------------|------|----------|----------------------------|---------------|---------------------|---------------|
| AS-7 | 8 | 4.3 | 100 | 6 | 2 | AS-17 | 9 | 2.2 | 100 | 8/1.9 7.5 |
| AS-8 | 8 | 1.5 | | 0.5 | 2 | AS-18 | 9.25 | 0 | | ? 8.5/- ? |
| AS-9 | 8 | 1.0 | | 7 | 2 | AS-19 | 10.0 | - | | Stuck 9/- - |
| AS-10 | 8.25 | 0 | | 7.9 | 2 | AS-20 | 3.8 | 9.5 | | 8.5/3.7 8 |
| AS-11 | 8.5 | - | ↓ | broken | 2 | AS-21 | 8.5 | 0 | ↓ | ? 7.5/- ? |
| AS-12 | 8.0 | 3.7 | 100 | 8/1.9 16 | 2 | AS-22 | 9.25 | 1.1 | ↓ | 8.5/0 7.8 |
| AS-13 | 8.0 | 5.2 | | 7.5/3.7 6 | 1 | AS-1 | 7.75 | 8.1 | 100 | 7.5/3.9 16 |
| AS-14 | 7.0 | 4.2 | | 7/2.7 6 | 1 | AS-2 | 6.75 | 8.5 | | 6.5/8.4 16 |
| AS-15 | 8.0 | 3.8 | | 7.5/1.7 6 | 1 | AS-3 | 7.0 | | | Stuck 7/- - |
| AS-16 | 7.5 | 7.4 | ↓ | Sticky 8/4 16 | 1 | AS-4 | 6.0 | 9.5 | ↓ | 6/6.9 16 |
| AS-23 | 9.25 | 3.8 | 100 | 8/1.5 17 | 1 | AS-5 | 7.5 | 7.5 | | 8/7.5/2.9 5.5 |
| AS-24 | 8.5 | 2.5 | | 7.5/1.6 7.25 | 1 | AS-6 | 7.0 | 7.2 | ↓ | 6.5/3.9 16 |
| AS-25 | 9.0 | 0 | | 7.5/0 7.8 | | | | | | |
| AS-26 | 9.5 | 1.8 | | 8.25/1.1 7.5 | | | | | | |
| AS-27 | 7.25 | 4.9 | ↓ | 6/4.2 17 | | | | | | |

zone
 5
 4
 3
 2
 1

Notes:

Black = Initial readings w/ bleed valve at same set point it was at with all 5 zones open at 6psi on the compressor

Red = breakthrough pressures, but based on the compressor gauge. Should probably redo using the manifold gauges, these are ballpark.

Blue = pressures + flows w/ bleed set so compressor is @ 8 psi. during zone 2, which had the highest back pressure

Abbreviations:

ppm = Parts per Million
 % = Percent
 deg F - degrees Fahrenheit

" H₂O = Inches of Water
 SCFM-G = Standard Cubic Feet per Minute - Gauge
 PSI = Pounds per Square Inch





INSTRUMENT CALIBRATION REPORT

Pine Environmental Services LLC

3225 South 116th St.
Building 1 Suite 181
Tukwila, WA 98168
425-285-9102

Pine Environmental Services, Inc.

Instrument ID 48808
Description MiniRAE 3000
Calibrated 4/11/2022 12:52:52PM

| | |
|---|------------------------|
| Manufacturer Rae Systems | State Certified |
| Model Number PGM 7320 | Status Pass |
| Serial Number/ Lot Number 592-600846 | Temp °C 16 |
| Location Seattle | Humidity % 42 |
| Department | |

Calibration Specifications

| | |
|-----------------------------------|-----------------------------|
| Group # 1 | Range Acc % 0.0000 |
| Group Name VOC | Reading Acc % 3.0000 |
| Stated Accy Pct of Reading | Plus/Minus 0.0 |

| <u>Nom In Val / In Val</u> | <u>In Type</u> | <u>Out Val</u> | <u>Out Type</u> | <u>Fnd As</u> | <u>Lft As</u> | <u>Dev%</u> | <u>Pass/Fail</u> |
|----------------------------|----------------|----------------|-----------------|---------------|---------------|-------------|------------------|
| 100.0 / 100.0 | PPM | 100.0 | PPM | 100.1 | 100.0 | 0.00% | Pass |

Test Instruments Used During the Calibration

(As Of Cal Entry Date)

| <u>Test Standard ID</u> | <u>Description</u> | <u>Manufacturer</u> | <u>Model Number</u> | <u>Serial Number / Lot Number</u> | <u>Last Cal Date / Expiration Date / Opened Date</u> |
|---------------------------------|----------------------------|---------------------|---------------------|-----------------------------------|--|
| SEA ISO 100 PPM KBJX02AI99CP | Isobutylene (C4H8) 100 PPM | Airgas | x02ai99cp342066 | KBJ-X02AI99 CP342066-1 | 10/14/2023 |

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Stethan Holmes

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

**Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment
Please call 800-301-9663 for Technical Assistance**

Americas

Daily Tailgate Meeting

S3AM-209-FM5

Instructions: Conduct meeting prior to sending crews to individual tasks. Require attendance of all AECOM employees and subcontractors. Invite personnel from simultaneous operations for coordination purposes. Review scope of work and briefly discuss required and applicable topics. **This meeting is a daily refresher, not a full orientation.** Task-specific discussions associated with Task Hazard Assessment (THA) follow this meeting at the task location immediately before individual task is started.

| |
|---|
| AECOM Supervisor Name: Paul Kalina |
| Phone Number: |
| AECOM SH&E Rep. Name: Andrew Paynter |
| Phone Number: |
| Meeting Leader: Gus Friedman |

| | | |
|----------------------|------------------------------------|------------------------|
| Date: 4/14/22 | Project Name/Location: T-30 | Project Number: |
|----------------------|------------------------------------|------------------------|

Today's Scope of Work:
 LNAP gauging; RW-11A sampling (Day 1 spring '22 sampling)

| | | | |
|-------------------------------|--------------------------------|------------------------------------|----------------------------|
| Muster Point Location: | First Aid Kit Location: | Fire Extinguisher Location: | Spill Kit Location: |
|-------------------------------|--------------------------------|------------------------------------|----------------------------|

| | |
|---|---|
| <p>1. Required Topics</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Fitness for Duty requirements, all sign in / sign out <input checked="" type="checkbox"/> Required training (incl. task specific) completed and current <input checked="" type="checkbox"/> SH&E Plan onsite - understood, reviewed, signed by all (incl. scope, preplanning hazard assessments / risk registers, controls, procedures, requirements, etc.) <input checked="" type="checkbox"/> Task Hazard Assessments (THAs) are to be reviewed and completed for each task immediately prior to conducting <input checked="" type="checkbox"/> STOP WORK Right & Responsibility- all task changes/changed conditions re-assess with THA <input checked="" type="checkbox"/> Requirement to report to supervisor any injury, illness, damage, near miss, unsafe act / condition <input checked="" type="checkbox"/> Emergency Response Plan – including muster point, first aid kit, fire extinguisher, clinic/hospital location <input checked="" type="checkbox"/> Personal Protective Equipment (PPE) - Required items per hazard assessments in good condition / in use by all <input checked="" type="checkbox"/> Equipment/machinery inspected (documented as required) and in good condition - operators properly trained/certified <input checked="" type="checkbox"/> Work area set up and demarcation/ barricades in place to protect workers, site staff, and the public <input checked="" type="checkbox"/> Required checklists/records available, understood (describe): <input checked="" type="checkbox"/> Lessons Learned / SH&E improvements (describe): | <p>2. Discuss if Applicable to Today's Work</p> <p><input checked="" type="checkbox"/> <input type="checkbox"/> Check <input checked="" type="checkbox"/> as reviewed or mark <input type="checkbox"/> as not applicable</p> <ul style="list-style-type: none"> <input type="checkbox"/> <input checked="" type="checkbox"/> Biological/ Chemical / Electrical Hazards <input checked="" type="checkbox"/> <input type="checkbox"/> Ergonomics - Lifting, Body Position <input type="checkbox"/> <input checked="" type="checkbox"/> Lock Out/ Tag Out <input type="checkbox"/> <input checked="" type="checkbox"/> Short Service Employees - visual identifier and mentor/ oversight assignment <input type="checkbox"/> <input checked="" type="checkbox"/> Simultaneous/ Neighbouring Operations <input type="checkbox"/> <input checked="" type="checkbox"/> Slip/ Trip/ Fall Hazards <input type="checkbox"/> <input checked="" type="checkbox"/> Specialized PPE Needs <input type="checkbox"/> <input checked="" type="checkbox"/> Traffic Control <input type="checkbox"/> <input checked="" type="checkbox"/> Waste Management/ Decontamination <input type="checkbox"/> <input checked="" type="checkbox"/> Weather Hazards / Heat Stress / Cold Stress <input type="checkbox"/> <input checked="" type="checkbox"/> Subcontractor Requirements (e.g., JHAs, THAs, procedures, reporting, etc.) <input type="checkbox"/> <input checked="" type="checkbox"/> Work Permits / Plans required (e.g., Fall Protection, Confined Space, Hot Work, Critical Lifts, etc.); in place, understood (identify/attach): <input type="checkbox"/> <input checked="" type="checkbox"/> Other Topics (describe/attach): <input type="checkbox"/> <input checked="" type="checkbox"/> Client specific requirements (describe): |
|---|---|

| | |
|--|---|
| 3. Daily Check Out by Site Supervisor | |
| Describe incidents, near misses, observations or Stop Work interventions from today: | Describe Lessons Learned/ Improvement Areas from today: |

The site is being left in a safe condition and work crew checked out as fit unless otherwise specified as above.

| | | |
|---|----------------------|--|
| Site Supervisor Name Gus Friedman | Signature | Date 4/14/22 Time (at end of day / shift) |
|---|----------------------|--|

Worker Acknowledgement / Sign In Sign Out sheets applicable to this meeting are on reverse and, if applicable, attached.

Daily Tailgate Meeting (S3AM-209-FM5)
 Revision 9 January 15, 2019

PRINTED COPIES ARE UNCONTROLLED. CONTROLLED COPY IS AVAILABLE ON COMPANY INTRANET.

All employees:

- **STOP WORK** if concerned / uncertain about safety / hazard or additional precaution is not recorded on the THA.
- **Be alert and communicate any changes in personnel or conditions at the worksite to the supervisor.**
- **Reassess task, hazards, & mitigations on an ongoing basis; amend the THA if needed.**

SITE WORKERS (including AECOM Contractors and Subcontractors): Your signature below means that you understand:

- * The requirement to participate in creating, reviewing, & updating hazard assessments (THA) applicable to your task(s).
- * The hazards & control measures associated with each task you are about to perform.
- * The permit to work requirements applicable to the work you are about to perform (if it includes permitted activities).
- * That no tasks or work is to be performed without a hazard assessment.
- * Your authority & obligation to "Stop Work" intervene, speak up/ listen up.

Your initials (right columns) certify that you arrived & departed fit for duty, & have reported all incidents/near misses; meaning:

- * You are physically and mentally fit for duty and have inspected your required PPE to ensure satisfactory condition.
- * You are not under the influence of any type of medication, drugs, or alcohol that could affect your ability to work safely.
- * You are aware of your responsibility to immediately report any illness, injury (regardless of where or when it occurred), or impairment/fatigue issue to the AECOM Supervisor.
- * You signed out as fit / uninjured unless you have otherwise informed the AECOM Supervisor.

| Print Name & Company | Signature | Initials & Sign In Time | Initials & Sign Out Time |
|----------------------|---------------------|-------------------------|--------------------------|
| Gus Friedman AECOM | <i>Gus Friedman</i> | In & Fit 1645 GF | Out & Fit |
| None Gary | <i>None Gary</i> | In & Fit 1645 NG | Out & Fit |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |

(Attach additional Site Worker sign-in/out sheets if needed) Identify number of attached sheets: _____

| SITE VISITOR / SITE REPRESENTATIVE | | | | |
|------------------------------------|--------------|--------------|----------------|-----------|
| Name | Company Name | Arrival Time | Departure Time | Signature |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

DAILY FIELD LOG

Project Information

| | |
|---------------------------|---------------------------|
| Project Name: <u>P-30</u> | Location: <u>Seattle</u> |
| Project/Task No.: _____ | Weather: <u>45 cloudy</u> |
| Date: <u>4/14/22</u> | Personnel: <u>GF, NG</u> |

Observations

| Time | Observation Description |
|------|---|
| 1 | 081645 Onsite, 2 nd Thursday, no port activity |
| 2 | scope: LNAPL gauging, RW-11A sampling. Will return to |
| 3 | site tomorrow for MW-89 sampling. |
| 4 | Tailgate: ergonomics. traffic hazards minimal |
| 5 | • System shut off. SVE hr meter 10785.6 |
| 6 | AS hr meter 5176.0 |
| 7 | Last zone on: Zone 4. Pressures 6.5-7.5 |
| 8 | • Amy successfully uncovered RW-101. Flows 1.5-4.3 |
| 9 | • NG will sample, GF will gauge. |
| 10 | • NG starting on 11A |
| 11 | • GF labeling monuments |
| 12 | - main LNAPL group is D319-D328 |
| 13 | - MW-36 btw zone C309-C310, btw the labels & outside |
| 14 | container area. |
| 15 | - MW-31A & -93 are outside of container stalls, shouldn't |
| 16 | be covered. |
| 17 | - MW-89 is at A257, outside container stall. |
| 18 | * has MW-36 been decommissioned? Can't find it, but there |
| 19 | is a patch where it could have been. It is on the |
| 20 | 2-year sampling schedule (would be sampled this fall) |
| 21 | • we need to sample MW-89 tomorrow & it is not |
| 22 | out on apron as initially thought. Need to |
| 23 | contact Amy to avoid work @ A257 tomorrow |
| 24 | @ 1:00 12:45 |
| 25 | 1810 NG collected samples @ RW-11A |

Comments / Site Activities / Personnel Tracking

DAILY FIELD LOG

Project Information

| | |
|---------------------------|------------------|
| Project Name: <u>7-30</u> | Location: _____ |
| Project/Task No.: _____ | Weather: _____ |
| Date: <u>4/14/22</u> | Personnel: _____ |

Observations

| # | Time | Observation Description |
|----|------|---|
| 1 | 2000 | Finished gauging the LNAPL wells |
| 2 | | ** Several on the list were crossed off during last |
| 3 | | event & we aren't sure why. Covered by container? No |
| 4 | | longer needing gauging? MW-35, -36A, and -1. And |
| 5 | | RW-102. |
| 6 | | ** Several wells on the list are not indicated as free |
| 7 | | product gauging or product recovery wells on the |
| 8 | | figure. Why are they included? MW-35, -36A, & RW-1. |
| 9 | | Same list as above minus RW-102. |
| 10 | | ** We re-read the comp d & seems unclear if gauging |
| 11 | | between recovery events is required. Double check |
| 12 | | this. |
| 13 | 2005 | Returned to system to see if rotameters can be |
| 14 | | removed for cleaning. Confirmed both styles can. |
| 15 | | Plan to come back tomorrow to attempt cleaning. |
| 16 | | * Email Marina to ensure system does not get |
| 17 | | restarted. |
| 18 | 2040 | GF, NG offsite |
| 19 | | |
| 20 | | |
| 21 | | |
| 22 | | |
| 23 | | |
| 24 | | |
| 25 | | |

Comments / Site Activities / Personnel Tracking

Gauging April 14

Port of Seattle Terminal 30 LNAPL Removal Event (February 17, 2022)

| Location | Time of Gaging | Initial Depth to LNAPL (Feet TOC) | Initial Depth to Water (Feet TOC) | LNAPL Thickness (Feet) | First Removal | | | Post Removal | | |
|---|----------------|--------------------------------------|--------------------------------------|------------------------------|--|--|--|----------------|------------------------------|------------------------------|
| | | | | | LNAPL Extraction Duration (Minutes) | Extraction Start/End Times (Approx.) | Estimated Total Fluid Removal (Gallons) | Time of Gaging | Depth to LNAPL (Feet TOC) | Depth to Water (Feet TOC) |
| MW-35 | 1951 | NA | 8.64 | 0 | | | | | | |
| MW-36 | 1931 | NA | 9.17 | 0 | | | | | | |
| MW-36A | 1928 | NA | 9.73 | 0 | | | | | | |
| MW-39A | 1937 | NA | 9.40 | 0 | | | | | | |
| MW-59 | 1857 | NA | 8.82 | 0 | water in manometer w/ a screen. | | | | | |
| MW-89 ³ | 1957 | NA | 9.92 | 0 | | | | | | |
| MW-93 | 1940 | NA | 9.66 | 0 | | | | | | |
| RW-1 | 1947 | 8.42 | 8.45 | 0.03 | dense layer | | | | | |
| RW-12 | 1849 | 9.04 | 9.10 | 0.06 | | | | | | |
| RW-101 | 1835 | NA | 7.83 | 0 | | | | | | |
| RW-102 | 1837 | NA | 8.81 | 0 | | | | | | |
| RW-103 | 1841 | 7.96 | 8.56 | 0.60 | | | | | | |
| RW-104 | 1827 | NA | 7.56 | 0 | | | | | | |
| RW-105 | 1859 | NA | 8.45 | 0 | | | | | | |
| RW-106 | 1855 | 8.06 | 9.18 | 1.12 | | | | | | |
| RW-107 | 1846 | 8.36 | 9.16 | 0.80 | | | | | | |
| RW-108 | 1905 | NA | 8.47 | 0 | | | | | | |
| RW-109 | 1912 | NA | 8.72 | 0 | | | | | | |
| RW-110 | 1922 | NA | 8.70 | 0 | | | | | | |
| VACUUM TRUCK MEASURED AND APPROXIMATED TOTALS ⁹ : | | | | | | | | | | |
| COMBINED APPROXIMATED TOTALS IN VACUUM TRUCK (INCLUDING HOLDING TANK) ¹⁰ : | | | | | | | | | | |
| COMBINED APPROXIMATED TOTALS AS MEASURED BY DH ON 11/12/2021 | | | | | | | | | | |

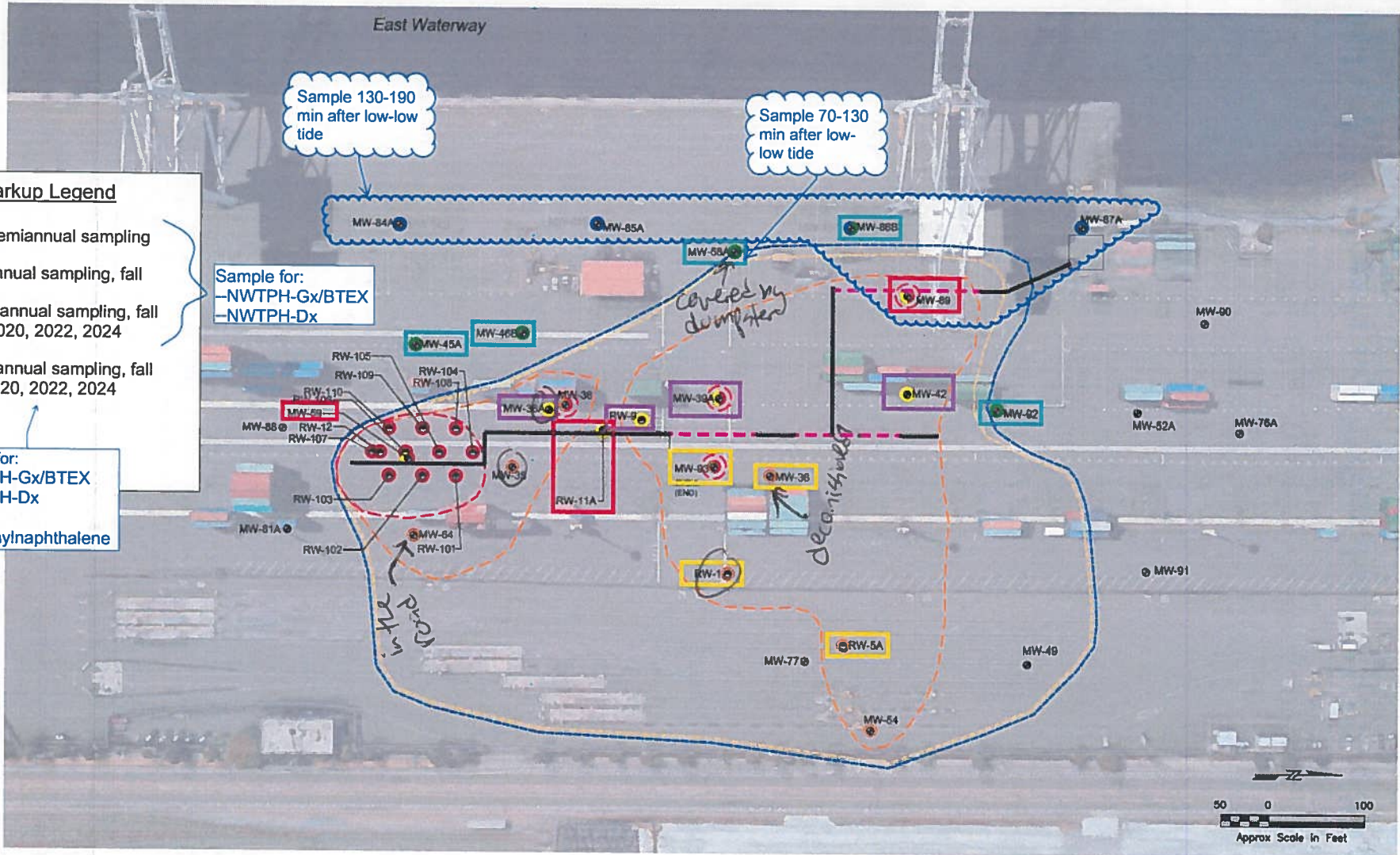
Notes:

1. Feet TOC = Feet below top of well casing.
2. LNAPL = Light Non-Aqueous Phase Liquid
3. Groundwater measurements taken at throughout the evening
4. NL = LNAPL not detected using interface probe.
5. For drum vacuumed wells, total removals calculated from drum volumes from each well post-recovery at each well.
6. NA - Not Available (not able to detect or measure)
7. TRACE, MINOR, VERY TRACE - Indications of LNAPL present, but no accurate measurement or below measurable amount.
8. MW-35 total depth tagged at 13.90-ft TOC.
9. DH Vacuum Truck removal volumes only (stick measured in vac truck tank).
10. Approximately 163-gallons of oily water (total fluids) in the holding tank prior to removal.

Red wells extracted by DH Environmental with vacuum truck.

on Feb 17 2022.
No activity in March,
lack the funding

re-gauged on 4/15 during low tide
DTP : 9.24 ft btoc
DTW : 9.25 ft btoc
LNAPL thickness : 0.01 Ft



Markup Legend

- semiannual sampling
- annual sampling, fall
- biannual sampling, fall 2020, 2022, 2024
- biannual sampling, fall 2020, 2022, 2024

Sample for:
 -NWTPH-Gx/BTEX
 -NWTPH-Dx

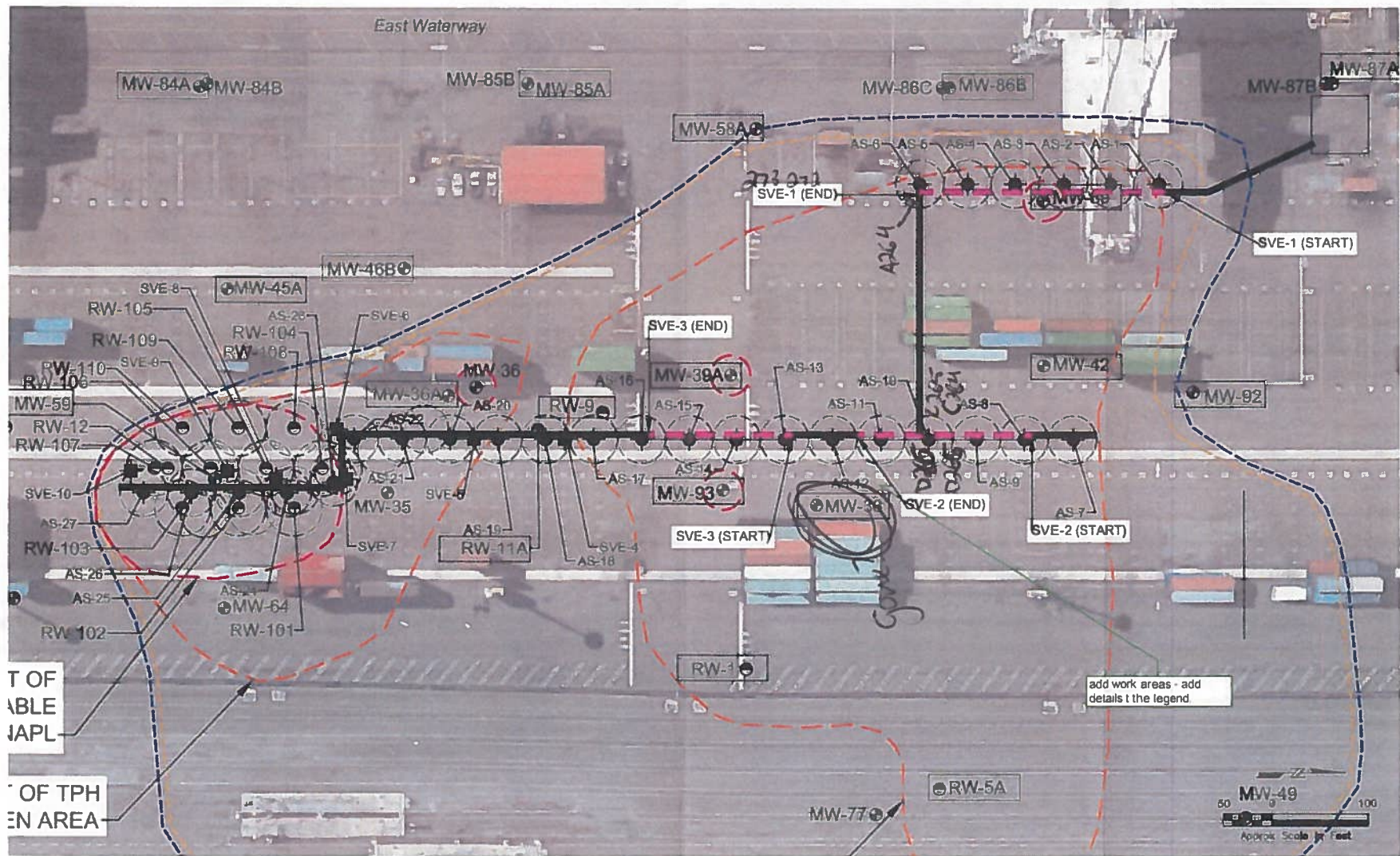
Sample for:
 -NWTPH-Gx/BTEX
 -NWTPH-Dx
 -PAH
 -2-methylnaphthalene

LEGEND

- MONITORING WELL
- PRODUCT RECOVERY WELL
- PERFORMANCE MONITORING WELL
- INTERIOR MONITORING WELL
- CPOC MONITORING WELL
- SHORELINE MONITORING WELL
- FREE PRODUCT GAUGING WELL



| | |
|--|-------------------------------|
| Compliance Monitoring Plan Terminal 30 Cleanup Action | Compliance Monitoring Network |
| DATE: 12/2/2017 DRAWN: BTS | Figure 4 |



LEGEND

- ◆ AS WELL
- SVE WELL (VERTICAL)
- MONITORING WELL
- PRODUCT RECOVERY WELL
- DECOMMISSIONED MONITORING WELL

- CPOC GROUNDWATER WELL
- INTERIOR GROUNDWATER WELL
- PERFORMANCE GROUNDWATER WELL

Engineering Design Report
Terminal 30 Cleanup Action

AS/SVE System Layout

DATE: 11/18/2017 DRAWN: BTS

Figure 4-1

Americas

Daily Tailgate Meeting

S3AM-209-FM5

Instructions: Conduct meeting prior to sending crews to individual tasks. Require attendance of all AECOM employees and subcontractors. Invite personnel from simultaneous operations for coordination purposes. Review scope of work and briefly discuss required and applicable topics. **This meeting is a daily refresher, not a full orientation.** Task-specific discussions associated with Task Hazard Assessment (THA) follow this meeting at the task location immediately before individual task is started.

| | |
|----------------------------------|----------------|
| AECOM Supervisor Name: | Paul Kulina |
| Phone Number: | |
| AECOM SH&E Rep. Name: | Andrew Paynter |
| Phone Number: | |
| Meeting Leader: | Gus Friedman |

| | | |
|----------------------|-----------------------------------|------------------------|
| Date: 4/15/22 | Project Name/Location: T30 | Project Number: |
|----------------------|-----------------------------------|------------------------|

Today's Scope of Work:
 • Clean system rotameters
 • Sample mwsn for day 2 of Spring Sampling

| | | | |
|---|---|--|---------------------------------|
| Muster Point Location: Front gate | First Aid Kit Location: Corex | Fire Extinguisher Location: System enclosure | Spill Kit Location: - |
|---|---|--|---------------------------------|

| | |
|--|--|
| <p>1. Required Topics</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Fitness for Duty requirements, all sign in / sign out <input type="checkbox"/> Required training (incl. task specific) completed and current <input checked="" type="checkbox"/> SH&E Plan onsite - understood, reviewed, signed by all (incl. scope, preplanning hazard assessments / risk registers controls, procedures, requirements, etc.) <input checked="" type="checkbox"/> Task Hazard Assessments (THAs) are to be reviewed and completed for each task immediately prior to conducting <input type="checkbox"/> STOP WORK Right & Responsibility- all task changes/changed conditions re-assess with THA <input type="checkbox"/> Requirement to report to supervisor any injury, illness, damage, near miss, unsafe act / condition <input type="checkbox"/> Emergency Response Plan – including muster point, first aid kit, fire extinguisher, clinic/hospital location <input checked="" type="checkbox"/> Personal Protective Equipment (PPE) - Required items per hazard assessments in good condition / in use by all <input type="checkbox"/> Equipment/machinery inspected (documented as required) and in good condition - operators properly trained/certified <input type="checkbox"/> Work area set up and demarcation/ barricades in place to protect workers, site staff, and the public <input type="checkbox"/> Required checklists/records available, understood (describe): <input checked="" type="checkbox"/> Lessons Learned / SH&E improvements (describe) | <p>2. Discuss if Applicable to Today's Work</p> <p><input checked="" type="checkbox"/> <input type="checkbox"/> Check <input checked="" type="checkbox"/> as reviewed or mark <input type="checkbox"/> as not applicable</p> <ul style="list-style-type: none"> <input type="checkbox"/> <input checked="" type="checkbox"/> Biological/ Chemical / Electrical Hazards <input type="checkbox"/> <input type="checkbox"/> Ergonomics - Lifting, Body Position <input type="checkbox"/> <input checked="" type="checkbox"/> Lock Out/ Tag Out Short Service Employees - visual identifier and mentor/ oversight assignment <input checked="" type="checkbox"/> <input type="checkbox"/> Simultaneous/ Neighbouring Operations <input checked="" type="checkbox"/> <input type="checkbox"/> Slip/ Trip/ Fall Hazards <input type="checkbox"/> <input checked="" type="checkbox"/> Specialized PPE Needs <input type="checkbox"/> <input type="checkbox"/> Traffic Control <input type="checkbox"/> <input checked="" type="checkbox"/> Waste Management/ Decontamination <input checked="" type="checkbox"/> <input type="checkbox"/> Weather Hazards / Heat Stress / Cold Stress <input type="checkbox"/> <input checked="" type="checkbox"/> Subcontractor Requirements (e.g., JHAs, THAs, procedures, reporting, etc.) <input type="checkbox"/> <input checked="" type="checkbox"/> Work Permits / Plans required (e.g., Fall Protection Confined Space, Hot Work, Critical Lifts etc.): in place, understood (identify/attach): <input type="checkbox"/> <input checked="" type="checkbox"/> Other Topics (describe/attach): <input type="checkbox"/> <input checked="" type="checkbox"/> Client specific requirements (describe): |
|--|--|

| | |
|--|---|
| 3. Daily Check Out by Site Supervisor | |
| Describe incidents, near misses, observations or Stop Work interventions from today: | Describe Lessons Learned/ Improvement Areas from today: |
| | |

The site is being left in a safe condition and work crew checked out as fit unless otherwise specified as above.

| | | |
|---|----------------------|--|
| Site Supervisor Name Gus Friedman | Signature | Date 4/15/22 Time (at end of day / shift) |
|---|----------------------|--|

Worker Acknowledgement / Sign In Sign Out sheets applicable to this meeting are on reverse and, if applicable, attached.

All employees:

- **STOP WORK** if concerned / uncertain about safety / hazard or additional precaution is not recorded on the THA.
- **Be alert and communicate any changes in personnel or conditions at the worksite to the supervisor.**
- **Reassess task, hazards, & mitigations on an ongoing basis; amend the THA if needed.**

SITE WORKERS (including AECOM Contractors and Subcontractors): Your signature below means that you understand:

- * The requirement to participate in creating, reviewing, & updating hazard assessments (THA) applicable to your task(s).
- * The hazards & control measures associated with each task you are about to perform.
- * The permit to work requirements applicable to the work you are about to perform (if it includes permitted activities).
- * That no tasks or work is to be performed without a hazard assessment.
- * Your authority & obligation to "Stop Work" intervene, speak up/ listen up.

Your initials (right columns) certify that you arrived & departed fit for duty, & have reported all incidents/near misses; meaning:

- * You are physically and mentally fit for duty and have inspected your required PPE to ensure satisfactory condition.
- * You are not under the influence of any type of medication, drugs, or alcohol that could affect your ability to work safely.
- * You are aware of your responsibility to immediately report any illness, injury (regardless of where or when it occurred), or impairment/fatigue issue to the AECOM Supervisor.
- * You signed out as fit / uninjured unless you have otherwise informed the AECOM Supervisor.

| Print Name & Company | Signature | Initials & Sign In Time | Initials & Sign Out Time |
|----------------------|---------------------|-------------------------|--------------------------|
| Nate Guyer Aecom | <i>Nate Guyer</i> | In & Fit NZJ 0915 | Out & Fit |
| Gus Friedman AECOM | <i>Gus Friedman</i> | In & Fit GF 0925 | Out & Fit |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |

(Attach additional Site Worker sign-in/out sheets if needed) Identify number of attached sheets: _____

SITE VISITOR / SITE REPRESENTATIVE

| Name | Company Name | Arrival Time | Departure Time | Signature |
|------|--------------|--------------|----------------|-----------|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

DAILY FIELD LOG

Project Information

Page 1 of 3

| | |
|---------------------------|------------------------------|
| Project Name: <u>T-30</u> | Location: <u>Seattle</u> |
| Project/Task No.: _____ | Weather: <u>45, overcast</u> |
| Date: <u>4/15/22</u> | Personnel: <u>GF, NG</u> |

Observations

| # | Time | Observation Description |
|----|------|---|
| 1 | 0925 | • GF onsite, NG already onsite prepping materials |
| 2 | | • Scope: clean rotameters |
| 3 | | Sample MW-59 (Spring sampling Day 2) |
| 4 | | • Tailgate: traffic hazards - part activity is live |
| 5 | | • Called Amy Spenberg to confirm part want need to |
| 6 | | work around MW-59 this afternoon and she confirmed |
| 7 | | → Also OK'd re-gauging MW-59 during lunch hour / low |
| 8 | | tide. PK + RK were curious if LNAPL might present now |
| 9 | | even though it didn't at high tide last night. |
| 10 | | • SVE-10 has a crack in the bottom piece that threads |
| 11 | | into the rotameter column (King model 0-60 SCFM) |
| 12 | 1135 | • GF + NG to gauge MW-59 again (low tide 1105) |
| 13 | | → product at 9.24 ft btlc to product |
| 14 | | water at 9.25 ft btlc |
| 15 | | 0.01 ft of product |
| 16 | 1145 | • Back to cleaning rotameters |
| 17 | | • Not all SVE pressure gauges are reading zero |
| 18 | | SVE-4: 13" H ₂ O |
| 19 | | SVE-5: 7" H ₂ O |
| 20 | | SVE-7: 15" H ₂ O |
| 21 | | SVE-10: 27" H ₂ O |
| 22 | | SVE-9: 10" H ₂ O |
| 23 | | SVE-46: 7" H ₂ O |
| 24 | | SVE-6: 8" H ₂ O |
| 25 | | • All AS gauges are zeroed out. |

all replaced w/ spares from core x

7 total. Can't adjust; need replacing.

Winters brand 0-100" H₂O bottom mount.

→ Still needs replacing. Order more gauge's.

Comments / Site Activities / Personnel Tracking

DAILY FIELD LOG

Project Information

Page 2 of 3

| | |
|---------------------------|--------------------------|
| Project Name: <u>T-30</u> | Location: _____ |
| Project/Task No.: _____ | Weather: _____ |
| Date: <u>4/15/22</u> | Personnel: <u>GF, NL</u> |

Observations

| Time | Observation Description |
|------|---|
| 1 | 1215 |
| 2 | • PVC nipple at base of SVE-8 rotameter snapped during removal of upper valve - fit was too tight. |
| 3 | • Same thing broken on SVE-5, though unclear if break was pre-existing. |
| 4 | |
| 5 | 1315 |
| 6 | • Called Marina to see if we can use the spare pressure gauges in the corex + order replacement nipples. No answer, left message |
| 7 | |
| 8 | 1415 |
| 9 | • Called Marina again, still no answer. Went ahead and installed the 6 spires we had on site. SVE-6 still needs a replacement. |
| 10 | |
| 11 | 1415 |
| 12 | • On SVE-5 and -9, the lower rotameter rod sheath and o-ring bumper were missing, allowing the float to drop all the way to bottom. PK recommends calling King to see if replacement parts are available. |
| 13 | |
| 14 | |
| 15 | → If we have to replace SVE-10 due to the crack in the base, we could steal the sheath/stopper from it |
| 16 | |
| 17 | 1530 |
| 18 | • Place order for 4 new 3/8" 40" close nipples with Ferguson. Won't be ready for pickup until Monday. |
| 19 | • SVE-7 removed for cleaning and its nipple broke as well if the valve is in there too tight, all the strain of removing it falls on the nipple at the base |
| 20 | |
| 21 | |
| 22 | • Call PK he gives the go-ahead to restart system at EOD with those 3 SVE wells closed off. Will return Monday morning to troubleshoot the fix |
| 23 | |
| 24 | |
| 25 | 1600 |
| | • Diameter of rotameter rod: "1/8" |

Comments / Site Activities / Personnel Tracking

DAILY FIELD LOG

Project Information

Page 3 of 3

| | |
|---------------------------|--------------------------|
| Project Name: <u>T-30</u> | Location: _____ |
| Project/Task No.: _____ | Weather: _____ |
| Date: <u>4/15/22</u> | Personnel: <u>GF, NG</u> |

Observations

| # | Time | Observation Description |
|----|------|---|
| 1 | | • Length of top bumper sleath: $\frac{3}{4}$ " |
| 2 | | bottom bumper sleath: $\frac{1}{2}$ " |
| 3 | 1610 | • Did not clean SVE -1, -2, or -3 as they were not fouled |
| 4 | | • Valves reinstalled on SVE -5, -7, and -8 in the OCF position. |
| 5 | | |
| 6 | | • NG finished cleaning AS rotameters. Several had deformed O-rings that need replacing. Order a pack of spares? |
| 7 | | → AS-12, AS-13, AS-27 at least. |
| 8 | | |
| 9 | | • ~12 gal of rinsewater emptied into poly tank |
| 10 | 1620 | • Alarms on HMI wait clear for restart. PAH on SVE blower, also VAL. |
| 11 | | |
| 12 | | • Call PK, CB, no one is sure. Will leave system off until return to site Monday to finish repairs. |
| 13 | | |
| 14 | 1635 | • Clean up, lock up |
| 15 | 1645 | • GF, NG offsite |
| 16 | | |
| 17 | | |
| 18 | | |
| 19 | | |
| 20 | | |
| 21 | | |
| 22 | | |
| 23 | | |
| 24 | | |
| 25 | | |

GF

Comments / Site Activities / Personnel Tracking

SAMPLE CHAIN OF CUSTODY

Report To Paul Kalina
 Company AECOM
 Address 1111 3rd Ave, Suite 1600
 City, State, ZIP Seattle, WA 98101
 Phone 206-438-2700 Email Paul.Kalina@Aecom.com

| | |
|--|------------|
| SAMPLERS (signature) <u>None of Gm</u> | |
| PROJECT NAME <u>T-30</u> | PO # |
| REMARKS | INVOICE TO |
| Project specific RLs? - Yes / No | |

Page # 1 of 1

| | |
|---|--|
| TURNAROUND TIME | |
| <input checked="" type="checkbox"/> Standard turnaround | |
| <input type="checkbox"/> RUSH | |
| Rush charges authorized by: _____ | |
| SAMPLE DISPOSAL | |
| <input type="checkbox"/> Archive samples | |
| <input type="checkbox"/> Other _____ | |
| Default: Dispose after 30 days | |

| Sample ID | Lab ID | Date Sampled | Time Sampled | Sample Type | # of Jars | ANALYSES REQUESTED | | | | | | | | | | | Notes | |
|-----------------|--------|--------------|--------------|-------------|-----------|--------------------|----------|---------------|------------|---------------|---------------|---------------|--|--|--|--|-------|--|
| | | | | | | NWTPH-Dx | NWTPH-Gx | BTEX EPA 8021 | NWTPH-HCID | VOCs EPA 8260 | PAHs EPA 8270 | PCBs EPA 8082 | | | | | | |
| RW-11A-0422 | | 4/14/22 | 1810 | GW | 4 | X | X | X | | | | | | | | | | with & without * Silica gel cleanup on DX |
| RW-11A-0422-MS | | 4/14/22 | 1810 | GW | 4 | X | X | X | | | | | | | | | | |
| RW-11A-0422-MSD | | 4/14/22 | 1810 | GW | 4 | X | X | X | | | | | | | | | | |
| MW-100-0422 | | 4/15/22 | 1230 | GW | 4 | X | X | X | | | | | | | | | | |
| MW-89-0422 | | 4/15/22 | 1330 | GW | 4 | X | X | X | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |

Friedman & Bruya, Inc.
 Ph. (206) 285-8282

| SIGNATURE | PRINT NAME | COMPANY | DATE | TIME |
|-------------------------------------|-----------------|---------|---------|------|
| Relinquished by: <u>[Signature]</u> | GUS Friedman | AECOM | 4/15/22 | 1710 |
| Received by: <u>[Signature]</u> | Yelena Aravkine | F&B | 4/15/22 | 1710 |
| Relinquished by: | | | | |
| Received by: | | | | |

Americas

Daily Tailgate Meeting

S3AM-209-FM5

Instructions: Conduct meeting prior to sending crews to individual tasks. Require attendance of all AECOM employees and subcontractors. Invite personnel from simultaneous operations for coordination purposes. Review scope of work and briefly discuss required and applicable topics. **This meeting is a daily refresher, not a full orientation.** Task-specific discussions associated with Task Hazard Assessment (THA) follow this meeting at the task location immediately before individual task is started.

AECOM Supervisor Name: *Paul Kalina*
 Phone Number:
 AECOM SH&E Rep. Name: *Andrew Paynter*
 Phone Number:
 Meeting Leader: *Gus Friedman*

Date: *4/18/22* Project Name/Location: *T-30 Seattle* Project Number:

Today's Scope of Work:
*Repair 3 SVE Rotameters
 restart system to confirm rotameter operation post-cleaning
 replace oxidizer mag gauge*

Muster Point Location: *Front gate* First Aid Kit Location: *Corex* Fire Extinguisher Location: *system* Spill Kit Location: *—*

| 1. Required Topics | 2. Discuss if Applicable to Today's Work |
|--|---|
| <input checked="" type="checkbox"/> Fitness for Duty requirements, all sign in / sign out <input type="checkbox"/> Required training (incl. task specific) completed and current <input checked="" type="checkbox"/> SH&E Plan onsite - understood, reviewed, signed by all (incl. scope, preplanning hazard assessments / risk registers, controls, procedures, requirements, etc.) <input type="checkbox"/> Task Hazard Assessments (THAs) are to be reviewed and completed for each task immediately prior to conducting <input checked="" type="checkbox"/> STOP WORK Right & Responsibility- all task changes/changed conditions re-assess with THA <input checked="" type="checkbox"/> Requirement to report to supervisor any injury, illness, damage, near miss, unsafe act / condition <input type="checkbox"/> Emergency Response Plan – including muster point, first aid kit, fire extinguisher, clinic/hospital location <input checked="" type="checkbox"/> Personal Protective Equipment (PPE) - Required items per hazard assessments in good condition / in use by all <input type="checkbox"/> Equipment/machinery inspected (documented as required) and in good condition - operators properly trained/certified <input checked="" type="checkbox"/> Work area set up and demarcation/ barricades in place to protect workers, site staff, and the public <input checked="" type="checkbox"/> Required checklists/records available, understood (describe): <input checked="" type="checkbox"/> Lessons Learned / SH&E improvements (describe): | <input checked="" type="checkbox"/> <input type="checkbox"/> Check <input checked="" type="checkbox"/> as reviewed or mark <input type="checkbox"/> as not applicable <input type="checkbox"/> <input checked="" type="checkbox"/> Biological/ Chemical / Electrical Hazards <input checked="" type="checkbox"/> <input type="checkbox"/> Ergonomics - Lifting, Body Position <input type="checkbox"/> <input checked="" type="checkbox"/> Lock Out/ Tag Out Short Service Employees - visual identifier and mentor/ oversight assignment <input type="checkbox"/> <input checked="" type="checkbox"/> Simultaneous/ Neighbouring Operations <input checked="" type="checkbox"/> <input type="checkbox"/> Slip/ Trip/ Fall Hazards <input type="checkbox"/> <input checked="" type="checkbox"/> Specialized PPE Needs <input type="checkbox"/> <input checked="" type="checkbox"/> Traffic Control <input type="checkbox"/> <input checked="" type="checkbox"/> Waste Management/ Decontamination <input type="checkbox"/> <input checked="" type="checkbox"/> Weather Hazards / Heat Stress / Cold Stress <input type="checkbox"/> <input checked="" type="checkbox"/> Subcontractor Requirements (e.g., JHAs, THAs, procedures, reporting, etc.) <input type="checkbox"/> <input checked="" type="checkbox"/> Work Permits / Plans required (e.g., Fall Protection, Confined Space, Hot Work, Critical Lifts, etc.); in place, understood (identify/attach): <input checked="" type="checkbox"/> <input type="checkbox"/> Other Topics (describe/attach): <i>pinch points</i> <input type="checkbox"/> <input checked="" type="checkbox"/> Client specific requirements (describe): |

3. Daily Check Out by Site Supervisor

| | |
|--|---|
| Describe incidents, near misses, observations or Stop Work interventions from today: | Describe Lessons Learned/ Improvement Areas from today: |
| | |

The site is being left in a safe condition and work crew checked out as fit unless otherwise specified as above.

| | | |
|---|----------------------------------|---|
| Site Supervisor Name <i>Gus Friedman</i> | Signature <i>Gus Friedman</i> | Date <i>4/18/22</i> Time (at end of day / shift) |
|---|----------------------------------|---|

Worker Acknowledgement / Sign In Sign Out sheets applicable to this meeting are on reverse and, if applicable, attached.

All employees:


- **STOP WORK** if concerned / uncertain about safety / hazard or additional precaution is not recorded on the THA.
- **Be alert and communicate any changes in personnel or conditions at the worksite to the supervisor.**
- **Reassess task, hazards, & mitigations on an ongoing basis; amend the THA if needed.**

SITE WORKERS (including AECOM Contractors and Subcontractors): Your signature below means that you understand:

- * The requirement to participate in creating, reviewing, & updating hazard assessments (THA) applicable to your task(s).
- * The hazards & control measures associated with each task you are about to perform.
- * The permit to work requirements applicable to the work you are about to perform (if it includes permitted activities).
- * That no tasks or work is to be performed without a hazard assessment.
- * Your authority & obligation to "Stop Work" intervene, speak up/ listen up.

Your initials (right columns) certify that you arrived & departed fit for duty, & have reported all incidents/near misses; meaning:

- * You are physically and mentally fit for duty and have inspected your required PPE to ensure satisfactory condition.
- * You are not under the influence of any type of medication, drugs, or alcohol that could affect your ability to work safely.
- * You are aware of your responsibility to immediately report any illness, injury (regardless of where or when it occurred), or impairment/fatigue issue to the AECOM Supervisor.
- * You signed out as fit / uninjured unless you have otherwise informed the AECOM Supervisor.

| Print Name & Company | Signature | Initials & Sign In Time | Initials & Sign Out Time |
|----------------------|---|-------------------------|--------------------------|
| Gus Friedman AECOM |  | In & Fit 12:50 GF | Out & Fit |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |

(Attach additional Site Worker sign-in/out sheets if needed) Identify number of attached sheets: _____

| SITE VISITOR / SITE REPRESENTATIVE | | | | |
|------------------------------------|--------------|--------------|----------------|-----------|
| Name | Company Name | Arrival Time | Departure Time | Signature |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

DAILY FIELD LOG

Project Information

Page 1 of 3

| | |
|---------------------------|--------------------------|
| Project Name: <u>T-30</u> | Location: <u>Seattle</u> |
| Project/Task No.: _____ | Weather: <u>SS rain</u> |
| Date: <u>4/16/22</u> | Personnel: <u>GF</u> |

Observations

| # | Time | Observation Description |
|----|------|--|
| 1 | 1250 | Onsite after picking up parts @ Ferguson |
| 2 | | Scope: Complete repairs of 3 rotameters w/ broken nipples |
| 3 | | Restent system & check for rotameter functionality |
| 4 | | replace broken mag. gauge @ Oxidizer |
| 5 | | Review spare parts w/ Marina |
| 6 | | Tailgate: part traffic hazards. Ship is currently @ part. |
| 7 | | pinh points working w/ system piping |
| 8 | | Marina on site on arrival. She will order: |
| 9 | | 6 x SVE mag gauges (0-100" H ₂ O, bottom mount) |
| 10 | | 6 x AS gauges (0-30 PSIG, center back mount) |
| 11 | | 1 x 0-2" H ₂ O mag gauge |
| 12 | | 1 x 0-15" H ₂ O mag gauge |
| 13 | | 7.7. 0-62 SCFM King rot.) SVE |
| 14 | | 7.7. 0-83 SCFM King rot.) |
| 15 | | 7.7. 0-13 SCFM Dyer rot) AS |
| 16 | | 7.7. SVE housing. Seems like there is some in coner |
| 17 | | leftover that is the right size. |
| 18 | | ** Do we want to consider a canopy to prevent |
| 19 | | sun damage? |
| 20 | | 1 x new scrub brush for sight glass! |
| 21 | 1415 | Broken nipple pieces successfully removed from rotameter |
| 22 | | bases re-install begun. |
| 23 | 1445 | SVE -4, -5, and -8 successfully reinstalled. Loosening |
| 24 | | the pipe clamp on the base allowed the lower section to |
| 25 | | lean out for more kenway fitting for valves back in. |

Comments / Site Activities / Personnel Tracking

DAILY FIELD LOG

Project Information

Page 2 of 3

| | |
|---------------------------|----------------------|
| Project Name: <u>A-30</u> | Location: _____ |
| Project/Task No.: _____ | Weather: _____ |
| Date: <u>08/16/22</u> | Personnel: <u>GF</u> |

Observations

| Time | Observation Description |
|------|---|
| 1 | * SVE-4 and -5 have deformed/misshapen lower bumpers on the inner rotameter rod, so the float goes all the way to the base. Need replacement parts or troubleshooting |
| 2 | |
| 3 | |
| 4 | |
| 5 | * SVE-10 has the crack in the rotameter base |
| 6 | * AS-16 is stuck up even after cleaning. |
| 7 | 15:20 Oxidizer rotameter successfully replaced. old did |
| 8 | had moisture init |
| 9 | 15:45 oxidizer start up |
| 10 | 16:00 SVE start up |
| 11 | • SVE-5 might be stuck. Maybe just needs new bumper |
| 12 | • SVE-8 & +9 are at 0, and do not appear stuck. 52 in H ₂ O |
| 13 | at each well. |
| 14 | 16:15 AS strap up w/ blow-off valve open on manifold (for moisture |
| 15 | removal). |
| 16 | • Zone 4 active. AS-16 seems to work if you knock it. Might |
| 17 | just get stuck up at times |
| 18 | 16:25 • Zone 5 active. (0-3.7 scfm). |
| 19 | - AS-7 & -11 take most of the flow. closing them off doesn't |
| 20 | significantly increase flow to the other well's (maybe 0.1 scfm?). |
| 21 | - AS-10 has too high a back pressure to get flow at our |
| 22 | current setpoint (8 psi @ the compressor in Zone 2). |
| 23 | 16:38 • Zone 1 active. (0-4.7 scfm) |
| 24 | - AS-5 & -6 receive most flow, but same as Zone 5 - reducing |
| 25 | them doesn't do much for other well's |

Comments / Site Activities / Personnel Tracking

DAILY FIELD LOG

Project Information

Page 3 of 3

| | |
|---------------------------|--------------------------|
| Project Name: <u>T-30</u> | Location: _____ |
| Project/Task No.: _____ | Weather: <u>SO rainy</u> |
| Date: <u>4/26/22</u> | Personnel: <u>OTI</u> |

Observations

| # | Time | Observation Description |
|----|------|---|
| 1 | | - AS-2 has high back pressure, not getting air. |
| 2 | | *AS-3 needs new O-ring on top, or current one adjusted |
| 3 | 1648 | • Zone 2 active. (0-2.6 scfm) |
| 4 | | - Can't get AS-18 or -21 to move. Unclear if stuck |
| 5 | | or just a high breakthrough pressure. 8.5 and 7.5 psi |
| 6 | | at the manifold respectively. |
| 7 | 1702 | • Zone 3 active (0-2.1 scfm) |
| 8 | | - AS-26 has breakthrough > 9 psi, not receiving flow |
| 9 | | *AS-24 was getting flow but the float was sticky. Taken |
| 10 | | offline for cleaning (debris was visible inside from the pipes |
| 11 | | already), but got totally stuck after re-install. Might need |
| 12 | | replacing? |
| 13 | 1720 | • Zone 4 active again, back to standard rotation. |
| 14 | | • The new oxidizer man gauge read 1.85 DP (in H ₂ O) |
| 15 | | *The SVE discharge pressure gauge reads 0. Might need |
| 16 | | replacing? Follow up on it. |
| 17 | 1730 | • Clean up, lock up. System running smoothly. |
| 18 | 1745 | offsite |
| 19 | | |
| 20 | | |
| 21 | | |
| 22 | | |
| 23 | | |
| 24 | | } OTI |
| 25 | | |

Comments / Site Activities / Personnel Tracking

PORT OF SEATTLE - TERMINAL 30

AS & SVE Manifold Readings

Date: 4/15/22 Time: 1630
 Field Tech(s): MC Equipment I.D. #: NA 1630
 SVE Discharge VOC (ppmv) PID
 SVE Discharge LEL (%)
 Oxygen (%)
 SVE System Inlet Vacuum (" H₂O)
 SVE System Inlet ΔP (" H₂O)
 Oxidizer Discharge VOC (ppmv) PID

SVE Wells

| Location | Vacuum ("H ₂ O) | Flow (SCFMG) | Valve Pos. (% Open) | Comments | Location | Vacuum ("H ₂ O) | Flow (SCFMG) | Valve Pos. (% Open) | Comments |
|----------|----------------------------|--------------|---------------------|----------------|----------|----------------------------|--------------|---------------------|-----------------------|
| HSVE-2 | 25 | 70 | 100 | | SVE-10 | 50 | 20 | 100 | bubbling, still dirty |
| HSVE-3 | 35 | 66 | 100 | | SVE-9 | 51 | 0 | 100 | |
| SVE-4 | 46 | 14 | 100 | | SVE-8 | 52 | 0 | 100 | |
| SVE-5 | 8 | 0 | 100 | Needs scrubber | SVE-6 | 00 | 10 | 100 | gauge 74, not working |
| SVE-7 | 44 | 16 | 100 | | HSVE-1 | 14 | 73 | 100 | |

AS Wells

| Location | Pressure (PSIG) | Flow (SCFMG) | Valve Pos. (% Open) | Comments | Location | Pressure (PSIG) | Flow (SCFMG) | Valve Pos. (% Open) | Comments |
|-----------|-----------------|--------------|---------------------|--------------------|----------|-----------------|--------------|---------------------|-----------------|
| AS-7 | 8.0 | 3.7 | 100 | | AS-17 | 8.0 | 2.6 | 100 | |
| 2.5 AS-8 | 7.75 | 1.8 | ↓ | | AS-18 | 8.25 | 0 | ↓ | o/stuck |
| AS-9 | 7.75 | 2.3 | ↓ | | AS-19 | 9.0 | 1.3 | ↓ | |
| AS-10 | 8.0 | 0 | ↓ | Not stuck | AS-20 | 9.5 | 1.2 | ↓ | |
| AS-11 | 8.25 | 3.4 | ↓ | | AS-21 | 7.5 | 0 | ↓ | o/stuck |
| AS-12 | 7.5 | 2.0 | 100 | | AS-22 | 8.5 | 1.0 | ↓ | |
| AS-13 | 7.5 | 4.5 | ↓ | | AS-1 | 7.5 | 2.4 | 100 | |
| 2.4 AS-14 | 6.5 | 2.6 | ↓ | | AS-2 | 7.75 | 0 | ↓ | not stuck |
| AS-15 | 7.5 | 2.0 | ↓ | bubbling | AS-3 | " | 2.3 | ↓ | new top o-ring? |
| AS-16 | 7.5 | 4.2 | ↓ | | AS-4 | 5.5 | 2.9 | ↓ | |
| AS-23 | 8.25 | 1.2 | 100 | | AS-5 | 7.5 | 3.7 | ↓ | |
| AS-24 | 7.5 | ? | ↓ | 70 flow, but stuck | AS-6 | 6.5 | 4.7 | ↓ | sticking |
| 2.3 AS-25 | 8.0 | 1.0 | ↓ | | | | | | |
| AS-26 | 8.5 | 0 | ↓ | not stuck: High BT | | | | | |
| AS-27 | 6.5 | 2.1 | ↓ | | | | | | |

Notes: 1st readings post-cleaning on 4/15/22.
 new oxidizer mag. reading 185 @
 SVE discharge pressure gauge broken? reads 0.

Abbreviations:

ppmv = Parts per million volume
 % = Percent
 deg F - degrees Fahrenheit

" H₂O = Inches of water
 SCFMG = Standard cubic feet per minute gauge
 PSIG = Pounds per square inch gauge





DUPLICATE

FERGUSON-SEATTLE #3007
4100 WEST MARGINAL WAY SW
SEATTLE, WA 98106-1209

ACCEPT B/O = Y
SHOWROOM = N
SOURCE = B25
IB FRT = N 0.
OB SHP = N 0.
18 APR 2022 15:20

PH: 206-767-7700 FAX: 206-763-3090
ORDER NO. REQUIRED DATE SHIP WHS. SELL WHS.

ONLINE SALES ORDER

*** C O D ***

WRITER SALESMAN
TAG PO. NO.

| | | | | | | | | | |
|--|-------------------------|----------------------|---------|------------------------|------------------------------------|-----------------------|--------------|-----------|------------|
| CUSTOMER NO. 1240605 | CUSTOMER ALPHA AECOM | CONTRACT NO. 3007 | BID NO. | ORDER DATE 04/15/22 | ORDERED BY Cus Friedman Friedma | INSTRUCTIONS | OML CONTACT | | |
| S O L D T O AECOM 1111 3RD AVE #1600 SEATTLE, WA 98101 COUNTER PICK-UP 4100 WEST MARGINAL WAY SW SEATTLE, WA 98106-1209 S H I P T O | | | | | | SHIP VIA | ROUTE NO. | RUN NO. | DEPAR |
| | | | | | | PCS | BAGS | BOXES | CRATES |
| CUSTOMER PO. NO. 285 334 4786 | JOB NAME | | | ATTN: | SHIP WT. | SHIP DATE 04/18/22 | DELIVERED BY | PACKED BY | CHECKED BY |

| LINE | ORDER QTY. | SHIP QTY. | BO QTY | ITEM CODE | DESCRIPTION | UNIT PRICE | U/M | TOTAL | P.O. NO. | aisle LO |
|------|------------|-----------|--------|-----------|--|------------|-----------|-------|----------|---------------------------|
| | | | | | ***** * SPECIAL SHIPPING INSTRUCTIONS * ***** | | | | | |
| | | | | | * STOREFRONT SALES ORDER * | | | | | |
| | | | | | * PRO PICK UP 1 HOUR WILL CALL * | | | | | |
| | | | | | * CASH ON DELIVERY SHIPMENT * | | | | | |
| | | | | | ***** | | | | | |
| 2 | 4 | 4 | 0 | DCOM | ENCLOSE PVC 690 NIP | 0.956 EA | | | | 109-12- 0.0 lb (30-C6- |
| | | | | | DCOM_PACKAGING Template ID | | | | | |
| | | | | | TOTAL WEIGHT OF ORDER: | | 0.150 lbs | | | |
| | | | | | Shipment information: XCPU1 | | | | | |
| | | | | | IPW: W5325004 | | | | | |
| | | | | | PAID \$ 4.25 BY Visa XXXX3042 ON 04/10/22 REF PO# P0913313 | | | | | |

| | | | | | | |
|--|----------|-----------------|-------------------|-----|--------------|-----------|
| NO RETURNS ALLOWED WITHOUT PROPER AUTHORIZATION. RETURNED MATERIALS SUBJECT TO HANDLING CHARGES. SEE REVERSE SIDE FOR IMPORTANT TERMS AND CONDITIONS OF SALE AND LIMITATIONS OF WARRANTY. | SUBTOTAL | INBOUND FREIGHT | OUTBOUND SHIPPING | TAX | LESS DEPOSIT | TOTAL DUE |
| | | | | | | |

CUSTOMER'S SIGNATURE: _____ DATE: _____ TERMS: CASH ON DEMAND *CONTINUED*

CUSTOMER COPY



FORM 2 OF 2

DUPLICATE

FERGUSON-SEATTLE #3007
4100 WEST MARGINAL WAY SW
SEATTLE, WA 98106-1209

ACCEPT B/O = Y
SHOWROOM = N
SOURCE = B2S
IB FRT = N
OB SHP = N

ORDER NO. 206-767-7700 REQUIRED DATE SHIP WHS. SELL WHS. FAX 206-763-3090

ONLINE SALES ORDER

*** COD ***

WRITER SALESMAN
TAG P.O. NO.

CUSTOMER NO. 1240685 CUSTOMER ALPHA AECOM CONTRACT NO. 3007 BID NO. ORDER DATE 04/15/22 ORDERED BY Gus Friedman Friedman INSTRUCTIONS OML CONTACT Vendor: Orchestralio VENDOR VENDOR P.O. NO. SHIP VIA ROUTE NO. RUN NO. DEPART. PCS BAGS BOXES CRATES LENGTHS BUNDLES ROUTE DESC. NCL PRO PICKUP

CUSTOMER P.O. NO. 206-334-4787 JOB NAME ATTN: SHIP WT. SHIP DATE DELIVERED BY PACKED BY CHECKED BY

Table with columns: LINE, ORDER QTY, SHIP QTY, ITEM CODE, DESCRIPTION, UNIT PRICE, U/M, TOTAL, P.O. NO., AISLE LO. Includes a large 'SOLD TO' and 'SHIP TO' vertical stamp on the left side.

LEAD TIME WARNING: It is illegal to install products that are not "lead free" in accordance with US Federal or other applicable law in potable water systems anticipated for human consumption. Products with "MP" in the description are NOT lead free and can only be installed in non-potable applications. Buyer is solely responsible for product selection. BUYER IS ORDERING ANY REFERENCE TO OR INCORPORATION OF EXECUTIVE ORDER 14042 AND/OR THE TO IMPLEMENT THE FEDERAL CLAUSE FAR 52.223-99 AND/OR DEARS (202-323-7999) IS EXPRESSLY REJECTED BY SELLER AND SHALL NOT APPLY AS SELLER IS A NON-FEDERAL SUPPLIER AND THEREFORE EXEMPT UNDER THE EXECUTIVE ORDER.

Summary table with columns: NO RETURNS ALLOWED WITHOUT PROPER AUTHORIZATION. RETURNED MATERIALS SUBJECT TO HANDLING CHARGES. SEE REVERSE SIDE FOR IMPORTANT TERMS AND CONDITIONS OF SALE AND LIMITATIONS OF WARRANTY. SUBTOTAL, INBOUND FREIGHT, OUTBOUND SHIPPING, TAX, LESS DEPOSIT, TOTAL DUE.

CUSTOMER'S SIGNATURE: _____ DATE: _____ TERMS: _____ CUSTOMER COPY

DAILY FIELD LOG

Project Information

Page 1 of 3

| | |
|---------------------------|------------------------------|
| Project Name: <u>T-30</u> | Location: <u>Seattle</u> |
| Project/Task No.: _____ | Weather: <u>55 sunny</u> |
| Date: <u>4/26/22</u> | Personnel: <u>GF, LP, AC</u> |

Observations

| # | Time | Observation Description | | | | | | | | | | | | | | | | | | |
|----------------|---------------|--|---------------|--------------|--------------|--------|--------|--------|---|---|------|---|---|-------|----------------|---|-------|---|---|-------|
| 1 | 1530 | Onsite, Vessel in port, vehicles active. | | | | | | | | | | | | | | | | | | |
| 2 | | Scope: Biweekly O+M; train up Antonio | | | | | | | | | | | | | | | | | | |
| 3 | | Safety tailgate on app | | | | | | | | | | | | | | | | | | |
| 4 | | System tour | | | | | | | | | | | | | | | | | | |
| 5 | 1600 | • Began taking system readings | | | | | | | | | | | | | | | | | | |
| 6 | | • HMI does <u>not</u> track indiv. system zone runtimes, | | | | | | | | | | | | | | | | | | |
| 7 | | just total. | | | | | | | | | | | | | | | | | | |
| 8 | | • We should reprogram the HMI so the zones on the | | | | | | | | | | | | | | | | | | |
| 9 | | screen match the zones in the field. Currently: | | | | | | | | | | | | | | | | | | |
| 10 | | <table style="margin-left: auto; margin-right: auto; border: none;"> <tr> <td style="text-align: center;"><u>Screen</u></td> <td style="text-align: center;"><u>Field</u></td> <td style="text-align: center;"><u>Wells</u></td> </tr> <tr> <td style="text-align: center;">Zone 1</td> <td style="text-align: center;">Zone 1</td> <td style="text-align: center;">AS-1-6</td> </tr> <tr> <td style="text-align: center;">5</td> <td style="text-align: center;">2</td> <td style="text-align: center;">7-11</td> </tr> <tr> <td style="text-align: center;">4</td> <td style="text-align: center;">3</td> <td style="text-align: center;">12-16</td> </tr> <tr> <td style="text-align: center;">2 3</td> <td style="text-align: center;">4</td> <td style="text-align: center;">17-22</td> </tr> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">5</td> <td style="text-align: center;">23-27</td> </tr> </table> | <u>Screen</u> | <u>Field</u> | <u>Wells</u> | Zone 1 | Zone 1 | AS-1-6 | 5 | 2 | 7-11 | 4 | 3 | 12-16 | 2 3 | 4 | 17-22 | 3 | 5 | 23-27 |
| <u>Screen</u> | <u>Field</u> | <u>Wells</u> | | | | | | | | | | | | | | | | | | |
| Zone 1 | Zone 1 | AS-1-6 | | | | | | | | | | | | | | | | | | |
| 5 | 2 | 7-11 | | | | | | | | | | | | | | | | | | |
| 4 | 3 | 12-16 | | | | | | | | | | | | | | | | | | |
| 2 3 | 4 | 17-22 | | | | | | | | | | | | | | | | | | |
| 3 | 5 | 23-27 | | | | | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | | | | | | | |
| 16 | | ↑ think they have it labeled wrong | | | | | | | | | | | | | | | | | | |
| 17 | 1630 | • Troubleshoot oxidizer magnetic gauge. installed last | | | | | | | | | | | | | | | | | | |
| 18 | | visit but read 0 on arrival today | | | | | | | | | | | | | | | | | | |
| 19 | | → removed HP tube & water pured out of the port. A | | | | | | | | | | | | | | | | | | |
| 20 | | few drops came out of the LP port | | | | | | | | | | | | | | | | | | |
| 21 | | → CSB recommends leaving tubes disconnected to | | | | | | | | | | | | | | | | | | |
| 22 | | prevent moisture from damaging the gauge. We | | | | | | | | | | | | | | | | | | |
| 23 | ** | need to install QTA-style valves on the pilot | | | | | | | | | | | | | | | | | | |
| 24 | | tube if we do so to prevent contaminated air | | | | | | | | | | | | | | | | | | |
| 25 | | from blowing out. Left them connected for now. | | | | | | | | | | | | | | | | | | |

Comments / Site Activities / Personnel Tracking

DAILY FIELD LOG

Project Information

| | |
|---------------------------|------------------|
| Project Name: <u>T-30</u> | Location: _____ |
| Project/Task No.: _____ | Weather: _____ |
| Date: <u>4/28/22</u> | Personnel: _____ |

Observations

| Time | Observation Description |
|------|---|
| 1 | 1645 → After draining the water out & re-zeroing the gauge, |
| 2 | it read ~40 in H ₂ O but fluctuated 30-50. Last time |
| 3 | 1645 LP & AC to began taking PID readings was at 1.85 |
| 4 | GF inspecting SVE discharge pressure gauge, which |
| 5 | has been reading zero. 0-100 in H ₂ O pressure gauge. |
| 6 | The only other spare pressure gauge on site was was a 0-30 |
| 7 | psi gauge. Swapped it in, but it read zero too. Flow |
| 8 | out of the port when open was pretty low. Maybe we |
| 9 | need a smaller scale, 0-10 in H ₂ O? |
| 10 | → Swapped the 0-100 in H ₂ O gauge onto an active |
| 11 | spurge well and it registered the pressure, so the |
| 12 | gauge isn't broken. There is just very low pressure |
| 13 | in the SVE discharge pipe. |
| 14 | 1710 (changed two zones so that next visit screen zone |
| 15 | 2 (Field 4) is active & pressure can be adjusted. It |
| 16 | will be active 3:00 - 7:30 pm now. Ideally, we can |
| 17 | catch the end of the prior zone (zone 3) and beginning |
| 18 | & mid of zone 2 next time. |
| 19 | 1735 Compressor pressure read 7 psi. Left it at 8 psi |
| 20 | last visit. |
| 21 | • Bleed valve adjusted to 9 psi |
| 22 | → AS-18 not stuck, reading 0 at 9.25 psi |
| 23 | → AS-21 breakthru ~ 7.75 psi. Took a while for pressure |
| 24 | to build up enough to flow. 1.2 scfm @ 8 psi. |
| 25 | → AS-19 : 1.8 scfm @ 10 psi |

Comments / Site Activities / Personnel Tracking

~~GF~~ Magnahelic optimization: CSB recommends adding 1/8" or 1/4" valves to the pitot tube parts.

DAILY FIELD LOG

Project Information

| | |
|---------------------------|------------------|
| Project Name: <u>T-30</u> | Location: _____ |
| Project/Task No.: _____ | Weather: _____ |
| Date: <u>4/28/22</u> | Personnel: _____ |

Observations

| Time | Observation Description |
|------|---|
| 1 | → So after ~30-45 min ^{ON} and an increased pressure of 9 psi at the compressor, 3 of the 6 Zone 2 wells were still reading below our 2 scfm minimum purge flow threshold. |
| 2 | |
| 3 | |
| 4 | |
| 5 | 1745 • Clean up, lock up |
| 6 | 1750 • All staff offsite |
| 7 | |
| 8 | |
| 9 | |
| 10 | |
| 11 | |
| 12 | |
| 13 | |
| 14 | |
| 15 | |
| 16 | |
| 17 | |
| 18 | |
| 19 | |
| 20 | |
| 21 | |
| 22 | |
| 23 | |
| 24 | |
| 25 | |

Comments / Site Activities / Personnel Tracking

PORT OF SEATTLE - TERMINAL 30

| SVE/AS & Oxidizer System Data Collection Form | | | |
|---|------------------------------------|--|-------------------------------|
| Date: 4/28/22 | | Field Tech(s): LP/GF/AC | |
| Watch Time: 15:59 | | Screen Time: 15:41 | |
| SVE/AS System <i>Motor Control</i> | | | |
| SVE Blower Speed (Hertz) - VFD | 54.0 11026.7 HMI | Sparge Blower Speed (Hertz) - VFD | 52.0 5412.9 HMI |
| SVE Blower Runtime (Hours) | 11026.7 HMI | AS Blower Runtime (Hours) - Sparge Blower | 5412.9 HMI |
| Transfer Pump Runtime (Hours) - MS Pump | 2.6 HMI | Sparge Heat Exchanger Runtime (Hours) | 5412.0 HMI |
| Sparge Zone 1 Operating Cycle Open Interval(s) | 12am - 5am HMI | Sparge Zone 4 Operating Cycle Open Interval(s) | (3 field) 3pm - 7:30am |
| Sparge Zone 2 Operating Cycle Open Interval(s) | <i>Screen (4 field)</i> 5am - 10am | Sparge Zone 5 Operating Cycle Open Interval(s) | (2 field) 7:30 - 12am |
| Sparge Zone 3 Operating Cycle Open Interval(s) | <i>Screen (5 field)</i> 10am - 3pm | | |
| Sparge Heat Exchanger Discharge Temperature (°F) - TI-500 | 74 | SVE Blower Filter Differential Pressure (" H2O) - DPI-200 | 0.5 |
| AS Blower Pressure (PSI) - PI-501 | 1.0 6.0 | SVE Blower Inlet Differential Pressure (" H2O) - FI-200 | 1.0 |
| AS Blower Flow (" H2O) - DPI-500 | 1.0 | Transfer Pump Discharge Pressure (PSI) - PI-300 | 0 |
| SVE Blower Inlet Temperature (°F) - TI-200 | 60 | SVE Blower Discharge Pressure (PSI) - PI-400 | 0 <i>Broken gauge</i> |
| SVE Blower Inlet Vacuum (" H2O) - VI-200 | 74 | SVE Blower Discharge Temperature (°F) - TI-400 | 106 |
| Oxidizer System | | | |
| Inlet Temperature (°F) | 681 HMI | Process Blower Runtime (Hours) | 17849 |
| Burner Chamber Temperature (°F) | 670 HMI | Combustion Fan Runtime (Hours) | 17849 |
| Outlet Temperature (°F) | 622 HMI | Burner Runtime (Hours) | 17839 |
| Inlet Limit Controller Temperature (°F) | 674 HMI | Processing Vapors Runtime (Hours) | 17825 HMI |
| Outlet Limit Controller Temperature (°F) | 617 HMI | Panel Temperature (°F) | 780 |
| Process Fan Valve Position (Open/Closed) | Open HMI | Flame Signal (Volts) | 5.0 |
| Dilution Valve Position (%) | 0 HMI | Burner Chamber Inlet Differential Pressure (" H2O) <i>Magnehelic</i> | 0.4 |
| Combustion Valve Position (%) | 10.1 HMI | | |
| Other Components | | | |
| Moisture Separator Level (% Full) | ?? <i>Cont read</i> | Propane Tank A Level (%) | 60 |
| Water Storage Tank Level (DTF, TD from MP; inches) | 83 in | Propane Tank B Level (%) | 53 |
| NOTES: <i>Water may have impact on magnehelic for Burner Chamber Inlet Diff Pressure.</i> | | | |
| Abbreviations: | | | |
| 1. " H ₂ O = Inches of Water | 5. DTF - Depth to Fluid | | |
| 2. °F = Degrees Fahrenheit | 6. TD - Total Depth | | |
| 3. PSI = Pounds per Square Inch | 7. MP - Measuring Point | | |
| 4. % = Percent | | | |



PORT OF SEATTLE - TERMINAL 30

AS & SVE Manifold Readings

| | |
|--|-------------------------|
| Date: 4/28/22 | Time: 15:40 |
| Field Tech(s): LP/GF/AC | Equipment I.D. #: 17227 |
| SVE Discharge VOC (ppmv) PID | 38.5 |
| SVE Discharge LEL (%) | |
| Oxygen (%) | |
| SVE System Inlet Vacuum (" H ₂ O) | |
| SVE System Inlet ΔP (" H ₂ O) | |
| Oxidizer Discharge VOC (ppmv) PID | 0.7 |

SVE Wells

| Location | Vacuum ("H ₂ O) | Flow (SCFMG) | Valve Pos. (% Open) | Comments | Location | Vacuum ("H ₂ O) | Flow (SCFMG) | Valve Pos. (% Open) | Comments |
|----------|----------------------------|--------------|---------------------|----------------|----------|----------------------------|--------------|---------------------|------------------|
| HSVE-2 | 26 | 74 | | | SVE-10 | 52 | 12 | | bouncing residue |
| HSVE-3 | 26.5 | 70 | | | SVE-9 | 56 | 0 | | water |
| SVE-4 | 52 | 10 | | bouncing water | SVE-8 | 60 | 0 | | water |
| SVE-5 | 8 | 0 | | | SVE-6 | 68 | 10 | | bouncing water |
| SVE-7 | 50 | 12 | | bouncing water | HSVE-1 | 14 | 72 | | |

AS Wells

| Location | Pressure (PSIG) | Flow (SCFMG) | Valve Pos. (% Open) | Comments | Location | Pressure (PSIG) | Flow (SCFMG) | Valve Pos. (% Open) | Comments |
|----------|-----------------|--------------|---------------------|-------------|----------|-----------------|--------------|---------------------|-------------|
| AS-7 | 0 | | | Zone closed | AS-17 | | | | Zone closed |
| AS-8 | 0 | | | | AS-18 | | | | |
| AS-9 | 0 | | | | AS-19 | | | | |
| AS-10 | 0 | | | | AS-20 | | | | |
| AS-11 | 0 | | | | AS-21 | | | | |
| AS-12 | 7.5 | 2.2 | 100 | | AS-22 | | | | |
| AS-13 | 7.5 | 4.5 | | | AS-1 | | | | Zone closed |
| AS-14 | 6.0 | 2.6 | | | AS-2 | | | | |
| AS-15 | 7.5 | 0.8 | | | AS-3 | | | | |
| AS-16 | 7.5 | 3.7 | | | AS-4 | | | | |
| AS-23 | | | | Zone closed | AS-5 | | | | |
| AS-24 | | | | | AS-6 | | | | |
| AS-25 | | | | | | | | | |
| AS-26 | | | | | | | | | |
| AS-27 | | | | | | | | | |

Zone 3 15 Zone 4 1/2 Zone 5 1/2

Zone 2 1/4 Zone 1 1/4

Notes:
 17:10 Gus changed zone times so different zone will be on during next visit
 3-7:30pm Zone 2
 5am-10 am Zone 4

Abbreviations:

ppmv = Parts per million volume
 % = Percent
 deg F - degrees Fahrenheit

" H₂O = Inches of water
 SCFMG = Standard cubic feet per minute gauge
 PSIG = Pounds per square inch gauge



AECOM Daily Tailgate Meeting Summary

Project information

| | |
|-------------------------|----------------|
| Project Name | T-30 |
| Project Number | 60681370 |
| Project Manager | Paul Kalina |
| Project Manager Phone # | 2063105097 |
| Muster Point location | Main gate |
| Meeting date | 4/28/2022 |
| Business Line | Environment |
| SH&E Manager | Andrew paynter |
| SH&E Manager Phone # | 8053611103 |
| First Aid Kit Location | Conex |
| Prepared by | Friedman, Gus |

Meeting Summary

| | |
|--------------------------------|--|
| Attendees | Panteleeff, Lucy;Corley, Antonio; |
| Location | SoDo |
| Tasks to be performed | Biweekly O&M |
| Hazards to be considered today | pressure, thermal |
| Will there be Lone Workers? | No |
| Hierarchy of controls | ppe |
| Personal Protective Equipment | Task Specific: Mandatory: safetyglasses, longpants, reflectivevest, workboots |
| High Risk Events | |
| Topic of the week | Situational Awareness Can Save Your Life |
| | |

| | |
|------------------------|--|
| Other topics discussed | |
| Hazards | <ul style="list-style-type: none"><li data-bbox="544 147 671 181">• Pressure<li data-bbox="544 188 671 221">• Thermal |

PROJECT T-30

COMPLETED BY LP/AC

JOB NO. 00667994

APPROVED BY _____

DAY & DATE Friday 5/13/22

SHEET 1 OF 1

| FIELD ACTIVITY SUBJECT: DESCRIPTION OF DAILY ACTIVITIES AND EVENTS: | |
|--|---|
| TIME | |
| 14:50 | Arrive on site / Tail gate |
| 14:56 | Took gauge reading at AS23-AS27 before auto switch |
| 15:07 | HMI readings |
| 15:20 | Spurge wells seem to shut down |
| 15:24 | Called GWS to discuss spurge wells shutting down. Did some troubleshooting but could not resolve. Did video call w/ Cam & GWS. Found VFD had fault. Researched fault online = the Spurge motor temp high. Could not find temp. Hit reset on (upper left button). Hit start button then HMI showed green and running. Spurge Blower never showed "auto" though. Spurge back on 16:08 |
| 16:05 | Did reading on all SVE Blower gauges |
| 16:35 | Did PID readings at Inf & Eff |
| 16:45 | Check pressures and flows on zone that opened at 16:30 with system restart. |
| 17:00 | Leave site and drop equipment at office |
| | |
| | |
| | |
| | |
| VISITORS ON SITE: | |
| CHANGES FROM PLANS OR IMPORTANT DECISIONS: | |
| WEATHER CONDITIONS: Sunny 53° | |
| IMPORTANT TELEPHONE CALLS: | |
| PERSONNEL ON SITE: | |

PORT OF SEATTLE - TERMINAL 30

SVE/AS & Oxidizer System Data Collection Form

Date: 5/13/22 Field Tech(s): LP, AC
 Watch Time: 3:11 15:11 Screen Time: 14:53

SVE/AS System

| | | | |
|---|--------------------|---|---|
| SVE Blower Speed (Hertz) - VFD | <u>54.0</u> HMI | Sparge Blower Speed (Hertz) - VFD | <u>52.0</u> HMI |
| SVE Blower Runtime (Hours) | <u>11337.5</u> HMI | AS Blower Runtime (Hours) - Sparge Blower | <u>5730.3</u> HMI |
| Transfer Pump Runtime (Hours) - MS Pump | <u>2.6</u> HMI | Sparge Heat Exchanger Runtime (Hours) | <u>5729.4</u> HMI |
| Sparge Zone 1 Operating Cycle Open Interval(s) | <u>off</u> HMI | Sparge Zone 4 Operating Cycle Open Interval(s) | <u>Field zone 4 on @ 1408</u> HMI |
| Sparge Zone 2 Operating Cycle Open Interval(s) | <u>off</u> HMI | Sparge Zone 5 Operating Cycle Open Interval(s) | <u>Field zone 5</u> <u>Running when arrived</u> HMI |
| Sparge Zone 3 Operating Cycle Open Interval(s) | <u>-</u> HMI | | |
| Sparge Heat Exchanger Discharge Temperature (°F) - TI-500 | <u>80.76*</u> | SVE Blower Filter Differential Pressure (" H2O) - DPI-200 | <u>0.5</u> |
| AS Blower Pressure (PSI) - PI-501 | <u>9 *</u> | SVE Blower Inlet Differential Pressure (" H2O) - FI-200 | <u>1.5</u> |
| AS Blower Flow (" H2O) - DPI-500 | <u>1 *</u> | Transfer Pump Discharge Pressure (PSI) - PI-300 | <u>0</u> |
| SVE Blower Inlet Temperature (°F) - TI-200 | <u>60 *</u> | SVE Blower Discharge Pressure (PSI) - PI-400 | <u>0</u> |
| SVE Blower Inlet Vacuum (" H2O) - VI-200 | <u>78 *</u> | SVE Blower Discharge Temperature (°F) - TI-400 | <u>108</u> |

* Done after reset

Oxidizer System

| | | | |
|--|-------------------|--|-------------------|
| Inlet Temperature (°F) | <u>680</u> HMI | Process Blower Runtime (Hours) | <u>1816.7</u> HMI |
| Burner Chamber Temperature (°F) | <u>626.68</u> HMI | Combustion Fan Runtime (Hours) | <u>1816.8</u> HMI |
| Outlet Temperature (°F) | <u>626</u> HMI | Burner Runtime (Hours) | <u>1815.7</u> HMI |
| Inlet Limit Controller Temperature (°F) | <u>671</u> HMI | Processing Vapors Runtime (Hours) | <u>1814.3</u> HMI |
| Outlet Limit Controller Temperature (°F) | <u>619</u> HMI | Panel Temperature (°F) | <u>84</u> HMI |
| Process Fan Valve Position (Open/Closed) | <u>open</u> HMI | Flame Signal (Volts) | <u>5.0</u> HMI |
| Dilution Valve Position (%) | <u>0.0</u> HMI | Burner Chamber Inlet Differential Pressure (" H2O) | <u>0.35</u> |
| Combustion Valve Position (%) | <u>10.6</u> HMI | | |

Other Components

| | | | |
|--|---------------------------|--------------------------|-----------|
| Moisture Separator Level (% Full) | <u>can't read dirty</u> | Propane Tank A Level (%) | <u>55</u> |
| Water Storage Tank Level (DTF, TD from MP; inches) | <u>visual looks empty</u> | Propane Tank B Level (%) | <u>48</u> |

NOTES:

PI 2 = 0
PI 1 = 0

Abbreviations:

- 1. " H₂O = Inches of Water
- 2. °F = Degrees Fahrenheit
- 3. PSI = Pounds per Square Inch
- 4. % = Percent
- 5. DTF - Depth to Fluid
- 6. TD - Total Depth
- 7. MP - Measuring Point



PORT OF SEATTLE - TERMINAL 30

AS & SVE Manifold Readings

| | |
|--|--------------------------|
| Date: 5/13/22 | Time: 16:35 |
| Field Tech(s): LP & AC | Equipment I.D. #: 045235 |
| SVE Discharge VOC (ppmv) PID | 34.7 |
| SVE Discharge LEL (%) | |
| Oxygen (%) | |
| SVE System Inlet Vacuum (" H ₂ O) | |
| SVE System Inlet ΔP (" H ₂ O) | 0.7 |
| Oxidizer Discharge VOC (ppmv) PID | 0.4 |

SVE Wells

| Location | Vacuum ("H ₂ O) | Flow (SCFMG) | Valve Pos. (% Open) | Comments | Location | Vacuum ("H ₂ O) | Flow (SCFMG) | Valve Pos. (% Open) | Comments |
|----------|----------------------------|--------------|---------------------|------------|----------|----------------------------|--------------|---------------------|----------------------------|
| HSVE-2 | 30 | 7.2 | | | SVE-10 | 58 | 15 | | VAC bouncing flow bouncing |
| HSVE-3 | 36 | 7.1 | | | SVE-9 | 60 | 0 | | flow broken? |
| SVE-4 | 58 | 1.0 | | bouncy vac | SVE-8 | 60 | 0 | | flow broken? |
| SVE-5 | 8 | 0 | | | SVE-6 | 78 | 10 | | flow bouncing |
| SVE-7 | 50 | 9 | | bouncy vac | HSVE-1 | 14 | 76 | | |

AS Wells

| Location | Pressure (PSIG) | Flow (SCFMG) | Valve Pos. (% Open) | Comments | Location | Pressure (PSIG) | Flow (SCFMG) | Valve Pos. (% Open) | Comments |
|----------|-----------------|--------------|---------------------|----------|----------|-----------------|--------------|---------------------|-------------------------|
| AS-7 | | | | | AS-17 | 8 | 2.8 | | 16:49 |
| AS-8 | | | | closed | AS-18 | 9.5 | 1.2 | | |
| AS-9 | | | | | AS-19 | 10 | 1.4 | | |
| AS-10 | | | | | AS-20 | 9 | 3.0 | | |
| AS-11 | | | | | AS-21 | 8 | 0 | | turned off on hose flow |
| AS-12 | | | | | AS-22 | 9 | 2.2 | | Flow jump |
| AS-13 | | | | closed | AS-1 | | | | |
| AS-14 | | | | | AS-2 | | | | |
| AS-15 | | | | | AS-3 | | | | closed |
| AS-16 | | | | | AS-4 | | | | |
| AS-23 | 4.0 | 3.2 | 100 | 19:56 pm | AS-5 | | | | |
| AS-24 | 8.5 | 3.8 | | | AS-6 | | | | |
| AS-25 | 8.5 | 3.2 | | | | | | | |
| AS-26 | 9.5 | 1.8 | | | | | | | |
| AS-27 | 6.0 | 3.2 | | | | | | | |

Notes:

Abbreviations:

ppmv = Parts per million volume
 % = Percent
 deg F - degrees Fahrenheit

" H₂O = Inches of water
 SCFMG = Standard cubic feet per minute gauge
 PSIG = Pounds per square inch gauge



DAILY FIELD LOG

Project Information

Page 1 of 1

| | |
|---------------------------|--------------------------|
| Project Name: <u>T-30</u> | Location: <u>Seattle</u> |
| Project/Task No.: _____ | Weather: <u>70 Sunny</u> |
| Date: <u>6/21/22</u> | Personnel: <u>GF, AC</u> |

Observations

| Time | Observation Description |
|------|--|
| 1 | 1755 GF + AC onsite |
| 2 | System ON |
| 3 | Scope: biweekly on M |
| 4 | Safety tailgate |
| 5 | Screen Zone 2 (field zone 4) is active |
| 6 | • Sprague VFD has an odd screen notification. Toggles |
| 7 | btw 52.0 Hz and "A20 10" |
| 8 | 1800 - GF updated zones so that they each overlap by |
| 9 | half an hour. Hopefully, it prevents the VFD faults |
| 10 | we've witnessed a few times during changeover |
| 11 | Zone 1: 0000 - 0530 (5.5 hrs) (45 hrs dedicated) |
| 12 | Zone 2: 1500 - 2000 (5.0 hrs) (40 hrs dedicated) |
| 13 | Zone 3: 1000 - 1530 (5.5 hrs) (45 hrs dedicated) |
| 14 | Zone 4: 0500 - 1030 (5.5 hrs) (45 hrs dedicated) |
| 15 | Zone 5: 1930 - 0030 (5 hrs) (40 hrs dedicated) |
| 16 | • 2010 is the motor temp high alarm code. Not sure what |
| 17 | the "A" in front signifies. |
| 18 | • Spare camlock caps for the stingers in RW-103 + -107 |
| 19 | are in the corex, potentially! Hard to say if they are the |
| 20 | same size. They are a different brand from what AC |
| 21 | prev. photographed in a different well. |
| 22 | 1920 Clean up, lock up, offsite. |
| 23 | |
| 24 | GF 6/21/22 |
| 25 | |

Comments / Site Activities / Personnel Tracking

DAILY FIELD LOG

Project Information

| | |
|--------------------------|---------------------------|
| Project Name: <u>T30</u> | Location: <u>Seattle</u> |
| Project/Task No.: _____ | Weather: <u>Sunny 70°</u> |
| Date: <u>6/21/22</u> | Personnel: <u>AC, GF</u> |

Observations

| Time | Observation Description |
|-------------------------------|--|
| 1 <u>1750</u> | <u>Arrived at T30</u> |
| 2 | <u>SCOPE - System O and M</u> |
| 3 <u>1800</u> | <u>Began System O and M / GF updated zones to have a</u> |
| 4 | <u>30 min overlap to hopefully prevent vfd faults</u> |
| 5 1815 <u>1920</u> | <u>Left site</u> |
| 6 | |
| 7 | |
| 8 | |
| 9 | |
| 10 | |
| 11 | |
| 12 | |
| 13 | |
| 14 | |
| 15 | |
| 16 | |
| 17 | |
| 18 | <u>AC</u> |
| 19 | <u>6/21/22</u> |
| 20 | |
| 21 | |
| 22 | |
| 23 | |
| 24 | |
| 25 | |

Comments / Site Activities / Personnel Tracking

PORT OF SEATTLE - TERMINAL 30

| SVE/AS & Oxidizer System Data Collection Form | | | |
|---|------------------------------------|---|------------------------------------|
| Date: | 6/21/22 | Field Tech(s): | AC, GF |
| Actual Time: | 1755 | AS/SVE HMI Time: | 1734 |
| SVE/AS System | | | |
| SVE Blower Speed (Hertz) - VFD | 54.0 HMI | Sparge Blower Speed (Hertz) - VFD | 52 HMI |
| SVE Blower Runtime (Hours) | 11824.4 HMI | AS Blower Runtime (Hours) - Sparge Blower | 6047.3 HMI |
| Transfer Pump Runtime (Hours) - MS Pump | 2.6 HMI | Sparge Heat Exchanger Runtime (Hours) | 6046.4 HMI |
| Sparge Zone 1 Time Span(s) Operational: | 1300 - 0500 0000 HMI | Sparge Zone 4 Time Span(s) Operational: | 0500 - 1000 HMI |
| Sparge Zone 2 Time Span(s) Operational: | 1500 - 1930 HMI | Sparge Zone 5 Time Span(s) Operational: | 1930 - 1200 0000 HMI |
| Sparge Zone 3 Time Span(s) Operational: | 1000 - 1500 HMI | Sparge Zone Active: | zone 2 |
| Sparge Heat Exchanger Discharge Temperature (°F) - TI-500 | 92°F | SVE Blower Filter Differential Pressure (" H2O) - DPI-200 | 0.5 |
| AS Blower Pressure (PSI) - PI-501 | 8 psi | SVE Blower Inlet Differential Pressure (" H2O) - FI-200 | 1.3 |
| AS Blower Differential Pressure (" H2O) - DPI-500 | 0.8 | Transfer Pump Discharge Pressure (PSI) - PI-300 | 0 |
| SVE Blower Inlet Temperature (°F) - TI-200 | 72°F | SVE Blower Discharge Pressure (" H2O) - PI-400 | 0 |
| SVE Blower Inlet Vacuum (" H2O) - VI-200 | 74 | SVE Blower Discharge Temperature (°F) - TI-400 | 115°F |
| Oxidizer System | | | |
| Inlet Temperature (°F) | 696 HMI | Process Blower Runtime (Hours) | 18655 HMI |
| Burner Chamber Temperature (°F) | 672°F HMI | Combustion Fan Runtime (Hours) | 18656 HMI |
| Outlet Temperature (°F) | 632 HMI | Burner Runtime (Hours) | 18645 HMI |
| Inlet Limit Controller Temperature (°F) | 698 HMI | Processing Vapors Runtime (Hours) | 18630 HMI |
| Outlet Limit Controller Temperature (°F) | 628 HMI | Panel Temperature (°F) | 103°F HMI |
| Process Fan Valve Position (Open/Closed) | open HMI | Flame Signal (Volts) | 5.0V HMI |
| Dilution Valve Position (%) | 0% HMI | Oxidizer Inlet Differential Pressure (" H2O) - FI-1 | .40 not reading correctly |
| Combustion Valve Position (%) | 10.3% HMI | | |
| Other Components | | | |
| Moisture Separator Level (% Full) | 0% HMI | Propane Tank A Level (%) | 35% HMI |
| Water Storage Tank Level (DTF, TD from MP; inches) | 2 inches TD HMI | Propane Tank B Level (%) | 20% HMI |
| NOTES: GF updated zones at EOD so that they each overlap by 30 mins. | | | |
| Abbreviations: 1. " H ₂ O = Inches of Water 2. °F = Degrees Fahrenheit 3. PSI = Pounds per Square Inch 4. % = Percent 5. DTF - Depth to Fluid 6. TD - Total Depth 7. MP - Measuring Point | | | |

see notes



PORT OF SEATTLE - TERMINAL 30

AS & SVE Manifold Readings

| | |
|--|--------------------------------|
| Date: 6/21/22 | Time: 1750 |
| Field Tech(s): AC, GF | Equipment I.D. #: P.I.D R11309 |
| SVE Discharge VOC (ppmv) PID | 24.3 |
| SVE Discharge LEL (%) | |
| Oxygen (%) | |
| SVE System Inlet Vacuum (" H ₂ O) | 75 |
| SVE System Inlet ΔP (" H ₂ O) | |
| Oxidizer Discharge VOC (ppmv) PID | 1.6 |

SVE Wells

| Location | Vacuum ("H ₂ O) | Flow (SCFMG) | Valve Pos. (% Open) | Comments | Location | Vacuum ("H ₂ O) | Flow (SCFMG) | Valve Pos. (% Open) | Comments |
|----------|----------------------------|--------------|---------------------|--------------------------------------|----------|----------------------------|--------------|---------------------|---|
| HSVE-2 | 30 | 70 | 100% | | SVE-10 | 52 | 14 | 100% | Flow meter bouncing |
| HSVE-3 | 34 | 70 | 100% | | SVE-9 | 50 | 2 | 100% | |
| SVE-4 | 62 | 12 | 100% | | SVE-8 | 62 | 4 | 100% | |
| SVE-5 | 10 | 0.15 | 100% | Broken Restrictor float gas stuck | SVE-6 | 70 | 12 | 100% | Both flow and vacuum meters bouncing |
| SVE-7 | 46 | 10 | 100% | | HSVE-1 | 14 | 74 | 30% | Partially opened |

AS Wells

| Location | Pressure (PSIG) | Flow (SCFMG) | Valve Pos. (% Open) | Comments | Location | Pressure (PSIG) | Flow (SCFMG) | Valve Pos. (% Open) | Comments |
|----------|-----------------|--------------|---------------------|----------|----------|-----------------|--------------|---------------------|----------------|
| AS-7 | | | | | AS-17 | 6.0 | 7.2 | 100% | |
| AS-8 | | | | Closed | AS-18 | 8.0 | 1.5 | 100% | |
| AS-9 | | | | | AS-19 | 9.0 | 1.8 | 100% | |
| AS-10 | | | | | AS-20 | 8.0 | 3.2 | 100% | |
| AS-11 | | | | | AS-21 | 6.0 | 0 | 100% | Stuck? |
| AS-12 | | | | | AS-22 | 7.5 | 2.45 | 100% | Float bouncing |
| AS-13 | | | | Closed | AS-1 | | | | |
| AS-14 | | | | | AS-2 | | | | Closed |
| AS-15 | | | | | AS-3 | | | | |
| AS-16 | | | | | AS-4 | | | | |
| AS-23 | | | | | AS-5 | | | | |
| AS-24 | | | | Closed | AS-6 | | | | |
| AS-25 | | | | | | | | | |
| AS-26 | | | | | | | | | |
| AS-27 | | | | | | | | | |

Notes: Zone 2 active. All other zones off until zone change

Abbreviations:

ppmv = Parts per million volume
% = Percent
deg F - degrees Fahrenheit

" H₂O = Inches of water
SCFMG = Standard cubic feet per minute gauge
PSIG = Pounds per square inch gauge



AECOM Daily Tailgate Meeting Summary

Project information

| | |
|-------------------------|---------------|
| Project Name | T-30 |
| Project Number | 60681370 |
| Project Manager | Paul Kalina |
| Project Manager Phone # | 2063105097 |
| Muster Point location | Main gate |
| Meeting date | 6/21/2022 |
| Business Line | Environment |
| SH&E Manager | Tim Gilles |
| SH&E Manager Phone # | 3128335991 |
| First Aid Kit Location | Conex |
| Prepared by | Friedman, Gus |

Shift Summary

| | |
|--------------------------------|--|
| Location | SoDo |
| Attendees (Workers) | Friedman, Gus;Corley, Antonio; |
| Attendees (Visitors) | |
| Tasks to be performed | Biweekly O&M |
| Hazards to be considered today | pressure, noise |
| Will there be Lone Workers? | No |
| Hierarchy of controls | ppe |
| Personal Protective Equipment | Task Specific: gloves Mandatory: safetyglasses, longpants, reflectivevest, workboots |
| High Risk Events | |
| | |

| | |
|---|--|
| Topic of the week | Plywood Floor Openings - Stay Aware |
| Other topics discussed | |
| Mid day reviews | |
| End of the day comments. The supervisor confirms that the site is being left in a safe condition and work crew checked out as fit unless otherwise specified here | |
| Hazards | <ul style="list-style-type: none">• Noise• Pressure |

DATE 6/29/22

| | | | | | | | |
|-----|---|---|---|----------|----|---|---|
| DAY | S | M | T | W | TH | F | S |
|-----|---|---|---|----------|----|---|---|

PROJECT MANAGER: Paul Kurn
 PROJECT: T-30
 JOB NO.: 60681370
 AECOM FIELD REP: N Guy S. Brand

| | | | | | |
|----------|------------|--------------|-----------------|------------|-------|
| WEATHER | BRIGHT SUN | CLEAR | OVERCAST | RAIN | SNOW |
| TEMP | To 32 | 32-50 | 50-70 | 70-85 | 85 up |
| WIND | Still | Moder | High | Report No. | |
| HUMIDITY | Dry | Moder | Humid | | |

SUB-CONTRACTORS ON SITE: NA

EQUIPMENT ON SITE: Pid, Sonoma consists, Hand tools

WORK PERFORMED:

- 1020 Arrive on site sign in get Situm Brief from and Set up tailgate area
- 1035 take Pid Readings at Both inlet and discharge
 Inlet 0.0 Dischem 0.5
- 1040 give Gus a call about low pid Readings and walk thru alarms on control panel
 Try both ports again Both Read 0.0 this time
 (THA Alarm, has SV off but, sive still on)
- 1110 Work around alarm and talk with Gus & carry Sample inlet and Dischem again
 inlet 18.4 Dischem 0.7 seems good make Sonoma Sample collecting
- 1123 start collecting Inlet Valve Sample initial vacuum of 28.5
- 1128 finish collecting inlet valve sample final vacuum of 5.0
- 1133 start collect Dischem Valve Sample initial vac of 30.0
- 1138 finish collect discharge Valve Sample final vac of 5.0
- 1140 fill out COC and Labo containers
- 1200 Pack up and leave site for day sign out of form

NZg
6/29/22

THA Alarm 6/25/22 XX:XX was tripped.
 The SVE was on when we arrived but AS was down due to alarm. This was only discovered when initial Readings were low Inlet 0.0 Dischem 0.5
 After clearing alarm AS started Back up Zone 5 Active Sampled Pid again Both intake & discharge were 0.0 checked other gauges to make sure some some similar to previous times and then check pid readings again about 30 min after restarted AS.
 TITLE Getting ISL

BY NZg

Vapor Sampling Field Form

Site Address: 1901 East Marginal Way South, Seattle, WA

Project No.: 60681370

Project: T-30

Date: 6/29/22

Field Personnel: N. Guyn, S. Brand

Surface Conditions: Overcast Breezy Dry 60's

| Sample ID | Sample Canister LAB ID | Flow Controller LAB ID | Sample Canister Size | Sample Start | | | Sample End | | | PID Field Reading |
|--------------------|------------------------|------------------------|----------------------|---|------|------|---|------|------|-------------------|
| | | | | Initial Canister Reading (in-Hg) ¹ | Time | Date | Final Canister Reading (in-Hg) ¹ | Time | Date | |
| Inlet - 062922 | 4183 | 305 | 1 L/hr | 28.5 | 1123 | 6/29 | 5.0 | 1128 | 6/29 | 18.4 |
| Discharge - 062922 | 9562 | 62 | 1 L/hr | 30.0 | 1133 | 6/29 | 5.0 | 1138 | 6/29 | 0.7 |

¹ Canisters measured using a standard vacuum gauge

Sample Collection Notes and General Observations:

Initial PID Field Readings were low Inlet - 0.0
 Discharge - 0.5

SVE on But AS off due to Thx Alarm 6/25/22

AS Back on after Warm cleared and re-sample PID readings after ~30 min Inlet - 18.4
 Discharge - 0.7

These readings seem to be more inline with previous ones so proceed to sample collections

Sample collection went well with no issues.

SAMPLE CHAIN OF CUSTODY

Report To Paul Kalina
 Company AECOM
 Address 1111 3rd Ave Suite 1600
 City, State, ZIP Seattle, WA 98101
 Phone 206 438 2700 Email Paul.Kalina@Aecom.com

| | |
|---|--------------------------|
| SAMPLERS (signature) <u>N. Gurn</u> | |
| PROJECT NAME & ADDRESS <u>T-30 Part of Seattle</u> | PO # |
| NOTES: | INVOICE TO <u>Aca</u> |

Page # _____ of _____

TURNAROUND TIME

Standard
 RUSH

Rush charges authorized by: _____

SAMPLE DISPOSAL

Default: Clean after 3 days
 Archive (Fee may apply)

SAMPLE INFORMATION

| Sample Name | Lab ID | Canister ID | Flow Cont. ID | Reporting Level: IA=Indoor Air SG=Soil Gas (Circle One) | Date Sampled | Initial Vac. ("Hg) | Field Initial Time | Final Vac. ("Hg) | Field Final Time | ANALYSIS REQUESTED | | | | | Notes |
|---------------------------|--------|-------------|---------------|--|----------------|--------------------|--------------------|------------------|------------------|--------------------|-------------------------------------|------------|-------------------------------------|--------|-------|
| | | | | | | | | | | TO15 Full Scan | TO15 BTEXN | TO15 cVOCs | APH | Helium | |
| <u>inlet - 062922</u> | | <u>4183</u> | <u>305</u> | IA / <u>SG</u> | <u>6/29/22</u> | <u>28.5</u> | <u>1123</u> | <u>5.0</u> | <u>1128</u> | | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> | | |
| <u>Discharge - 062922</u> | | <u>9562</u> | <u>62</u> | IA / <u>SG</u> | <u>6/29/22</u> | <u>30.0</u> | <u>1133</u> | <u>5.0</u> | <u>1138</u> | | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> | | |
| | | | | IA / SG | | | | | | | | | | | |
| | | | | IA / SG | | | | | | | | | | | |
| | | | | IA / SG | | | | | | | | | | | |
| | | | | IA / SG | | | | | | | | | | | |
| | | | | IA / SG | | | | | | | | | | | |
| | | | | IA / SG | | | | | | | | | | | |

Friedman & Bruya, Inc.
 3012 16th Avenue West
 Seattle, WA 98119-2029
 Ph. (206) 285-8282
 Fax (206) 283-5044

| SIGNATURE | PRINT NAME | COMPANY | DATE | TIME |
|-----------------------------------|---------------------|--------------|----------------|--------------|
| Relinquished by: <u>Nick Gurn</u> | <u>Nick Gurn</u> | <u>Aecom</u> | <u>6/29/22</u> | <u>12:25</u> |
| Received by: <u>W. Madden</u> | <u>Windy Madden</u> | <u>F+BI</u> | <u>6/29/22</u> | <u>12:25</u> |
| Relinquished by: | | | | |
| Received by: | | | | |



INSTRUMENT CALIBRATION REPORT

Pine Environmental Services LLC

3225 South 116th St.
Building 1 Suite 181
Tukwila, WA 98168
425-285-9102

Pine Environmental Services, Inc.

Instrument ID 38725
Description MIniRae 3000
Calibrated 6/28/2022 5:10:39PM

| | |
|---|------------------------|
| Manufacturer Rae Systems | State Certified |
| Model Number MiniRAE 3000 | Status Pass |
| Serial Number/ Lot Number 592-919182 | Temp °C 21 |
| Location Seattle | Humidity % 39 |
| Department | |

Calibration Specifications

| | |
|-----------------------------------|-----------------------------|
| Group # 1 | Range Acc % 0.0000 |
| Group Name isobutylene | Reading Acc % 5.0000 |
| Stated Accy Pct of Reading | Plus/Minus 0.00 |

| <u>Nom In Val / In Val</u> | <u>In Type</u> | <u>Out Val</u> | <u>Out Type</u> | <u>End As</u> | <u>Lft As</u> | <u>Dev%</u> | <u>Pass/Fail</u> |
|----------------------------|----------------|----------------|-----------------|---------------|---------------|-------------|------------------|
| 100.00 / 100.00 | PPM | 100.00 | PPM | 99.70 | 100.00 | 0.00% | Pass |

Test Instruments Used During the Calibration

(As Of Cal Entry Date)

| <u>Test Standard ID</u> | <u>Description</u> | <u>Manufacturer</u> | <u>Model Number</u> | <u>Serial Number / Lot Number</u> | <u>Last Cal Date/ Opened Date</u> | <u>Next Cal Date / Expiration Date</u> |
|-------------------------|--------------------|---------------------|---------------------|-----------------------------------|-----------------------------------|--|
| SEA ISO 100 PPM | SEA ISO 100 PPM | Gasco | SEA ISO 100 PPM | TJBJ-248-100-1 | | 9/9/2023 |
| TJBJ-248-100-1 | TJBJ-248-100-1 | | | | | |

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Larry Lorenzano

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment
Please call 800-301-9663 for Technical Assistance

Americas

Daily Tailgate Meeting

S3AM-209-FM5

Instructions: Conduct meeting prior to sending crews to individual tasks. Require attendance of all AECOM employees and subcontractors. Invite personnel from simultaneous operations for coordination purposes. Review scope of work and briefly discuss required and applicable topics. **This meeting is a daily refresher, not a full orientation.** Task-specific discussions associated with Task Hazard Assessment (THA) follow this meeting at the task location immediately before individual task is started.

| | |
|----------------------------------|--------------------|
| AECOM Supervisor Name: | |
| Phone Number: | <i>Paul Kullig</i> |
| AECOM SH&E Rep. Name: | |
| Phone Number: | <i>Nura Gey</i> |
| Meeting Leader: | <i>Nura Gey</i> |

| | | |
|-----------------------------|---|--|
| Date: <i>6/29/22</i> | Project Name/Location: <i>Vapor Sampling</i> | Project Number: <i>60681370</i> |
|-----------------------------|---|--|

Today's Scope of Work: *Vapor Sampling*

| | | | |
|---|--|---|---|
| Muster Point Location: <i>Vehicle</i> | First Aid Kit Location: <i>Vehicle</i> | Fire Extinguisher Location: <i>NA</i> | Spill Kit Location: <i>NA</i> |
|---|--|---|---|

| | |
|--|---|
| <p>1. Required Topics</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Fitness for Duty requirements, all sign in / sign out <input checked="" type="checkbox"/> Required training (incl. task specific) completed and current <input checked="" type="checkbox"/> SH&E Plan onsite - understood, reviewed, signed by all (incl. scope, preplanning hazard assessments / risk registers, controls, procedures, requirements, etc.) <input checked="" type="checkbox"/> Task Hazard Assessments (THAs) are to be reviewed and completed for each task immediately prior to conducting <input checked="" type="checkbox"/> STOP WORK Right & Responsibility- all task changes/changed conditions re-assess with THA <input checked="" type="checkbox"/> Requirement to report to supervisor any injury, illness, damage, near miss, unsafe act / condition <input type="checkbox"/> Emergency Response Plan – including muster point, first aid kit, fire extinguisher, clinic/hospital location <input checked="" type="checkbox"/> Personal Protective Equipment (PPE) - Required items per hazard assessments in good condition / in use by all <input checked="" type="checkbox"/> Equipment/machinery inspected (documented as required) and in good condition - operators properly trained/certified <input checked="" type="checkbox"/> Work area set up and demarcation/ barricades in place to protect workers, site staff, and the public <input checked="" type="checkbox"/> Required checklists/records available, understood (describe): <input checked="" type="checkbox"/> Lessons Learned / SH&E improvements (describe): | <p>2. Discuss if Applicable to Today's Work</p> <p><input checked="" type="checkbox"/> <input type="checkbox"/> Check <input checked="" type="checkbox"/> as reviewed or mark <input type="checkbox"/> as not applicable</p> <ul style="list-style-type: none"> <input type="checkbox"/> <input checked="" type="checkbox"/> Biological/ Chemical / Electrical Hazards <input checked="" type="checkbox"/> <input type="checkbox"/> Ergonomics - Lifting, Body Position <input type="checkbox"/> <input checked="" type="checkbox"/> Lock Out/ Tag Out <input type="checkbox"/> Short Service Employees - visual identifier and mentor/ oversight assignment <input checked="" type="checkbox"/> <input type="checkbox"/> Simultaneous/ Neighbouring Operations <input checked="" type="checkbox"/> <input type="checkbox"/> Slip/ Trip/ Fall Hazards <input type="checkbox"/> <input checked="" type="checkbox"/> Specialized PPE Needs <input type="checkbox"/> <input checked="" type="checkbox"/> Traffic Control <input type="checkbox"/> <input checked="" type="checkbox"/> Waste Management/ Decontamination <input type="checkbox"/> <input checked="" type="checkbox"/> Weather Hazards / Heat Stress / Cold Stress <input type="checkbox"/> <input checked="" type="checkbox"/> Subcontractor Requirements (e.g., JHAs, THAs, procedures, reporting, etc.) <input type="checkbox"/> <input checked="" type="checkbox"/> Work Permits / Plans required (e.g., Fall Protection, Confined Space, Hot Work, Critical Lifts, etc.); in place, understood (identify/attach): <input type="checkbox"/> <input checked="" type="checkbox"/> Other Topics (describe/attach): <input type="checkbox"/> <input checked="" type="checkbox"/> Client specific requirements (describe): |
|--|---|

| | |
|--|---|
| 3. Daily Check Out by Site Supervisor | |
| Describe incidents, near misses, observations or Stop Work interventions from today: | Describe Lessons Learned/ Improvement Areas from today: |

The site is being left in a safe condition and work crew checked out as fit unless otherwise specified as above.

| | | |
|--|-------------------------------------|---|
| Site Supervisor Name <i>Nura Gey</i> | Signature <i>Nura Gey</i> | Date <i>6/29/22</i> |
| | | Time (at end of day / shift) <i>1200</i> |

Worker Acknowledgement / Sign In Sign Out sheets applicable to this meeting are on reverse and, if applicable, attached.

All employees:

- **STOP WORK** if concerned / uncertain about safety / hazard or additional precaution is not recorded on the THA.
- **Be alert and communicate any changes in personnel or conditions at the worksite to the supervisor.**
- **Reassess task, hazards, & mitigations on an ongoing basis; amend the THA if needed.**

SITE WORKERS (including AECOM Contractors and Subcontractors): Your signature below means that you understand:

- * The requirement to participate in creating, reviewing, & updating hazard assessments (THA) applicable to your task(s).
- * The hazards & control measures associated with each task you are about to perform.
- * The permit to work requirements applicable to the work you are about to perform (if it includes permitted activities).
- * That no tasks or work is to be performed without a hazard assessment.
- * Your authority & obligation to "Stop Work" intervene, speak up/ listen up.

Your initials (right columns) certify that you arrived & departed fit for duty, & have reported all incidents/near misses; meaning:

- * You are physically and mentally fit for duty and have inspected your required PPE to ensure satisfactory condition.
- * You are not under the influence of any type of medication, drugs, or alcohol that could affect your ability to work safely.
- * You are aware of your responsibility to immediately report any illness, injury (regardless of where or when it occurred), or impairment/fatigue issue to the AECOM Supervisor.
- * You signed out as fit / uninjured unless you have otherwise informed the AECOM Supervisor.

| Print Name & Company | Signature | Initials & Sign In Time | Initials & Sign Out Time |
|----------------------|--------------------|-------------------------|--------------------------|
| Nathan Gunn Aecom | <i>Nathan Gunn</i> | In & Fit NRG 10:25 | Out & Fit 1200 NG |
| STEVE BRAND AECOM | <i>Steve Brand</i> | In & Fit S.B. 10:25 | Out & Fit 1200 SB |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |

(Attach additional Site Worker sign-in/out sheets if needed) Identify number of attached sheets: _____

| SITE VISITOR / SITE REPRESENTATIVE | | | | |
|------------------------------------|--------------|--------------|----------------|-----------|
| Name | Company Name | Arrival Time | Departure Time | Signature |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

DAILY FIELD LOG

Project Information

Page 1 of 3

| | |
|---------------------------|---------------------------|
| Project Name: <u>7-30</u> | Location: <u>Seattle</u> |
| Project/Task No.: _____ | Weather: <u>70, Sunny</u> |
| Date: <u>7/7/20</u> | Personnel: <u>GF, ACJ</u> |

Observations

| # | Time | Observation Description |
|----|------|---|
| 1 | 1700 | GF, AC onsite |
| 2 | | Safety tailgate. Electrical hazards training crane |
| 3 | | awareness. |
| 4 | | Scope: Biweekly O&M, zone rewiring analysis, |
| 5 | | dimensions for GAC proposal, replacement |
| 6 | | part order research |
| 7 | | System ON on arrival |
| 8 | 1710 | AC taking measurements |
| 9 | | • AS cabinet gauges are liquid-filled. |
| 10 | | • AS mag gauge (0-15" H ₂ O) does not have a PT. One |
| 11 | | tube is connected just before an intake? filter, & the other |
| 12 | * * | tube is open to atmosphere. Is that good OK? |
| 13 | | • Slight humming detectable @ SVE vac gauges. Don't know |
| 14 | | if I'd call it a vibration, but I guess it is. |
| 15 | | • 2 mag gauges: 0-15" H ₂ O, no PT, filter DP |
| 16 | | 0-15" H ₂ O, w/ PT, combined flow |
| 17 | | • Vibration more prominent @ SVE discharge gauges |
| 18 | | • Zone 2 (real zone 4) is active. Break through pressure/ |
| 19 | | rotameter functionality testing (bleed valve 1/4-turn open) |
| 20 | | AS -17 initial flow pressure Breakthrough PSI final flow is open |
| 21 | | -18 1.25 9 7.0 1.4 cracked |
| 22 | | -19 1.0 9.75 7.0 1.2 100 to |
| 23 | | -20 2.75 8.5 6.5 2.2 cracked |
| 24 | | -21 6.1 6.5 4.75 1.0 100 to |
| 25 | | -22 2.7 8.5 6.5 2.2 cracked |

Comments / Site Activities / Personnel Tracking

DAILY FIELD LOG

Project Information

Page 2 of 3

| | |
|---------------------------|--------------------------|
| Project Name: <u>T-30</u> | Location: _____ |
| Project/Task No.: _____ | Weather: _____ |
| Date: <u>7/7/22</u> | Personnel: <u>GF, AC</u> |

Observations

| Time | Observation Description | |
|------|--|--|
| 1 | <p>→ open on AS-17, -20, & -22 take flow most easily. Even w/ them barely cracked open & set just above 2 scfmg, we can't get more than 1.5 scfmg to the other 3 wells (spurge-level cutoff ~ 2 scfmg)</p> <p>→ All rotometers seem in working order, though AS-17 is a bit hard to read due to UV.</p> | |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | | |
| 6 | | |
| 7 | 1800 | <ul style="list-style-type: none"> Shut system down & shut off power for zone rewiring. |
| 8 | | |
| 9 | | <ul style="list-style-type: none"> Adjust plan to move the wires connecting the PLC unit to the motor valves. At the PLC unit, each wire labeled w/ its associated MV: <u>4 MV control wires</u> Previous |
| 10 | | |
| 11 | | |
| 12 | | MV-A PLC wire 0/7 60 A/B 0/7 |
| 13 | | MV-B 0/8 64 A/B 0/8 |
| 14 | | MV-C 0/9 63 A/B 0/10 |
| 15 | | MV-D 0/10 61 A/B 0/8 |
| 16 | | MV-E 0/11 62 A/B 0/9 |
| 17 | 1820 | <ul style="list-style-type: none"> Return power & restart system. Rewiring worked! Zones on the PLC now match the zones in the field. "Zone 2" had been on w/ MV-B, and Zone 2 is now on w/ MV-E & the accurate wells AS-7-11. |
| 18 | | |
| 19 | | |
| 20 | | |
| 21 | | <ul style="list-style-type: none"> All other MVs tested & work as desired. |
| 22 | | <ul style="list-style-type: none"> AC taking down new set of manifold readings |
| 23 | | <ul style="list-style-type: none"> GF measures out dimensions for the GAC design |
| 24 | | |
| 25 | | <ul style="list-style-type: none"> see next page |

Comments / Site Activities / Personnel Tracking

DAILY FIELD LOG

Project Information

| | |
|---------------------------|--------------------------|
| Project Name: <u>T-30</u> | Location: _____ |
| Project/Task No.: _____ | Weather: _____ |
| Date: <u>7/7/22</u> | Personnel: <u>GF, AC</u> |

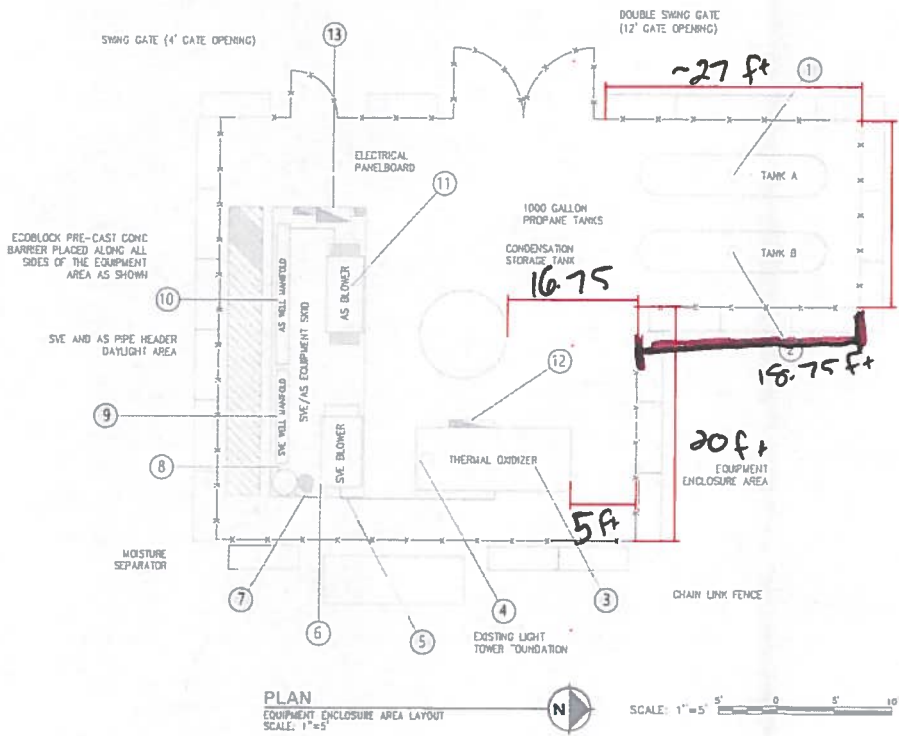
Observations

| Time | Observation Description |
|------|---|
| 1 | Potometer Inlet flow & Pressure Barometer Final flow ⁹⁰ open |
| 2 | AS-7 9.0 9.0 6.5 5 cracked sticky |
| 3 | -8 4.2 8.5 6.5 5 100 |
| 4 | -9 4.4 8.0 6.0 5 50 |
| 5 | -10 0 8.5 7.0 6 100 sticky |
| 6 | -11 8.6 9.0 6.5 4.6 cracked |
| 7 | |
| 8 | → even w/ other wells cranked down to 2 si fmg & |
| 9 | well pressure @ 9 psi, AS-10 won't take air. |
| 10 | • KO sightglass looks to be 2". |
| 11 | • Clean up, lock up |
| 12 | 1915 Offsite |
| 13 | |
| 14 | |
| 15 | |
| 16 | |
| 17 | |
| 18 | |
| 19 | |
| 20 | |
| 21 | GF |
| 22 | |
| 23 | |
| 24 | |
| 25 | |

+ 0.5 in leak @ bottom
sticky
sticky

Comments / Site Activities / Personnel Tracking

File: C:\Users\jacob\Documents\Projects\1 - 2014\10111111\10111111.dwg Plot Date: 11/20/2014 2:53 PM by jacob



| NUMBER | MEASUREMENT AND LOCATION | MEASUREMENT | UNITS | NOTES |
|--------|--|-----------------------|-----------------|--|
| 1 | PROPANE TANK A | FUEL LEVEL | % | |
| 2 | PROPANE TANK B | FUEL LEVEL | % | |
| 3 | BURNER CHAMBER INLET DIFFERENTIAL PRESSURE | DIFFERENTIAL PRESSURE | INCHES OF WATER | |
| 4 | OXIDIZER DISCHARGE VOC | VOC CONCENTRATION | PPM | COLLECT PSCAA DISCHARGE COMPLIANCE SAMPLE HERE |
| 5 | SVE DISCHARGE VOC | VOC CONCENTRATION | PPM | COLLECT PSCAA INLET COMPLIANCE SAMPLE HERE |
| 5 | SVE BLOWER DISCHARGE PRESSURE | PRESSURE | INCHES OF WATER | |
| 5 | SVE BLOWER DISCHARGE TEMPERATURE | TEMPERATURE | DEGREES F | |
| 5 | OXIDIZER INLET TEMPERATURE | TEMPERATURE | DEGREES F | |
| 6 | SVE BLOWER INLET DIFFERENTIAL PRESSURE | DIFFERENTIAL PRESSURE | INCHES OF WATER | |
| 6 | SVE BLOWER FILTER DIFFERENTIAL PRESSURE | DIFFERENTIAL PRESSURE | INCHES OF WATER | AT OR ABOVE 15 INCHES OF WATER - CHANGE FILTER |
| 7 | TRANSFER PUMP DISCHARGE PRESSURE | PRESSURE | PSI | |
| 8 | SVE BLOWER INLET TEMPERATURE | TEMPERATURE | DEGREES F | |
| 8 | SVE BLOWER INLET VACUUM | VACUUM | INCHES OF WATER | |
| 9 | HSVE AND SVE WELL VACUUM'S | VACUUM | INCHES OF WATER | |
| 9 | HSVE AND SVE WELL FLOWS | FLOW | SCFM | |
| 10 | AS WELL PRESSURES | PRESSURE | PSI | |
| 10 | AS WELL FLOWS | FLOW | SCFM | |
| 11 | HEAT EXCHANGER DISCHARGE TEMPERATURE | TEMPERATURE | DEGREES F | INSIDE AS BLOWER SOUND ENCLOSURE |
| 12 | OXIDIZER BURNER CHAMBER TEMPERATURE | TEMPERATURE | DEGREES F | SHOWN ON OXIDIZER PLC/MMI SCREEN |
| 12 | OXIDIZER DISCHARGE TEMPERATURE | TEMPERATURE | DEGREES F | SHOWN ON OXIDIZER PLC/MMI SCREEN |
| 12 | OXIDIZER INLET LIMIT CONTROLLER TEMPERATURE | TEMPERATURE | DEGREES F | SHOWN ON OXIDIZER PANEL |
| 12 | OXIDIZER OUTLET LIMIT CONTROLLER TEMPERATURE | TEMPERATURE | DEGREES F | SHOWN ON OXIDIZER PANEL |
| 12 | OXIDIZER PROCESS FAN VALVE POSITION | VALVE POSITION | OPEN/CLOSED | SHOWN ON OXIDIZER PLC/MMI SCREEN |
| 12 | OXIDIZER DILUTION VALVE POSITION | VALVE POSITION | % | SHOWN ON OXIDIZER PLC/MMI SCREEN |
| 12 | OXIDIZER COMBUSTION VALVE POSITION | VALVE POSITION | % | SHOWN ON OXIDIZER PLC/MMI SCREEN |
| 12 | OXIDIZER RUNTIMES | TIME | HOURS | SHOWN ON OXIDIZER PLC/MMI SCREEN |
| 12 | OXIDIZER PANEL TEMPERATURE | TEMPERATURE | DEGREES F | SHOWN ON OXIDIZER PLC/MMI SCREEN |
| 12 | OXIDIZER FLAME SIGNAL | FLAME STRENGTH | VOLTS | SHOWN ON OXIDIZER PANEL |
| 13 | SVE AND AS BLOWER SPEED | BLOWER SPEED | HERTZ | SHOWN ON SVE/AS PANEL |
| 13 | SVE/AS RUNTIMES | TIME | HOURS | SHOWN ON SVE/AS PLC/MMI SCREEN |
| 13 | SPARGE ZONE OPERATING CYCLES | TIME | HOURS | SHOWN ON SVE/AS PLC/MMI SCREEN |

CALL 2 DAYS BEFORE YOU DIG
 1-800-424-5555

| | <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="6">REVISIONS</th> </tr> <tr> <th>NO.</th> <th>DATE</th> <th>BY</th> <th>DESCRIPTION</th> <th>APP'D</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table> | REVISIONS | | | | | | NO. | DATE | BY | DESCRIPTION | APP'D | DATE | | | | | | | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>DESIGNED BY</td> <td> </td> </tr> <tr> <td>CHECKED BY</td> <td> </td> </tr> <tr> <td>DATE</td> <td> </td> </tr> <tr> <td>SCALE</td> <td> </td> </tr> <tr> <td>PROJECT NAME</td> <td> </td> </tr> <tr> <td>SHEET TITLE</td> <td>EQUIPMENT ENCLOSURE AREA LAYOUT</td> </tr> </table> | DESIGNED BY | | CHECKED BY | | DATE | | SCALE | | PROJECT NAME | | SHEET TITLE | EQUIPMENT ENCLOSURE AREA LAYOUT | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td> </td> <td style="font-size: small;"> PORT OF SEATTLE PROJECT NAME SHEET TITLE EQUIPMENT ENCLOSURE AREA LAYOUT </td> </tr> </table> | | PORT OF SEATTLE PROJECT NAME SHEET TITLE EQUIPMENT ENCLOSURE AREA LAYOUT |
|--------------|--|-----------|-------------|-------|------|--|--|-----|------|----|-------------|-------|------|--|--|--|--|--|--|--|-------------|--|------------|--|------|--|-------|--|--------------|--|-------------|---------------------------------|--|--|---|
| REVISIONS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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PORT OF SEATTLE - TERMINAL 30

| SVE/AS & Oxidizer System Data Collection Form | | | |
|---|-------------------------|---|-----------|
| Date: 7/7/22 | Field Tech(s): AC, GF | | |
| Actual Time: 1709 | AS/SVE HMI Time: 1650 | | |
| SVE/AS System | | | |
| SVE Blower Speed (Hertz) - VFD | 54.0 | Sparge Blower Speed (Hertz) - VFD | 52.0 |
| SVE Blower Runtime (Hours) | 12206.1 | AS Blower Runtime (Hours) - Sparge Blower | 6340.7 |
| Transfer Pump Runtime (Hours) - MS Pump | 2.6 | Sparge Heat Exchanger Runtime (Hours) | 6339.8 |
| Sparge Zone 1 Time Span(s) Operational: | 0000-0530 | Sparge Zone 4 Time Span(s) Operational: | 0500-1030 |
| Sparge Zone 2 Time Span(s) Operational: | 1500-2000 | Sparge Zone 5 Time Span(s) Operational: | 1930-0030 |
| Sparge Zone 3 Time Span(s) Operational: | 1000-1530 | Sparge Zone Active: | Zone 2 |
| Sparge Heat Exchanger Discharge Temperature (°F) - TI-500 | 94°F | SVE Blower Filter Differential Pressure (" H2O) - DPI-200 | 0.5 |
| AS Blower Pressure (PSI) - PI-501 | 8.5 psi | SVE Blower Inlet Differential Pressure (" H2O) - FI-200 | 1.0 |
| AS Blower Differential Pressure (" H2O) - DPI-500 | 0.5 | Transfer Pump Discharge Pressure (PSI) - PI-300 | 0 |
| SVE Blower Inlet Temperature (°F) - TI-200 | 64°F | SVE Blower Discharge Pressure (" H2O) - PI-400 | 0 |
| SVE Blower Inlet Vacuum (" H2O) - VI-200 | 76 | SVE Blower Discharge Temperature (°F) - TI-400 | 116°F |
| Oxidizer System | | | |
| Inlet Temperature (°F) | 681°F | Process Blower Runtime (Hours) | 19038 |
| Burner Chamber Temperature (°F) | 625°F | Combustion Fan Runtime (Hours) | 19039 |
| Outlet Temperature (°F) | 623°F | Burner Runtime (Hours) | 19028 |
| Inlet Limit Controller Temperature (°F) | 668°F | Processing Vapors Runtime (Hours) | 19014 |
| Outlet Limit Controller Temperature (°F) | 630°F | Panel Temperature (°F) | 93 |
| Process Fan Valve Position (Open/Closed) | Open | Flame Signal (Volts) | 5.0 |
| Dilution Valve Position (%) | 0 | Oxidizer Inlet Differential Pressure (" H2O) - FI-1 | 0.30 |
| Combustion Valve Position (%) | 9.5% | | |
| Other Components | | | |
| Moisture Separator Level (% Full) | 0 | Propane Tank A Level (%) | 85% |
| Water Storage Tank Level (DTF, TD from MP; inches) | < 1 inch of water | Propane Tank B Level (%) | 77% |
| NOTES: @ EOD, zones 1 + 2 runtimes swapped | | | |
| Abbreviations: | | | |
| 1. " H ₂ O = Inches of Water | 5. DTF - Depth to Fluid | | |
| 2. °F = Degrees Fahrenheit | 6. TD - Total Depth | | |
| 3. PSI = Pounds per Square Inch | 7. MP - Measuring Point | | |
| 4. % = Percent | | | |



PORT OF SEATTLE - TERMINAL 30

AS & SVE Manifold Readings

| | |
|--|---------------------------------------|
| Date: <u>7/7/22</u> | Time: |
| Field Tech(s): <u>AC, GF</u> | Equipment I.D. #: <u>P.S.D 045235</u> |
| SVE Discharge VOC (ppmv) PID | <u>13.0</u> |
| SVE Discharge LEL (%) | |
| Oxygen (%) | |
| SVE System Inlet Vacuum (" H ₂ O) | <u>76</u> |
| SVE System Inlet ΔP (" H ₂ O) | <u>0.5</u> |
| Oxidizer Discharge VOC (ppmv) PID | <u>1.0</u> |

SVE Wells

| Location | Vacuum ("H ₂ O) | Flow (SCFMG) | Valve Pos. (% Open) | Comments | Location | Vacuum ("H ₂ O) | Flow (SCFMG) | Valve Pos. (% Open) | Comments |
|----------|----------------------------|-----------------------|---------------------|-----------------------------|----------|----------------------------|--------------|---------------------|-----------------------|
| HSVE-2 | <u>30</u> | <u>72</u> | <u>100</u> | | SVE-10 | <u>55</u> | <u>14</u> | <u>100</u> | <u>gauge bouncing</u> |
| HSVE-3 | <u>36</u> | <u>68</u> | <u>100</u> | | SVE-9 | <u>60</u> | <u>6</u> | <u>100</u> | <u>gauge bouncing</u> |
| SVE-4 | <u>52</u> | <u>10</u> | <u>100</u> | <u>Gauge/float bouncing</u> | SVE-8 | <u>50</u> | <u>4</u> | <u>100</u> | <u>gauge bouncing</u> |
| SVE-5 | <u>40</u> | <u>0 float broken</u> | | <u>No Gauge bouncing</u> | SVE-6 | <u>70</u> | <u>12</u> | <u>100</u> | <u>gauge bouncing</u> |
| SVE-7 | <u>50</u> | <u>12</u> | <u>100</u> | | HSVE-1 | <u>14.0</u> | <u>78</u> | <u>200%</u> | |

AS Wells

| Location | Pressure (PSIG) | Flow (SCFMG) | Valve Pos. (% Open) | Comments | Location | Pressure (PSIG) | Flow (SCFMG) | Valve Pos. (% Open) | Comments |
|----------|-----------------|--------------|---------------------|----------|----------|-----------------|--------------|---------------------|-----------------------|
| AS-7 | | | | | AS-17 | <u>6.5</u> | <u>7.0</u> | <u>100</u> | |
| AS-8 | | | | | AS-18 | <u>9.0</u> | <u>1.2</u> | <u>100</u> | |
| AS-9 | | | | | AS-19 | <u>9.5</u> | <u>1.2</u> | <u>100</u> | |
| AS-10 | | | | | AS-20 | <u>9.0</u> | <u>3.6</u> | <u>100</u> | |
| AS-11 | | | | | AS-21 | <u>6.5</u> | <u>1.0</u> | <u>100</u> | |
| AS-12 | | | | | AS-22 | <u>8.5</u> | <u>2.4</u> | <u>100</u> | <u>Float Bouncing</u> |
| AS-13 | | | | | AS-1 | | | | |
| AS-14 | | | | | AS-2 | | | | |
| AS-15 | | | | | AS-3 | | | | |
| AS-16 | | | | | AS-4 | | | | |
| AS-23 | | | | | AS-5 | | | | |
| AS-24 | | | | | AS-6 | | | | |
| AS-25 | | | | | | | | | |
| AS-26 | | | | | | | | | |
| AS-27 | | | | | | | | | |

Notes:

Abbreviations:

ppmv = Parts per million volume
 % = Percent
 deg F = degrees Fahrenheit

" H₂O = Inches of water
 SCFMG = Standard cubic feet per minute gauge
 PSIG = Pounds per square inch gauge



PORT OF SEATTLE - TERMINAL 30

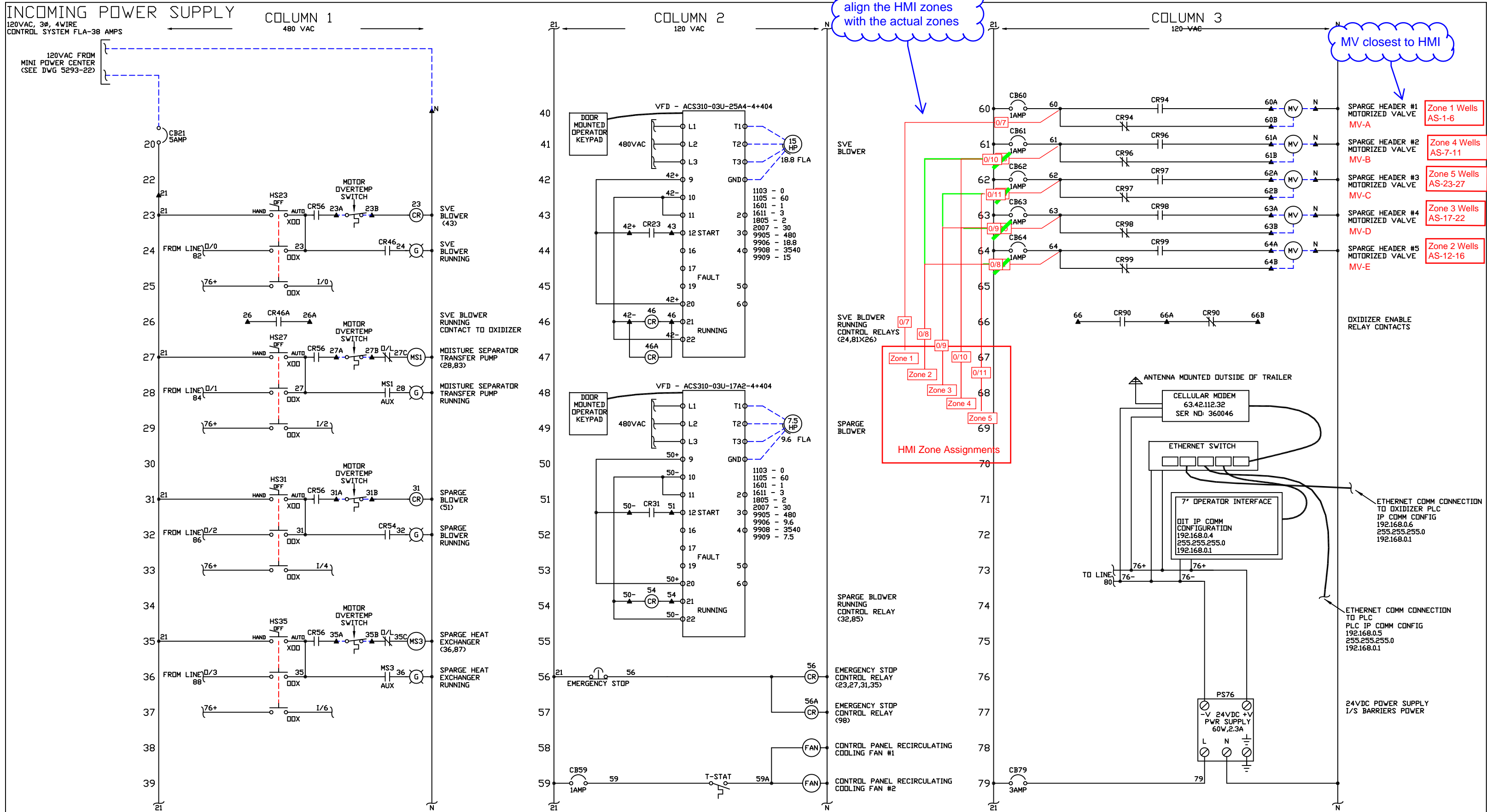
| AS & SVE Manifold Readings - New Zone From Initial Round of Readings | | | | | | | | | |
|--|-----------------|--------------|---------------------|--------------|--------------------------|-----------------|--------------|---------------------|----------|
| Date: 7/7/22 | | | | | Time: 1843 | | | | |
| Field Tech(s): | | | | | Equipment I.D. #: 045235 | | | | |
| Sparge Heat Exchanger Discharge Temperature (°F) - TI-500: | | | | | | | | | |
| AS Blower Pressure (PSI) - PI-501: | | | | | | | | | |
| AS Blower Differential Pressure (" H ₂ O) - DPI-500: | | | | | | | | | |
| SVE System Inlet Vacuum (" H ₂ O): | | | | | | | | | |
| SVE System Inlet ΔP (" H ₂ O): | | | | | | | | | |
| SVE Blower Inlet Temperature (°F) - TI-200: | | | | | | | | | |
| SVE Wells | | | | | | | | | |
| Location | Vacuum ("H2O) | Flow (SCFMG) | Valve Pos. (% Open) | Comments | Location | Vacuum ("H2O) | Flow (SCFMG) | Valve Pos. (% Open) | Comments |
| HSVE-2 | | | | | SVE-10 | | | | |
| HSVE-3 | | | | | SVE-9 | | | | |
| SVE-4 | | | | | SVE-8 | | | | |
| SVE-5 | | | | | SVE-6 | | | | |
| SVE-7 | | | | | HSVE-1 | | | | |
| AS Wells | | | | | | | | | |
| Location | Pressure (PSIG) | Flow (SCFMG) | Valve Pos. (% Open) | Comments | Location | Pressure (PSIG) | Flow (SCFMG) | Valve Pos. (% Open) | Comments |
| AS-7 | 9.0 | 9 | 100 | | AS-17 | | | | |
| AS-8 | 8.5 | 4.2 | 100 | | AS-18 | | | | |
| AS-9 | 8.0 | 4.4 | 100 | | AS-19 | | | | |
| AS-10 | 8.5 | 0 | 100 | Floot broken | AS-20 | | | | |
| AS-11 | 9.0 | 8.6 | 100 | | AS-21 | | | | |
| AS-12 | | | | | AS-22 | | | | |
| AS-13 | | | | | AS-1 | | | | |
| AS-14 | | | | | AS-2 | | | | |
| AS-15 | | | | | AS-3 | | | | |
| AS-16 | | | | | AS-4 | | | | |
| AS-23 | | | | | AS-5 | | | | |
| AS-24 | | | | | AS-6 | | | | |
| AS-25 | | | | | | | | | |
| AS-26 | | | | | | | | | |
| AS-27 | | | | | | | | | |
| Notes: | | | | | | | | | |

Abbreviations:

ppmv = Parts per million volume
 % = Percent
 deg F - degrees Fahrenheit

" H₂O = Inches of water
 SCFMG = Standard cubic feet per minute gauge
 PSIG = Pounds per square inch gauge





| REVISIONS | | | |
|-----------|-------------------------|----------|-----|
| REV | DESCRIPTION | DATE | DWN |
| A | RELEASE FOR SUBMITTAL | 05/10/19 | RC |
| B | RELEASE FOR RESUBMITTAL | 06/10/19 | RC |
| C | RELEASE FOR PRODUCTION | 06/26/19 | RC |
| D | AS BUILT | 08/12/19 | RC |

UNLESS SPECIFIED OTHERWISE
 * DIMENSIONS ARE IN INCHES
 * DO NOT SCALE DRAWING

DRAWN BY: RC
 DESIGNED BY: RC
 PROJECT MANAGER: TP
 DATE: 05/02/19
 PROJECT NO.: 5293

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PROJECT TITLE:
 TERMINAL 30 FORMER CHEVRON SITE CLEANUP
 MC-0319210
 WORK PROJECT #:U00212

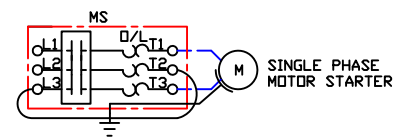
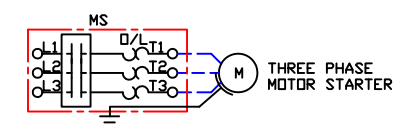
DRAWING TITLE:
 SCHEMATIC CONTROL PANEL

SHEET 3 OF 5
 DRAWING NO.:
 5293-23

CLEAR CREEK - TERMINAL 30 CLEANUP - SEATTLE, WA/#5293

STANDARD CONTROL PANEL SYMBOLS AND NOTES

- ▲ TERMINAL IN PANEL
- (CK) MOTOR CONTACTOR
- (G) GREEN PILOT LIGHT
- (R) RED PILOT LIGHT
- (W) WHITE PILOT LIGHT
- (A) AMBER PILOT LIGHT
- (TDR) CONTROL TIMER
- (CR) CONTROL RELAY
- (RTM) ELAPSED RUN TIMER METER
- FLOAT SWITCH CLOSES ON RISING LEVEL
- FLOAT SWITCH OPENS ON RISING LEVEL
- PRESSURE SWITCH CLOSES ON RISING PRESSURE
- PRESSURE SWITCH OPENS ON RISING PRESSURE
- TEMPERATURE SWITCH OPENS ON RISING TEMPERATURE
- TEMPERATURE SWITCH CLOSES ON RISING TEMPERATURE
- TIMER CONTACT CLOSES AFTER TIME SET
- TIMER CONTACT OPENS AFTER TIME SET
- ⋈ NORMALLY OPEN CONTACT
- ⋈ NORMALLY CLOSED CONTACT
- FIELD WIRING
- MULTI-POSITION GROUNDING BLOCK



- ⏏ NORMALLY OPEN MOMENTARY PUSHBUTTON
- ⏏ NORMALLY CLOSED MOMENTARY PUSHBUTTON
- ⏏ THREE POSITION H.O.A. SELECTOR SWITCH
- ⏏ SELECTOR SWITCH
ADDITIONAL CONTACTS MAY BE ADDED
- ⏏ 1 POLE CIRCUIT BREAKER
- ⏏ 2 POLE CIRCUIT BREAKER
- ⏏ 3 POLE CIRCUIT BREAKER
- ⏏ WIRE CONTINUATION
- ⏏ DISTRIBUTION BLOCK
- ⏏ FUSE WITH HOLDER
(TYPE & SIZE INDICATED)
- ⏏ DISCONNECT SWITCH

- WIRING COLORING & NOTES:**
- 1) 120VAC CONTROL - RED (16AWG OR 18AWG)
 - 2) 120NEUTRAL - WHITE (16AWG OR 18AWG)
 - 3) 24VDC POSITIVE - BLUE (16AWG)
 - 4) 24VDC COMMON - WHITE W/ BLUE STRIPE (16AWG)
 - 5) GROUND - GREEN (16AWG)
 - 6) ALL OTHER WIRING AS INDICATED
 - 7)

- TORQUE SPECIFICATIONS**
- 1) FIELD WIRING TERMINALS - 7LB-IN
 - 2) 25 AMP CONTACTORS - 16LB-IN
 - 3) OVERLOADS - 16LB-IN
 - 4) DISTRIBUTION BLOCK PRIMARY - 120LB-IN
 - 5) ALL OTHER DEVICES PER MANUFACTURER SPECIFICATIONS

CONTROL PANEL FULL LOAD PER UL508A/698A
NOT OVERALL SYSTEM POWER REQUIRED PER NEC OR LOCAL INSPECTING AUTHORITY
480VAC, 3Ø CONTROL PANEL LOAD PER UL508A PROCEDURES

| 480VAC, 3Ø, 3WIRE | | L1 | L2 | L3 |
|-----------------------------------|-------|-------|-------|-------|
| SVE BLOWER | 15HP | 18.8A | 18.8A | 18.8A |
| MOISTURE SEPARATOR TRANSFER PUMP | 3/4HP | 1.35A | 1.35A | 1.35A |
| SPARGE BLOWER | 7.5HP | 9.6A | 9.6A | 9.6A |
| SPARGE BLOWER HEAT EXCHANGER | 1/2HP | .9A | .9A | .9A |
| CONTROL PANEL SYSTEM FLA @ 480VAC | | 30.7A | 30.7A | 30.7A |

CONTROL PANEL FULL LOAD PER UL508A/698A
NOT OVERALL SYSTEM POWER REQUIRED PER NEC OR LOCAL INSPECTING AUTHORITY
120VAC, 1Ø CONTROL PANEL LOAD PER UL508A PROCEDURES

| 120VAC, 1Ø, 3WIRE | | L1 | N |
|-----------------------------------|--|----|----|
| CONTROL PANEL | | 3A | 3A |
| CONTROL PANEL SYSTEM FLA @ 120VAC | | 3A | 3A |

REVISIONS

| REV | DESCRIPTION | DATE | DWN |
|-----|-------------------------|----------|-----|
| A | RELEASE FOR SUBMITTAL | 05/10/19 | RC |
| B | RELEASE FOR RESUBMITTAL | 06/10/19 | RC |
| C | RELEASE FOR PRODUCTION | 06/26/19 | RC |
| D | AS BUILT | 08/12/19 | RC |

UNLESS SPECIFIED OTHERWISE
* DIMENSIONS ARE IN INCHES
* DO NOT SCALE DRAWING

DRAWN BY: RC
DESIGNED BY: RC
PROJECT MANAGER: TP
DATE: 05/02/19
PROJECT NO.: 5293

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PROJECT TITLE:
TERMINAL 30 FORMER CHEVRON SITE CLEANUP
MC-0319210
WORK PROJECT #:U00212

DRAWING TITLE:
SCHEMATIC CONTROL PANEL

SHEET 1 OF 5
DRAWING NO.:
5293-21

AECOM Daily Tailgate Meeting Summary

Project information

| | |
|-------------------------|---------------|
| Project Name | T-30 |
| Project Number | 60681370 |
| Project Manager | Paul Kalina |
| Project Manager Phone # | 2063105097 |
| Muster Point location | Main gate |
| Meeting date | 7/7/2022 |
| Business Line | Environment |
| SH&E Manager | Tim Gilles |
| SH&E Manager Phone # | 3128335991 |
| First Aid Kit Location | Conex |
| Prepared by | Friedman, Gus |

Shift Summary

| | |
|--------------------------------|---|
| Location | SoDo |
| Attendees (Workers) | Corley, Antonio;Friedman, Gus; |
| Attendees (Visitors) | |
| Tasks to be performed | Biweekly O&M Zone rewiring analysis GAC dimension measurements Replacement equipment analysis |
| Hazards to be considered today | noise, mechanical, electrical |
| Will there be Lone Workers? | No |
| Hierarchy of controls | elimination, ppe |
| Personal Protective Equipment | Task Specific: gloves Mandatory: safetyglasses, longpants, reflectivevest, workboots |
| High Risk Events | |

| | |
|---|---|
| Topic of the week | Hand Tools |
| Other topics discussed | |
| Mid day reviews | |
| End of the day comments. The supervisor confirms that the site is being left in a safe condition and work crew checked out as fit unless otherwise specified here | |
| Hazards | <ul style="list-style-type: none">• Mechanical• Noise• Electrical |

DAILY FIELD LOG

Project Information

| | |
|---------------------------|----------------------------------|
| Project Name: <u>T-30</u> | Location: <u>Port of Seattle</u> |
| Project/Task No.: _____ | Weather: <u>Sunny 76°F</u> |
| Date: <u>7/22/22</u> | Personnel: <u>AC, GF</u> |

Observations

| # | Time | Observation Description | | | | | | | | | | | | | | | | | | |
|----------------|-----------------|--|--|-----------------|--------------|-------|-----------|-----|-----|------------------------------------|--------------|-----|-----|--|------------|------|------|----------------|------|-----|
| 1 | 1608 | Arrived onsite, System "ON" on arrival. Did safety tailgate | | | | | | | | | | | | | | | | | | |
| 2 | | meeting | | | | | | | | | | | | | | | | | | |
| 3 | 1620 | Began taking system readings | | | | | | | | | | | | | | | | | | |
| 4 | 1649 | All readings taken, began taking PID readings | | | | | | | | | | | | | | | | | | |
| 5 | 1702 | PID readings complete | | | | | | | | | | | | | | | | | | |
| 6 | 1711 | GF began checking all Magnehelic gauges using Manometer from | | | | | | | | | | | | | | | | | | |
| 7 | | QTA to compare readings - See See chart below | | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | | | | | |
| 10 | | <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 25%;">Mag Location</th> <th style="width: 25%;">Current Reading</th> <th style="width: 25%;">Manometer QC</th> <th style="width: 25%;">Notes</th> </tr> </thead> <tbody> <tr> <td>AS Intake</td> <td>1.0</td> <td>1.1</td> <td>0-2, 0-5 range vs 0-15 range gauge</td> </tr> <tr> <td>SVE Influent</td> <td>1.0</td> <td>1.4</td> <td rowspan="3" style="text-align: center; vertical-align: middle;"> <div style="border-left: 1px solid black; border-right: 1px solid black; height: 40px; margin: 0 auto;"></div> </td> </tr> <tr> <td>SVE Filter</td> <td>0.25</td> <td>0.65</td> </tr> <tr> <td>Oxidizer Inlet</td> <td>0.30</td> <td>0.7</td> </tr> </tbody> </table> | Mag Location | Current Reading | Manometer QC | Notes | AS Intake | 1.0 | 1.1 | 0-2, 0-5 range vs 0-15 range gauge | SVE Influent | 1.0 | 1.4 | <div style="border-left: 1px solid black; border-right: 1px solid black; height: 40px; margin: 0 auto;"></div> | SVE Filter | 0.25 | 0.65 | Oxidizer Inlet | 0.30 | 0.7 |
| Mag Location | Current Reading | Manometer QC | Notes | | | | | | | | | | | | | | | | | |
| AS Intake | 1.0 | 1.1 | 0-2, 0-5 range vs 0-15 range gauge | | | | | | | | | | | | | | | | | |
| SVE Influent | 1.0 | 1.4 | <div style="border-left: 1px solid black; border-right: 1px solid black; height: 40px; margin: 0 auto;"></div> | | | | | | | | | | | | | | | | | |
| SVE Filter | 0.25 | 0.65 | | | | | | | | | | | | | | | | | | |
| Oxidizer Inlet | 0.30 | 0.7 | | | | | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | | | | | | | |
| 16 | 1727 | All gauges checked - GF suggest we change gauges from the | | | | | | | | | | | | | | | | | | |
| 17 | | current 0-15 range to a more reasonable 0-5 or 0-2 range | | | | | | | | | | | | | | | | | | |
| 18 | | for more accurate readings | | | | | | | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | | | | | | | | | |
| 20 | 1740 | GF checks breakthrough pressure for the sponge rotameters | | | | | | | | | | | | | | | | | | |
| 21 | | AS-1 through AS-6 | | | | | | | | | | | | | | | | | | |
| 22 | | See chart on next page | | | | | | | | | | | | | | | | | | |
| 23 | | | | | | | | | | | | | | | | | | | | |
| 24 | | | | | | | | | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | | | | | | | | |

Comments / Site Activities / Personnel Tracking

DAILY FIELD LOG

Project Information

| | |
|---------------------------|----------------------------------|
| Project Name: <u>T-30</u> | Location: <u>Port of Seattle</u> |
| Project/Task No.: _____ | Weather: _____ |
| Date: <u>7/22/22</u> | Personnel: <u>AC, GF</u> |

Observations

| Time | Observation Description | | | | | | | |
|------|-------------------------|--|-------|----------|--------------|-------|-------|------------------------------|
| 1 | | | | | | | | |
| 2 | | | | | | | | |
| 3 | 1740 | well | Init. | Init | Breakthrough | Final | % | Comments |
| 4 | | ID | Flow | Pressure | Pressure | Flow | open | |
| 5 | | AS-1 | 7.4 | 9.5 | 8.0 | 8.8 | 100 | |
| 6 | | AS-2 | 1.0 | 8.5 | 7.75 | 1.2 | 100 | Sticky rotameter |
| 7 | | AS-3 | 6.4 | 8.5 | 7.50 | 8.4 | 100 | |
| 8 | | AS-4 | 4.2 | 2.5 | <1.5 | 8.2 | 100 | Sticky rotameter/Floet Stick |
| 9 | | AS-5 | 11.6 | 9.0 | <5.25 | 11.6 | 100 | |
| 10 | | AS-6 | 11.8 | 8.5 | 5.25 | 4.3 | crack | |
| 11 | | | | | | | | |
| 12 | | Switched Zones 1 and 3 to check for zone | | | | | | |
| 13 | | 3 next time | | | | | | |
| 14 | 1755 | Done with all work for the day. Leaving site | | | | | | |
| 15 | | | | | | | | |
| 16 | | | | | | | | |
| 17 | | | | | | | | |
| 18 | | | | | | | | |
| 19 | | AC | | | | | | |
| 20 | | 7/22/22 | | | | | | |
| 21 | | | | | | | | |
| 22 | | | | | | | | |
| 23 | | | | | | | | |
| 24 | | | | | | | | |
| 25 | | | | | | | | |

Comments / Site Activities / Personnel Tracking

PORT OF SEATTLE - TERMINAL 30

| SVE/AS & Oxidizer System Data Collection Form | | | |
|---|---|---|---------------|
| Date: 7/22/22 | Field Tech(s): AC, GF | | |
| Actual Time: 1608 | AS/SVE HMI Time: 1549 07/22/22 | | |
| SVE/AS System | | | |
| SVE Blower Speed (Hertz) - VFD | 54 HMI | Spurge Blower Speed (Hertz) - VFD | 52 HMI |
| SVE Blower Runtime (Hours) | 12556.2 HMI | AS Blower Runtime (Hours) - Spurge Blower | 6692.5 HMI |
| Transfer Pump Runtime (Hours) - MS Pump | 2.6 HMI | Spurge Heat Exchanger Runtime (Hours) | 6691.4 HMI |
| Spurge Zone 1 Time Span(s) Operational: | 1500-2000 HMI | Spurge Zone 4 Time Span(s) Operational: | 0500-1030 HMI |
| Spurge Zone 2 Time Span(s) Operational: | 0000-0530 HMI | Spurge Zone 5 Time Span(s) Operational: | 1930-0030 HMI |
| Spurge Zone 3 Time Span(s) Operational: | 1000-1530 HMI | Spurge Zone Active: | Zone 1 |
| Spurge Heat Exchanger Discharge Temperature (°F) - TI-500 | 88°F | SVE Blower Filter Differential Pressure (" H2O) - DPI-200 | 0.5 |
| AS Blower Pressure (PSI) - PI-501 | 9.0 | SVE Blower Inlet Differential Pressure (" H2O) - FI-200 | 1.0 |
| AS Blower Differential Pressure (" H2O) - DPI-500 | 1.0 | Transfer Pump Discharge Pressure (PSI) - PI-300 | 0 |
| SVE Blower Inlet Temperature (°F) - TI-200 | 78°F | SVE Blower Discharge Pressure (" H2O) - PI-400 | 0 |
| SVE Blower Inlet Vacuum (" H2O) - VI-200 | 74 | SVE Blower Discharge Temperature (°F) - TI-400 | 116°F |
| Oxidizer System | | | |
| Inlet Temperature (°F) | 663 HMI | Process Blower Runtime (Hours) | 19390 HMI |
| Burner Chamber Temperature (°F) | 681 HMI | Combustion Fan Runtime (Hours) | 19391 HMI |
| Outlet Temperature (°F) | 631 HMI | Burner Runtime (Hours) | 19380 HMI |
| Inlet Limit Controller Temperature (°F) | 698 HMI | Processing Vapors Runtime (Hours) | 19365 HMI |
| Outlet Limit Controller Temperature (°F) | 622 HMI | Panel Temperature (°F) | 90°F HMI |
| Process Fan Valve Position (Open/Closed) | Open HMI | Flame Signal (Volts) | 5.0 HMI |
| Dilution Valve Position (%) | 0 HMI | Oxidizer Inlet Differential Pressure (" H2O) - FI-1 | 0.30 |
| Combustion Valve Position (%) | 14.2 HMI | | |
| Other Components | | | |
| Moisture Separator Level (% Full) | water had at 50% 50% before pump kicks on | Propane Tank A Level (%) | 65 |
| Water Storage Tank Level (DTF, TD from MP; inches) | 21 inch | Propane Tank B Level (%) | 60 |
| NOTES: | | | |
| Abbreviations: | | | |
| 1. " H ₂ O = Inches of Water | 5. DTF - Depth to Fluid | | |
| 2. °F = Degrees Fahrenheit | 6. TD - Total Depth | | |
| 3. PSI = Pounds per Square Inch | 7. MP - Measuring Point | | |
| 4. % = Percent | | | |



PORT OF SEATTLE - TERMINAL 30

AS & SVE Manifold Readings

| | | | |
|--|---------|-------------------|--------|
| Date: | 7/22/22 | Time: | 1610 |
| Field Tech(s): | AL, GF | Equipment I.D. #: | 045235 |
| SVE Discharge VOC (ppmv) PID | 12.1 | | |
| SVE Discharge LEL (%) | | | |
| Oxygen (%) | | | |
| SVE System Inlet Vacuum (" H ₂ O) | | | |
| SVE System Inlet ΔP (" H ₂ O) | | | |
| Oxidizer Discharge VOC (ppmv) PID | 0.9 | | |

SVE Wells

| Location | Vacuum ("H ₂ O) | Flow (SCFMG) | Valve Pos. (% Open) | Comments | Location | Vacuum ("H ₂ O) | Flow (SCFMG) | Valve Pos. (% Open) | Comments |
|----------|----------------------------|--------------|---------------------|--------------------------|----------|----------------------------|--------------|---------------------|----------------|
| HSVE-2 | 26 | 72 | 100 | | SVE-10 | 52 | 12 | 100 | Float bouncing |
| HSVE-3 | 32 | 70 | 100 | | SVE-9 | 50 | 2 | 100 | Float broken |
| SVE-4 | 50 | 15 | 100 | Gauge and float bouncing | SVE-8 | 60 | 2.0 | 100 | Float broken |
| SVE-5 | 10 | 12 | 100 | Float broken | SVE-6 | 70 | 10 | 100 | Gauge bouncing |
| SVE-7 | 52 | 16 | 100 | | HSVE-1 | 12 | 74 | 15% | |

AS Wells

| Location | Pressure (PSIG) | Flow (SCFMG) | Valve Pos. (% Open) | Comments | Location | Pressure (PSIG) | Flow (SCFMG) | Valve Pos. (% Open) | Comments |
|----------|-----------------|--------------|---------------------|----------|----------|-----------------|--------------|---------------------|----------|
| AS-7 | | | | | AS-17 | | | | |
| AS-8 | | | | | AS-18 | | | | |
| AS-9 | | | | | AS-19 | | | | |
| AS-10 | | | | | AS-20 | | | | |
| AS-11 | | | | | AS-21 | | | | |
| AS-12 | | | | | AS-22 | | | | |
| AS-13 | | | | | AS-1 | 9.5 | 87.4 | 100 | |
| AS-14 | | | | | AS-2 | 8.5 | 1.0 | 100 | |
| AS-15 | | | | | AS-3 | 8.5 | 6.4 | 30% | |
| AS-16 | | | | | AS-4 | 2.5 | 4.2 | 100 | |
| AS-23 | | | | | AS-5 | 9.0 | 11.6 | 100 | |
| AS-24 | | | | | AS-6 | 8.5 | 11.8 | 100 | |
| AS-25 | | | | | | | | | |
| AS-26 | | | | | | | | | |
| AS-27 | | | | | | | | | |

Notes:

Abbreviations:

ppmv = Parts per million volume
 % = Percent
 deg F - degrees Fahrenheit

" H₂O = Inches of water
 SCFMG = Standard cubic feet per minute gauge
 PSIG = Pounds per square inch gauge



AECOM Daily Tailgate Meeting Summary

Project information

| | |
|-------------------------|-----------------|
| Project Name | T-30 |
| Project Number | 60681370 |
| Project Manager | Paul Kalina |
| Project Manager Phone # | 2063105097 |
| Muster Point location | Main gate |
| Meeting date | 7/22/2022 |
| Business Line | Environment |
| SH&E Manager | Tim Gilles |
| SH&E Manager Phone # | 3128335991 |
| First Aid Kit Location | Conex |
| Prepared by | Corley, Antonio |

Shift Summary

| | |
|--------------------------------|--|
| Location | SoDo |
| Attendees (Workers) | Friedman, Gus; |
| Attendees (Visitors) | |
| Tasks to be performed | Biweekly system O&M |
| Hazards to be considered today | pressure, noise, mechanical, electrical |
| Will there be Lone Workers? | No |
| Hierarchy of controls | elimination, administrativecontrols, ppe |
| Personal Protective Equipment | Task Specific: gloves, earprotection Mandatory: safetyglasses, longpants, reflectivevest, workboots |
| High Risk Events | <ul style="list-style-type: none"> • Uncontrolled release of electricity • Contact with moving parts of machinery • Impact by vehicle or mobile equipment |

| | |
|---|--|
| Topic of the week | Heat Stress - Darker urine color, drink water, use shadows and breaks, Heat Stress Index |
| Other topics discussed | |
| Mid day reviews | |
| End of the day comments. The supervisor confirms that the site is being left in a safe condition and work crew checked out as fit unless otherwise specified here | |
| Hazards | <ul style="list-style-type: none">• Mechanical• Noise• Pressure• Electrical |



INSTRUMENT CALIBRATION REPORT

Pine Environmental Services LLC

3225 South 116th St.
Building 1 Suite 181
Tukwila, WA 98168
425-285-9102

Pine Environmental Services, Inc.

Instrument ID 45235
Description Mine Rae 3000
Calibrated 7/21/2022 5:54:01PM

Manufacturer Rae Systems
Model Number PGM7320
Serial Number/ Lot Number 592-927137w2
Location Seattle
Department

State Certified
Status Pass
Temp °C 27
Humidity % 42

Calibration Specifications

Group # 1
Group Name Isobutylene
Stated Accy Pct of Reading

Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.00

| <u>Nom In Val / In Val</u> | <u>In Type</u> | <u>Out Val</u> | <u>Out Type</u> | <u>Fnd As</u> | <u>Lft As</u> | <u>Dev%</u> | <u>Pass/Fail</u> |
|----------------------------|----------------|----------------|-----------------|---------------|---------------|-------------|------------------|
| 100.00 / 100.00 | PPM | 100.00 | PPM | 99.60 | 100.00 | 0.00% | Pass |

Test Instruments Used During the Calibration

(As Of Cal Entry Date)

| <u>Test Standard ID</u> | <u>Description</u> | <u>Manufacturer</u> | <u>Model Number</u> | <u>Serial Number / Lot Number</u> | <u>Last Cal Date / Opened Date</u> | <u>Next Cal Date / Expiration Date</u> |
|------------------------------------|------------------------------|---------------------|---------------------|-----------------------------------|--|--|
| SEA ISO 10 PPM TJBJ-248-10-7 | Isobutylene (C4H8) 10 PPM | Gasco | 31716 | TJBJ-248-10-7 | | 1/16/2024 |

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Jose Arroyo

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment
Please call 800-301-9663 for Technical Assistance

INSTRUMENT QC/ PACKING LIST

| | |
|-----------------|--|
| Description | RAE Systems MiniRAE 3000 |
| Instrument ID | 45235 |
| Lamp Voltage | <input checked="" type="checkbox"/> 10.6 eV <input type="checkbox"/> 11.7 eV <input type="checkbox"/> 9.8 eV |
| Date Calibrated | 07-21-22 |



| Standard Items | Prepared | QC check | Received by customer | Returned to Pine |
|---|----------|----------|----------------------|------------------|
| MiniRAE 3000 with carry case | / | / | _____ | _____ |
| Rechargeable battery (installed) | / | / | _____ | _____ |
| Protective rubber boot | / | / | _____ | _____ |
| Manual | / | / | _____ | _____ |
| Quick reference card | / | / | _____ | _____ |
| Probe tip | / | / | _____ | _____ |
| Charger/ adapter, or charger and cradle | / | / | _____ | _____ |
| (2) Hydrophobic filters | / | / | _____ | _____ |
| Alkaline adapter with (4) AA alkaline batteries installed | / | / | _____ | _____ |
| ProCal calibration sheet | / | / | _____ | _____ |
| Supporting Items | | | | |
| 100 ppm isobutylene calibration gas | | | _____ | _____ |
| Gas regulator | | | _____ | _____ |
| Tedlar bag | | | _____ | _____ |
| Datalogging software | | | _____ | _____ |
| Communications cable | | | _____ | _____ |
| *100 ppm Isobutylene SDS | | | _____ | _____ |
| ✓ Must match cylinder with setup | | | | |
| *SDS provided upon request | | | | |
| Spare alkaline battery pack | | | _____ | _____ |
| _____ Alkaline AA batteries | | | _____ | _____ |

Prepared by: LA
 QC checked by: KN
 Date: 07-21-22

This packing list is to ensure that every item needed to operate the unit was sent and received. Upon receiving a shipment, please fill out the "Received by customer" column. Call Pine within 24 hours of receiving the equipment if any pieces are missing, damaged, or malfunctioning. Thank you for choosing Pine Environmental Services LLC

DAILY FIELD LOG

Project Information

Page ____ of ____

| | |
|---|--|
| Project Name: <u> T-30 </u> | Location: <u> Port of Seattle </u> |
| Project/Task No.: <u> </u> | Weather: <u> </u> |
| Date: <u> 8/5/2022 </u> | Personnel: <u> AC </u> |

Observations

| # | Time | Observation Description |
|----|------|--|
| 1 | 1440 | Arrive on-site, System is on, Perform safety tail gate |
| 2 | 1445 | Tailgate complete, begin taking HMT Readings |
| 3 | 1529 | All readings taken, Zone change from Zone 1 to Zone |
| 4 | | 3 happens at 1521 real time, will wait for |
| 5 | | system to warm up and then take Zone change |
| 6 | | readings |
| 7 | 1540 | Began taking zone change readings |
| 8 | 1545 | All readings taken, locking up and leaving site |
| 9 | | |
| 10 | | |
| 11 | | |
| 12 | | |
| 13 | | |
| 14 | | |
| 15 | | |
| 16 | | |
| 17 | | |
| 18 | | AC 8/5/22 |
| 19 | | |
| 20 | | |
| 21 | | |
| 22 | | |
| 23 | | |
| 24 | | |
| 25 | | |

Comments / Site Activities / Personnel Tracking

PORT OF SEATTLE - TERMINAL 30

| SVE/AS & Oxidizer System Data Collection Form | | | |
|--|-----------|---|-----------|
| Date: | 8/8/22 | Field Tech(s): | AC |
| Actual Time: | 1435 | AS/SVE HMI Time: | 1414 |
| SVE/AS System | | | |
| SVE Blower Speed (Hertz) - VFD | 54.0 | Sparge Blower Speed (Hertz) - VFD | 52.0 |
| SVE Blower Runtime (Hours) | 12679.6 | AS Blower Runtime (Hours) - Sparge Blower | 6812.5 |
| Transfer Pump Runtime (Hours) - MS Pump | 2.7 | Sparge Heat Exchanger Runtime (Hours) | 6811.4 |
| Sparge Zone 1 Time Span(s) Operational: | 1000-1530 | Sparge Zone 4 Time Span(s) Operational: | 0500-1030 |
| Sparge Zone 2 Time Span(s) Operational: | 0000-0530 | Sparge Zone 5 Time Span(s) Operational: | 1930-0030 |
| Sparge Zone 3 Time Span(s) Operational: | 1500-2000 | Sparge Zone Active: | 1 |
| AS Blower Intake Pressure (" H2O) - DPI-500 | 0.60 | SVE Blower Filter Differential Pressure (" H2O) - DPI-200 | 0.50 |
| AS Blower Discharge Pressure (PSI) - PI-501 | 8.5 | SVE Blower Inlet Differential Pressure (" H2O) - FI-200 | 1.0 |
| Sparge Heat Exchanger Discharge Temp (°F) - TI-500 | 86°F | Transfer Pump Discharge Pressure (PSI) - PI-300 | 0 |
| SVE Blower Inlet Temperature (°F) - TI-200 | 80°F | SVE Blower Discharge Pressure (" H2O) - PI-400 | 0 |
| SVE Blower Inlet Vacuum (" H2O) - VI-200 | 85 | SVE Blower Discharge Temperature (°F) - TI-400 | 118°F |
| Oxidizer System | | | |
| Oxidizer Inlet Differential Pressure (" H2O) - FI-1 | 0.46 | Combustion Valve Position (%) | 14.7% |
| Burner Chamber Temperature (°F) | 677°F | Process Blower Runtime (Hours) | 19514 |
| Outlet Temperature (°F) | 611°F | Combustion Fan Runtime (Hours) | 19515 |
| Inlet Limit Controller Temperature (°F) | 661°F | Burner Runtime (Hours) | 19504 |
| Outlet Limit Controller Temperature (°F) | 613°F | Processing Vapors Runtime (Hours) | 19489 |
| Process Fan Valve Position (Open/Closed) | Open | Panel Temperature (°F) | 90°F |
| Dilution Valve Position (%) | 0 | Flame Signal (Volts) | 5.0 |
| Combustion Valve Position (%) | 14.7% | | |
| Other Components | | | |
| Knockout Tank Level (Sightglass % Full) ¹ | Empty 0% | Propane Tank A Level (%) | 72% |
| Water Depth in Storage Tank (DTF from MP/TD (calc); inches) ² | 1 inch | Propane Tank B Level (%) | 70% |
| NOTES: | | | |

Abbreviations:

" H₂O = Inches of Water
 °F = Degrees Fahrenheit
 PSI = Pounds per Square Inch
 % = Percent

DTF - Depth to Fluid
 DTB - Depth to Bottom
 MP - Measuring Point
 TD - Total Depth (of fluid)

Notes:

1. Low float = 0% full. Mid float = 100% full.
2. DTB of water tank from the MP is XX. Calculate the water depth by subtracting DTF from DTB.



PORT OF SEATTLE - TERMINAL 30

AS & SVE Manifold Readings

Date: 8/5/22 Time: 1445
 Field Tech(s): AC Equipment I.D. #: 17227

Vapor Concentrations

Oxidizer Inlet VOC (ppmv) PID: 99.6
 Oxidizer Discharge VOC (ppmv) PID: 2.5

SVE Wells

| Well ID | Vacuum (H ₂ O) | Flow (SCFMG) | Valve Pos. (% Open) | Dewater (Gal) | Comments | Well ID | Vacuum (H ₂ O) | Flow (SCFMG) | Valve Pos. (% Open) | Dewater (Gal) | Comments |
|---------|---------------------------|--------------|---------------------|---------------|--------------|---------|---------------------------|--------------|---------------------|---------------|---------------------------|
| HSVE-2 | 28 | 68 | 100% | | | SVE-10 | 52 | 20 | 100 | | |
| HSVE-3 | 34 | 64 | 100% | | | SVE-9 | 44 | 10 | 100% | | Floot bouncing |
| SVE-4 | 48 | 16 | 100% | | | SVE-8 | 50 | 4.0 | 100% | | Floot broken |
| SVE-5 | 28 | 13 | 100% | | Floot broken | SVE-6 | 68 | 15 | 100% | | Gauge, and Floot bouncing |
| SVE-7 | 48 | 18 | 100% | | | HSVE-1 | 12 | 74 | 25% | | |

Notes:

AS Wells

| Well ID | Pressure (PSIG) | Flow (SCFMG) | Valve Pos. (% Open) | Comments | Well ID | Pressure (PSIG) | Flow (SCFMG) | Valve Pos. (% Open) | Comments |
|---------|-----------------|--------------|---------------------|----------|---------|-----------------|--------------|---------------------|----------|
| Zone 2 | | | | | Zone 4 | | | | |
| AS-7 | | | | | AS-17 | | | | |
| AS-8 | | | | | AS-18 | | | | |
| AS-9 | | | | | AS-19 | | | | |
| AS-10 | | | | | AS-20 | | | | |
| AS-11 | | | | | AS-21 | | | | |
| | | | | | AS-22 | | | | |
| Zone 3 | | | | | Zone 1 | | | | |
| AS-12 | | | | | AS-1 | 9.0 | 6.9 | 100 | |
| AS-13 | | | | | AS-2 | 8.5 | 1.0 | 100 | |
| AS-14 | | | | | AS-3 | 8.0 | 7.4 | 100 | |
| AS-15 | | | | | AS-4 | 5.0 | 12.2 | 100 | |
| AS-16 | | | | | AS-5 | 8.0 | 11.8 | 40 | |
| Zone 5 | | | | | AS-6 | 6.5 | 4.0 | 50 | |
| AS-23 | | | | | | | | | |
| AS-24 | | | | | | | | | |
| AS-25 | | | | | | | | | |
| AS-26 | | | | | | | | | |
| AS-27 | | | | | | | | | |

Notes:

Abbreviations:

% = Percent
 " H₂O = Inches of water
 deg F = degrees Fahrenheit

N/A = Not applicable
 SCFMG = Standard cubic feet per minute gauge
 ppmv = Parts per million volume
 PSIG = Pounds per square inch gauge



PORT OF SEATTLE - TERMINAL 30

AS & SVE Manifold Readings - **New Zone From Initial Round of Readings**

Date: **A 8/5/22** Time: **1540**
 Field Tech(s): **AC** Equipment I.D. #:

Vapor Concentrations

Oxidizer Inlet VOC (ppmv) PID:

Oxidizer Discharge VOC (ppmv) PID:

SVE Wells

| Well ID | Vacuum (H ₂ O) | Flow (SCFMG) | Valve Pos. (% Open) | Dewater (Gal) | Comments | Well ID | Vacuum (H ₂ O) | Flow (SCFMG) | Valve Pos. (% Open) | Dewater (Gal) | Comments |
|---------|---------------------------|--------------|---------------------|---------------|----------|---------|---------------------------|--------------|---------------------|---------------|----------|
| HSVE-2 | 30 | 66 | 100 | | | SVE-10 | 52 | 20 | 100 | | |
| HSVE-3 | 34 | 64 | 100 | | | SVE-9 | 44 | 10 | 100 | | |
| SVE-4 | 48 | 16 | 100 | | | SVE-8 | 50 | 4.0 | 100 | | |
| SVE-5 | 28 | 13 | 100 | | | SVE-6 | 68 | 15 | 100 | | |
| SVE-7 | 48 | 18 | 100 | | | HSVE-1 | 12 | 74 | 25 | | |

Notes:

AS Wells

| Well ID | Pressure (PSIG) | Flow (SCFMG) | Valve Pos. (% Open) | Comments | Well ID | Pressure (PSIG) | Flow (SCFMG) | Valve Pos. (% Open) | Comments |
|---------|-----------------|--------------|---------------------|----------|---------|-----------------|--------------|---------------------|----------|
| Zone 2 | | | | | Zone 4 | | | | |
| AS-7 | | | | | AS-17 | | | | |
| AS-8 | | | | | AS-18 | | | | |
| AS-9 | | | | | AS-19 | | | | |
| AS-10 | | | | | AS-20 | | | | |
| AS-11 | | | | | AS-21 | | | | |
| | | | | | AS-22 | | | | |
| Zone 3 | | | | | Zone 1 | | | | |
| AS-12 | 8.0 | 1.2 | 100 | | AS-1 | 8.5 | 3.6 | 100 | |
| AS-13 | 8.0 | 5.6 | 100 | | AS-2 | 8.0 | 1.0 | 100 | |
| AS-14 | 6.5 | 3.8 | 100 | | AS-3 | 7.5 | 4.4 | 100 | |
| AS-15 | 8.0 | 2.8 | 100 | | AS-4 | 4.0 | 10.4 | 100 | |
| AS-16 | 8.0 | 5.2 | 100 | | AS-5 | 7.5 | 9.2 | 100 | |
| Zone 5 | | | | | AS-6 | 6.0 | 3.8 | 50 | |
| AS-23 | | | | | | | | | |
| AS-24 | | | | | | | | | |
| AS-25 | | | | | | | | | |
| AS-26 | | | | | | | | | |
| AS-27 | | | | | | | | | |

Notes:

Abbreviations:

% = Percent
 " H₂O = Inches of water
 deg F - degrees Fahrenheit

N/A = Not applicable
 ppmv = Parts per million volume
 PSIG = Pounds per square inch gauge

SCFMG = Standard cubic feet per minute gauge





INSTRUMENT CALIBRATION REPORT

Pine Environmental Services LLC

3225 South 116th St.
Building 1 Suite 181
Tukwila, WA 98168
425-285-9102

Pine Environmental Services, Inc.

Instrument ID 17227
Description MinRae 3000
Calibrated 8/4/2022 11:37:01AM

| | |
|---|------------------------|
| Manufacturer Rae Systems | State Certified |
| Model Number PGM-7320 | Status Pass |
| Serial Number/ Lot Number 592-000396 | Temp °C 24 |
| Location Seattle | Humidity % 43 |
| Department | |

Calibration Specifications

| | |
|-----------------------------------|-----------------------------|
| Group # 1 | Range Acc % 0.0000 |
| Group Name Isobutylene | Reading Acc % 3.0000 |
| Stated Accy Pct of Reading | Plus/Minus 0.0 |

| <u>Nom In Val / In Val</u> | <u>In Type</u> | <u>Out Val</u> | <u>Out Type</u> | <u>Fnd As</u> | <u>Lft As</u> | <u>Dev%</u> | <u>Pass/Fail</u> |
|----------------------------|----------------|----------------|-----------------|---------------|---------------|-------------|------------------|
| 100.0 / 100.0 | PPM | 100.0 | PPM | 106.3 | 100.0 | 0.00% | Pass |

Test Instruments Used During the Calibration

(As Of Cal Entry Date)

| <u>Test Standard ID</u> | <u>Description</u> | <u>Manufacturer</u> | <u>Model Number</u> | <u>Serial Number / Lot Number</u> | <u>Last Cal Date / Opened Date</u> | <u>Next Cal Date / Expiration Date</u> |
|---|-------------------------------|---------------------|---------------------|-----------------------------------|--|--|
| SEA ISO 100 PPM MBJ-X02A199C P | Isobutylene (C4H8) 100 PPM | Airgas | x02ai99cp342066 | MBJ-X02A199 CP342066-1 | | 12/5/2023 |

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Jose Arroyo

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

**Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment
Please call 800-301-9663 for Technical Assistance**

INSTRUMENT QC/ PACKING LIST

| | |
|-----------------|--|
| Description | RAE Systems MiniRAE 3000 |
| Instrument ID | 17227 |
| Lamp Voltage | <input checked="" type="checkbox"/> 10.6 eV <input type="checkbox"/> 11.7 eV <input type="checkbox"/> 9.8 eV |
| Date Calibrated | 08-04-22 |



| Standard Items | Prepared | QC check | Received by customer | Returned to Pine |
|---|----------|----------|----------------------|------------------|
| MiniRAE 3000 with carry case | / | / | _____ | _____ |
| Rechargeable battery (installed) | / | / | _____ | _____ |
| Protective rubber boot | / | / | _____ | _____ |
| Manual | / | / | _____ | _____ |
| Quick reference card | / | / | _____ | _____ |
| Probe tip | / | / | _____ | _____ |
| Charger/ adapter, or charger and cradle | / | / | _____ | _____ |
| (2) Hydrophobic filters | / | / | _____ | _____ |
| Alkaline adapter with (4) AA alkaline batteries installed | / | / | _____ | _____ |
| ProCal calibration sheet | / | / | _____ | _____ |
| Supporting Items | | | | |
| 100 ppm isobutylene calibration gas | | _____ | _____ | _____ |
| Gas regulator | | _____ | _____ | _____ |
| Tedlar bag | | _____ | _____ | _____ |
| Datalogging software | | _____ | _____ | _____ |
| Communications cable | | _____ | _____ | _____ |
| *100 ppm Isobutylene SDS | | _____ | _____ | _____ |
| ✓ Must match cylinder with setup | | _____ | _____ | _____ |
| *SDS provided upon request | | | | |
| Spare alkaline battery pack | _____ | _____ | _____ | _____ |
| _____ Alkaline AA batteries | _____ | _____ | _____ | _____ |

Prepared by: JA
 QC checked by: M
 Date: 08-04-22

This packing list is to ensure that every item needed to operate the unit was sent and received. Upon receiving a shipment, please fill out the "Received by customer" column. Call Pine within 24 hours of receiving the equipment if any pieces are missing, damaged, or malfunctioning. Thank you for choosing Pine Environmental Services LLC

AECOM Daily Tailgate Meeting Summary

Project information

| | |
|-------------------------|-----------------|
| Project Name | T-30 |
| Project Number | 60681370 |
| Project Manager | Paul Kalina |
| Project Manager Phone # | 2063105097 |
| Muster Point location | Main gate |
| Meeting date | 8/5/2022 |
| Business Line | Environment |
| SH&E Manager | Tim Gilles |
| SH&E Manager Phone # | 3128335991 |
| First Aid Kit Location | Conex |
| Prepared by | Corley, Antonio |

Shift Summary

| | |
|--------------------------------|--|
| Location | Terminal 30 |
| Attendees (Workers) | Antonio Corley; |
| Attendees (Visitors) | |
| Tasks to be performed | Bi weekly system O&M |
| Hazards to be considered today | pressure, noise, mechanical |
| Will there be Lone Workers? | Yes |
| Hierarchy of controls | administrativecontrols, ppe |
| Personal Protective Equipment | Task Specific: gloves, earprotection Mandatory: safetyglasses, longpants, reflectivevest, workboots |
| High Risk Events | <ul style="list-style-type: none">• Impact by vehicle or mobile equipment• Contact with moving parts of machinery• Uncontrolled release of electricity |

| | |
|---|---|
| Topic of the week | Lock Out Tag Out Basics - 10 basic steps |
| Other topics discussed | |
| Mid day reviews | |
| End of the day comments. The supervisor confirms that the site is being left in a safe condition and work crew checked out as fit unless otherwise specified here | |
| Hazards | <ul style="list-style-type: none">• Mechanical• Noise• Pressure |

DAILY FIELD LOG

Project Information

Page 1 of 1

| | |
|---------------------------|--------------------------|
| Project Name: <u>T-30</u> | Location: <u>Seattle</u> |
| Project/Task No.: _____ | Weather: _____ |
| Date: <u>8/19/22</u> | Personnel: <u>AC, SB</u> |

Observations

| Time | Observation Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------|--|---------------|---------------------|---------------|---------------------|------------|--------|---------|--|--|------|-----|-----|---------|--|--|-----|-----|-----|---------|--|--|-----|-----|-----|---------|--|--|---|------|-----|---------|--|--|-----|-----|----|---------|--|--|-----|-----|----|
| 1 1505 | Arrived on-site, System is on, Do safety tailgate | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | with Steve B | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 1513 | Tailgate complete, Scope of work is BE-weekly system | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | O and M | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 1515 | Begin taking HMI Readings | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 1521 | HMI Readings taken, Began taking burner readings | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 1528 | Burner readings taken. Began taking system Readings | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 1539 | Readings taken, began taking well readings | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 1558 | well reading taken, began taking PID readings | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 1611 | PID readings taken | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 1615 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">Well ID</th> <th style="width: 10%;">Init Flow</th> <th style="width: 10%;">Init Pressure</th> <th style="width: 15%;">Breakthrus Pressure</th> <th style="width: 15%;">Fistul Flw</th> <th style="width: 15%;">% open</th> </tr> </thead> <tbody> <tr> <td>14 AS-1</td> <td></td> <td></td> <td>76.5</td> <td>7.0</td> <td>100</td> </tr> <tr> <td>15 AS-2</td> <td></td> <td></td> <td>6.0</td> <td>3.6</td> <td>100</td> </tr> <tr> <td>16 AS-3</td> <td></td> <td></td> <td>6.5</td> <td>6.4</td> <td>100</td> </tr> <tr> <td>17 AS-4</td> <td></td> <td></td> <td>0</td> <td>10.2</td> <td>100</td> </tr> <tr> <td>18 AS-5</td> <td></td> <td></td> <td>5.0</td> <td>8.8</td> <td>30</td> </tr> <tr> <td>19 AS-6</td> <td></td> <td></td> <td>5.5</td> <td>6.0</td> <td>10</td> </tr> </tbody> </table> | Well ID | Init Flow | Init Pressure | Breakthrus Pressure | Fistul Flw | % open | 14 AS-1 | | | 76.5 | 7.0 | 100 | 15 AS-2 | | | 6.0 | 3.6 | 100 | 16 AS-3 | | | 6.5 | 6.4 | 100 | 17 AS-4 | | | 0 | 10.2 | 100 | 18 AS-5 | | | 5.0 | 8.8 | 30 | 19 AS-6 | | | 5.5 | 6.0 | 10 |
| Well ID | Init Flow | Init Pressure | Breakthrus Pressure | Fistul Flw | % open | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 AS-1 | | | 76.5 | 7.0 | 100 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 AS-2 | | | 6.0 | 3.6 | 100 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16 AS-3 | | | 6.5 | 6.4 | 100 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17 AS-4 | | | 0 | 10.2 | 100 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18 AS-5 | | | 5.0 | 8.8 | 30 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19 AS-6 | | | 5.5 | 6.0 | 10 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 21 | AS-4 had flow with bleed valve fully open | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 23 1625 | logged all Breakthrus Pressures for Zone 1, All zones | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 24 | at original timeframes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 25 1636 | leaves site | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Comments / Site Activities / Personnel Tracking

PORT OF SEATTLE - TERMINAL 30

| SVE/AS & Oxidizer System Data Collection Form | | | |
|--|--------------------------------------|---|-----------------------------------|
| Date: 8/19/22 | Field Tech(s): AC, SB | | |
| Actual Time: 1515 | AS/SVE HMI Time: 1455 | | |
| SVE/AS System | | | |
| SVE Blower Speed (Hertz) - VFD | 150 854 HMI | Sparge Blower Speed (Hertz) - VFD | 52 HMI |
| SVE Blower Runtime (Hours) | 13014.8 HMI | AS Blower Runtime (Hours) - Sparge Blower | 74 7149.3 HMI |
| Transfer Pump Runtime (Hours) - MS Pump | 2.7 HMI | Sparge Heat Exchanger Runtime (Hours) | 7148.0 HMI |
| Sparge Zone 1 Time Span(s) Operational: | 1000-1530 HMI | Sparge Zone 4 Time Span(s) Operational: | 0500-1030 HMI |
| Sparge Zone 2 Time Span(s) Operational: | 0000-0530 HMI | Sparge Zone 5 Time Span(s) Operational: | 1930 1400 -0030 HMI |
| Sparge Zone 3 Time Span(s) Operational: | 1500-2000 HMI | Sparge Zone Active: | ZONE 1 |
| AS Blower Intake Pressure (" H2O) - DPI-500 | 1.0 | SVE Blower Filter Differential Pressure (" H2O) - DPI-200 | 0.5 |
| AS Blower Discharge Pressure (PSI) - PI-501 | 7.1 | SVE Blower Inlet Differential Pressure (" H2O) - FI-200 | 1.0 |
| Sparge Heat Exchanger Discharge Temp (°F) - TI-500 | 98°F | Transfer Pump Discharge Pressure (PSI) - PI-300 | 0 |
| SVE Blower Inlet Temperature (°F) - TI-200 | 82°F | SVE Blower Discharge Pressure (" H2O) - PI-400 | 0 |
| SVE Blower Inlet Vacuum (" H2O) - VI-200 | 74 | SVE Blower Discharge Temperature (°F) - TI-400 | 50°F |
| Oxidizer System | | | |
| Oxidizer Inlet Differential Pressure (" H2O) - FI-1 | .40 | Combustion Valve Position (%) | HMI |
| Burner Chamber Temperature (°F) | 695 HMI | Process Blower Runtime (Hours) | 19851 HMI |
| Outlet Temperature (°F) | 630 M | Combustion Fan Runtime (Hours) | 19851 HMI |
| Inlet Limit Controller Temperature (°F) | 701 H | Burner Runtime (Hours) | 19840 HMI |
| Outlet Limit Controller Temperature (°F) | 627 HMI | Processing Vapors Runtime (Hours) | 19825 HMI |
| Process Fan Valve Position (Open/Closed) | Open HMI | Panel Temperature (°F) | 104 HMI |
| Dilution Valve Position (%) | 0 HMI | Flame Signal (Volts) | 5.0 |
| Combustion Valve Position (%) | 14.5 HMI | | |
| Other Components | | | |
| Knockout Tank Level (Sightglass % Full) ¹ | 0% | Propane Tank A Level (%) | 63% |
| Water Depth in Storage Tank (DTF from MP/TD (calc); inches) ² | less than 1 inch less than 1 inch | Propane Tank B Level (%) | 60% |
| NOTES: | | | |

Abbreviations:

" H₂O = Inches of Water
 °F = Degrees Fahrenheit
 PSI = Pounds per Square Inch
 % = Percent

DTF - Depth to Fluid
 DTB - Depth to Bottom
 MP - Measuring Point
 TD - Total Depth (of fluid)

Notes:

1. Low float = 0% full. Mid float = 100% full.
2. DTB of water tank from the MP is XX. Calculate the water depth by subtracting DTF from DTB.



PORT OF SEATTLE - TERMINAL 30

AS & SVE Manifold Readings

Date: _____ Time: 1515
 Field Tech(s): _____ Equipment I.D. #: _____

Vapor Concentrations

Oxidizer Inlet VOC (ppmv) PID: 29.3
 Oxidizer Discharge VOC (ppmv) PID: 2.7

SVE Wells

| Well ID | Vacuum ("H2O) | Flow (SCFMG) | Valve Pos. (% Open) | Dewater (Gal) | Comments | Well ID | Vacuum ("H2O) | Flow (SCFMG) | Valve Pos. (% Open) | Dewater (Gal) | Comments |
|---------|---------------|---------------|---------------------|---------------|-------------|---------|---------------|--------------|---------------------|---------------|----------------|
| HSVE-2 | 28 | 69 | 100 | | | SVE-10 | 52 | 20 | 100 | | Floet bouncing |
| HSVE-3 | 34 | 68 | 100 | | | SVE-9 | 50 | 10 | 100 | | Floet bouncing |
| SVE-4 | 52 | 17 | 100 | | | SVE-8 | 50 | 4 | 100 | | Floet stuck |
| SVE-5 | 42 | 20 | 100 | | Floet stuck | SVE-6 | 70 | 10 | 100 | | Gauge Bouncing |
| SVE-7 | 50 | 17 | 100 | | | HSVE-1 | 14 | 74 | 20% | | |

Notes:

AS Wells

| Well ID | Pressure (PSIG) | Flow (SCFMG) | Valve Pos. (% Open) | Comments | Well ID | Pressure (PSIG) | Flow (SCFMG) | Valve Pos. (% Open) | Comments |
|---------|-----------------|--------------|---------------------|----------|---------|-----------------|--------------|------------------------------|----------|
| Zone 2 | | | | | Zone 4 | | | | |
| AS-7 | | | | | AS-17 | | | | |
| AS-8 | | | | | AS-18 | | | | |
| AS-9 | | | | | AS-19 | | | | |
| AS-10 | | | | | AS-20 | | | | |
| AS-11 | | | | | AS-21 | | | | |
| | | | | | AS-22 | | | | |
| Zone 3 | | | | | Zone 1 | | | | |
| AS-12 | | | | | AS-1 | 8.0 | 8.2 | 100 | |
| AS-13 | | | | | AS-2 | 7.0 | 1.4 | 100 | |
| AS-14 | | | | | AS-3 | 7.0 | 8.2 | 100 | |
| AS-15 | | | | | AS-4 | 2.0 | 12.8 | 100 | |
| AS-16 | | | | | AS-5 | 7.0 | 10.0 | 100 ³⁰ | |
| Zone 5 | | | | | AS-6 | 6.0 | 5.4 | 10 | |
| AS-23 | | | | | | | | | |
| AS-24 | | | | | | | | | |
| AS-25 | | | | | | | | | |
| AS-26 | | | | | | | | | |
| AS-27 | | | | | | | | | |

Notes:

Abbreviations:

- % = Percent
- " H₂O = Inches of water
- deg F - degrees Fahrenheit
- N/A = Not applicable
- ppmv = Parts per million volume
- PSIG = Pounds per square inch gauge
- SCFMG = Standard cubic feet per minute gauge





INSTRUMENT CALIBRATION REPORT

Pine Environmental Services LLC

3225 South 116th St.
Building 1 Suite 181
Tukwila, WA 98168
425-285-9102

Pine Environmental Services, Inc.

Instrument ID 38726
Description MiniRAE 3000
Calibrated 8/18/2022 12:33:37PM

| | |
|---|------------------------|
| Manufacturer Rae Systems | State Certified |
| Model Number PGM7320 | Status Pass |
| Serial Number/ Lot Number 592-920494 | Temp °C 26 |
| Location Seattle | Humidity % 49 |
| Department | |

Calibration Specifications

| | |
|-----------------------------------|-----------------------------|
| Group # 1 | Range Acc % 0.0000 |
| Group Name VOC | Reading Acc % 3.0000 |
| Stated Accy Pct of Reading | Plus/Minus 0.0 |

| <u>Nom In Val / In Val</u> | <u>In Type</u> | <u>Out Val</u> | <u>Out Type</u> | <u>Fnd As</u> | <u>Lft As</u> | <u>Dev%</u> | <u>Pass/Fail</u> |
|----------------------------|----------------|----------------|-----------------|---------------|---------------|-------------|------------------|
| 100.0 / 100.0 | PPM | 100.0 | PPM | 106.5 | 100.0 | 0.00% | Pass |

Test Instruments Used During the Calibration

(As Of Cal Entry Date)

| <u>Test Standard ID</u> | <u>Description</u> | <u>Manufacturer</u> | <u>Model Number</u> | <u>Serial Number / Lot Number</u> | <u>Last Cal Date/ Expiration Date</u> | <u>Next Cal Date / Expiration Date</u> |
|---|-------------------------------|---------------------|---------------------|-----------------------------------|---------------------------------------|--|
| SEA ISO 100 PPM 304-402467314- 1 | Isobutylene (C4H8) 100 PPM | Airgas | x02ai99cp342066 | 304-402467314 -1 | | 6/13/2026 |

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Jose Arroyo

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

**Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment
Please call 800-301-9663 for Technical Assistance**

DAILY FIELD LOG

Project Information

Page 1 of

| | |
|-------------------------------|----------------------------------|
| Project Name: <u>T30</u> | Location: <u>Port of Seattle</u> |
| Project/Task No.: <u> </u> | Weather: <u>Sunny 78°F</u> |
| Date: <u>09/02/2022</u> | Personnel: <u>AC</u> |

Observations

| # | Time | Observation Description |
|----|------|---|
| 1 | 1455 | Arrive on-site, SVE is on upon arrival, sparge system |
| 2 | | off Sparge alarm Reads |
| 3 | | " Sparge Blower TAH" at 1448 on 08/31/22 |
| 4 | | Oxidizer is on |
| 5 | 1500 | Reset sparge alarm, sparge is back online |
| 6 | 1503 | Began taking readings to allow Sparge System to |
| 7 | | warm up |
| 8 | 1332 | All readings taken, begin taking PID readings |
| 9 | 1346 | PID readings taken |
| 10 | 1551 | locking up and leaving site |
| 11 | | |
| 12 | | |
| 13 | | |
| 14 | | |
| 15 | | |
| 16 | | |
| 17 | | AC 09/2/22 |
| 18 | | |
| 19 | | |
| 20 | | |
| 21 | | |
| 22 | | |
| 23 | | |
| 24 | | |
| 25 | | |

Comments / Site Activities / Personnel Tracking

PORT OF SEATTLE - TERMINAL 30

| SVE/AS & Oxidizer System Data Collection Form | | | |
|--|-----------------------|---|-----------|
| Date: 09/02/22 | Field Tech(s): AC | | |
| Actual Time: 1455 | AS/SVE HMI Time: 1433 | | |
| SVE/AS System | | | |
| SVE Blower Speed (Hertz) - VFD | 54 | Sparge Blower Speed (Hertz) - VFD | 52 |
| SVE Blower Runtime (Hours) | 13294.7 | AS Blower Runtime (Hours) - Sparge Blower | 7382.6 |
| Transfer Pump Runtime (Hours) - MS Pump | 2.7 | Sparge Heat Exchanger Runtime (Hours) | 7381.3 |
| Sparge Zone 1 Time Span(s) Operational: | 1500-2000 | Sparge Zone 4 Time Span(s) Operational: | 0500-1030 |
| Sparge Zone 2 Time Span(s) Operational: | 0000-0530 | Sparge Zone 5 Time Span(s) Operational: | 1930-0000 |
| Sparge Zone 3 Time Span(s) Operational: | 1000-1830 | Sparge Zone Active: | 3 |
| AS Blower Intake Pressure (" H2O) - DPI-500 | 1.0 | SVE Blower Filter Differential Pressure (" H2O) - DPI-200 | 1.0 |
| AS Blower Discharge Pressure (PSI) - PI-501 | 7.5 | SVE Blower Inlet Differential Pressure (" H2O) - FI-200 | 1.5 |
| Sparge Heat Exchanger Discharge Temp (°F) - TI-500 | 76°F | Transfer Pump Discharge Pressure (PSI) - PI-300 | 0 |
| SVE Blower Inlet Temperature (°F) - TI-200 | 82°F | SVE Blower Discharge Pressure (" H2O) - PI-400 | 0 |
| SVE Blower Inlet Vacuum (" H2O) - VI-200 | 72 | SVE Blower Discharge Temperature (°F) - TI-400 | 116°F |
| Oxidizer System | | | |
| Oxidizer Inlet Differential Pressure (" H2O) - FI-1 | .40 | Combustion Valve Position (%) | |
| Burner Chamber Temperature (°F) | 661 | Process Blower Runtime (Hours) | 20132 |
| Outlet Temperature (°F) | 631 | Combustion Fan Runtime (Hours) | 20132 |
| Inlet Limit Controller Temperature (°F) | 669 | Burner Runtime (Hours) | 20121 |
| Outlet Limit Controller Temperature (°F) | 634 | Processing Vapors Runtime (Hours) | 20106 |
| Process Fan Valve Position (Open/Closed) | Open | Panel Temperature (°F) | 97°F |
| Dilution Valve Position (%) | 0 | Flame Signal (Volts) | 5.0 |
| Combustion Valve Position (%) | 11.3 | | |
| Other Components | | | |
| Knockout Tank Level (Sightglass % Full) ¹ | Empty | Propane Tank A Level (%) | 55 |
| Water Depth in Storage Tank (DTF from MP/TD (calc); inches) ² | less than 1 inch | Propane Tank B Level (%) | 50 |
| NOTES: | | | |

Abbreviations:

" H₂O = Inches of Water
 °F = Degrees Fahrenheit
 PSI = Pounds per Square Inch
 % = Percent

DTF - Depth to Fluid
 DTB - Depth to Bottom
 MP - Measuring Point
 TD - Total Depth (of fluid)

Notes:

1. Low float = 0% full. Mid float = 100% full.
2. DTB of water tank from the MP is XX. Calculate the water depth by subtracting DTF from DTB.



PORT OF SEATTLE - TERMINAL 30

AS & SVE Manifold Readings

Date: 09/02/22 Time: 1455
 Field Tech(s): AC Equipment I.D. #: 24193

Vapor Concentrations

Oxidizer Inlet VOC (ppmv) PID: 12.0
 Oxidizer Discharge VOC (ppmv) PID: 2.8

SVE Wells

| Well ID | Vacuum (H ₂ O) | Flow (SCFMG) | Valve Pos (% Open) | Dewater (Gal) | Comments | Well ID | Vacuum (H ₂ O) | Flow (SCFMG) | Valve Pos (% Open) | Dewater (Gal) | Comments |
|---------|---------------------------|--------------|--------------------|---------------|--------------|---------|---------------------------|--------------|--------------------|---------------|----------|
| HSVE-2 | 30 | 70 | 100 | | | SVE-10 | 48 | 18 | 100 | | |
| HSVE-3 | 36 | 68 | 100 | | | SVE-9 | 44 | 8 | 100 | | |
| SVE-4 | 50 | 16 | 100 | | | SVE-8 | 50 | 10 | 100 | | |
| SVE-5 | 42 | 14 | 100 | | Float broken | SVE-6 | 64 | 12 | 100 | | |
| SVE-7 | 46 | 18 | 100 | | | HSVE-1 | 12 | 72 | 15 | | |

Notes:

AS Wells

| Well ID | Pressure (PSIG) | Flow (SCFMG) | Valve Pos (% Open) | Comments | Well ID | Pressure (PSIG) | Flow (SCFMG) | Valve Pos. (% Open) | Comments |
|---------|-----------------|--------------|--------------------|----------|---------|-----------------|--------------|---------------------|----------|
| Zone 2 | | | | | Zone 4 | | | | |
| AS-7 | | | | | AS-17 | | | | |
| AS-8 | | | | | AS-18 | | | | |
| AS-9 | | | | | AS-19 | | | | |
| AS-10 | | | | | AS-20 | | | | |
| AS-11 | | | | | AS-21 | | | | |
| | | | | | AS-22 | | | | |
| Zone 3 | | | | | Zone 1 | | | | |
| AS-12 | 7.5 | 1.4 | 100 | | AS-1 | | | | |
| AS-13 | 7.5 | 4.8 | 100 | | AS-2 | | | | |
| AS-14 | 5.6 | 3.6 | 100 | | AS-3 | | | | |
| AS-15 | 7.0 | 2.4 | 100 | | AS-4 | | | | |
| AS-16 | 7.5 | 3.8 | 100 | | AS-5 | | | | |
| Zone 5 | | | | | AS-6 | | | | |
| AS-23 | | | | | | | | | |
| AS-24 | | | | | | | | | |
| AS-25 | | | | | | | | | |
| AS-26 | | | | | | | | | |
| AS-27 | | | | | | | | | |

Notes:

Abbreviations:

% = Percent
 " H₂O = Inches of water
 deg F - degrees Fahrenheit

N/A = Not applicable

ppmv = Parts per million volume
 PSIG = Pounds per square inch gauge

SCFMG = Standard cubic feet per minute gauge





INSTRUMENT CALIBRATION REPORT

Pine Environmental Services LLC

11669 Lilburn Park Rd.
St. Louis, MO 63146
Office: 314.344.1079

Pine Environmental Services, Inc.

Instrument ID 24193
Description MiniRAE 3000
Calibrated 8/30/2022 8:18:25PM

Manufacturer Rae Systems
Model Number MiniRAE 3000
Serial Number/ Lot Number 592-910774
Location St. Louis
Department

State Certified
Status Pass
Temp °C 27
Humidity % 41

Calibration Specifications

Group # 1
Group Name Isobutylene
Stated Accy Pct of Reading

Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.0

| <u>Nom In Val / In Val</u> | <u>In Type</u> | <u>Out Val</u> | <u>Out Type</u> | <u>Fnd As</u> | <u>Lft As</u> | <u>Dev%</u> | <u>Pass/Fail</u> |
|----------------------------|----------------|----------------|-----------------|---------------|---------------|-------------|------------------|
| 100.0 / 100.0 | PPM | 100.0 | PPM | 99.1 | 100.1 | 0.10% | Pass |

Test Instruments Used During the Calibration

| <u>Test Standard ID</u> | <u>Description</u> | <u>Manufacturer</u> | <u>Model Number</u> | <u>Serial Number / Lot Number</u> | <u>(As Of Cal Entry Date)</u> | |
|--|----------------------------|---------------------|---------------------|-----------------------------------|--|--|
| | | | | | <u>Last Cal Date / Opened Date</u> | <u>Next Cal Date / Expiration Date</u> |
| SEA ISO 100PPM 304-402206886- 1 | Isobutylene (C4H8) 100 PPM | Airgas | x02ai99cp342066 | 304-402206886 -1 | | 9/16/2025 |

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Larry Lorenzano

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

**Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment
Please call 800-301-9663 for Technical Assistance**

INSTRUMENT QC/ PACKING LIST

| | |
|-----------------|--|
| Description | RAE Systems MiniRAE 3000 |
| Instrument ID | 24193 |
| Lamp Voltage | <input checked="" type="checkbox"/> 10.6 eV <input type="checkbox"/> 11.7 eV <input type="checkbox"/> 9.8 eV |
| Date Calibrated | 8/30 |



www.pine-environmental.com

| Standard Items | Prepared | QC check | Received by customer | Returned to Pine |
|---|----------|----------|----------------------|------------------|
| MiniRAE 3000 with carry case | / | / | _____ | _____ |
| Rechargeable battery (installed) | / | / | _____ | _____ |
| Protective rubber boot | / | / | _____ | _____ |
| Manual | / | / | _____ | _____ |
| Quick reference card | / | / | _____ | _____ |
| Probe tip | / | / | _____ | _____ |
| Charger/ adapter, or charger and cradle | / | / | _____ | _____ |
| (2) Hydrophobic filters | / | / | _____ | _____ |
| Alkaline adapter with (4) AA alkaline batteries installed | / | / | _____ | _____ |
| ProCal calibration sheet | / | / | _____ | _____ |
| Supporting Items | | | | |
| 100 ppm isobutylene calibration gas | _____ | _____ | _____ | _____ |
| Gas regulator | _____ | _____ | _____ | _____ |
| Tedlar bag | _____ | _____ | _____ | _____ |
| Datalogging software | _____ | _____ | _____ | _____ |
| Communications cable | _____ | _____ | _____ | _____ |
| *100 ppm Isobutylene SDS | _____ | _____ | _____ | _____ |
| ✓ Must match cylinder with setup | _____ | _____ | _____ | _____ |
| *SDS provided upon request | _____ | _____ | _____ | _____ |
| Spare alkaline battery pack | _____ | _____ | _____ | _____ |
| _____ Alkaline AA batteries | _____ | _____ | _____ | _____ |

Prepared by: u
 QC checked by: KR
 Date: 8/30

This packing list is to ensure that every item needed to operate the unit was sent and received. Upon receiving a shipment, please fill out the "Received by customer" column. Call Pine within 24 hours of receiving the equipment if any pieces are missing, damaged, or malfunctioning. Thank you for choosing Pine Environmental Services LLC

DAILY FIELD LOG

Project Information

Page 1 of 7

| | |
|---------------------------|------------------------------|
| Project Name: <u>T-20</u> | Location: <u>Seattle</u> |
| Project/Task No.: _____ | Weather: <u>65 cloudy</u> |
| Date: <u>9/14/22</u> | Personnel: <u>GF, AC, CB</u> |

Observations

| # | Time | Observation Description |
|----|------|---|
| 1 | 0900 | Onsite, meet in parking lot. Drive 2 cars in. |
| 2 | | Safety tailgate meeting |
| 3 | | Scope: biweekly atm |
| 4 | | 32 vapor samples |
| 5 | | System optimizations: suv de-water pilot; gauge replacements, |
| 6 | | AS PRV test, holding tank MP measurement, 23 |
| 7 | | breakthru testing |
| 8 | 1000 | AC takes down biweekly system readings |
| 9 | | • 24 active. Low AS flows, 1-2 scfm per well. This |
| 10 | | is consistent w/ past data |
| 11 | | • Low influent PID - 4 ppmv |
| 12 | | • GF + CB discuss AS optimization. → 2 scfm ideal, but |
| 13 | | happy if a well is getting any air. 24 was previously |
| 14 | | adjusted to achieve this & will be left as-is. |
| 15 | 1100 | Set up Summas to take vapor samples (TO15 & PAN) |
| 16 | | Inlet - 091422 @ 11:25 |
| 17 | | Discharge - 091422 @ 11:25 |
| 18 | | All good w/ initial & final pressures (30/5) |
| 19 | 1130 | Inspect 24 pressure gauges for pressure trap after |
| 20 | | zone shut-down (23 now active). |
| 21 | | - No check valves so all wells in the zone should |
| 22 | | equilibrate to the same pressure. AS-17 and AS-19 |
| 23 | | were not matching the others and were replaced. |
| 24 | | - 22 still had pressure from before 24. AS-9 pressure |
| 25 | | gauge did not match the others and was replaced. |

+/- 1 psi
but gauges
acceptable

Comments / Site Activities / Personnel Tracking

DAILY FIELD LOG

Project Information

Page 2 of 7

| | |
|---------------------------|------------------------------|
| Project Name: <u>T-36</u> | Location: _____ |
| Project/Task No.: _____ | Weather: _____ |
| Date: <u>9/14/22</u> | Personnel: <u>GF, AC, CB</u> |

Observations

| Time | Observation Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------|---|----------------|-----------------|----------------|-----------------|-------------------------|-----------------|----------|-----------------|-------|-----|-----|-----|-----|-----|-------------------------|-----|-----|-----|-----|-----|-----|----|------|------|-----|-----|-----|------|-----|----|------|-----|-----|-----|-----|-----|-----|----|------|------|-----|-----|-----|------|-----|----|------|------|
| 1 | 1220 23 break-thru pressures | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | <table border="1" style="width: 100%; border-collapse: collapse; font-size: small;"> <tr> <th>Well ID</th> <th>Inlet Flow</th> <th>Inlet Pressure</th> <th>B-thru Pressure</th> <th>Final Flow</th> <th>% open</th> <th>Comments</th> <th>Final pressures</th> </tr> <tr> <td>AS-12</td> <td>1.7</td> <td>7.5</td> <td>7.0</td> <td>2.2</td> <td>100</td> <td>didn't want to take air</td> <td>8.5</td> </tr> <tr> <td>-13</td> <td>5.2</td> <td>7.5</td> <td>6.5</td> <td>2.5</td> <td>10</td> <td>good</td> <td>6.75</td> </tr> <tr> <td>-14</td> <td>3.2</td> <td>6.0</td> <td>5.25</td> <td>3.0</td> <td>10</td> <td>good</td> <td>6.0</td> </tr> <tr> <td>-15</td> <td>2.0</td> <td>8.0</td> <td>7.0</td> <td>2.9</td> <td>10</td> <td>good</td> <td>7.75</td> </tr> <tr> <td>-16</td> <td>4.2</td> <td>7.5</td> <td>6.75</td> <td>3.3</td> <td>10</td> <td>good</td> <td>7.25</td> </tr> </table> | Well ID | Inlet Flow | Inlet Pressure | B-thru Pressure | Final Flow | % open | Comments | Final pressures | AS-12 | 1.7 | 7.5 | 7.0 | 2.2 | 100 | didn't want to take air | 8.5 | -13 | 5.2 | 7.5 | 6.5 | 2.5 | 10 | good | 6.75 | -14 | 3.2 | 6.0 | 5.25 | 3.0 | 10 | good | 6.0 | -15 | 2.0 | 8.0 | 7.0 | 2.9 | 10 | good | 7.75 | -16 | 4.2 | 7.5 | 6.75 | 3.3 | 10 | good | 7.25 |
| Well ID | Inlet Flow | Inlet Pressure | B-thru Pressure | Final Flow | % open | Comments | Final pressures | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| AS-12 | 1.7 | 7.5 | 7.0 | 2.2 | 100 | didn't want to take air | 8.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -13 | 5.2 | 7.5 | 6.5 | 2.5 | 10 | good | 6.75 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -14 | 3.2 | 6.0 | 5.25 | 3.0 | 10 | good | 6.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -15 | 2.0 | 8.0 | 7.0 | 2.9 | 10 | good | 7.75 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -16 | 4.2 | 7.5 | 6.75 | 3.3 | 10 | good | 7.25 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | 1245 checked pressure gauges in the other zones | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | - Zone 3: All gauges reading ~1/2 PSI high, had replaced ^{except AS-11. AS-11 replaced.} | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | - Zone 1: AS-4 reading low & replaced | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | - Zone 5: AS-27 replaced | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | • SVE-6 vac gauge replaced. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | • Remaining gauge stock: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16 | - 5 = 0-100 in the vac gauges | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17 | - 0 new 0-30 psi pressure gauges | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18 | → 2 used, one reads 1/2 psi high, the other 1 psi high | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19 | order more of these! But make them 0-15. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | • Investigated the AS pressure relief valve. It has been working the whole time, but different than what we're used to. Doesn't pop & shut anything down, it just bleeds off air at increasing flows as pressure increases. It was hard to tell at what point it started venting, but somewhere in the 8-9 psi range. However, it does not vent | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Comments / Site Activities / Personnel Tracking

Order more 0-15 psi center-back liquid-filled gauges (better than 0-30!)

DAILY FIELD LOG

Project Information

Page 3 of 7

| | |
|---------------------------|------------------------------|
| Project Name: <u>T-30</u> | Location: _____ |
| Project/Task No.: _____ | Weather: _____ |
| Date: <u>9/14/22</u> | Personnel: <u>GF, AC, CB</u> |

Observations

| Time | Observation Description |
|------|---|
| 1 | <p>enough to keep the compressor pressure at 8-9 psi. we turned switched to zone 4, which has the highest back pressure of the zones (note this used to be called zone 2 on the UMI) in Z4 and with the bleed valve shut to zero, the PRV kept the compressor pressure to at 11.5 psi. This is in excess of the max design pressure, but the Z4 manifold pressures were all at or below 10 psi, which was previously determined to be acceptable. <u>Conclusion: we can keep the bleed valve closed and the PRV will keep us within our design parameters.</u></p> <p>→ When we switched zones back to Z3 under these conditions, total Z3 flows doubled (15.5 scfm to 41.0 scfm) (4.6 - 10.2 scfm range). We should see much better flowrates across the board like this as the PRV will only vent as needed</p> <p>write → Total flow in zone 1 in these conditions: 47.7 scfm. Baseline not recorded. Last zone 1 data in the spreadsheet equalled 27.6 46 scfm total.</p> |
| 2 | |
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| 8 | |
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| 10 | |
| 11 | |
| 12 | • SVE inspection |
| 13 | → observed that the dilution valve was open. CB remembered Rusty saying that was to keep flows w/in target ranges. We closed it down and were able to maintain the prior flows by reducing the UFD from 5 Hz to 42 Hz. |
| 14 | → CB recommends calcing the energy savings via HP reduction. |
| 15 | |
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| 18 | |
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| 25 | |

Comments / Site Activities / Personnel Tracking

DAILY FIELD LOG

Project Information

Page 4 of 7

| | |
|---------------------------|------------------------------|
| Project Name: <u>T-30</u> | Location: _____ |
| Project/Task No.: _____ | Weather: _____ |
| Date: <u>9/14/22</u> | Personnel: <u>GF, AC, CB</u> |

Observations

| Time | Observation Description |
|------|--|
| 1 | <p>• Zone transition on AS occurred w/ zone 1 joining zone 3 for the 30-min overlap before zone 3 shuts down. The AS blower shut down due to a VFD fault shortly thereafter, which it did earlier in the day when zone 1 was activated too. Neither time did it result in an HMZ alarm. The fault was a motor high temp both times, and was resolved by cleaning it on the VFD & toggling the blower to OFF and back to AUTO. No clear indication of why this happened. With multiple zones open, total back pressure should have decreased & reduced strain on the motor.</p> |
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| 11 | |
| 12 | → While inspecting the VFDs in the cabinet we noticed there are two standalone ventilation fans, one of which (the bottom one) was not connected to power. When we reconnected the power cord hanging next to it, it immediately kicked on. This is how we left it. |
| 13 | → odd note: No vents to atmosphere in the cabinet. No circulation of outside air - just the warm/hot air inside the cabinet. |
| 14 | |
| 15 | |
| 16 | |
| 17 | |
| 18 | |
| 19 | |
| 20 | • SVE dewatering: |
| 21 | -we tried a lot of things & results were a bit inconclusive. |
| 22 | SVE-6, 8, and -5 all had significant water in the rotameters. We drained them via the dead legs with a peripump, and then stuck tubing down the stab-ups and drained those as well. About 4 gallons total |
| 23 | |
| 24 | |
| 25 | |

Comments / Site Activities / Personnel Tracking

DAILY FIELD LOG

Project Information

Page 5 of 7

| | |
|---------------------------|------------------------------|
| Project Name: <u>T-30</u> | Location: _____ |
| Project/Task No.: _____ | Weather: _____ |
| Date: <u>9/14/22</u> | Personnel: <u>GF, AC, CB</u> |

Observations

| Time | Observation Description |
|------|---|
| 1 | were recovered in this way, which was less than anticipated. |
| 2 | - The rotameter floats seem to trap water in the |
| 3 | rotameters, retaining it even after everything else |
| 4 | was pumped, even w/ the system on. Our |
| 5 | solution was to block the end of the air tubing to |
| 6 | increase vacuum and enable the system to suck |
| 7 | the water up out the top of the rotameter. once |
| 8 | this was done at all 3, water did not return |
| 9 | for the rest of the site visit. |
| 10 | - CB installed a 1/4-in hose barb for 3/8" tubing at |
| 11 | the base of SNE-8. It worked well for draining the |
| 12 | deadleg and was more accessible than the preexisting |
| 13 | tubing behind the manifold |
| 14 | - Disconnecting the air hose camlocks to clear out the |
| 15 | rotameter water is a pain. Recommend a pilot |
| 16 | test to alter the manifold assembly. Replace the 4-in |
| 17 | Sch 80 ^{pressure} PVC cap at the top of the deadleg with a |
| 18 | 4x2" bushing, a close nipple, and a 2" ball valve. |
| 19 | This is would be a much more accessible way to |
| 20 | increase the vacuum, and could also act as an |
| 21 | access point for dewatering (stick tubing down into |
| 22 | the deadleg) |
| 23 | - The own spare air hose in the cones matches what |
| 24 | is in use. Two rolls of 15? ft each with a male & |
| 25 | female camlock fitting attached. The ones in use |

Comments / Site Activities / Personnel Tracking

Sch 80 PVC:
 4x2" bushing
 2" close nipple
 2" ball valve

DAILY FIELD LOG

Project Information

Page 6 of 7

| | |
|---------------------------|------------------------------|
| Project Name: <u>T-30</u> | Location: _____ |
| Project/Task No.: _____ | Weather: _____ |
| Date: <u>9/14/22</u> | Personnel: <u>GF, AC, CB</u> |

Observations

| Time | Observation Description |
|------|--|
| 1 | <p>have female fittings on both ends, so the new ones would need retrofitting. CB said in his experience hot water works best to soften the hose. The camlock fittings in use could be reused.</p> <p>→ Recommendation is to replace one of the hoses on the wells affected by water as a pilot test. Drape it over a barrier (Sawhorse? Cinder block?) to avoid low point. See if this is effective at preventing water accumulation in the manifold. Check if we can do this or MM has to.</p> <p>- For vapor sampling, can we buy a vacuum pump like the one we have to keep onsite? If the rotameters are decently by next visit we can try monitoring vapor levels at the manifold for each well.</p> <p>- We really need replacement internal parts for the SVE rotameters. Probably for 7 of them GF to follow up with Marina.</p> <p>• ROT sightglass scrubbed out. Full of very dirty water that we drained w/ the pump manually into the holding tank. Tested the float to make sure it shut the system down, which it did.</p> <p>• Holding tank depth measured from the inner lip of the rim to the bottom as: <u>0.92 ft</u></p> <p>→ both floats triggered successfully to test alarm functionality. All looked good</p> |
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Comments / Site Activities / Personnel Tracking

DAILY FIELD LOG

Project Information

Page 7 of 7

| | | | |
|-------------------|----------------|------------|-------------------|
| Project Name: | <u>T-30</u> | Location: | _____ |
| Project/Task No.: | _____ | Weather: | _____ |
| Date: | <u>9/14/22</u> | Personnel: | <u>GF, AC, CB</u> |

Observations

| Time | Observation Description |
|------|--|
| 1 | 1745 All tasks complete for the day. Clean up site. Lock |
| 2 | cabarets, conex, & system gate. All 3 systems |
| 3 | running smoothly on departure. |
| 4 | 1815 All staff offsite |
| 5 | |
| 6 | |
| 7 | |
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GF
9/14/22

Comments / Site Activities / Personnel Tracking

| |
|--|
| |
|--|

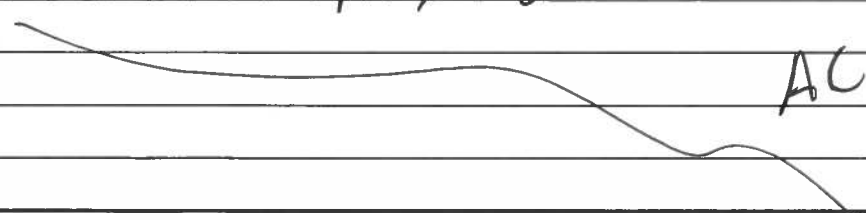
DAILY FIELD LOG

Project Information

Page 1 of 1

| | |
|---------------------------|----------------------------------|
| Project Name: <u>T-30</u> | Location: <u>Part of Seattle</u> |
| Project/Task No.: _____ | Weather: <u>Sunny 73°F</u> |
| Date: <u>09/14/22</u> | Personnel: <u>AC, GF, CB</u> |

Observations

| # | Time | Observation Description |
|----|------|--|
| 1 | 0935 | Arrive on-site Scope of work is Normal System O and M |
| 2 | | plus additional maint. items to optimize system |
| 3 | 0942 | Performed safety tailgate |
| 4 | 0950 | Tailgate Complete |
| 5 | 0954 | Began taking system readings |
| 6 | 1025 | All readings taken, began taking P.I.D readings |
| 7 | 1039 | Readings complete, All system readings taken |
| 8 | 1050 | Switching scope to performing additional maintenance |
| 9 | | on system with GF, CB and myself |
| 10 | 1100 | Began setting up for vapor sampling of Inlet and |
| 11 | | discharge voc sampling points |
| 12 | 1143 | All sampling complete, vapor samples taken at initial |
| 13 | | time of 1125 and finished at 1131 |
| 14 | | Initial Vacuum of canisters, |
| 15 | | Inlet - 30 in Hg |
| 16 | | Discharge - 29 in Hg |
| 17 | | Final reading |
| 18 | | Inlet - 5 in Hg |
| 19 | | Discharge 5 in Hg |
| 20 | 1206 | Began doing additional Maintenance to AS/SVE Systems |
| 21 | 1806 | All maintenance complete, leaving site |
| 22 | | |
| 23 | |  |
| 24 | | |
| 25 | | |

Comments / Site Activities / Personnel Tracking

T-30 Summa Can Vapor Sampling Field Form

Project: Terminal 30 Site Address: 1901 East Marginal Way South, Seattle, WA
 Date: 9/14/22 Field Personnel: GF, AC, CB
 Weather: 65 cloudy Weather Barometric Pressure (in Hg): 30
 Sample ID: Inlet-091422 (INLET/DISCHARGE-mmddyy)
 Sample Port Description: Dedicated oxidizer inlet vapor port

Conditions at Sample Port:

| Pressure (PSI) | Temperature (°F) | VOCs via PID (ppmv) | SVE Runtime (hrs) |
|----------------|------------------|---------------------|-------------------|
| 0 | 112°F | 4.5 | 13567.8 |

Before Sampling:

| | Yes or No (Y/N) |
|---|-----------------|
| Install clean tubing on the sample port | Y |
| Purge the tubing (30-60 seconds) | Y |

Summa Can Leak Test¹:

| Initial Canister Reading (in-Hg) | Duration of Test (2 min recommended) | Final Canister Reading (in-Hg) |
|----------------------------------|--------------------------------------|--------------------------------|
| 30 | 2 min | 30 |

¹ For the summa can leak test, connect the flow controller to the can with the cap nut secured. No air should enter the can when the can valve is opened. Once this is confirmed, open the summa can valve and record the initial vacuum. Wait for two minutes and then record the vacuum again. If the two readings do not match there is a leak and a new can and valve should be acquired before sampling.

Sampling Information²:

| Sample Canister LAB ID | Flow Controller LAB ID | Sample Canister Size | Initial Canister Reading (in-Hg) ³ | Sample Times | Sample Date(s) | Final Canister Reading (in-Hg) ³ |
|---|------------------------|----------------------|---|--------------|----------------|---|
| 3230 | 204 | 1L | 30 | Sample Start | | 5 |
| | | | | 1125 | 9/14/22 | |
| | | | | Sample End | | |
| Analyses Requested: TO-15 BTEXN; APH | | | | 1131 | 9/14/22 | |

² The flow controller should be for a 4-5 minute integrated sample

³ Canisters measured using a standard vacuum gauge

Sample Collection Notes and General Observations:

All good

T-30 Summa Can Vapor Sampling Field Form

Project: Terminal 30 Site Address: 1901 East Marginal Way South, Seattle, WA
 Date: 9/14/22 Field Personnel: AC, GF, CB
 Weather: 65 cloudy Weather Barometric Pressure (in Hg): 30
 Sample ID: Discharge 091422 (INLET/DISCHARGE-mmddyy)
 Sample Port Description: Dedicated oxidizer discharge vapor port

Conditions at Sample Port:

| Pressure (PSI) | Temperature (°F) | VOCs via PID (ppmv) | SVE Runtime (hrs) |
|----------------|------------------|---------------------|-------------------|
| 0 | N/A | 0.5 | 13567.8 |

Before Sampling:

| | Yes or No (Y/N) |
|---|-----------------|
| Install clean tubing on the sample port | Y |
| Purge the tubing (30-60 seconds) | Y |

Summa Can Leak Test¹:

| Initial Canister Reading (in-Hg) | Duration of Test (2 min recommended) | Final Canister Reading (in-Hg) |
|----------------------------------|--------------------------------------|--------------------------------|
| 29.25 | 2 min | 29.25 |

¹ For the summa can leak test, connect the flow controller to the can with the cap nut secured. No air should enter the can when the can valve is opened. Once this is confirmed, open the summa can valve and record the initial vacuum. Wait for two minutes and then record the vacuum again. If the two readings do not match there is a leak and a new can and valve should be acquired before sampling.

Sampling Information²:

| Sample Canister LAB ID | Flow Controller LAB ID | Sample Canister Size | Initial Canister Reading (in-Hg) ³ | Sample Times | Sample Date(s) | Final Canister Reading (in-Hg) ³ |
|--|------------------------|----------------------|---|--------------|----------------|---|
| 3540 | 206 | 1L | 29.25 | Sample Start | | 5 |
| | | | | 1125 | 9/14/22 | |
| | | | | Sample End | | |
| Analyses Requested: <u>TO-15 BTEXN, APH</u> | | | | 1131 | 9/14/22 | |

² The flow controller should be for a 4-5 minute integrated sample

³ Canisters measured using a standard vacuum gauge

Sample Collection Notes and General Observations:

All good

SAMPLE CHAIN OF CUSTODY

Page # 1 of 1

TURNAROUND TIME

Standard
 RUSH
 Rush charges authorized by: _____

SAMPLE DISPOSAL
 Default: Clean following final report delivery
 Hold (Fee may apply): _____

SAMPLERS (signature) [Signature]

PROJECT NAME & ADDRESS
T-30 Port of Seattle

PO # _____

INVOICE TO _____

NOTES: _____

Report To Paul Kalina

Company AECOM

Address 1111 3rd Ave Suite 1600

City, State, ZIP Seattle, WA 98101

Phone 206-438-2700 Email Paul.Kalina@aecom.com

| SAMPLE INFORMATION | | ANALYSIS REQUESTED | | | | | | | | | | | | | | |
|----------------------|--------|--------------------|---------------|--|--------------|--------------------|--------------------|------------------|------------------|----------------|-----------------|------------|-----|--------|-----------|-------|
| Sample Name | Lab ID | Canister ID | Flow Cont. ID | Reporting Level: IA=Indoor Air SG=Soil Gas (Circle One) | Date Sampled | Initial Vac. ("Hg) | Field Initial Time | Final Vac. ("Hg) | Field Final Time | TO15 Full Scan | TO15 BTEXN | TO15 cVOCs | APH | Helium | TO15 BTEX | Notes |
| Inlet - 09/14/22 | | 3230 | 204 | IA / (SG) | 9/14/22 | 30 | 1125 | 5 | 1131 | | XXXX | | X | | X | |
| Discharge - 09/14/22 | | 3540 | 206 | IA / (SG) | 9/14/22 | 29.25 | 1125 | 5 | 1131 | | | | X | | X | |
| | | | | IA / SG | | | | | | | | | | | | |
| | | | | IA / SG | | | | | | | | | | | | |
| | | | | IA / SG | | | | | | | | | | | | |
| | | | | IA / SG | | | | | | | | | | | | |
| | | | | IA / SG | | | | | | | | | | | | |

Friedman & Bruya, Inc.
 3012 16th Avenue West
 Seattle, WA 98119-2029
 Ph. (206) 285-8282
 Fax (206) 283-5044

SIGNATURE
 Relinquished by: [Signature]
 Received by: [Signature]
 Relinquished by:
 Received by:

PRINT NAME
 Gus Friedman
 ANH PHAN

COMPANY
 AECOM
 FB B

DATE
 9/19/22
 09/19/22

TIME
 12:51
 12:51

T-30 Optimization Task List

- Pilot test of SVE dewatering
 - Tap new hole in front of deadleg & move/build a new valve assembly there
 - Pump out deadleg and hose/pipe & observe recharge time
 - Determine potential to alleviate water issue by elevating SVE hoses
- Determine if anything new is needed to begin SVE header vapor monitoring
- Mechanical pressure relief valve test
- Measure from holding tank MP to bottom of tank for incorporation into field form
- Conduct breakthrough pressure testing on active zone (should be Zone 3 (10:00-3:30))
 - Maybe adjust Zone 3 to come on earlier in the day to ensure that it's at equilibrium when we arrive?
- Install whatever valves/gauges we can from what Marina has ordered
 - SVE-6 pressure gauge is the faulty one still
 - Replace SVE influent magnehelic with a lower scale gauge?
 - Don't change the other two. The changeout threshold for Solberg filters is 15 " H2O. MM is supposed to take care of this.
 - OMM Manual Table 13 (pg 71)

| Moisture Separator | | |
|---|--|---|
| As Needed. Recommended to check monthly during blower oil changes. | Clean/Replace demister. Clean sump, site glass, pump down switch. | When differential pressure across the filter exceeds 15" of water. As needed, depending on water quality. Recommend initial inspection after 6 months. |

- Solberg section of O&M manual (Appendix D pg 61)

Section D

MAINTENANCE RECOMMENDATIONS

1. Pressure drop readings are recommended to have an effective air filter. Always document initial pressure drop during start-up when element is clean. Replacement cartridge is needed when system experiences 10" to 15" / 250-380mm H₂O higher pressure drop above the initial reading. Refer to page 4 for instructions.

- Remove "zone cheat sheet" list from the cabinet door
-



INSTRUMENT CALIBRATION REPORT

Pine Environmental Services LLC

3225 South 116th St.
Building 1 Suite 181
Tukwila, WA 98168
425-285-9102

Pine Environmental Services, Inc.

Instrument ID 15961
Description MiniRae 3000
Calibrated 9/13/2022 12:03:33PM

| | |
|---|------------------------|
| Manufacturer Rae Systems | State Certified |
| Model Number PGM-7320 | Status Pass |
| Serial Number/ Lot Number 592-903385 | Temp °C 24 |
| Location Seattle | Humidity % 46 |
| Department | |

Calibration Specifications

| | |
|-----------------------------------|-----------------------------|
| Group # 1 | Range Acc % 0.0000 |
| Group Name Isobutylene | Reading Acc % 3.0000 |
| Stated Accy Pct of Reading | Plus/Minus 0.00 |

| <u>Nom In Val / In Val</u> | <u>In Type</u> | <u>Out Val</u> | <u>Out Type</u> | <u>Fnd As</u> | <u>Lft As</u> | <u>Dev%</u> | <u>Pass/Fail</u> |
|----------------------------|----------------|----------------|-----------------|---------------|---------------|-------------|------------------|
| 100.00 / 100.00 | PPM | 100.00 | PPM | 100.20 | 100.00 | 0.00% | Pass |

Test Instruments Used During the Calibration

(As Of Cal Entry Date)

| <u>Test Standard ID</u> | <u>Description</u> | <u>Manufacturer</u> | <u>Model Number</u> | <u>Serial Number / Lot Number</u> | <u>Last Cal Date / Opened Date</u> | <u>Next Cal Date / Expiration Date</u> |
|---|-------------------------------|---------------------|---------------------|-----------------------------------|--|--|
| SEA ISO 100 PPM 302-402445936- 1 | Isobutylene (C4H8) 100 PPM | Airgas | x02ai99cp342066 | 302-402445936 -1 | | 7/28/2026 |

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Jose Arroyo

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

**Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment
Please call 800-301-9663 for Technical Assistance**

PORT OF SEATTLE - TERMINAL 30

| SVE/AS & Oxidizer System Data Collection Form | | | |
|--|-----------------------------|--|-----------|
| Date: 09/14/22 | Field Tech(s): AC, GF, CB | | |
| Actual Time: 0954 | AS/SVE HMI Time: 0932 | | |
| SVE/AS System | | | |
| SVE Blower Speed (Hertz) - VFD | 54.0 | Sparge Blower Speed (Hertz) - VFD | 52.0 |
| SVE Blower Runtime (Hours) | 13567.8 | AS Blower Runtime (Hours) - Sparge Blower | 7657.0 |
| Transfer Pump Runtime (Hours) - MS Pump | 2.7 | Sparge Heat Exchanger Runtime (Hours) | 7655.5 |
| Sparge Zone 1 Time Span(s) Operational: | 1500-2000 | Sparge Zone 4 Time Span(s) Operational: | 0500-1030 |
| Sparge Zone 2 Time Span(s) Operational: | 0000-0530 | Sparge Zone 5 Time Span(s) Operational: | 1930-0030 |
| Sparge Zone 3 Time Span(s) Operational: | 1000-1530 | Sparge Zone Active: | Zone 4 |
| AS Blower Intake Pressure (" H ₂ O) - DPI-500 | 1.0 | SVE Blower Filter Differential Pressure (" H ₂ O) - DPI-200 | 0.5 |
| AS Blower Discharge Pressure (PSI) - PI-501 | 8.5 | SVE Blower Inlet Differential Pressure (" H ₂ O) - FI-200 | 1.5 |
| Sparge Heat Exchanger Discharge Temp (°F) - TI-500 | 90°F | Transfer Pump Discharge Pressure (PSI) - PI-300 | 0 |
| SVE Blower Inlet Temperature (°F) - TI-200 | 84°F | SVE Blower Discharge Pressure (" H ₂ O) - PI-400 | 0 |
| SVE Blower Inlet Vacuum (" H ₂ O) - VI-200 | 72 | SVE Blower Discharge Temperature (°F) - TI-400 | 114°F |
| Oxidizer System | | | |
| Oxidizer Inlet Differential Pressure (" H ₂ O) - FI-1 | .40 | Combustion Valve Position (%) | 9.2% |
| Burner Chamber Temperature (°F) | 664°F | Process Blower Runtime (Hours) | 20406 |
| Outlet Temperature (°F) | 635°F | Combustion Fan Runtime (Hours) | 20407 |
| Inlet Limit Controller Temperature (°F) | 702°F | Burner Runtime (Hours) | 20396 |
| Outlet Limit Controller Temperature (°F) | 625°F | Processing Vapors Runtime (Hours) | 20381 |
| Process Fan Valve Position (Open/Closed) | open | Panel Temperature (°F) | 88°F |
| Dilution Valve Position (%) | 0% | Flame Signal (Volts) | 5.0 |
| Combustion Valve Position (%) | 9.2% | | |
| Other Components | | | |
| Knockout Tank Level (Sightglass % Full) ¹ | 0% | Propane Tank A Level (%) | 60% |
| Water Depth in Storage Tank (DTF from MP/TD (calc); inches) ² | 2.1 6.68 1.24 | Propane Tank B Level (%) | 55% |
| NOTES: | | | |

Abbreviations:

" H₂O = Inches of Water
 °F = Degrees Fahrenheit
 PSI = Pounds per Square Inch
 % = Percent

DTF - Depth to Fluid
 DTB - Depth to Bottom
 MP - Measuring Point
 TD - Total Depth (of fluid)

Notes:

1. Low float = 0% full. Mid float = 100% full.
2. DTB of water tank from the MP is XX. Calculate the water depth by subtracting DTF from DTB. 6.92



PORT OF SEATTLE - TERMINAL 30

AS & SVE Manifold Readings

Date: 9/14/22 Time: 0954
 Field Tech(s): AC, GF, CB Equipment I.D. #: P.C.D 15961

Vapor Concentrations

Oxidizer Inlet VOC (ppmv) PID: 4.5
 Oxidizer Discharge VOC (ppmv) PID: 0.5

SVE Wells

| Well ID | Vacuum (H ₂ O) | Flow (SCFMG) | Valve Pos. (% Open) | Dewater (Gal) | Comments | Well ID | Vacuum (H ₂ O) | Flow (SCFMG) | Valve Pos. (% Open) | Dewater (Gal) | Comments |
|---------|---------------------------|--------------|---------------------|---------------|----------------|---------|---------------------------|--------------|---------------------|---------------|----------------|
| HSVE-2 | 29 | 68 | 100 | | | SVE-10 | 52 | 20 | 100 | | float bouncing |
| HSVE-3 | 31 | 70 | 100 | | | SVE-9 | 48 | 6 | 100 | | float bouncing |
| SVE-4 | 50 | 17 | 100 | | float bouncing | SVE-8 | 50 | 2 | 100 | | float broken |
| SVE-5 | 42 | 14 | 100 | | float broken | SVE-6 | 74 | 18 | 100 | | |
| SVE-7 | 44 | 19 | 100 | | | HSVE-1 | 13 | 72 | 15 | | |

Notes:

AS Wells

| Well ID | Pressure (PSIG) | Flow (SCFMG) | Valve Pos. (% Open) | Comments | Well ID | Pressure (PSIG) | Flow (SCFMG) | Valve Pos. (% Open) | Comments |
|---------|-----------------|--------------|---------------------|----------|---------|-----------------|--------------|---------------------|--------------------------|
| Zone 2 | | | | | Zone 4 | | | | |
| AS-7 | | | | | AS-17 | 5.0 | 1.4 | 100 | actually around 10% open |
| AS-8 | | | | | AS-18 | 9.0 | 1.0 | 100 | |
| AS-9 | | | | | AS-19 | 9.5 | 2.0 | 100 | |
| AS-10 | | | | | AS-20 | 7.5 | 1.3 | 100 | 10% |
| AS-11 | | | | | AS-21 | 6.0 | 1.5 | 100 | |
| | | | | | AS-22 | 8.5 | 2.4 | 100 | 10% |
| Zone 3 | | | | | Zone 1 | | | | |
| AS-12 | | | | | AS-1 | | | | |
| AS-13 | | | | | AS-2 | | | | |
| AS-14 | | | | | AS-3 | | | | |
| AS-15 | | | | | AS-4 | | | | |
| AS-16 | | | | | AS-5 | | | | |
| Zone 5 | | | | | AS-6 | | | | |
| AS-23 | | | | | | | | | |
| AS-24 | | | | | | | | | |
| AS-25 | | | | | | | | | |
| AS-26 | | | | | | | | | |
| AS-27 | | | | | | | | | |

Notes:

Abbreviations:

% = Percent
 " H₂O = Inches of water
 deg F - degrees Fahrenheit

N/A = Not applicable
 ppmv = Parts per million volume
 PSIG = Pounds per square inch gauge

SCFMG = Standard cubic feet per minute gauge



PORT OF SEATTLE - TERMINAL 30

AS & SVE Manifold Readings - **New Zone From Initial Round of Readings**

Date: 09/14/22 Time: 1048
 Field Tech(s): _____ Equipment I.D. #: _____

Vapor Concentrations

Oxidizer Inlet VOC (ppmv) PID: _____

Oxidizer Discharge VOC (ppmv) PID: _____

SVE Wells

| Well ID | Vacuum (H ₂ O) | Flow (SCFMG) | Valve Pos. (% Open) | Dewater (Gal) | Comments | Well ID | Vacuum (H ₂ O) | Flow (SCFMG) | Valve Pos. (% Open) | Dewater (Gal) | Comments |
|---------|---------------------------|--------------|---------------------|---------------|----------|---------|---------------------------|--------------|---------------------|---------------|----------|
| HSVE-2 | | | | | | SVE-10 | | | | | |
| HSVE-3 | | | | | | SVE-9 | | | | | |
| SVE-4 | | | | | | SVE-8 | | | | | |
| SVE-5 | | | | | | SVE-6 | | | | | |
| SVE-7 | | | | | | HSVE-1 | | | | | |

Notes:

AS Wells

| Well ID | Pressure (PSIG) | Flow (SCFMG) | Valve Pos. (% Open) | Comments | Well ID | Pressure (PSIG) | Flow (SCFMG) | Valve Pos. (% Open) | Comments |
|---------|-----------------|--------------|---------------------|----------|---------|-----------------|--------------|---------------------|----------|
| Zone 2 | | | | | Zone 4 | | | | |
| AS-7 | | | | | AS-17 | | | | |
| AS-8 | | | | | AS-18 | | | | |
| AS-9 | | | | | AS-19 | | | | |
| AS-10 | | | | | AS-20 | | | | |
| AS-11 | | | | | AS-21 | | | | |
| | | | | | AS-22 | | | | |
| Zone 3 | | | | | Zone 1 | | | | |
| AS-12 | 8.0 | 1.4 | 100 | | AS-1 | | | | |
| AS-13 | 7.5 | 5.2 | 100 | | AS-2 | | | | |
| AS-14 | 6.5 | 3.0 | 100 | | AS-3 | | | | |
| AS-15 | 8.0 | 2.0 | 100 | | AS-4 | | | | |
| AS-16 | 8.0 | 3.9 | 100 | | AS-5 | | | | |
| Zone 5 | | | | | AS-6 | | | | |
| AS-23 | | | | | | | | | |
| AS-24 | | | | | | | | | |
| AS-25 | | | | | | | | | |
| AS-26 | | | | | | | | | |
| AS-27 | | | | | | | | | |

Notes:

Abbreviations:

% = Percent

" H₂O = Inches of water

deg F - degrees Fahrenheit

N/A = Not applicable

ppmv = Parts per million volume

PSIG = Pounds per square inch gauge

SCFMG = Standard cubic feet per minute gauge



T-30 alarm reset

9/15/22

- High temp alarm activated at 21:00 on 9/14/22. This followed a day of O&M and optimization work that concluded around 18:00.
- Marina cleared the alarm ~16:30 on 9/15/22 and the system started itself back up
- Analysis:
 - 21:00 is in the middle of a zone, so this was not associated with a zone switch
 - This was a blower issue, not a VFD issue
 - A possible cause is that during our optimization work we closed down the AS bleed valve in favor of letting the air vent through the PRV as needed. A possible downside is that while the bleed valve is downstream of the heat exchanger, the PRV is upstream. The AS cabinet is enclosed without ventilation so it could be that the hotter air vented by the PRV is getting recirculated and caused the system air temperatures to exceed the programmed threshold. We will monitor future alarms and adjust set points accordingly.

T-30 Sparge Alarm Reset

9/20/22

Action 1

- Sparge high temp alarm activated at 22:48 on Thursday 9/15/22. This was just 6 hours after Marina restarted the system due to the same alarm, seemingly triggered by the closure of the AS bleed valve and venting through the PRV.
- Marina cleared the alarm ~12:30 on 9/20/22 (~4.5 days downtime) and the system started itself back up.
- Analysis:
 - This was a blower issue, not a VFD issue
 - A possible cause is that during our optimization work we closed down the AS bleed valve in favor of letting the air vent through the PRV as needed. A possible downside is that while the bleed valve is downstream of the heat exchanger, the PRV is upstream. The AS cabinet is enclosed without ventilation so it could be that the hotter air vented by the PRV is getting recirculated and caused the system air temperatures to exceed the programmed threshold. We will monitor future alarms and adjust set points accordingly.

Action 2

- Another sparge high temp alarm (TAH) activated at 13:36 on 9/20/22, just 1 hour after Marina restarted the system due to the same alarm.
- MM cleared the alarm at 16:30 (4 hrs downtime) and the system started itself back up. With AECOM recommendation they opened up the bleed valve ~1/2 turn.
- After re-opening the bleed valve, there was not another TAH alarm and the system stayed operational through the next O&M visit on 9/30/22.

DAILY FIELD LOG

Project Information

Page ____ of ____

| | |
|---------------------------|----------------------------------|
| Project Name: <u>T-30</u> | Location: <u>Port of Seattle</u> |
| Project/Task No.: _____ | Weather: <u>Sunny 70°F</u> |
| Date: <u>09/30/22</u> | Personnel: <u>AC</u> |

Observations

| Time | Observation Description |
|---------|---|
| 1 1257 | Arrive on-site, open fence and immediately hear a grinding noise coming from one of the blower motors for the thermal oxidizer. I take a video recording and send to Gus F. |
| 2 | |
| 3 | |
| 4 | |
| 5 1305 | Perform safety tailgate. Today's scope of work is Bi-weekly system Oand M |
| 6 | |
| 7 1306 | Tailgate complete. Began taking HMT and Oxidizer readings |
| 8 1403 | All system readings taken, visible water in hose lines for SVE-6, SVE-8 and SVE-9. KO tank sight glass was empty |
| 9 | |
| 10 | |
| 11 1425 | Taking pictures of system and looking for more potential optimization areas for entire system |
| 12 | |
| 13 1500 | Tuned system off to get motor sheave readings for both SVE Blower and Air Sparge Blower |
| 14 | |
| 15 | |
| 16 | Air Sparge Sheaves |
| 17 | SVE Sheaves |
| 18 | Motor - 8 inches |
| 19 | Blower - 5.5 inches |
| 20 | Motor - 7 inches |
| 21 | Blower - 6.5 inches |
| 22 1549 | Sheave readings taken, covers put back on at starting systems back up |
| 23 | |
| 24 1603 | System fully turned on, locking up and leaving site |
| 25 | <i>AC</i> 9/30/22 |

Comments / Site Activities / Personnel Tracking

PORT OF SEATTLE - TERMINAL 30

| SVE/AS & Oxidizer System Data Collection Form | | | |
|--|-----------------------|---------|---|
| Date: 09/30/22 | Field Tech(s): AC | | |
| Actual Time: 1310 | AS/SVE HMI Time: 1247 | | |
| SVE/AS System | | | |
| SVE Blower Speed (Hertz) - VFD | 42 | 13953.2 | Spurge Blower Speed (Hertz) - VFD |
| SVE Blower Runtime (Hours) | 13592.2 | | AS Blower Runtime (Hours) - Spurge Blower |
| Transfer Pump Runtime (Hours) - MS Pump | 2.8 | | Spurge Heat Exchanger Runtime (Hours) |
| Spurge Zone 1 Time Span(s) Operational: | 1500-2000 | | Spurge Zone 4 Time Span(s) Operational: |
| Spurge Zone 2 Time Span(s) Operational: | 0000-0530 | | Spurge Zone 5 Time Span(s) Operational: |
| Spurge Zone 3 Time Span(s) Operational: | 1000-1530 | | Spurge Zone Active: |
| AS Blower Intake Pressure (" H2O) - DPI-500 | 1.0 | | SVE Blower Filter Differential Pressure (" H2O) - DPI-200 |
| AS Blower Discharge Pressure (PSI) - PI-501 | 8.5 | | SVE Blower Inlet Differential Pressure (" H2O) - FI-200 |
| Spurge Heat Exchanger Discharge Temp (°F) - TI-500 | 84°F | | Transfer Pump Discharge Pressure (PSI) - PI-300 |
| SVE Blower Inlet Temperature (°F) - TI-200 | 72°F | | SVE Blower Discharge Pressure (" H2O) - PI-400 |
| SVE Blower Inlet Vacuum (" H2O) - VI-200 | 78 | | SVE Blower Discharge Temperature (°F) - TI-400 |
| Oxidizer System | | | |
| Oxidizer Inlet Differential Pressure (" H2O) - FI-1 | 0.30 | | Combustion Valve Position (%) |
| Burner Chamber Temperature (°F) | 694 | | Process Blower Runtime (Hours) |
| Outlet Temperature (°F) | 632 | | Combustion Fan Runtime (Hours) |
| Inlet Limit Controller Temperature (°F) | 693 | | Burner Runtime (Hours) |
| Outlet Limit Controller Temperature (°F) | 642 | | Processing Vapors Runtime (Hours) |
| Process Fan Valve Position (Open/Closed) | open | | Panel Temperature (°F) |
| Dilution Valve Position (%) | 0 | | Flame Signal (Volts) |
| Combustion Valve Position (%) | 9.0 | | |
| Other Components | | | |
| Knockout Tank Level (Sightglass % Full) ¹ | 0 | | Propane Tank A Level (%) |
| Water Depth in Storage Tank ² (DTF/WD (calc in ft)) | .25 in 6.67 in | | Propane Tank B Level (%) |
| NOTES: | | | |

Abbreviations:

" H₂O = Inches of Water
 °F = Degrees Fahrenheit
 PSI = Pounds per Square Inch
 % = Percent

DTF - Depth to Fluid
 DTB - Depth to Bottom
 MP - Measuring Point
 WD - Water Depth

Notes:

1. Low float = 0% full. Mid float = 100% full.
2. Calculate the water depth by measuring DTF from the MP and then subtracting that from 6.92 ft (DTB).



PORT OF SEATTLE - TERMINAL 30

AS & SVE Manifold Readings

Date: **09/30/22** Time: **1310**
 Field Tech(s): **AC** Equipment I.D. #: **36590**

Vapor Concentrations

Oxidizer Inlet VOC (ppmv) PID: **56.5**
 Oxidizer Discharge VOC (ppmv) PID: **5.7**

SVE Wells

| Well ID | Vacuum (H ₂ O) | Flow (SCFMG) | Valve Pos. (% Open) | Dewater (Gal) | Comments | Well ID | Vacuum (H ₂ O) | Flow (SCFMG) | Valve Pos. (% Open) | Dewater (Gal) | Comments |
|---------|---------------------------|--------------|---------------------|---------------|----------|---------|---------------------------|--------------|---------------------|---------------|----------|
| HSVE-2 | 30 | 76 | 100 | | | SVE-10 | 54 | 28 | 100 | | |
| HSVE-3 | 34 | 73 | 100 | | | SVE-9 | 50 | 10 | 100 | | |
| SVE-4 | 52 | 15 | 100 | | | SVE-8 | 66 | 2 | 100 | | |
| SVE-5 | 52 | 13 | 100 | | | SVE-6 | 52 | 10 | 100 | | |
| SVE-7 | 50 | 18 | 100 | | | HSVE-1 | 14 | 77 | 15 | | |

Notes:

AS Wells

| Well ID | Pressure (PSIG) | Flow (SCFMG) | Valve Pos. (% Open) | Comments | Well ID | Pressure (PSIG) | Flow (SCFMG) | Valve Pos. (% Open) | Comments |
|---------|-----------------|--------------|---------------------|----------|---------|-----------------|--------------|---------------------|----------|
| Zone 2 | | | | | Zone 4 | | | | |
| AS-7 | | | | | AS-17 | | | | |
| AS-8 | | | | | AS-18 | | | | |
| AS-9 | | | | | AS-19 | | | | |
| AS-10 | | | | | AS-20 | | | | |
| AS-11 | | | | | AS-21 | | | | |
| | | | | | AS-22 | | | | |
| Zone 3 | | | | | Zone 1 | | | | |
| AS-12 | 9.0 | 4.5 | 100 | | AS-1 | | | | |
| AS-13 | 9.0 | 9.4 | 100 | | AS-2 | | | | |
| AS-14 | 8.5 | 7.8 | 100 | | AS-3 | | | | |
| AS-15 | 9.0 | 7.3 | 100 | | AS-4 | | | | |
| AS-16 | 9.0 | 9.2 | 100 | | AS-5 | | | | |
| Zone 5 | | | | | AS-6 | | | | |
| AS-23 | | | | | | | | | |
| AS-24 | | | | | | | | | |
| AS-25 | | | | | | | | | |
| AS-26 | | | | | | | | | |
| AS-27 | | | | | | | | | |

Notes:

Total flow of OPEN ZONE 3 is 38.2 scfm

Abbreviations:

% = Percent
 " H₂O = Inches of water
 deg F - degrees Fahrenheit

N/A = Not applicable
 SCFMG = Standard cubic feet per minute gauge
 ppmv = Parts per million volume
 PSIG = Pounds per square inch gauge





INSTRUMENT CALIBRATION REPORT

Pine Environmental Services LLC

3225 South 116th St.
Building 1 Suite 181
Tukwila, WA 98168
425-285-9102

Pine Environmental Services, Inc.

Instrument ID 36590
Description MiniRAE 3000
Calibrated 9/29/2022 1:38:45PM

| | |
|---|------------------------|
| Manufacturer Rae Systems | State Certified |
| Model Number PGM7320 | Status Pass |
| Serial Number/ Lot Number 592-918212 | Temp °C 22 |
| Location Seattle | Humidity % 52 |
| Department | |

Calibration Specifications

| | |
|---------------------------------|-----------------------------|
| Group # 1 | Range Acc % 0.0000 |
| Group Name Isobutylene | Reading Acc % 0.0000 |
| Stated Accy Pct of Range | Plus/Minus 3.00 |

| <u>Nom In Val / In Val</u> | <u>In Type</u> | <u>Out Val</u> | <u>Out Type</u> | <u>End As</u> | <u>Lft As</u> | <u>Dev%</u> | <u>Pass/Fail</u> |
|----------------------------|----------------|----------------|-----------------|---------------|---------------|-------------|------------------|
| 100.00 / 100.00 | PPM | 100.00 | PPM | 101.00 | 100.00 | 0.00% | Pass |

Test Instruments Used During the Calibration

(As Of Cal Entry Date)

| <u>Test Standard ID</u> | <u>Description</u> | <u>Manufacturer</u> | <u>Model Number</u> | <u>Serial Number / Lot Number</u> | <u>Last Cal Date / Opened Date</u> | <u>Next Cal Date / Expiration Date</u> |
|--|-------------------------------|---------------------|---------------------|-----------------------------------|--|--|
| SEA ISO 100PPM 304-402206886- 1 | Isobutylene (C4H8) 100 PPM | Airgas | x02ai99cp342066 | 304-402206886 -1 | | 9/16/2025 |

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Larry Lorenzano

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

**Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment
Please call 800-301-9663 for Technical Assistance**

AECOM Daily Tailgate Meeting Summary

Project information

| | |
|-------------------------|-----------------|
| Project Name | T-30 |
| Project Number | 60681370 |
| Project Manager | Paul Kalina |
| Project Manager Phone # | 2063105097 |
| Muster Point location | Clubhouse |
| Meeting date | 9/30/2022 |
| Business Line | Environment |
| SH&E Manager | Tim Gilles |
| SH&E Manager Phone # | 3128335991 |
| First Aid Kit Location | Conex |
| Prepared by | Corley, Antonio |

Meeting Summary

| | |
|--------------------------------|--|
| Attendees | Antonio Corley |
| Location | SODO |
| Tasks to be performed | Bi-weekly system O&M |
| Hazards to be considered today | noise, mechanical, electrical |
| Will there be Lone Workers? | Yes |
| Hierarchy of controls | administrativecontrols, ppe |
| Personal Protective Equipment | Task Specific: gloves, earprotection Mandatory: safetyglasses, longpants, reflectivevest, workboots |
| High Risk Events | <ul style="list-style-type: none">• Impact by vehicle or mobile equipment• Contact with moving parts of machinery• Uncontrolled release of electricity |
| Topic of the week | Severe Weather(Flooding)- Water on roads, watch-warning-emergency |

| | |
|------------------------|---|
| Other topics discussed | |
| Hazards | <ul style="list-style-type: none">• Mechanical• Noise• Electrical |

PROJECT T30

COMPLETED BY AC

JOB NO. _____

APPROVED BY _____

DAY & DATE 10/13/22

SHEET _____ OF _____

**FIELD ACTIVITY SUBJECT:
DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:**

| TIME | |
|------|--|
| 1453 | Arrive onsite, sparge system is off but oxidizer is on, Perform safety tailgate |
| 1501 | Tailgate complete, Sparge blower VFD Read Alarm "F0009". I do not restart air sparge due to sample event happening after OandM |
| 1506 | Begin taking other system readings as normal |
| 1527 | All readings taken, moving to grabbins PID readings |
| 1543 | PID readings taken. All system system OandM complete |
| 1556 | Shutting system down for well gauging and GW sampling to be done after Port Shutdown |
| | |
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VISITORS ON SITE:

CHANGES FROM PLANS OR IMPORTANT DECISIONS:

WEATHER CONDITIONS:

IMPORTANT TELEPHONE CALLS:

PERSONNEL ON SITE:

PORT OF SEATTLE - TERMINAL 30

| SVE/AS & Oxidizer System Data Collection Form | | | |
|--|-----------------------|---|--------------------------------|
| Date: 10/13/22 | Field Tech(s): AC | | |
| Actual Time: 1513 | AS/SVE HMI Time: 1449 | | |
| SVE/AS System | | | |
| SVE Blower Speed (Hertz) - VFD | 42 | Sparge Blower Speed (Hertz) - VFD | 8019.2 VFD in alarm |
| SVE Blower Runtime (Hours) | 14261.6 | AS Blower Runtime (Hours) - Sparge Blower | 8019.2 |
| Transfer Pump Runtime (Hours) - MS Pump | 2.8 | Sparge Heat Exchanger Runtime (Hours) | 8017.5 |
| Sparge Zone 1 Time Span(s) Operational: | 1700-2230 | Sparge Zone 4 Time Span(s) Operational: | 1930-0030 |
| Sparge Zone 2 Time Span(s) Operational: | 1000-1530 | Sparge Zone 5 Time Span(s) Operational: | 1200-1730 |
| Sparge Zone 3 Time Span(s) Operational: | 1500-2000 | Sparge Zone Active: | 5 |
| AS Blower Intake Pressure (" H2O) - DPI-500 | 0 | SVE Blower Filter Differential Pressure (" H2O) - DPI-200 | 0.5 |
| AS Blower Discharge Pressure (PSI) - PI-501 | 0 | SVE Blower Inlet Differential Pressure (" H2O) - FI-200 | 2.0 |
| Sparge Heat Exchanger Discharge Temp (°F) - TI-500 | 70°F | Transfer Pump Discharge Pressure (PSI) - PI-300 | 0 |
| SVE Blower Inlet Temperature (°F) - TI-200 | 68°F | SVE Blower Discharge Pressure (" H2O) - PI-400 | 0 |
| SVE Blower Inlet Vacuum (" H2O) - VI-200 | 78 | SVE Blower Discharge Temperature (°F) - TI-400 | 106°F |
| Oxidizer System | | | |
| Oxidizer Inlet Differential Pressure (" H2O) - FI-1 | .20 | Combustion Valve Position (%) | 14.6 |
| Burner Chamber Temperature (°F) | 667°F | Process Blower Runtime (Hours) | 21103 |
| Outlet Temperature (°F) | 624°F | Combustion Fan Runtime (Hours) | 21104 |
| Inlet Limit Controller Temperature (°F) | 663°F | Burner Runtime (Hours) | 21093 |
| Outlet Limit Controller Temperature (°F) | 642°F | Processing Vapors Runtime (Hours) | 21077 |
| Process Fan Valve Position (Open/Closed) | Open | Panel Temperature (°F) | 106 |
| Dilution Valve Position (%) | 0 | Flame Signal (Volts) | 5.0 |
| Combustion Valve Position (%) | 14.6 | | |
| Other Components | | | |
| Knockout Tank Level (Sightglass % Full) ¹ | 60% full | Propane Tank A Level (%) | 60 |
| Water Depth in Storage Tank ² (DTF/WD (calc in ft)) | | Propane Tank B Level (%) | 40 |
| NOTES: | | | |

Abbreviations:
 " H₂O = Inches of Water
 °F = Degrees Fahrenheit
 PSI = Pounds per Square Inch
 % = Percent

DTF - Depth to Fluid
 DTB - Depth to Bottom
 MP - Measuring Point
 WD - Water Depth

Notes:
 1. Low float = 0% full. Mid float = 100% full.
 2. Calculate the water depth by measuring DTF from the MP and then subtracting that from 6.92 ft (DTB).



PORT OF SEATTLE - TERMINAL 30

AS & SVE Manifold Readings

Date: 10/13/27 Time: 1530
 Field Tech(s): AC Equipment I.D. #: 045235

Vapor Concentrations

Oxidizer Inlet VOC (ppmv) PID: 9.3
 Oxidizer Discharge VOC (ppmv) PID: 0.7

SVE Wells

| Well ID | Vacuum (H2O) | Flow (SCFMG) | Valve Pos. (% Open) | Dewater (Gal) | Comments | Well ID | Vacuum (H2O) | Flow (SCFMG) | Valve Pos. (% Open) | Dewater (Gal) | Comments |
|---------|--------------|--------------|---------------------|---------------|----------|---------|--------------|--------------|---------------------|---------------|----------|
| HSVE-2 | 30 | 72 | 100 | | | SVE-10 | 50 | 37 | 100 | | |
| HSVE-3 | 34 | 70 | 100 | | | SVE-9 | 44 | 10 | 100 | | |
| SVE-4 | 52 | 18 | 100 | | | SVE-8 | 62 | 6 | 100 | | |
| SVE-5 | 40 | 26 | 100 | | | SVE-6 | 54 | 16 | 100 | | |
| SVE-7 | 50 | 22 | 100 | | | HSVE-1 | 14 | 74 | 10 | | |

Notes:

AS Wells

| Well ID | Pressure (PSIG) | Flow (SCFMG) | Valve Pos. (% Open) | Comments | Well ID | Pressure (PSIG) | Flow (SCFMG) | Valve Pos. (% Open) | Comments |
|---------|-----------------|--------------|---------------------|------------------------|---------|-----------------|--------------|---------------------|----------|
| Zone 2 | | | | | Zone 4 | | | | |
| AS-7 | | | | | AS-17 | | | | |
| AS-8 | | | | | AS-18 | | | | |
| AS-9 | | | | | AS-19 | | | | |
| AS-10 | | | | | AS-20 | | | | |
| AS-11 | | | | | AS-21 | | | | |
| | | | | | AS-22 | | | | |
| Zone 3 | | | | | Zone 1 | | | | |
| AS-12 | | | | | AS-1 | | | | |
| AS-13 | | | | | AS-2 | | | | |
| AS-14 | | | | | AS-3 | | | | |
| AS-15 | | | | | AS-4 | | | | |
| AS-16 | | | | | AS-5 | | | | |
| Zone 5 | | | | | AS-6 | | | | |
| AS-23 | | | | AS Is off on gmal I | | | | | |
| AS-24 | | | | | | | | | |
| AS-25 | | | | | | | | | |
| AS-26 | | | | | | | | | |
| AS-27 | | | | | | | | | |

Notes:

Abbreviations:

% = Percent
 " H₂O = Inches of water
 deg F - degrees Fahrenheit

N/A = Not applicable

ppmv = Parts per million volume

PSIG = Pounds per square inch gauge

SCFMG = Standard cubic feet per minute gauge





INSTRUMENT CALIBRATION REPORT

Pine Environmental Services LLC

3225 South 116th St.
Building 1 Suite 181
Tukwila, WA 98168
425-285-9102

Pine Environmental Services, Inc.

Instrument ID 45235
Description Mine Rae 3000
Calibrated 10/12/2022 5:17:10PM

| | |
|---|------------------------|
| Manufacturer Rae Systems | State Certified |
| Model Number PGM7320 | Status Pass |
| Serial Number/ Lot Number 592-927137w2 | Temp °C 24 |
| Location Seattle | Humidity % 40 |
| Department | |

Calibration Specifications

| | |
|-----------------------------------|-----------------------------|
| Group # 1 | Range Acc % 0.0000 |
| Group Name Isobutylene | Reading Acc % 3.0000 |
| Stated Accy Pct of Reading | Plus/Minus 0.00 |

| <u>Nom In Val / In Val</u> | <u>In Type</u> | <u>Out Val</u> | <u>Out Type</u> | <u>Fnd As</u> | <u>Lft As</u> | <u>Dev%</u> | <u>Pass/Fail</u> |
|----------------------------|----------------|----------------|-----------------|---------------|---------------|-------------|------------------|
| 100.00 / 100.00 | PPM | 100.00 | PPM | 99.90 | 100.00 | 0.00% | Pass |

Test Instruments Used During the Calibration

(As Of Cal Entry Date)

| <u>Test Standard ID</u> | <u>Description</u> | <u>Manufacturer</u> | <u>Model Number</u> | <u>Serial Number / Lot Number</u> | <u>Last Cal Date/ Opened Date</u> | <u>Next Cal Date / Expiration Date</u> |
|------------------------------------|----------------------------|---------------------|---------------------|-----------------------------------|-----------------------------------|--|
| SEA ISO 100 PPM 302-402445936-1 | Isobutylene (C4H8) 100 PPM | Airgas | x02ai99cp342066 | 302-402445936 -1 | | 7/28/2026 |

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Jose Arroyo

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment
Please call 800-301-9663 for Technical Assistance

DAILY FIELD LOG

Project Information

| | |
|---------------------------|------------------------------------|
| Project Name: <u>T-30</u> | Location: <u>Seattle</u> |
| Project/Task No.: _____ | Weather: <u>SS, Smokey / Sunny</u> |
| Date: <u>10/19/22</u> | Personnel: <u>GF, CB</u> |

Observations

| # | Time | Observation Description |
|----|------|--|
| 1 | 0710 | • Arrive onsite, CB already here. |
| 2 | | • Scope: GW sample the 3 remaining tidal wells |
| 3 | | Troubleshoot the AS VFD |
| 4 | | • Safety tailgate: Traffic hazards are the most significant |
| 5 | | as the Port is operational today. |
| 6 | | SVE system ON on arrival, but AS system was down |
| 7 | | due to another VFD high temp fault. AS hr meter |
| 8 | | at 8030. |
| 9 | | → SVE system left ON for sampling |
| 10 | 0730 | • GF + CB set up on MW-58A. Target sample 70-130 min |
| 11 | | today's ^{after the} low-low tide. Today's low-low tide was 0640, |
| 12 | | so sample window was 0750-0850. |
| 13 | | → MW-58A-1022 sampled at 0823. |
| 14 | | • Some small rust-colored flecks were observed |
| 15 | | in the VOA samples that were not previously |
| 16 | | detected in the purgewater. |
| 17 | 0850 | • GF set up on MW-80B, and CB on MW-89. |
| 18 | | Both have target sample periods of 130-190 min |
| 19 | | after low-low tide, translating to 0850-0950. |
| 20 | | → MW-80B-1022 sampled at 0940. at |
| 21 | | → DUP 2-1022 sampled at "1200" |
| 22 | | → MW-89-1022 sampled at 0949. PH ^{was} and |
| 23 | | lower than ^{the} all other wells on site (3.75 vs ~7) |
| 24 | | and temp was higher (22.5°C vs ~19°C) |
| 25 | 1030 | • VFD troubleshooting |

Comments / Site Activities / Personnel Tracking

DAILY FIELD LOG

Project Information

Page 2 of 4

| | |
|---------------------------|--------------------------|
| Project Name: <u>T-30</u> | Location: <u>Seattle</u> |
| Project/Task No.: _____ | Weather: <u>60°</u> |
| Date: <u>10/19/22</u> | Personnel: <u>GF, CB</u> |

Observations

| Time | Observation Description |
|------|--|
| 1 | • VFD would not restart when we tested it on arrival, but immediately did when we pressed the "start" button at 1050. Not sure why. |
| 2 | |
| 3 | |
| 4 | <ul style="list-style-type: none"> • With heat exchanger OFF, temp switch is shutting the system down in the 100-110°F range, TAH fault. • The anemometer is measuring the air velocity out of the heat exchanger between ~150-650 fpm, depending where in the opening it is held. Lowest velocity is in the middle, & highest is to the right (Southern) side. → opening is 2.3 ft x 0.83 ft = 1.94 sf → Flow rate range = 290-1150 cfm → Sorage cabinet is ~3' x 6' x 4.25' = 76.5 cf. That means we're getting 3.75-15 air exchanges per minute. NOTE: vendor said the heat exchange should do 1700 cfm, assuming it has the motor he thought it would. Haven't confirmed. |
| 5 | |
| 6 | |
| 7 | |
| 8 | |
| 9 | |
| 10 | |
| 11 | |
| 12 | |
| 13 | |
| 14 | |
| 15 | |
| 16 | NOTE: vendor said the heat exchange should do |
| 17 | 1700 cfm, assuming it has the motor |
| 18 | he thought it would. Haven't confirmed. |
| 19 | 1155 • With the AS cabinet fully open, the heat exchanger |
| 20 | was keeping temps ~62°F. Ambient temps ~58°F. |
| 21 | 1157 • Cabinet doors closed to see effect on temps |
| 22 | 1224 → 72° on the thermometer. An A2010 code appeared |
| 23 | on the AS VFD, which is the lesser high temp |
| 24 | alarm. VFD stays on w/ it active. There doesn't appear |
| 25 | to be any reason to doubt the thermometer's accuracy. |

Comments / Site Activities / Personnel Tracking

DAILY FIELD LOG

Project Information

Page 3 of 4

| | |
|---------------------------|--------------------------|
| Project Name: <u>T-20</u> | Location: _____ |
| Project/Task No.: _____ | Weather: _____ |
| Date: <u>10/19/22</u> | Personnel: <u>GF, CB</u> |

Observations

| Time | Observation Description |
|------|--|
| 1 | The AS motor is warm but not hot to the touch. The |
| 2 | SVE motor is significantly hotter. Its discharge air |
| 3 | is ~100°F. |
| 4 | → A2010 code spontaneously stopped flashing, despite |
| 5 | no marked change in operation, ~12:50. |
| 6 | 12:25 • GF installed snubbers on all vertical SVE well leaders |
| 7 | (SVE-4-10). They work great, stabilizing previously very |
| 8 | unstable readings. Prior to install, one gauge was |
| 9 | estimated to be at 48 in H ₂ O, with a range of 42-54. |
| 10 | With the snubber installed, it was stable at 47 in H ₂ O. |
| 11 | → the horizontal SVE wells do not have the same vacuum |
| 12 | fluctuation and snubbers are not needed. |
| 13 | • GF installed a snubber & the new 0-15 in H ₂ O gauge |
| 14 | at the SVE discharge port, in place of the 0-100 in H ₂ O |
| 15 | gauge that always read 0. The new gauge reads |
| 16 | a steady 10.9 in H ₂ O. |
| 17 | → When the gauge was zeroed in its needle rotated |
| 18 | counterclockwise to 10.9, passing the bottom of |
| 19 | the gauge. Seemed odd, but was reproducible, with |
| 20 | and without the snubber. |
| 21 | → there are 4 snubbers left as spares. |
| 22 | 13:00 • New ball valves for the mag gauges are onsite but they |
| 23 | are 1/4" NPT and need to be 1/8". |
| 24 | • CB is troubleshooting the VFD. Eventually calls ABB |
| 25 | (the manufacturer) & determines that the motor is humming |

Comments / Site Activities / Personnel Tracking

DAILY FIELD LOG

Project Information

Page 4 of 4

| | |
|---------------------------|--------------------------|
| Project Name: <u>T-30</u> | Location: _____ |
| Project/Task No.: _____ | Weather: _____ |
| Date: <u>10/19/22</u> | Personnel: <u>GF, CB</u> |

Observations

| Time | Observation Description |
|------|--|
| 1 | to work too hard with the bleed valve at its current position. Full-load Amps are 9.6 but it was running at 10.5 and higher. ABB recommends using a current loop to determine whether it is actually sending that many amps to the motor. If it is, the motor has an issue. If it isn't, the VFD has an issue. I can try this during O&M on next Weds. |
| 2 | |
| 3 | |
| 4 | |
| 5 | |
| 6 | |
| 7 | |
| 8 | → in the meantime, we opened the bleed valve more to drop the amps down to 10 or so. Hopefully this avoids the faults |
| 9 | |
| 10 | |
| 11 | → we also confirmed there is no actual temp sensor in the motor it is communicating with. |
| 12 | → Cory has detailed notes on all of this |
| 13 | |
| 14 | 1430 • The temp sensor has an adjustable dial that has been set to 120°F. However, we observed TAT shutdowns earlier in the day when temps were 100-100F. We increased the dial to 130°F to compensate. |
| 15 | |
| 16 | |
| 17 | |
| 18 | 1515 • CB took a call for another project, but will stick around to check on the system when he is done. It was in the zone 2/zone 5 overlap period, and everything was running smoothly. |
| 19 | |
| 20 | |
| 21 | |
| 22 | • GF off site |
| 23 | |
| 24 | |
| 25 | } GF |

Comments / Site Activities / Personnel Tracking

LOW-FLOW GROUND WATER SAMPLING FORM

Project Name: T-30
 Project Number: 60681370
 Date: 10/19/22
 Weather: 50 cloudy°F

Well ID: MW-58A
 Sample ID: MW-58A-1022 [Well ID-MMY]
 Well Condition: Fair
 Sampled by: GF, CB

PRE-PURGE INFORMATION

Initial Depth to Water* (ft btoc): 10.93 @ 7:36
 Depth to Product* (ft btoc): -
 Product Thickness (ft): 0
 Water Column (ft): ~13.77
 Water Volume in Well (gal): ~2.26
 Inner Casing Diameter (Inch): 2
 Inner Casing Material: PVC

Purge/Sample Method: Low-Flow
 Purge/Sample Equipment: Peristaltic Pump
 Total Well Depth* (ft bgs): 25
 Screened Interval* (ft bgs): 5-25
 Tubing Inlet Depth* (ft): 18
 Sampling Tube Material: LPDE

Pipe Equipment:
YSI: 51292
Probe: 40206

PURGING INFORMATION

Start Purge Time: 7:42

****Tidal well, sample 70-130 min after the low-low tide

06:40

| Time | Purge Rate (mL/min) | Depth to Water (ft) | Volume Purged (gal) | Temp (°C) | Conductivity (mS/m) | Dissolved Oxygen (mg/L) | pH (SI Units) | ORP mV | Turbidity (NTU) | Comments |
|---------------------|---------------------|---------------------|---------------------|-----------|---------------------|-------------------------|---------------|--------|-----------------|----------|
| 0752 | 200 | 10.98 | | 19.2 | 1173 | 0.29 | 6.76 | -116.1 | 55.7 | |
| 0802 | " | 10.99 | | 19.2 | 1164 | 0.20 | 6.77 | -122.1 | 14.7 | |
| 0807 | " | " | | 19.2 | 1161 | 0.17 | 6.77 | -123.3 | 16.1 | |
| 0814 | " | 11.00 | | 19.2 | 1159 | 0.14 | 6.77 | -123.9 | 18.7 | |
| 0817 | " | 11.02 | | 19.1 | 1157 | 0.13 | 6.77 | -124.0 | 17.7 | |
| 0821 | " | | | 19.2 | 1157 | 0.12 | 6.76 | -124.2 | 17.5 | |
| <u>SAMPLED 0823</u> | | | | | | | | | | |
| <u>GF</u> | | | | | | | | | | |

SAMPLING INFORMATION

| Sample ID(s) | Sample time(s) | COC | Method | Container | No. of bottles | Preservative |
|--------------------|----------------|----------------------------|--------------|--------------|----------------|--------------|
| <u>MW-58A-1022</u> | <u>0823</u> | Gx/BTEX | NWTPH-G/BTEX | 40 mL VOA | 3 | HCL |
| | | Dx | NWTPH-Dx | 500 mL Amber | 1 | - |
| | | PAHs & 2-methylnaphthalene | SVOCs | 1 L Amber | 1 | - |

STABILIZATION RANGES

Dissolved Oxygen: +/- 10%
 Conductivity: +/- 10%
 Temperature: +/- 10%
 pH: +/- 0.1 unit
 Redox Potential: +/- 10%
 Turbidity: +/- 10%

COMMENTS & OBSERVATIONS: (slow recharge, turbidity, odor, sheen, PID readings)

Grass odor present
rust-colored flecks visible in VOAs that were not observed at end of purging.

USEFUL INFORMATION

* = Measured from top of inner casing
 DTW - Depth to Water
 Initial purge 15 minutes, then measure at 3 minute intervals
 Water Levels Measured with an Electronic Water Level Meter
 Field parameter meter calibration results are recorded in the field book.

2" casing: 1 ft = 0.164 gal = 0.62 L
 4" casing: 1 ft = 0.656 gal = 2.48 L
 1 gal = 3785.4 mL

LOW-FLOW GROUND WATER SAMPLING FORM

Project Name: T-30
 Project Number: 60681370
 Date: 10/19/22
 Weather: _____ °F

Well ID: MW-86B + Dup 2
 Sample ID: MW-86B-1022 [Well ID-MMYY]
 Well Condition: Fair
 Sampled by: GF

PRE-PURGE INFORMATION

Initial Depth to Water* (ft btoc): 12.03
 Depth to Product* (ft btoc): -
 Product Thickness (ft): 0
 Water Column (ft): ~7.07
 Water Volume in Well (gal): 1.16
 Inner Casing Diameter (Inch): 2
 Inner Casing Material: PVC

Purge/Sample Method: Low-Flow
 Purge/Sample Equipment: Peristaltic Pump
 Total Well Depth* (ft bgs): 20
 Screened Interval* (ft bgs): 5-20
 Tubing Inlet Depth* (ft): 16 bgs
 Sampling Tube Material: LPDE

Pine Equipment
YSI: 51292
Probe: 40206

PURGING INFORMATION

Start Purge Time: 0907

****Tidal well, sample 130-190 min after the low-low tide

0640

| Time | Purge Rate (mL/min) | Depth to Water (ft) | Volume Purged (gal) | Temp (°C) | Conductivity (mS/m) | Dissolved Oxygen (mg/L) | pH (SI Units) | ORP mV | Turbidity (NTU) | Comments |
|--|---------------------|---------------------|---------------------|-----------|---------------------|-------------------------|---------------|--------|-----------------|----------|
| 0917 | 200 | 12.02 | | 18.8 | 2022 | 0.29 | 7.16 | -90.4 | 5.27 | |
| 0927 | " | 12.54 | | 18.8 | 1946 | 0.20 | 7.14 | -109.1 | 3.34 | |
| 0932 | " | 12.51 | | 18.8 | 1931 | 0.17 | 7.14 | -114.0 | 2.41 | |
| 0935 | " | 12.49 | | 18.8 | 1921 | 0.16 | 7.14 | -114.9 | 1.44 | |
| 0938 | " | 12.48 | | 18.6 | 1917 | 0.15 | 7.13 | -116.8 | 1.07 | |
| <p>— SAMPLE 0940 —</p> <div style="text-align: center; font-size: 2em; margin-top: 10px;">GF</div> | | | | | | | | | | |

SAMPLING INFORMATION

| Sample ID(s) | Sample time(s) | COC | Method | Container | No. of bottles | Preservative |
|--------------|----------------|----------------------------|--------------|--------------|----------------|--------------|
| MW-86B-1022 | 0940 1200 | Gx/BTEX | NWTPH-G/BTEX | 40 mL VOA | 3 3 | HCL |
| Dup 2-1022 | | Dx | NWTPH-Dx | 500 mL Amber | 1 1 | - |
| | | PAHs & 2-methylnaphthalene | SVOCs | 1 L Amber | 1 1 | - |

For Dup 2

STABILIZATION RANGES

Dissolved Oxygen: +/- 10%
 Conductivity: +/- 10%
 Temperature: +/- 10%
 pH: +/- 0.1 unit
 Redox Potential: +/- 10%
 Turbidity: +/- 10%

USEFUL INFORMATION

* = Measured from top of inner casing
 DTW - Depth to Water
 Initial purge 15 minutes, then measure at 3 minute intervals
 Water Levels Measured with an Electronic Water Level Meter
 Field parameter meter calibration results are recorded in the field book.

COMMENTS & OBSERVATIONS: (slow recharge, turbidity, odor, sheen, PID readings)
N/A

2" casing: 1 ft = 0.164 gal = 0.62 L
 4" casing: 1 ft = 0.656 gal = 2.48 L
 1 gal = 3785.4 mL

LOW-FLOW GROUND WATER SAMPLING FORM

Project Name: T-30
 Project Number: 60681370
 Date: Oct 19, 2022
 Weather: ~55 °F

Well ID: MW-89
 Sample ID: MW-89-1022 [Well ID-MMY] GOOD
 Well Condition: GOOD
 Sampled by: Cary Broom

PRE-PURGE INFORMATION

Initial Depth to Water* (ft btoc): 10.53
 Depth to Product* (ft btoc): NP
 Product Thickness (ft): NP
 Water Column (ft): 10.53
 Water Volume in Well (gal): 5.626 CB
 Inner Casing Diameter (Inch): 2
 Inner Casing Material: PVC

Purge/Sample Method: Low-Flow
 Purge/Sample Equipment: Peristaltic Pump
 Total Well Depth* (ft bgs): 20 19.6
 Screened Interval* (ft bgs): 5-20
 Tubing Inlet Depth* (ft bgs): ~14 (tubing won't go deeper)
 Sampling Tube Material: LPDE

PURGING INFORMATION

Start Purge Time: 9:09

****Tidal well, sample 130-190 min after the low-low tide

| Time | Purge Rate (mL/min) | Depth to Water (ft) | Volume Purged (gal) | Temp (°C) | Conductivity (mS/m) | Dissolved Oxygen (mg/L) | pH (SI Units) | ORP mV | Turbidity (NTU) | Comments |
|---|---------------------|---------------------|---------------------|-----------|---------------------|-------------------------|---------------|--------|-----------------|----------|
| 916 | 280 | 10.91 | | 23.2 | 2801 | 3.99 | 3.95 | 226 | 8.5 | |
| 925 | 230 | 10.83 | | 22.3 | 2757 | 4.64 | 3.76 | 292 | 8.6 | |
| 933 | 250 | 10.81 | | 22.5 | 2719 | 4.96 | 3.76 | 311 | 7.1 | |
| 936 | 200 | 10.80 | | 22.1 | 2700 | 5.07 | 3.76 | 319 | 8.8 | |
| 940 | 200 | 10.80 | | 22.2 | 2692 | 5.11 | 3.76 | 324 | 7.4 | |
| 943 | 200 | 10.80 | | 22.1 | 2688 | 5.14 | 3.76 | 327 | 4.5 | |
| Switch to 2nd YSI to confirm Temp & pH Readings | | | | | | | | | | |
| 948 | 200 | 10.7 | | 22.4 | 2947 | 5.26 | 3.48 | 227 | 1.2 | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

SAMPLING INFORMATION

| Sample ID(s) | Sample time(s) | Analysis | Method | Container | No. of bottles | Preservative |
|--------------|----------------|----------|--------------|--------------|----------------|--------------|
| MW-89-1022 | 949 | Gx/BTEX | NWTPH-G/BTEX | 40 mL VOA | 3 | HCL |
| | | Dx | NWTPH-Dx | 500 mL Amber | 1 | - |

STABILIZATION RANGES

- Dissolved Oxygen: +/- 10%
- Conductivity: +/- 10%
- Temperature: +/- 10%
- pH: +/- 0.1 unit
- Redox Potential: +/- 10%
- Turbidity: +/- 10%

USEFUL INFORMATION

* = Measured from top of inner casing
 DTW - Depth to Water
 Initial purge 15 minutes, then measure at 3 minute intervals
 Water Levels Measured with an Electronic Water Level Meter
 Field parameter meter calibration results are recorded in the field book.

COMMENTS & OBSERVATIONS: (slow recharge, turbidity, odor, sheen, PID readings)

~3 gallons removed from well MW-89

2" casing: 1 ft = 0.164 gal = 0.62 L
 4" casing: 1 ft = 0.656 gal = 2.48 L
 1 gal = 3785.4 mL

Pize Equipment
 VSI: 46376
 Probe: 7481

SAMPLE CHAIN OF CUSTODY

Report To Paul Kalina
 Company AECOM
 Address 1111 3rd Ave
 City, State, ZIP Seattle, WA 98101
 Phone 206-310-5097 Email Paul.kalina@aecom.com
Gus.friedman@aecom.com

| | |
|---|------------|
| SAMPLERS (signature) <u>Gus</u> | |
| PROJECT NAME <u>T-30</u> | PO # |
| REMARKS | INVOICE TO |
| Project specific RLs? - Yes / <u>No</u> | |

Page # 1 of 1

TURNAROUND TIME

Standard turnaround
 RUSH

Rush charges authorized by: _____

SAMPLE DISPOSAL

Archive samples
 Other _____
 Default: Dispose after 30 days

| Sample ID | Lab ID | Date Sampled | Time Sampled | Sample Type | # of Jars | ANALYSES REQUESTED | | | | | | | | | | Notes | | | |
|-------------|--------|--------------|--------------|-------------|-----------|--------------------|----------|---------------|------------|---------------|---------------|---------------|---------------|--|---|-------|--|--|--------------------------------------|
| | | | | | | NWTPH-Dx | NWTPH-Gx | BTEX EPA 8021 | NWTPH-HCID | VOCs EPA 8260 | PAHs EPA 8270 | PCBs EPA 8082 | BTEX EPA 8260 | | | | | | |
| MW-89-1022 | | 10/19/22 | 0949 | gw | 4 | x | x | | | | | | | | | | | | |
| MW-58A-1022 | | 10/19/22 | 0823 | gw | 5 | x | x | | | | | | x | | x | | | | PAHs include 2-methyl naphthalene |
| MW-86B-1022 | | 10/19/22 | 0940 | gw | 5 | x | x | | | | | | x | | x | | | | |
| Dup2-1022 | | 10/19/22 | 1200 | gw | 5 | x | x | | | | | | x | | x | | | | |
| | | | | | | | | | | | | | | | | | | | |

Friedman & Bruya, Inc.
 Ph. (206) 285-8282

| SIGNATURE | PRINT NAME | COMPANY | DATE | TIME |
|---------------------------------|---------------------|--------------|-----------------|-------------|
| Relinquished by: <u>Gus</u> | <u>Gus Friedman</u> | <u>AECOM</u> | <u>10/19/22</u> | <u>1640</u> |
| Received by: <u>Wesley Eard</u> | <u>Wesley Eard</u> | <u>FBI</u> | <u>10/19/22</u> | <u>1646</u> |
| Relinquished by: | | | | |
| Received by: | | | | |



INSTRUMENT CALIBRATION REPORT

Pine Environmental Services LLC

7332 S. Alton Way, Bldg. 13, Suite E.
Centennial, CO 80112
Toll-free: (866) 960-PINE (7463)

Pine Environmental Services, Inc.

Instrument ID 51292
Description Pro DSS Display
Calibrated 10/10/2022 4:54:48PM

| | |
|--|------------------------|
| Manufacturer YSI | State Certified |
| Model Number Pro DSS | Status Pass |
| Serial Number/ Lot Number 21D221618 | Temp °C 25 |
| Location Colorado | Humidity % 16 |
| Department | |

Calibration Specifications

| <u>Group #</u> | <u>Group Name</u> | <u>Stated Accy</u> | <u>Range Acc %</u> | <u>Reading Acc %</u> | <u>Plus/Minus</u> | <u>Nom In Val / In Val</u> | <u>In Type</u> | <u>Out Val</u> | <u>Out Type</u> | <u>Fnd As</u> | <u>Lft As</u> | <u>Dev%</u> | <u>Pass/Fail</u> |
|----------------|-------------------|--------------------|--------------------|----------------------|-------------------|----------------------------|----------------|----------------|-----------------|---------------|---------------|-------------|------------------|
|----------------|-------------------|--------------------|--------------------|----------------------|-------------------|----------------------------|----------------|----------------|-----------------|---------------|---------------|-------------|------------------|

Test Instruments Used During the Calibration

(As Of Cal Entry Date)

| <u>Test Standard ID</u> | <u>Description</u> | <u>Manufacturer</u> | <u>Model Number</u> | <u>Serial Number / Lot Number</u> | <u>Last Cal Date / Expiration Date</u> | <u>Next Cal Date / Expiration Date</u> |
|-------------------------|--------------------|---------------------|---------------------|-----------------------------------|--|--|
|-------------------------|--------------------|---------------------|---------------------|-----------------------------------|--|--|

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Kevin Morin

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment
Please call 800-301-9663 for Technical Assistance



INSTRUMENT CALIBRATION REPORT

Pine Environmental Services LLC

7332 S. Alton Way, Bldg. 13, Suite E.
Centennial, CO 80112

Toll-free: (866) 960-PINE (7463)

Pine Environmental Services, Inc.

Instrument ID 51293

Description YSI Pro DSS Sonde

Calibrated 10/10/2022 4:54:10PM

| | | | | | | | |
|---|-----------------------------|----------------|-----------------|---------------|---------------|-------------|------------------|
| Group # 5 | Range Acc % 0.0000 | | | | | | |
| Group Name Dissolved Oxygen Span | Reading Acc % 3.0000 | | | | | | |
| Stated Accy Pct of Reading | Plus/Minus 0.00 | | | | | | |
| Nom In Val / In Val | In Type | Out Val | Out Type | Fnd As | Lft As | Dev% | Pass/Fail |
| 100.00 / 100.00 | % | 100.00 | % | 102.30 | 100.00 | 0.00% | Pass |

| <u>Test Instruments Used During the Calibration</u> | | | | | <u>(As Of Cal Entry Date)</u> | |
|---|--------------------------------------|---|---------------------|-----------------------------------|------------------------------------|--|
| <u>Test Standard ID</u> | <u>Description</u> | <u>Manufacturer</u> | <u>Model Number</u> | <u>Serial Number / Lot Number</u> | <u>Last Cal Date / Opened Date</u> | <u>Next Cal Date / Expiration Date</u> |
| CO 126/124 NTU (22A214...) | CO 126/124 YSI NTU 21L21440187 | YSI | 607300 | 22A21460130 | | 1/30/2023 |
| CO AUTO CAL 0NTU/PH4 18262406 | CO AUTO CAL 0NTU/PH4 18262406 | AMCOCLEAR | | 18262406 | | |
| CO COND 1.413(2GG653) | 1413 COND STND LOT | AquaPhoenix Scientific | 31986 | 2GG653 | | 7/30/2023 |
| CO ORP 240MV(2GI207) | ORP SOLUTION 240 mV | Pine Environmental Services, Inc. | 32001 | 2GI207 | | 6/1/2023 |
| CO PH 4 1GF009 | CO PH 7 | AquaPhoenix Scientific | | 1GF009 | | 6/1/2023 |
| CO PH10 1GD492 | CO PH10 | AquaPhoenix Scientific | | 1GD492 | | 4/1/2023 |
| CO PH7 1GF460 | CO PH 7 | AquaPhoenix Scientific | BU5007-T | | | 6/1/2023 |
| CO ZERO DO | CO Zero Dissolved Oxygen Solution | Hanna | HI7040L | S0021/18 | | 3/1/2023 |

Notes about this calibration

Calibration Result Calibration Successful

Who Calibrated Kevin Morin



INSTRUMENT CALIBRATION REPORT

Pine Environmental Services LLC

7332 S. Alton Way, Bldg. 13, Suite E.
Centennial, CO 80112

Toll-free: (866) 960-PINE (7463)

Pine Environmental Services, Inc.

Instrument ID 51293
Description YSI Pro DSS Sonde
Calibrated 10/10/2022 4:54:10PM

Manufacturer YSI
Model Number Pro DSS
Serial Number/ Lot Number 21E100011
Location Colorado
Department

State Certified
Status Pass
Temp °C 25
Humidity % 16

Calibration Specifications

Group # 1
Group Name PH
Stated Accy Pct of Reading

Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.00

| <u>Nom In Val / In Val</u> | <u>In Type</u> | <u>Out Val</u> | <u>Out Type</u> | <u>Fnd As</u> | <u>Lft As</u> | <u>Dev%</u> | <u>Pass/Fail</u> |
|----------------------------|----------------|----------------|-----------------|---------------|---------------|-------------|------------------|
| 7.00 / 7.00 | PH | 7.00 | PH | 6.94 | 7.00 | 0.00% | Pass |
| 4.00 / 4.00 | PH | 4.00 | PH | 4.23 | 4.00 | 0.00% | Pass |
| 10.00 / 10.00 | PH | 10.00 | PH | 9.83 | 10.00 | 0.00% | Pass |

Group # 2
Group Name Turbidity
Stated Accy Pct of Reading

Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.00

| <u>Nom In Val / In Val</u> | <u>In Type</u> | <u>Out Val</u> | <u>Out Type</u> | <u>Fnd As</u> | <u>Lft As</u> | <u>Dev%</u> | <u>Pass/Fail</u> |
|----------------------------|----------------|----------------|-----------------|---------------|---------------|-------------|------------------|
| 0.00 / 0.00 | NTU | 0.00 | NTU | 0.00 | 0.00 | 0.00% | Pass |
| 124.00 / 124.00 | NTU | 124.00 | NTU | 126.00 | 124.00 | 0.00% | Pass |

Group # 3
Group Name Conductivity
Stated Accy Pct of Reading

Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.000

| <u>Nom In Val / In Val</u> | <u>In Type</u> | <u>Out Val</u> | <u>Out Type</u> | <u>Fnd As</u> | <u>Lft As</u> | <u>Dev%</u> | <u>Pass/Fail</u> |
|----------------------------|----------------|----------------|-----------------|---------------|---------------|-------------|------------------|
| 1.413 / 1.413 | ms/cm | 1.413 | ms/cm | 1.430 | 1.413 | 0.00% | Pass |

Group # 4
Group Name Redox (ORP)
Stated Accy Pct of Reading

Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.00

| <u>Nom In Val / In Val</u> | <u>In Type</u> | <u>Out Val</u> | <u>Out Type</u> | <u>Fnd As</u> | <u>Lft As</u> | <u>Dev%</u> | <u>Pass/Fail</u> |
|----------------------------|----------------|----------------|-----------------|---------------|---------------|-------------|------------------|
| 240.00 / 240.00 | mv | 240.00 | mv | 243.50 | 240.00 | 0.00% | Pass |

Group # 5
Group Name Dissolved Oxygen Span
Stated Accy Pct of Reading

Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.00

| <u>Nom In Val / In Val</u> | <u>In Type</u> | <u>Out Val</u> | <u>Out Type</u> | <u>Fnd As</u> | <u>Lft As</u> | <u>Dev%</u> | <u>Pass/Fail</u> |
|----------------------------|----------------|----------------|-----------------|---------------|---------------|-------------|------------------|
|----------------------------|----------------|----------------|-----------------|---------------|---------------|-------------|------------------|

INSTRUMENT CALIBRATION REPORT



Pine Environmental Services LLC

3225 South 116th St.
Building 1 Suite 181
Tukwila, WA 98168
425-285-9102

Pine Environmental Services, Inc.

Instrument ID 40206
Description Solinst IP (200 ft)
Calibrated 10/11/2022 5:41:18PM

| | |
|---|------------------------|
| Manufacturer Solinst | State Certified |
| Model Number N/A | Status Pass |
| Serial Number/ Lot Number 312227 | Temp °C 23 |
| Location Seattle | Humidity % 43 |
| Department | |

Calibration Specifications

| Group # | Group Name | Stated Accy | Range Acc % | Reading Acc % | Plus/Minus | Dev% | Pass/Fail |
|----------------------------|-------------------|--------------------|--------------------|----------------------|-------------------|-------------|------------------|
| <u>Nom In Val / In Val</u> | <u>In Type</u> | <u>Out Val</u> | <u>Out Type</u> | <u>Fnd As</u> | <u>Lft As</u> | <u>Dev%</u> | <u>Pass/Fail</u> |

Test Instruments Used During the Calibration

(As Of Cal Entry Date)

| <u>Test Standard ID</u> | <u>Description</u> | <u>Manufacturer</u> | <u>Model Number</u> | <u>Serial Number / Lot Number</u> | <u>Last Cal Date / Expiration Date</u> | <u>Next Cal Date / Expiration Date</u> |
|-------------------------|--------------------|---------------------|---------------------|-----------------------------------|--|--|
|-------------------------|--------------------|---------------------|---------------------|-----------------------------------|--|--|

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Larry Lorenzano

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment
Please call 800-301-9663 for Technical Assistance

INSTRUMENT CALIBRATION REPORT



Pine Environmental Services LLC

3225 South 116th St.
Building 1 Suite 181
Tukwila, WA 98168
425-285-9102

Pine Environmental Services, Inc.

Instrument ID 51630
Description Pine Environmental Peristaltic Pump
Calibrated 10/11/2022 1:03:56PM

| | |
|---|------------------------|
| Manufacturer Pine Environmental Services, Inc. | State Certified |
| Model Number | Status Pass |
| Serial Number/ Lot Number n/a | Temp °C 23 |
| Location Seattle | Humidity % 46 |
| Department | |

Calibration Specifications

Group # 1
Group Name
Test Performed: Yes **As Found Result:** Pass **As Left Result:** Pass

Test Instruments Used During the Calibration

(As Of Cal Entry Date)

| <u>Test Standard ID</u> | <u>Description</u> | <u>Manufacturer</u> | <u>Model Number</u> | <u>Serial Number / Lot Number</u> | <u>Next Cal Date / Last Cal Date/ Expiration Date</u> | <u>Opened Date</u> |
|-------------------------|--------------------|---------------------|---------------------|---------------------------------------|---|--------------------|
|-------------------------|--------------------|---------------------|---------------------|---------------------------------------|---|--------------------|

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Larry Lorenzano

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

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INSTRUMENT CALIBRATION REPORT



Pine Environmental Services LLC

3225 South 116th St.
Building 1 Suite 181
Tukwila, WA 98168
425-285-9102

Pine Environmental Services, Inc.

Instrument ID 46801
Description Geotech Peristaltic Pump
Calibrated 10/11/2022 1:06:32PM

| | |
|---|------------------------|
| Manufacturer Pine Environmental Services, Inc. | State Certified |
| Model Number Geopump | Status Pass |
| Serial Number/ Lot Number n/a | Temp °C 23 |
| Location Seattle | Humidity % 46 |
| Department | |

Calibration Specifications

Group # 1
Group Name PERISTALSIS AND FUNCTIONAL TEST
Test Performed: Yes **As Found Result:** Pass **As Left Result:** Pass

Test Instruments Used During the Calibration

(As Of Cal Entry Date)

| <u>Test Standard ID</u> | <u>Description</u> | <u>Manufacturer</u> | <u>Model Number</u> | <u>Serial Number / Lot Number</u> | <u>Next Cal Date / Expiration Date</u> |
|-------------------------|--------------------|---------------------|---------------------|-----------------------------------|--|
|-------------------------|--------------------|---------------------|---------------------|-----------------------------------|--|

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Larry Lorenzano

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INSTRUMENT CALIBRATION REPORT



Pine Environmental Services LLC

3225 South 116th St.
Building 1 Suite 181
Tukwila, WA 98168
425-285-9102

Pine Environmental Services, Inc.

Instrument ID 7481
Description Solinst Interface
Calibrated 10/11/2022 5:40:10PM

| | |
|---|------------------------|
| Manufacturer Solinst | State Certified |
| Model Number IP 200' | Status Pass |
| Serial Number/ Lot Number 286714 | Temp °C 24 |
| Location Seattle | Humidity % 43 |
| Department | |

Calibration Specifications

Group # 1
Group Name
Test Performed: Yes **As Found Result:** Pass **As Left Result:** Pass

Test Instruments Used During the Calibration

(As Of Cal Entry Date)

| <u>Test Standard ID</u> | <u>Description</u> | <u>Manufacturer</u> | <u>Model Number</u> | <u>Serial Number / Lot Number</u> | <u>Next Cal Date / Expiration Date</u> |
|-------------------------|--------------------|---------------------|---------------------|-----------------------------------|--|
|-------------------------|--------------------|---------------------|---------------------|-----------------------------------|--|

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Larry Lorenzano

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INSTRUMENT CALIBRATION REPORT



Pine Environmental Services LLC

3225 South 116th St.
Building 1 Suite 181
Tukwila, WA 98168
425-285-9102

Pine Environmental Services, Inc.

Instrument ID 46376
Description Pro DSS Display
Calibrated 10/6/2022 12:47:34PM

Manufacturer YSI
Model Number Pro DSS
Serial Number/ Lot Number 19D104639
Location Seattle
Department

State Certified
Status Pass
Temp °C 21
Humidity % 56

Calibration Specifications

| Group # | Group Name | Stated Accy | Range Acc % | Reading Acc % | Plus/Minus | Dev% | Pass/Fail |
|----------------------------|----------------|----------------|-----------------|---------------|---------------|-------------|------------------|
| <u>Nom In Val / In Val</u> | <u>In Type</u> | <u>Out Val</u> | <u>Out Type</u> | <u>Fnd As</u> | <u>Lft As</u> | <u>Dev%</u> | <u>Pass/Fail</u> |

Test Instruments Used During the Calibration

(As Of Cal Entry Date)

| <u>Test Standard ID</u> | <u>Description</u> | <u>Manufacturer</u> | <u>Model Number</u> | <u>Serial Number / Lot Number</u> | <u>Last Cal Date / Expiration Date</u> | <u>Next Cal Date / Expiration Date</u> |
|-------------------------|--------------------|---------------------|---------------------|-----------------------------------|--|--|
|-------------------------|--------------------|---------------------|---------------------|-----------------------------------|--|--|

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Jose Arroyo

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment
Please call 800-301-9663 for Technical Assistance

INSTRUMENT CALIBRATION REPORT



Pine Environmental Services LLC

3225 South 116th St.
Building 1 Suite 181
Tukwila, WA 98168
425-285-9102

Pine Environmental Services, Inc.

Instrument ID 46873
Description YSI Pro DSS
Calibrated 10/6/2022 12:43:56PM

| | | | | | | | |
|----------------------------|----------------------|----------------|-----------------|---------------|---------------|-------------|------------------|
| Group # | 5 | Range Acc % | 0.0000 | | | | |
| Group Name | Disolved Oxygen Span | Reading Acc % | 3.0000 | | | | |
| Stated Accy | Pct of Reading | Plus/Minus | 0.00 | | | | |
| <u>Nom In Val / In Val</u> | <u>In Type</u> | <u>Out Val</u> | <u>Out Type</u> | <u>Fnd As</u> | <u>Lft As</u> | <u>Dev%</u> | <u>Pass/Fail</u> |
| 100.00 / 100.00 | % | 100.00 | % | 105.10 | 100.00 | 0.00% | Pass |

| <u>Test Instruments Used During the Calibration</u> | | | | <u>(As Of Cal Entry Date)</u> | |
|---|--------------------------------------|---------------------------|-----------------------------|-----------------------------------|--|
| <u>Test Standard ID</u> | <u>Description</u> | <u>Manufacturer</u> | <u>Model Number</u> | <u>Serial Number / Lot Number</u> | <u>Next Cal Date / Expiration Date</u> |
| SEA AUTOCAL 22140172 | SEA AUTOCAL AMCO Clear | GFS | 8483 | 22140172 | 4/30/2023 |
| SEA COND 1.413 µS/CM 2GE259 | Conductivity solution 1.413 µS/cm | AquaPhoenix Scientific | Conductivity 1.413 mS/cm | 2GE259 | 5/31/2023 |
| SEA NTU 126 22C2205179 | SEA 126 NTU turbidity for YSI | YSI | 607300 | 22C2205179 | 3/31/2023 |
| SEA ORP 240 2GB110 | 240 mV ORP Solution | AquaPhoenix Scientific | 32001 | 2GB110 | 11/30/2022 |
| SEA PH 10 2GGG018 | pH 10 Buffer Solution | AquaPhoenix Scientific | 32034 | 2GGG018 | 7/24/2024 |
| SEA PH 7 2GB314 | pH 7 Buffer Solution | AquaPhoenix Scientific | 32025 | 2GB314 | 2/29/2024 |
| SEA PH4 2GG184 | pH 4 Buffer Solution | AquaPhoenix Scientific | 32017 | 2GG184 | 7/31/2024 |

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Jose Arroyo

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INSTRUMENT CALIBRATION REPORT



Pine Environmental Services LLC

3225 South 116th St.
Building 1 Suite 181
Tukwila, WA 98168
425-285-9102

Pine Environmental Services, Inc.

Instrument ID 46873
Description YSI Pro DSS
Calibrated 10/6/2022 12:43:56PM

| | |
|--|------------------------|
| Manufacturer YSI | State Certified |
| Model Number Pro DSS | Status Pass |
| Serial Number/ Lot Number 19K104044 | Temp °C 21 |
| Location Seattle | Humidity % 56 |
| Department | |

Calibration Specifications

| Group # 1 | | | | Range Acc % | | | |
|----------------------------------|----------------|----------------|-----------------|---------------|---------------|-------------|------------------|
| Group Name PH | | | | Reading Acc % | | | |
| Stated Accy Pct of Reading | | | | Plus/Minus | | | |
| <u>Nom In Val / In Val</u> | <u>In Type</u> | <u>Out Val</u> | <u>Out Type</u> | <u>Fnd As</u> | <u>Lft As</u> | <u>Dev%</u> | <u>Pass/Fail</u> |
| 7.00 / 7.00 | PH | 7.00 | PH | 7.12 | 7.02 | 0.29% | Pass |
| 4.00 / 4.00 | PH | 4.00 | PH | 3.89 | 4.00 | 0.00% | Pass |
| 10.00 / 10.00 | PH | 10.00 | PH | 10.37 | 10.05 | 0.50% | Pass |
| Group # 2 | | | | Range Acc % | | | |
| Group Name Turbidity | | | | Reading Acc % | | | |
| Stated Accy Pct of Reading | | | | Plus/Minus | | | |
| <u>Nom In Val / In Val</u> | <u>In Type</u> | <u>Out Val</u> | <u>Out Type</u> | <u>Fnd As</u> | <u>Lft As</u> | <u>Dev%</u> | <u>Pass/Fail</u> |
| 0.00 / 0.00 | NTU | 0.00 | NTU | 1.20 | 0.00 | 0.00% | Pass |
| 124.00 / 124.00 | NTU | 124.00 | NTU | 127.51 | 124.02 | 0.02% | Pass |
| Group # 3 | | | | Range Acc % | | | |
| Group Name Conductivity | | | | Reading Acc % | | | |
| Stated Accy Pct of Reading | | | | Plus/Minus | | | |
| <u>Nom In Val / In Val</u> | <u>In Type</u> | <u>Out Val</u> | <u>Out Type</u> | <u>Fnd As</u> | <u>Lft As</u> | <u>Dev%</u> | <u>Pass/Fail</u> |
| 1.413 / 1.413 | ms/cm | 1.413 | ms/cm | 1.174 | 1.413 | 0.00% | Pass |
| Group # 4 | | | | Range Acc % | | | |
| Group Name Redox (ORP) | | | | Reading Acc % | | | |
| Stated Accy Pct of Reading | | | | Plus/Minus | | | |
| <u>Nom In Val / In Val</u> | <u>In Type</u> | <u>Out Val</u> | <u>Out Type</u> | <u>Fnd As</u> | <u>Lft As</u> | <u>Dev%</u> | <u>Pass/Fail</u> |
| 240.00 / 240.00 | mv | 240.00 | mv | 238.90 | 240.00 | 0.00% | Pass |
| Group # 5 | | | | Range Acc % | | | |
| Group Name Dissolved Oxygen Span | | | | Reading Acc % | | | |
| Stated Accy Pct of Reading | | | | Plus/Minus | | | |
| <u>Nom In Val / In Val</u> | <u>In Type</u> | <u>Out Val</u> | <u>Out Type</u> | <u>Fnd As</u> | <u>Lft As</u> | <u>Dev%</u> | <u>Pass/Fail</u> |
| | | | | | | | |

AECOM Daily Tailgate Meeting Summary

Project information

| | |
|-------------------------|---------------|
| Project Name | T-30 |
| Project Number | 60681370 |
| Project Manager | Paul Kalina |
| Project Manager Phone # | 2063105097 |
| Muster Point location | Clubhouse |
| Meeting date | 10/19/2022 |
| Business Line | Environment |
| SH&E Manager | Tim Gilles |
| SH&E Manager Phone # | 3128335991 |
| First Aid Kit Location | Conex |
| Prepared by | Friedman, Gus |

Shift Summary

| | |
|--------------------------------|--|
| Location | SODO |
| Attendees (Workers) | Brown, Cary;Friedman, Gus; |
| Attendees (Visitors) | |
| Tasks to be performed | Tidal well gw sampling AS VFD troubleshooting |
| Hazards to be considered today | noise, motion, mechanical, electrical |
| Will there be Lone Workers? | No |
| Hierarchy of controls | engineering, ppe |
| Personal Protective Equipment | Task Specific: gloves Mandatory: safetyglasses, longpants, reflectivevest, workboots |
| High Risk Events | |
| | |

| | |
|--|--|
| Topic of the week | Hearing Conservation |
| Other topics discussed | Traffic hazards Crane operation awareness |
| Mid day reviews | |
| End of the day comments.The supervisor confirms that the site is being left in a safe condition and work crew checked out as fit unless otherwise specified here | All wells sampled within the required time periods. Progress made troubleshooting VFD |
| Hazards | <ul style="list-style-type: none">• Mechanical• Motion• Noise• Electrical |

DATE 10/26/12

| | | | | | | | |
|-----|---|---|---|----------|----|---|---|
| DAY | S | M | T | W | TH | F | S |
|-----|---|---|---|----------|----|---|---|

PROJECT MANAGER: Paul Kalina
 PROJECT: T-30
 JOB NO.: _____
 AECOM FIELD REP: GF

| | | | | | |
|----------|--------------|--------------|----------|------------|-------|
| WEATHER | BRIGHT SUN | CLEAR | OVERCAST | RAIN | SNOW |
| TEMP | To 32 | 32-50 | 50-70 | 70-85 | 85 up |
| WIND | Still | Moder | High | Report No. | |
| HUMIDITY | Dry | Moder | Humid | | |

SUB-CONTRACTORS ON SITE: N/A

EQUIPMENT ON SITE: PID ID: 39957

WORK PERFORMED: Biweekly O&M, VFD current loop measurements
1500 - onsite

- Safety tailgate - ship in port, traffic is active.
- System ON on arrival. Zones 2 & 3 active during an overlap period.
 - As VFD was registered 52 Hz and 9.5 A at 82 %.
- Marina has installed new shelves for equipment in the cove
 - King SVE rotaneter guide rods have arrived
 - Sch 80 PVC close ripples for AS rats. have arrived
 - spare union fittings w/ o-rings for Pwyer AS rats have arrived
 - still missing King SVE stoppers + floats (if applicable?)
 - 2" ball valve assembly for SVE leaders
 - bushes for pitot tubes.

1600. Began taking system readings
Reset zones 2, 3, & 4 routines. They were accidentally entered
with AM/PM switched. The result was that only Zone 5 was
active.

- AS-7, -9, & 11 rotaneter floats were stuck after zone switch (zone 2)
- same for AS-13, 15 + 16 in zone 3
- * All dropped with a smack except AS-11, which stayed stuck. → AS-1 + 2 are also stuck

- SVE-5, 8, & 9 have significant water
- SVE-5 + 8 floats get stuck at bottom
- SVE-9 is dirty

1645 collected PID readings @ 6 inlet / 0.7 discharge

BY GF TITLE _____

PROJECT: T-30

REPORT NO.

JOB NO.:

DATE 6/26/22

1655 Zone 5 breakthrough pressures:

| well ID | Initial flow | Init Pressure | Breakthru Press | Final flow | Final valve | comments |
|---------|--------------|---------------|-----------------|------------|-------------|--------------|
| AS-23 | 2.2 | 9.75 | 8.25 | 2.1 | 100 | good |
| AS-24 | 3.8 | 9.0 | 8.0 | 3.6 | 100 | Sticky |
| AS-25 | 1.9 | 9.5 | 8.75 | 2.2 | 100 | Condensation |
| AS-26 | 1.2 | 10.0 | 9.0 | 1.3 | 100 | " |
| AS-27 | 2.3 | 8.75 | 7.75 | 2.4 | 100 | good |

Closing AS-24 gave everything ~1 sec flow bump. Not worth it.

1715 VFD current loop measurements. Zone 5 active. VFD reads 10.5.

| | Supply Side | | | Motor Side | | | VFD |
|------|-------------|-------|-------|------------|--------|--------|------|
| | V1 | V1 | W1 | V2 | V2 | W2 | |
| | black | black | black | Brown | orange | Yellow | |
| Z5 | 10.25 | 9.89 | 10.15 | 11.33 | 11.73 | 11.32 | 10.5 |
| Z5+1 | 9.59 | 9.35 | 9.18 | 11.08 | 10.87 | 11.57 | 9.5 |

Called C Brown to discuss. He will talk to ABB about it.

1740 opened bleed valve another 1/4-turn. It is now 1 full turn open. Reduced Z-5 +1 amp draw from 9.5 to 9.1. Bigger concern is the amp draw during single zone operation, which got messed up for the last few weeks due to runtime snafu.


1745 Locked up system area. Everything running smoothly

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

1750 Attempted to add 3-plugs to flow-103 & -107, which were noted to be missing them during LMAPL gauging. There are well caps, but the stingers are open to atmosphere. Maybe 1"?, 1.5"?

TOMORROW'S EXPECTATIONS:

12600 GF offsite.

 GF 6/26/22

BY GF

TITLE

PORT OF SEATTLE - TERMINAL 30

| SVE/AS & Oxidizer System Data Collection Form | | | |
|---|-------------------------------|---|-------------------------|
| Date: <i>10/26/22</i> | Field Tech(s): <i>CF</i> | | |
| Actual Time: <i>1600</i> | AS/SVE HMI Time: <i>15:38</i> | | |
| SVE/AS System | | | |
| SVE Blower Speed (Hertz) - VFD | <i>42 Hz, 14.2 A, 50%</i> | Sparge Blower Speed (Hertz) - VFD | <i>52 Hz, 9.5A, 82%</i> |
| SVE Blower Runtime (Hours) | <i>14564.8</i> | AS Blower Runtime (Hours) - Sparge Blower | <i>8136.5</i> |
| Transfer Pump Runtime (Hours) - MS Pump | <i>2.9</i> | Sparge Heat Exchanger Runtime (Hours) | <i>8134.1</i> |
| Sparge Zone 1 Time Span(s) Operational: | <i>1700 - 2230</i> | Sparge Zone 4 Time Span(s) Operational: | <i>1930 - 0030</i> |
| Sparge Zone 2 Time Span(s) Operational: | <i>1000 - 1530</i> | Sparge Zone 5 Time Span(s) Operational: | <i>1200 - 1730</i> |
| Sparge Zone 3 Time Span(s) Operational: | <i>1500 - 2000</i> | Sparge Zone Active: | <i>2, 3, & 5</i> |
| AS Blower Intake Pressure (" H2O) - DPI-500 | <i>1.0</i> | SVE Blower Filter Differential Pressure (" H2O) - DPI-200 | <i>0.5</i> |
| AS Blower Discharge Pressure (PSI) - PI-501 | <i>9.0</i> | SVE Blower Inlet Differential Pressure (" H2O) - FI-200 | <i>1.5</i> |
| Sparge Heat Exchanger Discharge Temp (°F) - TI-500 | <i>70</i> | Transfer Pump Discharge Pressure (PSI) - PI-300 | <i>0</i> |
| SVE Blower Inlet Temperature (°F) - TI-200 | <i>58</i> | SVE Blower Discharge Pressure (" H2O) - PI-400 | <i>10.4</i> |
| SVE Blower Inlet Vacuum (" H2O) - VI-200 | <i>83</i> | SVE Blower Discharge Temperature (°F) - TI-400 | <i>102</i> |
| Oxidizer System | | | |
| Oxidizer Inlet Differential Pressure (" H2O) - FI-1 | <i>0.75</i> | Combustion Valve Position (%) | <i>—</i> |
| Burner Chamber Temperature (°F) | <i>682</i> | Process Blower Runtime (Hours) | <i>21408</i> |
| Outlet Temperature (°F) | <i>644</i> | Combustion Fan Runtime (Hours) | <i>21409</i> |
| Inlet Limit Controller Temperature (°F) | <i>672</i> | Burner Runtime (Hours) | <i>12397</i> |
| Outlet Limit Controller Temperature (°F) | <i>643</i> | Processing Vapors Runtime (Hours) | <i>21382</i> |
| Process Fan Valve Position (Open/Closed) | <i>open</i> | Panel Temperature (°F) | <i>76</i> |
| Dilution Valve Position (%) | <i>0</i> | Flame Signal (Volts) | <i>5.0</i> |
| Combustion Valve Position (%) | <i>10</i> | | |
| Other Components | | | |
| Knockout Tank Level (Sightglass % Full) ¹ | <i>33%</i> | Propane Tank A Level (%) | <i>65</i> |
| Water Depth in Storage Tank ² (DTF/WD (calc in ft)) | <i>5.07</i> / <i>1.25</i> | Propane Tank B Level (%) | <i>55</i> |
| NOTES: <i>Runtimes were nessed up on arrival - AMs & PMs swapped. Runtimes were get back to desired rotation prior to collection of readings. Only Zone 5 was active for the readings.</i> | | | |

only 25 active

updated 12:30

Abbreviations:

- " H₂O = Inches of Water
- °F = Degrees Fahrenheit
- PSI = Pounds per Square Inch
- % = Percent

- DTF - Depth to Fluid
- DTB - Depth to Bottom
- MP - Measuring Point
- WD - Water Depth

Notes:

1. Low float = 0% full. Mid float = 100% full.
2. Calculate the water depth by measuring DTF from the MP and then subtracting that from 6.92 ft (DTB).



PORT OF SEATTLE - TERMINAL 30

AS & SVE Manifold Readings

Date: 10/26/22 Time: 1630
 Field Tech(s): GF Equipment I.D. #: 39957

Vapor Concentrations

Oxidizer Inlet VOC (ppmv) PID: 21.6
 Oxidizer Discharge VOC (ppmv) PID: 0.7

SVE Wells

| Well ID | Vacuum ("H2O) | Flow (SCFMG) | Valve Pos. (% Open) | Dewater (Gal) | Comments | Well ID | Vacuum ("H2O) | Flow (SCFMG) | Valve Pos. (% Open) | Dewater (Gal) | Comments |
|---------|---------------|--------------|---------------------|---------------|---------------|---------|---------------|--------------|---------------------|---------------|----------------------|
| HSVE-2 | 32 | 78 | 100 | - | good | SVE-10 | 55 | 29 | 100 | - | good |
| HSVE-3 | 39 | 72 | 100 | - | good | SVE-9 | 53 | 8? | 100 | - | lots of water |
| SVE-4 | 56 | 17 | 100 | - | bumping float | SVE-8 | 59 | 5? | 100 | - | stuck; lots of water |
| SVE-5 | 53 | 20 | 100 | - | lots of water | SVE-6 | 57 | 11 | 100 | - | good minor water |
| SVE-7 | 52 | 20 | 100 | - | good | HSVE-1 | 14 | 78 | 20 | - | good |

Notes:
 lots of water

AS Wells

| Well ID | Pressure (PSIG) | Flow (SCFMG) | Valve Pos. (% Open) | Comments | Well ID | Pressure (PSIG) | Flow (SCFMG) | Valve Pos. (% Open) | Comments |
|---------|-----------------|--------------|---------------------|----------|---------|-----------------|--------------|---------------------|----------|
| Zone 2 | | | | | Zone 4 | | | | |
| AS-7 | | | | | AS-17 | | | | |
| AS-8 | | | | | AS-18 | | | | |
| AS-9 | | | | | AS-19 | | | | |
| AS-10 | | | | | AS-20 | | | | |
| AS-11 | | | | | AS-21 | | | | |
| Zone 3 | | | | | Zone 1 | | | | |
| AS-12 | | | | | AS-1 | | | | |
| AS-13 | | | | | AS-2 | | | | |
| AS-14 | | | | | AS-3 | | | | |
| AS-15 | | | | | AS-4 | | | | |
| AS-16 | | | | | AS-5 | | | | |
| Zone 5 | | | | | | | | | |
| AS-23 | 9.75 | 2.2 | 100 | | | | | | |
| AS-24 | 9.0 | 3.8 | | | | | | | |
| AS-25 | 9.5 | 1.9 | | | | | | | |
| AS-26 | 10.0 | 1.2 | | | | | | | |
| AS-27 | 8.75 | 2.3 | | | | | | | |

Notes:

Abbreviations:

% = Percent
 " H₂O = Inches of water
 deg F - degrees Fahrenheit

N/A = Not applicable
 SCFMG = Standard cubic feet per minute gauge
 ppmv = Parts per million volume
 PSIG = Pounds per square inch gauge





INSTRUMENT CALIBRATION REPORT

Pine Environmental Services LLC

3225 South 116th St.
Building 1 Suite 181
Tukwila, WA 98168
425-285-9102

Pine Environmental Services, Inc.

Instrument ID 39957
Description MiniRAE 3000
Calibrated 10/25/2022 12:33:46PM

Manufacturer Rae Systems
Model Number PGM 7320
Serial Number/ Lot Number 592-920838
Location Seattle
Department

State Certified
Status Pass
Temp °C 18
Humidity % 48

Calibration Specifications

Group # 1
Group Name ISOBUTYLENE
Stated Accy Pct of Reading

Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.00

| <u>Nom In Val / In Val</u> | <u>In Type</u> | <u>Out Val</u> | <u>Out Type</u> | <u>Fnd As</u> | <u>Lft As</u> | <u>Dev%</u> | <u>Pass/Fail</u> |
|----------------------------|----------------|----------------|-----------------|---------------|---------------|-------------|------------------|
| 100.00 / 100.00 | PPM | 100.00 | PPM | 94.20 | 99.90 | -0.10% | Pass |

Test Instruments Used During the Calibration

(As Of Cal Entry Date)

| <u>Test Standard ID</u> | <u>Description</u> | <u>Manufacturer</u> | <u>Model Number</u> | <u>Serial Number / Lot Number</u> | <u>Last Cal Date / Opened Date</u> | <u>Next Cal Date / Expiration Date</u> |
|---|-------------------------------|---------------------|---------------------|-----------------------------------|--|--|
| SEA ISO 100 PPM 304-402397702- 1 | Isobutylene (C4H8) 100 PPM | Airgas | x02ai99cp342066 | 304-402397702 -1 | | 3/23/2026 |

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Jessica Brandgard

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment
Please call 800-301-9663 for Technical Assistance

AECOM Daily Tailgate Meeting Summary

Project information

| | |
|-------------------------|---------------|
| Project Name | T-30 |
| Project Number | 60681370 |
| Project Manager | Paul Kalina |
| Project Manager Phone # | 2063105097 |
| Muster Point location | Clubhouse |
| Meeting date | 10/26/2022 |
| Business Line | Environment |
| SH&E Manager | Tim Gilles |
| SH&E Manager Phone # | 3128335991 |
| First Aid Kit Location | Conex |
| Prepared by | Friedman, Gus |

Shift Summary

| | |
|--------------------------------|--|
| Location | SODO |
| Attendees (Workers) | Gus Friedman; |
| Attendees (Visitors) | |
| Tasks to be performed | Biweekly O&M AS VFD troubleshooting |
| Hazards to be considered today | pressure, noise, mechanical, electrical |
| Will there be Lone Workers? | Yes |
| Hierarchy of controls | engineering, administrativecontrols, ppe |
| Personal Protective Equipment | Task Specific: gloves Mandatory: safetyglasses, longpants, reflectivevest, workboots |
| High Risk Events | |
| | |

| | |
|---|--|
| Topic of the week | Hazardous Materials Communication |
| Other topics discussed | |
| Mid day reviews | |
| End of the day comments. The supervisor confirms that the site is being left in a safe condition and work crew checked out as fit unless otherwise specified here | All work completed safely |
| Hazards | <ul style="list-style-type: none">• Mechanical• Noise• Pressure• Electrical |

DAILY FIELD LOG

Project Information

Page 1 of 2

| | |
|---------------------------|---------------------------|
| Project Name: <u>T-30</u> | Location: <u>Seattle</u> |
| Project/Task No.: _____ | Weather: <u>45 cloudy</u> |
| Date: <u>11/10/22</u> | Personnel: <u>SUE</u> |

Observations

| Time | Observation Description |
|------|---|
| 1 | 1445 onsite |
| 2 | Scope: biweekly O&M |
| 3 | replacement parts/system upgrades |
| 4 | LNAPL Gauging |
| 5 | Safety tailgate |
| 6 | System ON on arrival, SUE AS + OX |
| 7 | System readings collected. All operating per usual |
| 8 | 42.6 ppmv coming in, 0.8 ppmv going out. |
| 9 | - water in several rotameters (SUE) |
| 10 | • Still don't have all the parts for pitot tube/may gauge |
| 11 | ball valves. Need 1/8 close nipples & 1/4 female connectors, or |
| 12 | 1/8 FPT x inpt ball valves & scrap what we have. |
| 13 | • Still don't have all the pieces for SUE rot. repairs. They |
| 14 | only sent guide rods & the PVC end fittings. Do they |
| 15 | have spare bumpers? I guess we don't need replacement |
| 16 | floats. |
| 17 | • Pilot SUE pipe upgrade completed - 4" stub up to 2" ball |
| 18 | valve. Unfortunately the peri pump was malfunctioning, |
| 19 | so I couldn't try to dewater. Seems like it should |
| 20 | work well though, as intended. |
| 21 | • Ferrell gas showed up to refill propane tanks. They |
| 22 | got filled to 88% (A) & 82% (B) full. |
| 23 | 1700 • began LNAPL gauging & ID'ing well locations w/stall #s. |
| 24 | • Found camlock caps in context or added them to the RW-103 |
| 25 | & -107 stingers |

Comments / Site Activities / Personnel Tracking

DAILY FIELD LOG

Project Information

Page 2 of 2

| | | | |
|-------------------|-----------------|------------|-----------|
| Project Name: | <u>T-30</u> | Location: | _____ |
| Project/Task No.: | _____ | Weather: | _____ |
| Date: | <u>11/10/22</u> | Personnel: | <u>GF</u> |

Observations

| Time | Observation Description |
|------|---|
| 1 | 1910 • LNAPL gauging completed. S wells had product 70.01 ft. |
| 2 | • System on. Gates locked. |
| 3 | 1915 • GF offsite |
| 4 | |
| 5 | |
| 6 | |
| 7 | |
| 8 | |
| 9 | |
| 10 | |
| 11 | |
| 12 | |
| 13 | |
| 14 | |
| 15 | |
| 16 | |
| 17 | |
| 18 | |
| 19 | |
| 20 | |
| 21 | |
| 22 | |
| 23 | |
| 24 | |
| 25 | |

GF
11/10/22

Comments / Site Activities / Personnel Tracking

PORT OF SEATTLE - TERMINAL 30

AS & SVE Manifold Readings

Date: 11/10/22 Time: 1605
 Field Tech(s): GF Equipment I.D. #:

| | |
|--|--------------|
| SVE Discharge VOC (ppmv) PID | <u>42.6</u> |
| SVE Discharge LEL (%) | X |
| Oxygen (%) | |
| SVE System Inlet Vacuum (" H ₂ O) | |
| SVE System Inlet ΔP (" H ₂ O) | |
| Oxidizer Discharge VOC (ppmv) PID | <u>0.8</u> |

SVE Wells

| Location | Vacuum ("H ₂ O) | Flow (SCFMG) | Valve Pos. (% Open) | Comments | Location | Vacuum ("H ₂ O) | Flow (SCFMG) | Valve Pos. (% Open) | Comments |
|----------|----------------------------|--------------|---------------------|--|----------|----------------------------|--------------|---------------------|-----------------------------------|
| HSVE-2 | <u>31</u> | <u>80</u> | <u>100</u> | <u>good</u> | SVE-10 | <u>55</u> | <u>30</u> | <u>100</u> | <u>bouncing float</u> |
| HSVE-3 | <u>38</u> | <u>78</u> | <u>100</u> | <u>good</u> | SVE-9 | <u>58</u> | <u>7</u> | <u>100</u> | <u>bts of water, dirty</u> |
| SVE-4 | <u>56</u> | <u>17</u> | <u>100</u> | <u>dirty rotameter</u> | SVE-8 | <u>64</u> | <u>0</u> | <u>100</u> | <u>float stuck? lots of water</u> |
| SVE-5 | <u>54</u> | <u>~20</u> | <u>100</u> | <u>float gets stuck at bottom; water</u> | SVE-6 | <u>64</u> | <u>12</u> | <u>100</u> | <u>sticky float</u> |
| SVE-7 | <u>58</u> | <u>15</u> | <u>100</u> | <u>bouncing float</u> | HSVE-1 | <u>14</u> | <u>80</u> | <u>25</u> | <u>good</u> |

AS Wells

| Location | Pressure (PSIG) | Flow (SCFMG) | Valve Pos. (% Open) | Comments | Location | Pressure (PSIG) | Flow (SCFMG) | Valve Pos. (% Open) | Comments |
|----------|-----------------|--------------|---------------------|-------------|----------|-----------------|--------------|---------------------|----------|
| AS-7 | | | | | AS-17 | | | | |
| AS-8 | | | | | AS-18 | | | | |
| AS-9 | | | | | AS-19 | | | | |
| AS-10 | | | | | AS-20 | | | | |
| AS-11 | | | | | AS-21 | | | | |
| AS-12 | | | | | AS-22 | | | | |
| AS-13 | | | | | AS-1 | | | | |
| AS-14 | | | | | AS-2 | | | | |
| AS-15 | | | | | AS-3 | | | | |
| AS-16 | | | | | AS-4 | | | | |
| AS-23 | <u>9.5</u> | <u>1.4</u> | <u>100</u> | <u>good</u> | AS-5 | | | | |
| AS-24 | <u>9.0</u> | <u>2.5</u> | | | AS-6 | | | | |
| AS-25 | <u>9.0</u> | <u>1.2</u> | | | | | | | |
| AS-26 | <u>9.5</u> | <u>1.0</u> | | | | | | | |
| AS-27 | <u>8.5</u> | <u>1.9</u> | | | | | | | |

Notes:

Abbreviations:

ppmv = Parts per million volume
 % = Percent
 deg F - degrees Fahrenheit

" H₂O = Inches of water
 SCFMG = Standard cubic feet per minute gauge
 PSIG = Pounds per square inch gauge



PORT OF SEATTLE - TERMINAL 30

SVE/AS & Oxidizer System Data Collection Form

| | | | |
|--|-------------------------|--|------------------|
| Date: 11/10/22 | Field Tech(s): GTF | | |
| Actual Time: 1505 | AS/SVE HMI Time: 15:41 | | |
| SVE/AS System | | | |
| SVE Blower Speed (Hertz) - VFD H ₂ /A/WT | 42/14.7/53.8 HMI | Sparge Blower Speed (Hertz) - VFD H ₂ /A/WT | 52/10.2/89.3 HMI |
| SVE Blower Runtime (Hours) | 14923.3 HMI | AS Blower Runtime (Hours) - Sparge Blower | 8495.3 HMI |
| Transfer Pump Runtime (Hours) - MS Pump | 24 HMI | Sparge Heat Exchanger Runtime (Hours) | 8492.8 HMI |
| Sparge Zone 1 Time Span(s) Operational: | 1700-2230 HMI | Sparge Zone 4 Time Span(s) Operational: | 0730-1230 HMI |
| Sparge Zone 2 Time Span(s) Operational: | 2200-0330 HMI | Sparge Zone 5 Time Span(s) Operational: | 1200-1730 HMI |
| Sparge Zone 3 Time Span(s) Operational: | 0300-0800 HMI | Sparge Zone Active: | 5 |
| Sparge Heat Exchanger Discharge Temperature (°F) - TI-500 | 69 | SVE Blower Filter Differential Pressure (" H ₂ O) - DPI-200 | 0.5 |
| AS Blower Pressure (PSI) - PI-501 | 8.5 | SVE Blower Inlet Differential Pressure (" H ₂ O) - FI-200 | 1.5 |
| AS Blower Differential Pressure (" H ₂ O) - DPI-500 | 1.0 | Transfer Pump Discharge Pressure (PSI) - PI-300 | 0 |
| SVE Blower Inlet Temperature (°F) - TI-200 | 53 | SVE Blower Discharge Pressure (" H ₂ O) - PI-400 | 10.2 |
| SVE Blower Inlet Vacuum (" H ₂ O) - VI-200 | 85 | SVE Blower Discharge Temperature (°F) - TI-400 | 97 |
| Oxidizer System | | | |
| Inlet Temperature (°F) | 681 HMI | Process Blower Runtime (Hours) | 21768 HMI |
| Burner Chamber Temperature (°F) | 681 HMI | Combustion Fan Runtime (Hours) | 21768 HMI |
| Outlet Temperature (°F) | 638 HMI | Burner Runtime (Hours) | 21757 HMI |
| Inlet Limit Controller Temperature (°F) | 680 HMI | Processing Vapors Runtime (Hours) | 21741 HMI |
| Outlet Limit Controller Temperature (°F) | 638 HMI | Panel Temperature (°F) | 71 HMI |
| Process Fan Valve Position (Open/Closed) | open HMI | Flame Signal (Volts) | 5 HMI |
| Dilution Valve Position (%) | 0 HMI | Oxidizer Inlet Differential Pressure (" H ₂ O) - FI-1 | 0.6 |
| Combustion Valve Position (%) | 9.2 HMI | | |
| Other Components | | | |
| Moisture Separator Level (% Full) | 12% on GA | Propane Tank A Level (%) | 47 |
| Water Storage Tank Level (DTF, TD from MP; inches) | 1.75 Ft | Propane Tank B Level (%) | 40 |
| NOTES: | | | |
| Abbreviations: | | | |
| 1. " H ₂ O = Inches of Water | 5. DTF - Depth to Fluid | | |
| 2. °F = Degrees Fahrenheit | 6. TD - Total Depth | | |
| 3. PSI = Pounds per Square Inch | 7. MP - Measuring Point | | |
| 4. % = Percent | | | |

Bleed valve 1 turn open

Dilution valve 0 turns open



Port of Seattle Terminal 30 -- LNAPL Gauging Event





| | |
|---------------------------------|--------------------------------|
| Field Technician(s): <i>GF</i> | Client: Port of Seattle |
| Date: <i>11/10/22</i> | Location: Terminal 30, Seattle |
| Project Number: 60681370 | Weather: <i>45 cloudy</i> |
| Closest High Tide: 16:51 | Closest Low Tide: 23:54 |

| Location | Time of Gauging | Depth to LNAPL (Feet BTOC) | Depth to Water (Feet BTOC) | LNAPL Thickness (Feet) | Comments |
|----------|-----------------|----------------------------|----------------------------|------------------------|--|
| MW-35 | <i>1800</i> | <i>20.01</i> | <i>9.07</i> | — | |
| MW-36 | <i>1811</i> | ND | <i>9.27</i> | — | <i>water in monument</i> |
| MW-59 | <i>1817</i> | ND | <i>8.59</i> | — | |
| RW-1 | <i>1849</i> | <i>8.99</i> | <i>9.06</i> | <i>0.07</i> | |
| RW-12 | <i>1830</i> | <i>9.16</i> | <i>9.49</i> | <i>0.33</i> | <i>monument silled in</i> |
| RW-103 | <i>1821</i> | <i>8.13</i> | <i>8.41</i> | <i>0.28</i> | |
| RW-104 | <i>1804</i> | ND | <i>8.31</i> | — | 9.20 is the average |
| RW-106 | <i>1807</i> | <i>7.11</i> | <i>9.05/9.35</i> | 2.09 | <i>interface probe gave a first beep starting @ 9.05 + slow beep at 9.35</i> |
| RW-107 | <i>1814</i> | <i>8.60</i> | <i>8.98</i> | <i>0.16</i> | |
| RW-110 | <i>1833</i> | ND | <i>8.80</i> | — | |

Notes:

1. Feet BTOC = Feet below top of well casing.
2. LNAPL = Light Non-Aqueous Phase Liquid
3. ND = LNAPL not detected using interface probe.
4. NA - Not Available (not able to detect or measure)
5. TRACE, MINOR - Indications of LNAPL present, but no accurate measurement or below measurable amount.
6. During the 10/6/22 Ops Meeting, agreed that wells measured <0.01 ft for 1 yr can be removed from monitoring schedule. This pertained to MW-36A, -39A, -89, -93, and RW-101, -102, -105, -108, and -109.

T-30 Well Locations

| Sampling Well ID | Stall #/ Location | Product Well ID | Stall #/ Location | AS/SVE Well ID | Stall #/ Location | AS/SVE Well ID | Stall #/ Location |
|------------------|---|-------------------|---|----------------|----------------------|----------------|----------------------|
| MW-59 | D324* | MW-35 | D 314 * | HSVE-1 | A254.5 | AS-10 | 4/D 265 |
| MW-89 | A257 | MW-36 | C 309.5 | HSVE-2 | D 260 | AS-11 | 4/D 268 |
| RW-9 | C302 | MW-36A | C 311.5 | HSVE-3 | | AS-12 | 4/D 271 |
| MW-36A | C311.5 | MW-39A |  | SVE-4 | 4/D 304 | AS-13 | 4/D 273 |
| MW-39A | C 273 | MW-59 | A257 | SVE-5 | 4/D 309 | AS-14 | 4/D 275 |
| MW-42 | C258 * | MW-89 |  | SVE-6 | 4/D 317 | AS-15 | 4/D intersection |
| RW-1 | Entry lanes enter w/ D 275 (1/2 of wall) | MW-93 | D 275 | SVE-7 | D 316* | AS-16 | 4/D 301 |
| RW-5A | entry lanes (1/2 of wall) | RW-11A | 4/D 306 | SVE-8 | D 320.5* | AS-17 | 4/D 302 |
| MW-38 |  | RW-12 | D 327 | SVE-9 | D 323* | AS-18 | 4/D 305 |
| MW-93 |  | RW-101 | D 319.5 | SVE-10 | D 329* | AS-19 | 4/D 308 |
| MW-45A | B 324 | RW-102 | D 322.5* | AS-1 | A 250* | AS-20 | 4/D 311 |
| MW-46B | B 313.5 | RW-103 | D 326 | AS-2 | A 253* | AS-21 | 4/D 313 |
| MW-58A | A 273 | RW-104 | D 318 | AS-3 | A 256* | AS-22 | 4/D 316 |
| MW-86B | Apron | RW-105 | D 321 | AS-4 | A 259* | AS-23 | D 317* |
| MW-92 | C250 | RW-106 | D 324 | AS-5 | A 261 | AS-24 | D 320* |
| MW-84A | Apron | RW-107 | D 327 | AS-6 | A 264 | AS-25 | D 325* |
| MW-85A | Apron | RW-108 | 4/D 320 | AS-7 | 4/D 257 | AS-26 | D 325* |
| MW-87A | Apron | RW-109 | 4/D 323 | AS-8 | 4/D 259 | AS-27 | D 328 |
| | | RW-110 | 4/D 326 | AS-9 | 4/D 262 | | |



INSTRUMENT CALIBRATION REPORT

Pine Environmental Services LLC

3225 South 116th St.
Building 1 Suite 181
Tukwila, WA 98168
425-285-9102

Pine Environmental Services, Inc.

Instrument ID 21852
Description Geopump - Peristaltic Pump
Calibrated 11/8/2022 3:08:06PM

| | |
|--|------------------------|
| Manufacturer Geotech | State Certified |
| Model Number Geo pump | Status Pass |
| Serial Number/ Lot Number 21852 | Temp °C 17 |
| Location Seattle | Humidity % 41 |
| Department | |

Calibration Specifications

| | |
|-----------------------------------|------------------------------|
| Group # 1 | |
| Group Name Functional Test | |
| Test Performed: Yes | As Found Result: Pass |
| | As Left Result: Pass |

Test Instruments Used During the Calibration

(As Of Cal Entry Date)

| <u>Test Standard ID</u> | <u>Description</u> | <u>Manufacturer</u> | <u>Model Number</u> | <u>Serial Number / Lot Number</u> | <u>Next Cal Date / Last Cal Date/ Expiration Date Opened Date</u> |
|-------------------------|--------------------|---------------------|---------------------|---------------------------------------|---|
|-------------------------|--------------------|---------------------|---------------------|---------------------------------------|---|

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Jose Arroyo

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

**Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment
Please call 800-301-9663 for Technical Assistance**



INSTRUMENT CALIBRATION REPORT

Pine Environmental Services LLC

3225 South 116th St.
Building 1 Suite 181
Tukwila, WA 98168
425-285-9102

Pine Environmental Services, Inc.

Instrument ID 21852
Description Geopump - Peristaltic Pump
Calibrated 11/8/2022 3:08:06PM

| | |
|--|------------------------|
| Manufacturer Geotech | State Certified |
| Model Number Geo pump | Status Pass |
| Serial Number/ Lot Number 21852 | Temp °C 17 |
| Location Seattle | Humidity % 41 |
| Department | |

Calibration Specifications

| | |
|-----------------------------------|------------------------------|
| Group # 1 | |
| Group Name Functional Test | |
| Test Performed: Yes | As Found Result: Pass |
| | As Left Result: Pass |

| <u>Test Instruments Used During the Calibration</u> | | | | | <u>(As Of Cal Entry Date)</u> | |
|---|--------------------|---------------------|---------------------|-----------------------------------|---|--|
| <u>Test Standard ID</u> | <u>Description</u> | <u>Manufacturer</u> | <u>Model Number</u> | <u>Serial Number / Lot Number</u> | <u>Next Cal Date / Last Cal Date/ Expiration Date</u> | |
| | | | | | <u>Opened Date</u> | |
| | | | | | | |

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Jose Arroyo

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment
Please call 800-301-9663 for Technical Assistance

AECOM Daily Tailgate Meeting Summary

Project information

| | |
|-------------------------|---------------|
| Project Name | T-30 |
| Project Number | 60681370 |
| Project Manager | Paul Kalina |
| Project Manager Phone # | 2063105097 |
| Muster Point location | Clubhouse |
| Meeting date | 11/10/2022 |
| Business Line | Environment |
| SH&E Manager | Tim Gilles |
| SH&E Manager Phone # | 3128335991 |
| First Aid Kit Location | Conex |
| Prepared by | Friedman, Gus |

Shift Summary

| | |
|--------------------------------|--|
| Location | SODO |
| Attendees (Workers) | Gus Friedman; |
| Attendees (Visitors) | |
| Tasks to be performed | Biweekly O&M System part upgrades LNAPL gauging |
| Hazards to be considered today | pressure, noise, motion, mechanical |
| Will there be Lone Workers? | Yes |
| Hierarchy of controls | engineering, administrativecontrols, ppe |
| Personal Protective Equipment | Task Specific: gloves Mandatory: safetyglasses, longpants, reflectivevest, workboots |
| High Risk Events | |

| | |
|---|--|
| Topic of the week | Fall Season - Daylight Saving Time Hazards |
| Other topics discussed | |
| Mid day reviews | |
| End of the day comments. The supervisor confirms that the site is being left in a safe condition and work crew checked out as fit unless otherwise specified here | Completed safely and successfully |
| Hazards | <ul style="list-style-type: none">• Mechanical• Motion• Noise• Pressure |

DAILY FIELD LOG

Project Information

Page 1 of 3

| | |
|---------------------------|----------------------------|
| Project Name: <u>T-30</u> | Location: <u>Seattle</u> |
| Project/Task No.: _____ | Weather: <u>SO, cloudy</u> |
| Date: <u>11/23/22</u> | Personnel: <u>GF, AB</u> |

Observations

| # | Time | Observation Description |
|----|------|--|
| 1 | 1515 | GF + AB onsite |
| 2 | | Scope: biweekly O&M; part upgrades |
| 3 | | Safety tailgate. Practice crane operators are active. |
| 4 | | System ON on arrival. GF showed AB around, gave |
| 5 | | an orientation |
| 6 | | Took down regular O&M readings |
| 7 | 1600 | Took PID readings. Inlet 8.8 ppmv, outlet 1.1 ppmv |
| 8 | 1615 | Set up SVE manifold vapor monitoring. Silicon on hose |
| 9 | | bars. New mini KO. Existing sample ports work great. |
| 10 | | HSVE-1 : 1.0 ppmv |
| 11 | | HSVE-2 : 13.5 |
| 12 | | HSVE-3 : 4.6 |
| 13 | | SVE-4 : 1.0 |
| 14 | | -5 : NM |
| 15 | | -6 : 0.6 |
| 16 | | -7 : 0.5 |
| 17 | | -8 : 1.1 |
| 18 | | -9 : 2.5 |
| 19 | | -10 : 0.9 |
| 20 | 1640 | SVE-8 dewatering w/ manifold upgrade |
| 21 | | - closed globe valve + opened ball valve |
| 22 | | - dewatered deadleg w/ peri pump thru ball valve. w/ gal. |
| 23 | | - closed opened globe valve + cleared rotameter by covering |
| 24 | | + uncovering the open ball valve |
| 25 | | - water successfully cleared from rotameter, & float read 15-20 |

Comments / Site Activities / Personnel Tracking

Should try bigger tubing. Took a while (15 min?) to dewater 1 gal w/ the normal peri pump sized tubing.

DAILY FIELD LOG

Project Information

Page 2 of 3

| | |
|---------------------------|--------------------------|
| Project Name: <u>T-30</u> | Location: <u>Seattle</u> |
| Project/Task No.: _____ | Weather: _____ |
| Date: <u>11/23/22</u> | Personnel: <u>GF, AB</u> |

Observations

| Time | Observation Description |
|------|--|
| 1 | Screaming momentarily before dropping down to 0. The vac gauge reads 77 in H ₂ O but the well is not getting any flow? |
| 2 | |
| 3 | |
| 4 | When the SVE-5 float gets stuck at 0 the vac also drops to 0, essentially blocking the pipe. SVE-8 is doing something different. It does have an intact bottom bumper which SVE-5 does not. Seems like it might really be 0 flow. The float is free-moving & not sticky. |
| 5 | |
| 6 | |
| 7 | |
| 8 | <p>1700 ^{AB} OFFSITE</p> <p>• We should advise addition of ball valve setup for at least 4 of the wells (SVE-4, 5, 6, & 9).</p> <p>→ horizontal wells don't seem to accumulate</p> <p>→ SVE-7 & 10 don't accumulate?</p> |
| 9 | |
| 10 | |
| 11 | |
| 12 | <p>1715</p> <p>• Upgraded oxidizer mag gauge w/ 1/8-in ball valves to protect from condensation/water</p> <p>• SVE pitot/mag gauge already had mini ball valves but the tubing has always been kept attached. Easy to keep detached except when taking a reading moving forward.</p> |
| 13 | |
| 14 | |
| 15 | |
| 16 | <p>1820</p> <p>Poly tank measurements</p> <p>- 2.17 ft water in tank</p> <p>→ low float is at 3.26 ft w/ ~5 in until it hits its float stopper, so maybe 3.75 ft before it triggers?</p> <p>→ high float is at 4.84 ft, also w/ ~5 in until it hits its float stopper. Maybe 5.25 ft before it triggers?</p> <p>→ 1.09-1.5 ft remaining before 1st float, 2.67-3.08 ft before</p> |
| 17 | |
| 18 | |
| 19 | |
| 20 | |
| 21 | |
| 22 | |
| 23 | |
| 24 | |
| 25 | |

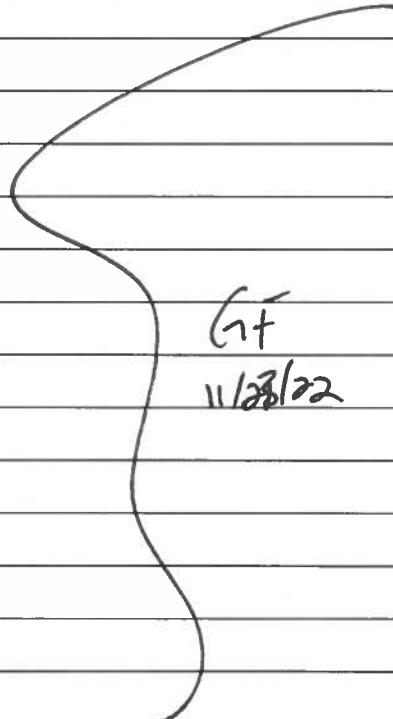
Comments / Site Activities / Personnel Tracking

DAILY FIELD LOG

Project Information

| | |
|---------------------------|--------------------------|
| Project Name: <u>T-30</u> | Location: <u>Seattle</u> |
| Project/Task No.: _____ | Weather: _____ |
| Date: <u>11/23/22</u> | Personnel: <u>GF, AB</u> |

Observations

| Time | Observation Description |
|------|--|
| 1 | 2 nd float triggers. 2 weeks until LNAPL recovery w/ DM. |
| 2 | |
| 3 | 1835 Clean up, lock up. |
| 4 | Follow-ups: - King rotameter bumper replacements - bigger per. pump tubing - more SVE manifold ball valve assemblies - spray bottles to keep on site |
| 5 | |
| 6 | |
| 7 | |
| 8 | |
| 9 | 1855 offsite (GF) |
| 10 |  |
| 11 | |
| 12 | |
| 13 | |
| 14 | |
| 15 | |
| 16 | |
| 17 | |
| 18 | |
| 19 | |
| 20 | |
| 21 | |
| 22 | |
| 23 | |
| 24 | |
| 25 | |

Comments / Site Activities / Personnel Tracking

PORT OF SEATTLE - TERMINAL 30

AS & SVE Manifold Readings - **New Zone From Initial Round of Readings**

Date: 11/23/22 Time: 1600
 Field Tech(s): G.F. AB Equipment I.D. #:

Vapor Concentrations

Oxidizer Inlet VOC (ppmv) PID: 8.8
 Oxidizer Discharge VOC (ppmv) PID: 1.1

SVE Wells

| Well ID | Vacuum (H ₂ O) | Flow (SCFMG) | Valve Pos. (% Open) | Dewater (Gal) | Comments | Well ID | Vacuum (H ₂ O) | Flow (SCFMG) | Valve Pos. (% Open) | Dewater (Gal) | Comments |
|---------|---------------------------|--------------|---------------------|---------------|----------------------|---------|---------------------------|--------------|---------------------|---------------|--------------|
| HSVE-2 | 33 | 79 | 100 | | good | SVE-10 | 60 | 27 | 100 | | good |
| HSVE-3 | 41 | 74 | 100 | | good | SVE-9 | 61 | 8 | 100 | | water, dirty |
| SVE-4 | 66 | 17 | 100 | | dirty | SVE-8 | 68 | 0 | 100 | | water |
| SVE-5 | 58 | 16 | 100 | | knocking/stuck water | SVE-6 | 64 | 10 | 100 | | minor water |
| SVE-7 | 58 | 17 | 100 | | good | HSVE-1 | 16 | 80 | 20 | | good |

Notes: HSVE-1, 2, & 3 positions updated to achieve 75 scfm targets

AS Wells

| Well ID | Pressure (PSIG) | Flow (SCFMG) | Valve Pos. (% Open) | Comments | Well ID | Pressure (PSIG) | Flow (SCFMG) | Valve Pos. (% Open) | Comments |
|---------|-----------------|--------------|---------------------|----------|---------|-----------------|--------------|---------------------|----------|
| Zone 2 | | | | | Zone 4 | | | | |
| AS-7 | | | | | AS-17 | | | | |
| AS-8 | | | | | AS-18 | | | | |
| AS-9 | | | | | AS-19 | | | | |
| AS-10 | | | | | AS-20 | | | | |
| AS-11 | | | | | AS-21 | | | | |
| | | | | | AS-22 | | | | |
| Zone 3 | | | | | Zone 1 | | | | |
| AS-12 | | | | | AS-1 | | | | |
| AS-13 | | | | | AS-2 | | | | |
| AS-14 | | | | | AS-3 | | | | |
| AS-15 | | | | | AS-4 | | | | |
| AS-16 | | | | | AS-5 | | | | |
| Zone 5 | | | | | AS-6 | | | | |
| AS-23 | 9.0 | 2.0 | W0 | | | | | | |
| AS-24 | 8.5 | 2.2 | | | | | | | |
| AS-25 | 8.7 | 1.7 | | | | | | | |
| AS-26 | 9.25 | 1.2 | | | | | | | |
| AS-27 | 8.5 | 1.5 | | | | | | | |

Notes:

Abbreviations:
 % = Percent
 " H₂O = Inches of water
 deg F - degrees Fahrenheit
 N/A = Not applicable
 ppmv = Parts per million volume
 PSIG = Pounds per square inch gauge
 SCFMG = Standard cubic feet per minute gauge



PORT OF SEATTLE - TERMINAL 30

| SVE/AS & Oxidizer System Data Collection Form | | | |
|--|------------------------------|---|----------------------------|
| Date: <u>11/23/22</u> | Field Tech(s): <u>GF, AB</u> | | |
| Actual Time: <u>1535</u> | AS/SVE HMI Time: <u>1612</u> | | |
| SVE/AS System | | | |
| SVE Blower VFD Setpoints (Hertz/Amps/Torque %) - VFD | <u>42/14.8A/54%</u> HMI | AS Blower VFD Setpoints (Hertz/Amps/Torque %) - VFD | <u>52 Hz/10.2A/89%</u> HMI |
| SVE Blower Runtime (Hours) | <u>15228.3</u> HMI | AS Blower Runtime (Hours) - Sparge Blower | <u>8800.3</u> HMI |
| Transfer Pump Runtime (Hours) - MS Pump | <u>2.9</u> HMI | AS Heat Exchanger Runtime (Hours) | <u>8797.7</u> HMI |
| Sparge Zone 1 Time Span(s) Operational: | <u>1700 - 2230</u> HMI | Sparge Zone 4 Time Span(s) Operational: | <u>0730 - 1230</u> HMI |
| Sparge Zone 2 Time Span(s) Operational: | <u>2200 - 2330</u> HMI | Sparge Zone 5 Time Span(s) Operational: | <u>1200 - 1730</u> HMI |
| Sparge Zone 3 Time Span(s) Operational: | <u>0700 - 0800</u> HMI | Sparge Zone Active: | <u>5</u> |
| AS Blower Intake Pressure (" H2O) - DPI-500 | <u>1.0</u> | SVE Blower Filter Differential Pressure (" H2O) - DPI-200 | <u>0.5</u> |
| AS Blower Discharge Pressure (PSI) - PI-501 | <u>8.25</u> | SVE Blower Inlet Differential Pressure (" H2O) - FI-200 | <u>1.75</u> |
| AS Bleed Valve (# turns open) - | <u>1</u> | Transfer Pump Discharge Pressure (PSI) - PI-300 | <u>0</u> |
| AS Heat Exchanger Discharge Temp (°F) - TI-500 | <u>73</u> | SVE Blower Discharge Pressure (" H2O) - PI-400 | <u>10.2</u> |
| SVE Blower Inlet Temperature (°F) - TI-200 | <u>53</u> | SVE Blower Discharge Temperature (°F) - TI-400 | <u>97</u> |
| SVE Blower Inlet Vacuum (" H2O) - VI-200 | <u>86</u> | SVE Blower Dilution Valve (# turns open) - | <u>0</u> |
| Oxidizer System | | | |
| Oxidizer Inlet Differential Pressure (" H2O) - FI-1 | <u>0.2</u> | Combustion Valve Position (%) | <u>11.1</u> HMI |
| Inlet Temperature (°F) | <u>670</u> HMI | Process Blower Runtime (Hours) | <u>22074</u> HMI |
| Burner Chamber Temperature (°F) | <u>669</u> HMI | Combustion Fan Runtime (Hours) | <u>22075</u> HMI |
| Outlet Temperature (°F) | <u>626</u> HMI | Burner Runtime (Hours) | <u>22063</u> HMI |
| Inlet Limit Controller Temperature (°F) | <u>668</u> HMI | Processing Vapors Runtime (Hours) | <u>22048</u> HMI |
| Outlet Limit Controller Temperature (°F) | <u>626</u> HMI | Panel Temperature (°F) | <u>76</u> HMI |
| Process Fan Valve Position (Open/Closed) | <u>open</u> HMI | Flame Signal (Volts) | <u>5</u> HMI |
| Dilution Valve Position (%) | <u>0</u> HMI | | |
| Other Components | | | |
| Knockout Tank Level (Sightglass % Full) ¹ | <u>10</u> | Propane Tank A Level (%) | <u>80</u> |
| Water Depth in Storage Tank ² (DTF/WD (calc in ft)) | <u>4.75</u> <u>(2.17)</u> | Propane Tank B Level (%) | <u>70</u> |
| NOTES: | | | |

Abbreviations:

" H₂O = Inches of Water
 °F = Degrees Fahrenheit
 PSI = Pounds per Square Inch
 % = Percent

DTF - Depth to Fluid
 DTB - Depth to Bottom
 MP - Measuring Point
 WD - Water Depth

Notes:

1. Low float = 0% full. Mid float = 100% full.
2. Calculate the water depth by measuring DTF from the MP and then subtracting that from 6.92 ft (DTB).



AECOM Daily Tailgate Meeting Summary

Project information

| | |
|-------------------------|---------------|
| Project Name | T-30 |
| Project Number | 60681370 |
| Project Manager | Paul Kalina |
| Project Manager Phone # | 2063105097 |
| Muster Point location | Clubhouse |
| Meeting date | 11/23/2022 |
| Business Line | Environment |
| SH&E Manager | Tim Gilles |
| SH&E Manager Phone # | 3128335991 |
| First Aid Kit Location | Conex |
| Prepared by | Friedman, Gus |

Shift Summary

| | |
|--------------------------------|--|
| Location | SODO |
| Attendees (Workers) | Friedman, Gus;Bragg, Austin; |
| Attendees (Visitors) | |
| Tasks to be performed | Biweekly O&M System part upgrades |
| Hazards to be considered today | pressure, noise, motion, mechanical |
| Will there be Lone Workers? | No |
| Hierarchy of controls | engineering, administrativecontrols, ppe |
| Personal Protective Equipment | Task Specific: gloves Mandatory: safetyglasses, longpants, reflectivevest, workboots |
| High Risk Events | |
| | |

| | |
|--|--|
| Topic of the week | ThanksgivingSafety |
| Other topics discussed | |
| Mid day reviews | |
| End of the day comments.The supervisor confirms that the site is being left in a safe condition and work crew checked out as fit unless otherwise specified here | All tasks completed safely and successfully |
| Hazards | <ul style="list-style-type: none">• Mechanical• Motion• Noise• Pressure |



INSTRUMENT CALIBRATION REPORT

Pine Environmental Services LLC

3225 South 116th St.
Building 1 Suite 181
Tukwila, WA 98168
425-285-9102

Pine Environmental Services, Inc.

Instrument ID 38726
Description MiniRAE 3000
Calibrated 11/18/2022 6:18:21PM

| | |
|---|------------------------|
| Manufacturer Rac Systems | State Certified |
| Model Number PGM7320 | Status Pass |
| Serial Number/ Lot Number 592-920494 | Temp °C 19 |
| Location Seattle | Humidity % 27 |
| Department | |

Calibration Specifications

| | |
|-----------------------------------|-----------------------------|
| Group # 1 | Range Acc % 0.0000 |
| Group Name VOC | Reading Acc % 3.0000 |
| Stated Accy Pct of Reading | Plus/Minus 0.0 |

| <u>Nom In Val / In Val</u> | <u>In Type</u> | <u>Out Val</u> | <u>Out Type</u> | <u>Fnd As</u> | <u>Lft As</u> | <u>Dev%</u> | <u>Pass/Fail</u> |
|----------------------------|----------------|----------------|-----------------|---------------|---------------|-------------|------------------|
| 100.0 / 100.0 | PPM | 100.0 | PPM | 102.1 | 100.0 | 0.00% | Pass |

Test Instruments Used During the Calibration

(As Of Cal Entry Date)

| <u>Test Standard ID</u> | <u>Description</u> | <u>Manufacturer</u> | <u>Model Number</u> | <u>Serial Number / Lot Number</u> | <u>Last Cal Date / Opened Date</u> | <u>Next Cal Date / Expiration Date</u> |
|---|-------------------------------|---------------------|---------------------|-----------------------------------|--|--|
| SEA ISO 100 PPM 302-402485610- 1 | Isobutylene (C4H8) 100 PPM | Airgas | x02ai99cp342066 | 302-402485610 -1 | | 8/18/2026 |

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Jose Arroyo

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

**Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment
Please call 800-301-9663 for Technical Assistance**

DAILY FIELD LOG

Project Information

Page 1 of 3

| | |
|---------------------------|--------------------------|
| Project Name: <u>T-30</u> | Location: <u>Seattle</u> |
| Project/Task No.: _____ | Weather: _____ |
| Date: <u>12/8/22</u> | Personnel: <u>GF, AB</u> |

Observations

| # | Time | Observation Description |
|----|-------|---|
| 1 | 11:45 | GF, AB on site |
| 2 | | • Scope: 4Q O&M w/ deeper sampling; 4Q LNAPL recovery |
| 3 | | • Safety trailgate |
| 4 | 12:00 | • System OFF on arrival. |
| 5 | | - LAMH alarm 12/5/22 @ 12:29 |
| 6 | | - LAMH fault 12/7/22 @ 08:19 shut system down |
| 7 | | & triggered other faults. maybe not though? |
| 8 | | - KO T LAMH triggered 12/7/22 @ 14:22 and seems |
| 9 | | to have shut the system down then. |
| 10 | | → maybe the LAMH just shuts down the transfer pump? |
| 11 | | • Marina on site waiting for Farrell gas. Tanks are at |
| 12 | | 30% (A) and 20% (B) |
| 13 | 13:00 | • Magnet test completed. Power disconnected in advance. |
| 14 | | - the Nothing significantly stood out from the readings. |
| 15 | | • Took care of several maintenance to-dos: |
| 16 | | - Swapped in a new rotameter for AS-7. Very hard |
| 17 | | to get the top black hose off of the barb. The |
| 18 | | new rotameter + union combo is taller than the |
| 19 | | old ones, but instead of cutting down the |
| 20 | | black hose we just left it bumped up higher |
| 21 | | than the other ones. Figured we can always cut |
| 22 | | it down to size later if need be. All of the |
| 23 | | pipe pieces & fittings below the rotameter were |
| 24 | | impossible to get apart, which we tried to do |
| 25 | | to swap in a smaller pipe nipple there. |

Comments / Site Activities / Personnel Tracking

DAILY FIELD LOG

Project Information

Page 2 of 3

| | |
|---------------------------|------------------|
| Project Name: <u>T-30</u> | Location: _____ |
| Project/Task No.: _____ | Weather: _____ |
| Date: <u>12/8/22</u> | Personnel: _____ |

Observations

| Time | Observation Description |
|------|---|
| 1 | <ul style="list-style-type: none"> • Replaced the hose on SVE-9. removed the female camlock fittings from the old hose using hot water to soften it. Had to cut the male fitting off the new hose as it had steps crimped on. Put one of the old female fittings over the new hose + hooked it up. Left it long for the time being + propped up the coils w/ 5 gal buckets. It all worked reasonably well. |
| 2 | |
| 3 | |
| 4 | |
| 5 | |
| 6 | |
| 7 | |
| 8 | |
| 9 | <ul style="list-style-type: none"> • Replaced the cracked bottom piece of the SVE-10 using spare part marina ordered. Had to retain the drift from the old piece. |
| 10 | |
| 12 | <ul style="list-style-type: none"> • Scrubbed out the KOT sight glass • Tried using the larger-sized solinst peri pump to dewater the SVE wells, but it wouldn't turn on. Didn't work with the battery or off of my car. Called Larry (PINE) + he'll take a look + have a functional one ready for our next visit. |
| 13 | |
| 14 | |
| 18 | <ul style="list-style-type: none"> • Looked at swapping out the SVE mag gauge (0-15" H₂O) but we only had 0-2 or 0-0.25 in the carbox. |
| 20 | |
| 21 | <ul style="list-style-type: none"> • Couldn't build out further dewatering setups yet b/c parts are still in transit. |
| 22 | |
| 23 | <ul style="list-style-type: none"> • SVE rotameter internal parts are still being ordered • opened + closed rarely-used valves @ KOT + SVE manifold. |
| 24 | |
| 25 | <ul style="list-style-type: none"> • DH onsite (AI) for LNAPL gauging |

Comments / Site Activities / Personnel Tracking

DAILY FIELD LOG

Project Information

Page 3 of 3

| | |
|---------------------------|------------------|
| Project Name: <u>T-20</u> | Location: _____ |
| Project/Task No.: _____ | Weather: _____ |
| Date: <u>12/16/22</u> | Personnel: _____ |

Observations

| # | Time | Observation Description |
|----|------|---|
| 1 | | • Safety tailgate. Scope is 9 wells, expecting product in sub. AP goes over truck safety. |
| 2 | | |
| 3 | | • Began gauging & fencing on RW-59. |
| 4 | | • GIF talked AB through the process, showed him the wells, & got him oriented. |
| 5 | | |
| 6 | 1700 | AB offsite for the night. |
| 7 | | • GIF gauged all other wells. Product present in 7 wells: |
| 8 | | MW-35, RW-1, -12, -104, -106, -107, & MW-59 |
| 9 | 2100 | Done vacing wellfield. Moved to system tank. |
| 10 | | → Holding tank has ~0.25 ft of scum/product at the surface. Tank is 7ft dia, so ~95 gal. |
| 11 | | |
| 12 | 2120 | Went to re-gauge RW-107 & -12 for end-of-day measurements |
| 13 | 2140 | • Returned to system. At done vacing & got the entire holding tank & secondary containment. 2328 gal tot EOD. |
| 14 | | • Cleared system alarms & restarted oxidizer |
| 15 | | |
| 16 | | - checked KOT & it had already pumped itself out. Maybe once the holding tank floats dropped during the vac? |
| 17 | | |
| 18 | | • SVE & AS started up fine once Ox heated up |
| 19 | | → Zone 2 happened to be active, including AS-7. New rotameter looks good. No leaks audible. Easy to read (~2) |
| 20 | | |
| 21 | | → seems like lots of water in the SVE lines |
| 22 | | * NOTE: Tried the POS interface probe but it wouldn't sense water or product. Also it is metric, cm & m. |
| 23 | | |
| 24 | | → New hole on SVE-9 had water visible in it. |
| 25 | 2210 | offsite. System all locked up |

Comments / Site Activities / Personnel Tracking

GIF
 12/16/22

TERMINAL 30 MEGGER TESTING OF MOTOR WINDINGS

Field Tech(s): GF, AB
 Date: 12/8/22

Equipment ID: _____

| Baseline Readings (See Note 2) | | | | | |
|--------------------------------|------|---------------------------|----------------------------------|---------------------------|----------------------------------|
| Motor | | AS Compressor | | SVE Blower | |
| Motor Wires | Date | Winding Resistance (Ohms) | Insulation Resistance (Megaohms) | Winding Resistance (Ohms) | Insulation Resistance (Megaohms) |
| G & B | N/A | N/A (>100.0) | NM | N/A (>100.0) | NM |
| G & O | N/A | N/A (>100.0) | NM | N/A (>100.0) | NM |
| G & Y | N/A | N/A (>100.0) | NM | N/A (>100.0) | NM |
| B & O | N/A | NM | N/A (0.00) | NM | N/A (0.00) |
| O & Y | N/A | NM | N/A (0.00) | NM | N/A (0.00) |
| B & Y | N/A | NM | N/A (0.00) | NM | N/A (0.00) |

Legend:
 G= Ground Wire
 B= Brown Wire
 O= Orange Wire
 Y= Yellow Wire
 N/A= Not applicable

Notes:

- 1 These tests check for a breakdown of insulation within the internal motor windings over time. Use a Megger Model MIT 220.
- 2 Baseline data is unavailable. Testing was not conducted by CRETE and readings were only initiated once issues with the AS motor were identified.
- 3 Insulation resistance testing was completed between winding phase at 500 volts over approximately 30 seconds
- 4 >1,000 Mohm readings generally means you have an open circuit
- 5 0.00 Mohm readings mean that the phase being tested is shorted to Ground
- 6 Ideally the phase-to-phase winding resistance readings between each phase should be the same or at least very close
- 7 Phase-to-phase winding resistance readings should not be 0 ohms (i.e. short) or OL (overload) or infinity
- 8 Generally high resistance readings (greater than 10 Mohms) indicate the motor insulation is good

| Motor | AS Compressor Motor | | | | | | Comments |
|-------------|---------------------|--------|--------|-----------------------|------------|------------|--------------------------------|
| Test | Winding Resistance | | | Insulation Resistance | | | B & Y jumped from 1.4-1.8 Ohms |
| Motor Wires | B & O | O & Y | B & Y | G & B | G & O | G & Y | |
| Date/Time | (Ohms) | (Ohms) | (Ohms) | (Megaohms) | (Megaohms) | (Megaohms) | |
| Baseline | N/A | N/A | N/A | N/A | N/A | N/A | |
| | 1.41 | 1.42 | 1.40 | 0.14 | 0.13 | 0.12 | |

| Motor | SVE Blower Motor | | | | | | Comments |
|-------------|--------------------|--------|--------|-----------------------|------------|------------|---|
| Test | Winding Resistance | | | Insulation Resistance | | | G & B initially 0.12, but 0.14 after others were tested |
| Motor Wires | B & O | O & Y | B & Y | G & B | G & O | G & Y | |
| Date/Time | (Ohms) | (Ohms) | (Ohms) | (Megaohms) | (Megaohms) | (Megaohms) | |
| Baseline | N/A | N/A | N/A | N/A | N/A | N/A | |
| | 0.73 | 0.73 | 0.74 | 0.12 | 0.13 | 0.14 | |

Port of Seattle Terminal 30 LNAPL Removal Event

| | | |
|------------------------------------|-------------------------|-----------------------------|
| Field Technician(s): GF, AB | Client: Port of Seattle | Closest Low Tide: |
| Project Number: 60681370 | Project: T-30 | Closest High Tide: |
| Date: 12/8/22 | Location: Seattle, WA | Weather: 40, drizzle |

| Well ID | Well Location | Initial Gauging | | | | First Removal | | | | Post-Removal | | | Further Removals Required? (Yes/No) | Comments | |
|---------|--------------------------------------|---|----------------------------------|----------------------------------|------------------------|-------------------------------|---------------------------------|-------------------------------|-----------------------------|-----------------|--------------------------|---------------------------|-------------------------------------|----------|--|
| | | Time of Gauging | Initial Depth to LNAPL (Ft BTOC) | Initial Depth to Water (Ft BTOC) | LNAPL Thickness (Feet) | Approx Vac Duration (Minutes) | Extraction Start Time (Approx.) | Extraction End Time (Approx.) | Est Total Removal (Gallons) | Time of Gauging | Depth to LNAPL (Ft BTOC) | Depth to Water (Feet TOC) | | | LNAPL Thickness (Feet) |
| MW-35 | D 314 ** | 1750 | 9.04 | 9.07 | 0.03 | 20 | 1955 | 2015 | - | 2032 | - | 10.52 | - | No | 1.5 ft depression even 15 min post-vac |
| MW-36 | C 309.5 | Removed from LNAPL monitoring protocol following 11/10/22 event | | | | | | | | | | | | | |
| MW-36A | C 311.5 | Removed from LNAPL monitoring protocol following 09/08/22 event | | | | | | | | | | | | | |
| MW-39A | C 237 | Removed from LNAPL monitoring protocol following 09/08/22 event | | | | | | | | | | | | | |
| MW-59 | D 324 ** | 1651 | 9.10 | 9.15 | 0.05 | 20 | 1765 | 1725 | - | 1813 | - | 9.14 | - | No | |
| MW-89 | A 257 | Removed from LNAPL monitoring protocol following 09/08/22 event | | | | | | | | | | | | | |
| MW-93 | D 275 | Removed from LNAPL monitoring protocol following 09/08/22 event | | | | | | | | | | | | | |
| RW-1 | Entry lanes W of wall, even w/ D 275 | 1753 | 9.64 | 9.68 | 0.04 | 20 | 2040 | 2100 | - | 2165 | - | 10.14 | - | No | @29.35 DTW 9.65 |
| RW-12 | D 327 | 1732 | 9.25 | 9.63 | 0.38 | 30 | 1845 | 1930 | - | 1951 | 9.40 | 9.55 | 0.15 | Yes | |
| RW-101 | D 319.5 | Removed from LNAPL monitoring protocol following 09/08/22 event | | | | | | | | | | | | | |
| RW-102 | D 322.5 ** | Removed from LNAPL monitoring protocol following 09/08/22 event | | | | | | | | | | | | | |
| RW-103 | D 326 | 1716 | 8.40 | 8.55 | 0.15 | 20 | 1755 | 1815 | - | 1841 | - | 8.42 | - | No | |
| RW-104 | D 318 | 1743 | - | 8.12 | - | - | - | - | - | - | - | - | - | - | |
| RW-105 | D 321 | Removed from LNAPL monitoring protocol following 09/08/22 event | | | | | | | | | | | | | |
| RW-106 | D 324 | Removed from LNAPL monitoring protocol following 09/08/22 event see below | | | | | | | | | | | | | |
| RW-107 | D 327 | 1729 | 8.74 | 9.18 | 0.44 | 40 | 1815 | 1845 | - | 1925 | 8.75 | 8.89 | 0.14 | Yes | |
| RW-108 | C/D 320 | Removed from LNAPL monitoring protocol following 09/08/22 event | | | | | | | | | | | | | |
| RW-109 | C/D 323 | Removed from LNAPL monitoring protocol following 09/08/22 event | | | | | | | | | | | | | |
| RW-110 | C/D 326 | 1736 | - | 8.97 | - | - | - | - | - | - | - | - | - | - | |

VACUUM TRUCK MEASURED AND APPROXIMATED TOTALS

Estimated volume in vac truck, post-LNAPL recovery but pre-poly tank (gal): **11M, ~ 1328 (poly tank is 1000 gal)**

Estimated volume in vac truck at end of day (including poly tank) (gal): **2328**

Estimated combined volume, measured by DH the following day (gal):

--> Estimated product portion (gal):

--> Estimated water portion (gal):

Abbreviations:

BTOC = Below top of well casing.
 LNAPL = Light Non-Aqueous Phase Liquid
 ND = LNAPL not detected using interface probe.
 NA = Not Available (not able to detect or measure)
 TRACE = LNAPL present, but no accurate measurement.

- Guidelines:**
- If product thickness is 0.01 - 0.25 ft, vac for approx 20 min
 - If product thickness is 0.26 - 0.5 ft, vac for approx 30-40 min
 - If product thickness is greater than 0.51 ft, vac for approx 60 min
- D 314 ** = Well located in a container stall

Notes:
 During the 10/6/22 Ops Meeting, agreed that wells measured <0.01 ft for 1 yr can be removed from monitoring schedule.

RW-106 | 1653 | 8.50 | 8.82 | 0.32 | 30 min | 1725 | 1755 | 1915 | 1865 | - | No

Port of Seattle Terminal 30 LNAPL Removal Event -- Further Removals

| | | |
|-------------------------------------|-------------------------|----------------------------|
| Field Technician(s): C.F. AS | Client: Port of Seattle | Closest Low Tide: |
| Project Number: 60681370 | Project: T-30 | Closest High Tide: |
| Date: 10/6/22 | Location: Seattle, WA | Weather: 40 drizzly |

| Well ID | Well Location | Post-Removal LNAPL Thickness (Ft BTOC) | Second Removal | | | | | Third Removal | | | | | Comments | | |
|---------|--------------------------------------|---|----------------------------------|---------------------------------|-------------------------------|-----------------|---------------------------------------|---------------------------------------|------------------------|----------------------------------|---------------------------------|-------------------------------|----------|-----------------|---------------------------------------|
| | | | Approx Vacuum Duration (Minutes) | Extraction Start Time (Approx.) | Extraction End Time (Approx.) | Time of Gauging | Post-Removal Depth to LNAPL (Ft BTOC) | Post-Removal Depth to Water (Ft BTOC) | LNAPL Thickness (Feet) | Approx Vacuum Duration (Minutes) | Extraction Start Time (Approx.) | Extraction End Time (Approx.) | | Time of Gauging | Post-Removal Depth to LNAPL (Ft BTOC) |
| MW-35 | D 314 ** | | | | | | | | | | | | | | |
| MW-36 | C 309.5 | Removed from LNAPL monitoring protocol following 11/10/22 event | | | | | | | | | | | | | |
| MW-36A | C 311.5 | Removed from LNAPL monitoring protocol following 09/08/22 event | | | | | | | | | | | | | |
| MW-39A | C 237 | Removed from LNAPL monitoring protocol following 09/08/22 event | | | | | | | | | | | | | |
| MW-59 | D 324 ** | | | | | | | | | | | | | | |
| MW-89 | A 257 | Removed from LNAPL monitoring protocol following 09/08/22 event | | | | | | | | | | | | | |
| MW-93 | D 275 | Removed from LNAPL monitoring protocol following 09/08/22 event | | | | | | | | | | | | | |
| RW-1 | Entry lanes W of wall, even w/ D 275 | | | | | | | | | | | | | | |
| RW-12 | D 327 | 0.15 | 20 | 2015 | 2019 | 2025 | 10.40 | 10.40 | 10.01 | | | | | | |
| RW-101 | D 319.5 | Removed from LNAPL monitoring protocol following 09/08/22 event | | | | | | | | | | | | | |
| RW-102 | D 322.5 ** | Removed from LNAPL monitoring protocol following 09/08/22 event | | | | | | | | | | | | | |
| RW-103 | D 326 | | | | | | | | | | | | | | |
| RW-104 | D 318 | | | | | | | | | | | | | | |
| RW-105 | D 321 | Removed from LNAPL monitoring protocol following 09/08/22 event | | | | | | | | | | | | | |
| RW-106 | D 324 | | | | | | | | | | | | | | |
| RW-107 | D 327 | 0.14 | 20 | 1930 | 1950 | 2011 | — | 8.80 | — | | | | | | |
| RW-108 | C/D 320 | Removed from LNAPL monitoring protocol following 09/08/22 event | | | | | | | | | | | | | |
| RW-109 | C/D 323 | Removed from LNAPL monitoring protocol following 09/08/22 event | | | | | | | | | | | | | |
| RW-110 | C/D 326 | | | | | | | | | | | | | | |

Guidelines:

- If product thickness is 0.01 - 0.25 ft, vac for approx 20 min
- If product thickness is 0.26 - 0.5 ft, vac for approx 30-40 min
- If product thickness is greater than 0.51 ft, vac for approx 60 min
- Repeat vac events until product thickness is <0.01 ft or three vac events have been completed
- Perform an end-of-day DTW/product gauge for any well that initially had >0.25 ft of product

Abbreviations:

- BTOC = Below top of well casing.
- LNAPL = Light Non-Aqueous Phase Liquid
- ND = LNAPL not detected using interface probe.
- NA = Not Available (not able to detect or measure)
- TRACE = LNAPL present, but no accurate measurement.

Notes:

During the 10/6/22 Ops Meeting, agreed that wells measured <0.01 ft for 1 yr can be removed from monitoring schedule.

Port of Seattle Terminal 30 LNAPL Removal Event -- EOD Gauge

| | | |
|------------------------------------|-------------------------|----------------------------|
| Field Technician(s): GF, AS | Client: Port of Seattle | Closest Low Tide: |
| Project Number: 60681370 | Project: T-30 | Closest High Tide: |
| Date: 12/16/22 | Location: Seattle, WA | Weather: 10 drizzle |

| Well ID | Well Location | End of Day | | | | | | | Comments | |
|---------|--------------------------------------|---|--------------------------------------|-----------------|--------------------------|--------------------------|------------------------|---------------------------------------|----------|--|
| | | Initial LNAPL Thickness (Feet) | End Time of Last Extraction | Time of Gauging | Depth to LNAPL (Ft BTOC) | Depth to Water (Ft BTOC) | LNAPL Thickness (Feet) | Time Lapse Since Extraction (Minutes) | | |
| MW-35 | D 314 ** | | | | | | | | | |
| MW-36 | C 309.5 | Removed from LNAPL monitoring protocol following 11/10/22 event | | | | | | | | |
| MW-36A | C 311.5 | Removed from LNAPL monitoring protocol following 09/08/22 event | | | | | | | | |
| MW-39A | C 237 | Removed from LNAPL monitoring protocol following 09/08/22 event | | | | | | | | |
| MW-59 | D 324 ** | | | | | | | | | |
| MW-89 | A 257 | Removed from LNAPL monitoring protocol following 09/08/22 event | | | | | | | | |
| MW-93 | D 275 | Removed from LNAPL monitoring protocol following 09/08/22 event | | | | | | | | |
| RW-1 | Entry lanes W of wall, even w/ D 275 | | | | | | | | | |
| RW-12 | D 327 | 0.46 | 20 ²⁵ 20 ⁴⁰ | 2135 | 9 ⁰⁹ | 8.72 | 0.03 | 65 | | |
| RW-101 | D 319.5 | Removed from LNAPL monitoring protocol following 09/08/22 event | | | | | | | | |
| RW-102 | D 322.5 ** | Removed from LNAPL monitoring protocol following 09/08/22 event | | | | | | | | |
| RW-103 | D 326 | | | | | | | | | |
| RW-104 | D 318 | | | | | | | | | |
| RW-105 | D 321 | Removed from LNAPL monitoring protocol following 09/08/22 event | | | | | | | | |
| RW-106 | D 324 | | | | | | | | | |
| RW-107 | D 327 | 0.44 | 16 ³⁰ 19 ⁵⁰ | 2136 | 8 ⁵⁰ | 8.92 | 0.12 | 100 | | |
| RW-108 | C/D 320 | Removed from LNAPL monitoring protocol following 09/08/22 event | | | | | | | | |
| RW-109 | C/D 323 | Removed from LNAPL monitoring protocol following 09/08/22 event | | | | | | | | |
| RW-110 | C/D 326 | | | | | | | | | |

Guidelines:

- Perform an end-of-day DTW/product gauge for any well that initially had >0.25 ft of product

Abbreviations:

BTOC = Below top of well casing.
LNAPL = Light Non-Aqueous Phase Liquid

ND = LNAPL not detected using interface probe.
NA = Not Available (not able to detect or measure)

TRACE = LNAPL present, but no accurate measurement.

Notes:

During the 10/6/22 Ops Meeting, agreed that wells measured <0.01 ft for 1 yr can be removed from monitoring schedule.

NON-HAZARDOUS WASTE MANIFEST

1. Generator ID Number

None Required

2. Page 1 of

1

3. Emergency Response Phone

(800) 337 7455

4. Waste Tracking Number

POS-T30-12822-01

5. Generator's Name and Mailing Address

Port of Seattle Terminal 3D
1731 Alaskan Way S
Seattle, WA 98154

Generator's Site Address (if different than mailing address)

Generator's Phone:

Attn:

6. Transporter 1 Company Name

DH Environmental, Inc.

U.S. EPA ID Number

WAH000047217

7. Transporter 2 Company Name

U.S. EPA ID Number

8. Designated Facility Name and Site Address

Water Treatment Services
1516 S Graham St
Seattle, WA 98108

U.S. EPA ID Number

WAD980974521

Facility's Phone:

9. Waste Shipping Name and Description

10. Containers

No.

Type

11. Total Quantity

12. Unit Wt./Vol.

1. Non-RCRA, non DOT (City Ground Water)

01 TT 2328 G1

2.

3.

4.

13. Special Handling Instructions and Additional Information

1) Profile# POS-30-IDW Water-021320

14. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

Generator's/Offeror's Printed/Typed Name

Signature

Month Day Year

Gene H. (Signature)

(Signature)

7 8 22

15. International Shipments

Import to U.S.

Export from U.S.

Port of entry/exit:

Date leaving U.S.:

Transporter Signature (for exports only):

16. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name

Signature

Month Day Year

Al (Signature)

(Signature)

12 8 22

Transporter 2 Printed/Typed Name

Signature

Month Day Year

17. Discrepancy

17a. Discrepancy Indication Space

Quantity

Type

Residue

Partial Rejection

Full Rejection

Manifest Reference Number:

17b. Alternate Facility (or Generator)

U.S. EPA ID Number

Facility's Phone:

17c. Signature of Alternate Facility (or Generator)

Month Day Year

18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a

Printed/Typed Name

Signature

Month Day Year

GENERATOR

INT'L

TRANSPORTER

DESIGNATED FACILITY

INSTRUMENT CALIBRATION REPORT



Pine Environmental Services LLC

3225 South 116th St.
Building 1 Suite 181
Tukwila, WA 98168
425-285-9102

Pine Environmental Services, Inc.

Instrument ID 38679
Description Solinst 410 Reristaltic Pump
Calibrated 12/6/2022 5:04:26PM

| | |
|---------------------------------------|------------------------|
| Manufacturer Solinst | State Certified |
| Model Number 410 | Status Pass |
| Serial Number/ Lot Number 1591 | Temp °C 16 |
| Location Seattle | Humidity % 41 |
| Department | |

Calibration Specifications

Group # 1
Group Name
Test Performed: Yes **As Found Result:** Pass **As Left Result:** Pass

Test Instruments Used During the Calibration

(As Of Cal Entry Date)

| <u>Test Standard ID</u> | <u>Description</u> | <u>Manufacturer</u> | <u>Model Number</u> | <u>Serial Number / Lot Number</u> | <u>Next Cal Date / Expiration Date</u> |
|--------------------------------|---------------------------|----------------------------|----------------------------|--|---|
|--------------------------------|---------------------------|----------------------------|----------------------------|--|---|

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Jose Arroyo

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment
Please call 800-301-9663 for Technical Assistance

AECOM Daily Tailgate Meeting Summary

Project information

| | |
|-------------------------|---------------|
| Project Name | T-30 |
| Project Number | 60681370 |
| Project Manager | Paul Kalina |
| Project Manager Phone # | 2063105097 |
| Muster Point location | Clubhouse |
| Meeting date | 12/8/2022 |
| Business Line | Environment |
| SH&E Manager | Tim Gilles |
| SH&E Manager Phone # | 3128335991 |
| First Aid Kit Location | Conex |
| Prepared by | Friedman, Gus |

Shift Summary

| | |
|--------------------------------|--|
| Location | SODO |
| Attendees (Workers) | Friedman, Gus;Al Leiatua;Bragg, Austin; |
| Attendees (Visitors) | |
| Tasks to be performed | 4Q system O&M w/vapor sampling |
| Hazards to be considered today | pressure, noise, motion, mechanical |
| Will there be Lone Workers? | No |
| Hierarchy of controls | engineering, administrativecontrols, ppe |
| Personal Protective Equipment | Task Specific: gloves Mandatory: safetyglasses, longpants, reflectivevest, workboots |
| High Risk Events | |
| | |

| | |
|---|--|
| Topic of the week | Winter Driving |
| Other topics discussed | |
| Mid day reviews | |
| End of the day comments. The supervisor confirms that the site is being left in a safe condition and work crew checked out as fit unless otherwise specified here | All work completed safely and successfully |
| Hazards | <ul style="list-style-type: none">• Mechanical• Motion• Noise• Pressure |

DAILY FIELD LOG

Project Information

Page 1 of 2

| | |
|---------------------------|--------------------------|
| Project Name: <u>T-30</u> | Location: <u>Seattle</u> |
| Project/Task No.: _____ | Weather: _____ |
| Date: <u>12/9/22</u> | Personnel: <u>GF, AB</u> |

Observations

| # | Time | Observation Description |
|----|-------|--|
| 1 | 0830 | Onsite. Some confusion at entrance, guards didn't think |
| 2 | | we had access, but then they let us through. |
| 3 | | • Scope: Completion of 4th O&M visit + vapor sampling |
| 4 | | Safety tailgate. Port shut down today so external |
| 5 | | guards are far fewer. |
| 6 | | • System ON on arrival. Began taking down O&M |
| 7 | | readings. Zone 4 active. |
| 8 | | • checked mag gauges w/ a hand held manometer |
| 9 | | • checked mag gauges w/ a hand held manometer. |
| 10 | | - SVE inlet is accurate but we should replace w/ a 0.5 |
| 11 | | in H ₂ O gauge for improved precision. Hard to tell 1.5 |
| 12 | | vs 1.75 on this one |
| 13 | | - particulate filter OP was only 0.25 vs 0.43. Need |
| 14 | | to be able to measure to 15" on that one for |
| 15 | | changeout indication. |
| 16 | | • Walked AB thru tube blow-out procedure for the mag gauge |
| 17 | | readings. |
| 18 | 10:00 | • Took PID's. 1.8 ppmv at SVE and 1.0 ppmv at OX |
| 19 | | discharge. |
| 20 | 10:30 | • Took Vapor samples |
| 21 | | - Discharge - 120922 @ 10:32 |
| 22 | | - Inlet - 120922 @ 10:32 |
| 23 | 10:45 | • Took down manifold readings + checked PID readings on |
| 24 | | SVE side. w/ zone 4 active, zone 2 was still extracting |
| 25 | | the most mass. In 24, SVE-6 had 0 ppmv and the SVE-5 |

Comments / Site Activities / Personnel Tracking

DAILY FIELD LOG

Project Information

Page 2 of 2

| | |
|---------------------------|--------------------------|
| Project Name: <u>T-36</u> | Location: _____ |
| Project/Task No.: _____ | Weather: _____ |
| Date: <u>12/9/22</u> | Personnel: <u>GF, AB</u> |

Observations

| Time | Observation Description |
|------|---|
| 1 | rotameter float is stuck on the bottom. Needs a new bumper. |
| 2 | of dewatering. |
| 3 | • On the AS side, AS-14 of -22 had sticky floats. AS-18 |
| 4 | and -21 read 0. |
| 5 | • Could not dewater today due to a malfunctioning |
| 6 | pump from Pine (solinst mod' peri pump) |
| 7 | 11:15 • Packed up & locked up the gate |
| 8 | • Since the port was shut down, went out to zone |
| 9 | 5 to inspect a few AS wells. |
| 10 | - AS-26 had a 0-10 psi pressure gauge on top of a |
| 11 | mini ball valve threaded into a bushing in the well |
| 12 | stub up. The gauge read 0 PSI even though the |
| 13 | zone system was off. It read 0 at the manifold, so |
| 14 | likely a broken gauge? |
| 15 | - AS-25 was full of water, but I could feel the |
| 16 | some sort of gauge assembly. Could not see |
| 17 | the gauge to check its reading. |
| 18 | 11:30 offsite for QTA. |
| 19 | |
| 20 | |
| 21 | |
| 22 | |
| 23 | GF |
| 24 | 12/9/22 |
| 25 | |

Comments / Site Activities / Personnel Tracking

PORT OF SEATTLE - TERMINAL 30

AS & SVE Manifold Readings

Date: 12/9/22 Time: 1045
 Field Tech(s): GE, AB Equipment I.D. #:

SVE Wells

| Well ID | Vacuum ("H2O) | Flow (SCFMG) | Valve Pos. (% Open) | Dewater (Gal) | PID (ppmv) | Comments | Well ID | Vacuum ("H2O) | Flow (SCFMG) | Valve Pos. (% Open) | Dewater (Gal) | PID (ppmv) | Comments |
|-------------|---------------|--------------|---------------------|---------------|------------|----------------------------------|---------|---------------|--------------|---------------------|---------------|------------|--------------|
| 22 [HSVE-2 | 34 | 81 | 25 | - | 10.6 | good | SVE-10 | 78 | 20 | 100 | - | 0.8 | bouncing 5-2 |
| 23 [HSVE-3 | 40 | 72 | 25 | - | 3.1 | good | SVE-9 | 74 | 0 | 100 | - | 0.0 | water, dirty |
| 24 [SVE-4 | 72 | 15 | 100 | - | 1.3 | bouncing, little bit dirty | SVE-8 | 89 | 0 | 100 | - | 0.0 | not stuck? |
| SVE-5 | 66 | 0? | 100 | - | 3.2 | stuck on bottom lots of no water | SVE-6 | 80 | 10 | 100 | - | 0.0 | water |
| 25 [SVE-7 | 68 | 17 | 100 | - | 0.3 | | HSVE-1 | 15 | 78 | 10 | - | 0.5 | good |

Notes:

AS Wells

| Well ID | Pressure (PSIG) | Flow (SCFMG) | Valve Pos. (% Open) | Comments | Well ID | Pressure (PSIG) | Flow (SCFMG) | Valve Pos. (% Open) | Comments |
|---------|-----------------|--------------|---------------------|----------|---------|-----------------|--------------|---------------------|--------------|
| Zone 2 | | | | | Zone 4 | | | | |
| AS-7 | | | | | AS-17 | 8.0 | 5.3 | 100 | |
| AS-8 | | | | | AS-18 | 8.5 | 0 | | |
| AS-9 | | | | | AS-19 | 8.0 | 2.1 | | sticky float |
| AS-10 | | | | | AS-20 | 8.5 | 2.3 | | |
| AS-11 | | | | | AS-21 | 9.5 | 0 | | |
| Zone 3 | | | | | AS-22 | 8.5 | 3.0 | | sticky float |
| Zone 5 | | | | | Zone 1 | | | | |
| AS-12 | | | | | AS-1 | | | | |
| AS-13 | | | | | AS-2 | | | | |
| AS-14 | | | | | AS-3 | | | | |
| AS-15 | | | | | AS-4 | | | | |
| AS-16 | | | | | AS-5 | | | | |
| AS-23 | | | | | AS-6 | | | | |
| AS-24 | | | | | | | | | |
| AS-25 | | | | | | | | | |
| AS-26 | | | | | | | | | |
| AS-27 | | | | | | | | | |

Notes:

Abbreviations:

% = Percent
 " H₂O = inches of water
 deg F - degrees Fahrenheit

N/A = Not applicable
 ppmv = Parts per million volume
 PSIG = Pounds per square inch gauge

SCFMG = Standard cubic feet per minute gauge



PORT OF SEATTLE - TERMINAL 30

| SVE/AS & Oxidizer System Data Collection Form | | | |
|--|-----------------------|---|---|
| Date: 12/9/22 | Field Tech(s): GF, AB | Ambient: 39°F | |
| Actual Time: | AS/SVE HMI Time: | | |
| SVE/AS System | | | |
| SVE Blower VFD Setpoints (Hertz/Amps/Torque %) - VFD | 42 / 16.4 / 60.5 | AS Blower VFD Setpoints (Hertz/Amps/Torque %) - VFD | 52 / 10.1 / 88.2 |
| SVE Blower Runtime (Hours) | 15572.4 | AS Blower Runtime (Hours) - Sparge Blower | 9144.3 |
| Transfer Pump Runtime (Hours) - MS Pump | 3.0 | AS Heat Exchanger Runtime (Hours) | 9141.5 |
| Sparge Zone 1 Time Span(s) Operational: | 1700 - 2230 | Sparge Zone 4 Time Span(s) Operational: | 0730 - 1230 |
| Sparge Zone 2 Time Span(s) Operational: | 2200 - 0530 | Sparge Zone 5 Time Span(s) Operational: | 1200 0900 - 1730 |
| Sparge Zone 3 Time Span(s) Operational: | 0300 - 0800 | Sparge Zone Active: | 4 |
| AS Blower Intake Pressure (" H2O) - DPI-500 | 1.0 | SVE Blower Filter Differential Pressure (" H2O) - DPI-200 | 0.25 → 0.43 ^{1/2} _{manometer} |
| AS Blower Discharge Pressure (PSI) - PI-501 | 8.25 | SVE Blower Inlet Differential Pressure (" H2O) - FI-200 | 1.50 → 1.75 _{manometer} |
| AS Bleed Valve (# turns open) - | 1 | Transfer Pump Discharge Pressure (PSI) - PI-300 | 0 |
| AS Heat Exchanger Discharge Temp (°F) - TI-500 | 60 | SVE Blower Discharge Pressure (" H2O) - PI-400 | 9.8 |
| SVE Blower Inlet Temperature (°F) - TI-200 | < 50 | SVE Blower Discharge Temperature (°F) - TI-400 | 97 |
| SVE Blower Inlet Vacuum (" H2O) - VI-200 | 96 | SVE Blower Dilution Valve (# turns open) - | 0 |
| Oxidizer System | | | |
| Oxidizer Inlet Differential Pressure (" H2O) - FI-1 | 0.15 | Combustion Valve Position (%) | 5.7 |
| Inlet Temperature (°F) | 650 | Process Blower Runtime (Hours) | 22420 |
| Burner Chamber Temperature (°F) | 686 | Combustion Fan Runtime (Hours) | 22421 |
| Outlet Temperature (°F) | 637 | Burner Runtime (Hours) | 22409 |
| Inlet Limit Controller Temperature (°F) | 686 | Processing Vapors Runtime (Hours) | 22393 |
| Outlet Limit Controller Temperature (°F) | 639 | Panel Temperature (°F) | 59 |
| Process Fan Valve Position (Open/Closed) | open | Flame Signal (Volts) | 5.0 |
| Dilution Valve Position (%) | 0 | | |
| SVE Discharge PID (ppmv) | 11.8 | Oxidizer Discharge PID (ppmv) | 1.0 |
| Other Components | | | |
| Knockout Tank Level (Sightglass % Full) ¹ | 0% | Propane Tank A Level (%) | 27 |
| Water Depth in Storage Tank ² (DTF/WD (calc in ft)) | 60.1 ft. | Propane Tank B Level (%) | 22 |
| NOTES: | | | |

Abbreviations:
 " H₂O = Inches of Water
 °F = Degrees Fahrenheit
 PSI = Pounds per Square Inch
 % = Percent

DTF - Depth to Fluid
 DTB - Depth to Bottom
 MP - Measuring Point
 WD - Water Depth

Notes:
 1. Low float = 0% full. Mid float = 100% full.
 2. Calculate the water depth by measuring DTF from the MP and then subtracting that from 6.92 ft (DTB).



T-30 Vapor Sampling Field Form

Project: Terminal 30 Site Address: 1901 East Marginal Way South, Seattle, WA
 Date: 12/9/22 Field Personnel: GF, AB
 Weather: 40 Sun Weather Barometric Pressure (in Hg): 30
 Sample ID: Discharge - 120922 (INLET/DISCHARGE-mmddyy)
 Sample Port Description: SVE discharge/ox inlet sample port

Conditions at Sample Port:

| Pressure (PSI) | Temperature (°F) | VOCs via PID (ppmv) | SVE Runtime (hrs) |
|----------------|------------------|---------------------|-------------------|
| 0 | 637 | 1.0 | 15572.4 |

Before Sampling:

| | Yes or No (Y/N) |
|---|-----------------|
| Install clean tubing on the sampling port | Y |
| Purge the tubing (30-60 seconds) | N |

Summa Can Leak Test¹:

| Initial Canister Reading (in-Hg) | Duration of Test (2 min recommended) | Final Canister Reading (in-Hg) |
|----------------------------------|--------------------------------------|--------------------------------|
| 29 | 2 min | 29 |

¹ For the summa can leak test, connect the flow controller to the can with the cap nut secured. No air should enter the can when the can valve is opened. Once this is confirmed, open the summa can valve and record the initial vacuum. Wait for two minutes and then record the vacuum again. If the two readings do not match there is a leak and a new can and valve should be acquired before sampling.

Sampling Information²:

| Sample Canister LAB ID | Flow Controller LAB ID | Sample Canister Size | Initial Canister Reading (in-Hg) ³ | Time | Date | Final Canister Reading (in-Hg) ³ |
|------------------------|------------------------|----------------------|---|--------------|---------|---|
| 2295 | 101 | 14 | 29 | Sample Start | | 4 |
| | | | | 1032 | 12/9/22 | |
| | | | | Sample End | | |
| | | | | 1038 | 12/9/22 | |

² The flow controller should be for a 4-5 minute integrated sample

³ Canisters measured using a standard vacuum gauge

Sample Collection Notes and General Observations:

Analysis: AP4, TOLX-BTEX

T-30 Summa Can Vapor Sampling Field Form

Project: Terminal 30 Site Address: 1901 East Marginal Way South, Seattle, WA
 Date: 12/9/22 Field Personnel: GF, AB
 Weather: 40 sun Weather Barometric Pressure (in Hg): 30
 Sample ID: Inlet-120922 (INLET/DISCHARGE-mmddyy)
 Sample Port Description: SVE discharge/ox inlet sample port

Conditions at Sample Port:

| Pressure (PSI) | Temperature (°F) | VOCs via PID (ppmv) | SVE Runtime (hrs) |
|----------------|------------------|---------------------|-------------------|
| 9.8 | 97 | 11.6 | 15572.4 |

Before Sampling:

| | Yes or No (Y/N) |
|---|-----------------|
| Install clean tubing on the sample port | Y |
| Purge the tubing (30-60 seconds) | N |

Summa Can Leak Test¹:

| Initial Canister Reading (in-Hg) | Duration of Test (2 min recommended) | Final Canister Reading (in-Hg) |
|----------------------------------|--------------------------------------|--------------------------------|
| 30 | 2 min | 30 |

¹ For the summa can leak test, connect the flow controller to the can with the cap nut secured. No air should enter the can when the can valve is opened. Once this is confirmed, open the summa can valve and record the initial vacuum. Wait for two minutes and then record the vacuum again. If the two readings do not match there is a leak and a new can and valve should be acquired before sampling.

Sampling Information²:

| Sample Canister LAB ID | Flow Controller LAB ID | Sample Canister Size | Initial Canister Reading (in-Hg) ³ | Sample Times | Sample Date(s) | Final Canister Reading (in-Hg) ³ |
|---------------------------------------|------------------------|----------------------|---|--------------|----------------|---|
| 3252 | 111 | 1L | 30 | Sample Start | | 45 |
| | | | | 10:32 | 12/9/22 | |
| | | | | Sample End | | |
| Analyses Requested: APH, TOL5-BTEX | | | | 10:38 | 12/9/22 | |

² The flow controller should be for a 4-5 minute integrated sample

³ Canisters measured using a standard vacuum gauge

Sample Collection Notes and General Observations:

SAMPLE CHAIN OF CUSTODY

Report To Paul Kalina, Gus Friedman
 Company AECOM
 Address 111 2nd Ave Ste 1600
 City, State, ZIP Seattle, WA 98101
 Phone 206-438-2700 Email paul.kalina@aecom.com
gus.friedman@aecom.com

| | |
|---|------------|
| SAMPLERS (signature) <u>Gus</u> | |
| PROJECT NAME & ADDRESS <u>T-30 part of Seattle</u> | PO # |
| NOTES: | INVOICE TO |

Page # 1 of 1

TURNAROUND TIME
 Standard
 RUSH
 Rush charges authorized by: _____

SAMPLE DISPOSAL
 Default: Clean following final report delivery
 Hold (Fee may apply): _____

| SAMPLE INFORMATION | | | | | | | | | | ANALYSIS REQUESTED | | | | | Notes |
|-----------------------------|--------|-----------------|----------------|---|--------------------|--------------------|--------------------|------------------|------------------|--------------------|------------|------------|--------------|--------|--------------|
| Sample Name | Lab ID | Canister ID | Flow Cont. ID | Reporting Level: IA=Indoor Air SG=Soil Gas (Circle One) | Date Sampled | Initial Vac. ("Hg) | Field Initial Time | Final Vac. ("Hg) | Field Final Time | TO15 Full Scan | TO15 BTEXN | TO15 cVOCs | APH | Helium | |
| Inlet-091402 | | 3252 | 111 | IA / (SG) | 12/1/22 | 30 | | | | | | | X | | X |
| Discharge-091402 | | | | IA / (SG) | 12/1/22 | | | | | | | | X | | X |
| Inlet-120922 | | 3252 | 111 | IA / (SG) | 12/9/22 | 30 | 10:32 | 5 | 10:46 | | | | X | | X |
| Discharge-120922 | | 2295 | 101 | IA / (SG) | 12/9/22 | 29 | 10:32 | 4 | 10:46 | | | | X | | X |
| | | | | IA / SG | | | | | | | | | | | |
| | | | | IA / SG | | | | | | | | | | | |
| | | | | IA / SG | | | | | | | | | | | |
| | | | | IA / SG | | | | | | | | | | | |

Friedman & Bruya, Inc.
 5500 4th Avenue South
 Seattle, WA 98108
 Ph. (206) 285-8282
 Fax (206) 283-5044

| SIGNATURE | PRINT NAME | COMPANY | DATE | TIME |
|-----------------------------|--------------|---------|----------|-------|
| Relinquished by: <u>Gus</u> | Gus Friedman | AECOM | 12/9/22 | 15:28 |
| Received by: <u>Paul</u> | ANH PHANI | F&B | 12/09/22 | 15:28 |
| Relinquished by: | | | | |
| Received by: | | | | |



INSTRUMENT CALIBRATION REPORT

Pine Environmental Services LLC

3225 South 116th St.
Building 1 Suite 181
Tukwila, WA 98168
425-285-9102

Pine Environmental Services, Inc.

Instrument ID 18993
Description MiniRac 3000_V2.22A
Calibrated 12/6/2022 4:42:35PM

| | |
|---|------------------------|
| Manufacturer Rac Systems | State Certified |
| Model Number PGM-7320 | Status Pass |
| Serial Number/ Lot Number 592-906428 | Temp °C 16 |
| Location Seattle | Humidity % 41 |
| Department | |

Calibration Specifications

| | |
|-----------------------------------|-----------------------------|
| Group # 1 | Range Acc % 0.0000 |
| Group Name IsoButylene | Reading Acc % 3.0000 |
| Stated Accy Pct of Reading | Plus/Minus 0.00 |

| <u>Nom In Val / In Val</u> | <u>In Type</u> | <u>Out Val</u> | <u>Out Type</u> | <u>Fnd As</u> | <u>Lft As</u> | <u>Dev%</u> | <u>Pass/Fail</u> |
|----------------------------|----------------|----------------|-----------------|---------------|---------------|-------------|------------------|
| 100.00 / 100.00 | PPM | 100.00 | PPM | 103.90 | 100.10 | 0.10% | Pass |

Test Instruments Used During the Calibration

| <u>Test Standard ID</u> | <u>Description</u> | <u>Manufacturer</u> | <u>Model Number</u> | <u>Serial Number / Lot Number</u> | <u>(As Of Cal Entry Date)</u> | |
|------------------------------------|----------------------------|---------------------|---------------------|-----------------------------------|-----------------------------------|--|
| | | | | | <u>Last Cal Date/ Opened Date</u> | <u>Next Cal Date / Expiration Date</u> |
| SEA ISO 100 PPM 304-402467314-1 | Isobutylene (C4H8) 100 PPM | Airgas | x02ai99cp342066 | 304-402467314-1 | | 6/13/2026 |

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Jose Arroyo

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment
Please call 800-301-9663 for Technical Assistance

AECOM Daily Tailgate Meeting Summary

Project information

| | |
|-------------------------|---------------|
| Project Name | T-30 |
| Project Number | 60681370 |
| Project Manager | Paul Kalina |
| Project Manager Phone # | 2063105097 |
| Muster Point location | Clubhouse |
| Meeting date | 12/9/2022 |
| Business Line | Environment |
| SH&E Manager | Tim Gilles |
| SH&E Manager Phone # | 3128335991 |
| First Aid Kit Location | Conex |
| Prepared by | Friedman, Gus |

Shift Summary

| | |
|--------------------------------|--|
| Location | SODO |
| Attendees (Workers) | Friedman, Gus;Bragg, Austin; |
| Attendees (Visitors) | |
| Tasks to be performed | Completion of 4Q O&M |
| Hazards to be considered today | pressure, noise, motion |
| Will there be Lone Workers? | No |
| Hierarchy of controls | engineering, administrativecontrols, ppe |
| Personal Protective Equipment | Task Specific: gloves Mandatory: safetyglasses, longpants, reflectivevest, workboots |
| High Risk Events | |
| | |

| | |
|---|---|
| Topic of the week | Winter Driving |
| Other topics discussed | |
| Mid day reviews | |
| End of the day comments. The supervisor confirms that the site is being left in a safe condition and work crew checked out as fit unless otherwise specified here | All tasks completed safely and successfully |
| Hazards | <ul style="list-style-type: none">• Motion• Noise• Pressure |

DAILY FIELD LOG

Project Information

| | |
|---------------------------|---------------------------------|
| Project Name: <u>T-30</u> | Location: <u>Seattle</u> |
| Project/Task No.: _____ | Weather: <u>45 cloudy/rainy</u> |
| Date: <u>12/29/22</u> | Personnel: <u>GF, CB</u> |

Observations

| Time | Observation Description |
|---------|--|
| 1 1330 | • GF + CB onsite |
| 2 | • Scope: binexel, ODM + SVE emissions stack analysis |
| 3 | + SVE hose analysis |
| 4 | • Safety tailgate. Slips trips; electric when in control panel |
| 5 | • System OFF on arrival |
| 6 | • Moisture Separator LHM @ K626 on 12/28/22 |
| 7 | - SVELTS failed to run + Oxidizer Alarm both at K627 on 12/28 |
| 8 | → This was weird. KOT Sightglass was ~ 1/2 full, so how could the LHM have triggered? |
| 9 | |
| 10 | → This was ~ 2.5 hrs after Marisa said she restarted it |
| 11 | (~ 1630 on 12/28) |
| 12 | • System turned to OFF for troubleshooting. Turned transfer pump to HAND to test functionality & water started spraying everywhere. Turned OFF & inspected. A union broke in |
| 13 | half behind the SVE blower, presumably due to freezing |
| 14 | last week. Doesn't explain why the KOT LHM alarm |
| 15 | triggered |
| 16 | |
| 17 | |
| 18 | - KOT drain valves adjusted to recirculate + KOT floats |
| 19 | were tested. They accurately started the pump up |
| 20 | when activated, so the alarm remains a mystery. |
| 21 | • Pigs found in the caex & placed over the spill/puddle to |
| 22 | soak it up & limit spread of steam/product. |
| 23 1440 | • System restarted |
| 24 | • CB offsite to purchase ferricos/pipe repair parts |
| 25 | • GF replaced SVE inlet mag gauge w/ the replacement |

Comments / Site Activities / Personnel Tracking

DAILY FIELD LOG

Project Information

Page 2 of 5

| | |
|---------------------------|------------------|
| Project Name: <u>T-30</u> | Location: _____ |
| Project/Task No.: _____ | Weather: _____ |
| Date: <u>12/29/22</u> | Personnel: _____ |

Observations

| # | Time | Observation Description |
|----|------|---|
| 1 | | 0-5" H ₂ O scale Marina purchased |
| 2 | | → He also purchased pipe parts for SVE manifold but |
| 3 | | the ball valves are not threaded. Need to rectify. |
| 4 | 1515 | CB onsite. started repairing pipe. |
| 5 | 1545 | • GF started taking down system readings |
| 6 | | • CB started setting up per pump for dewatering. Pump was |
| 7 | | spotty again, only sometimes turning on. Ultimately it |
| 8 | | was usable, but not sure what changed. |
| 9 | | • Zone 5 active. 3.9 scfm total getting out to |
| 10 | | wellfield. Very a ton |
| 11 | | → AS-24 plant was sticky |
| 12 | | • Also @ 1515, noticed that the KOT was up to the 100% mark but was not draining. Not sure why. Manually |
| 13 | | activated the pump & drained down to ~25%. |
| 14 | | |
| 15 | 1615 | • SVE dewatering. Drained deadlegs of SVE -4, -6, -8, and -9. All were full, which ≈ 0.5 gal per. |
| 16 | | → water pretty quickly (w/in minutes) reappeared in the rotameters. This was consistent w/ how |
| 17 | | quickly the KOT was filling. Did not attempt to pump drain out the pipes, ^(unsuccessfully) just did the manifold. |
| 18 | | |
| 19 | | |
| 20 | | |
| 21 | 1645 | • System improvements brainstorm |
| 22 | | → Ideally we have smaller new SVE hoses w/ 1' high point & the camlocks as the low points so there is nowhere for the water to collect. |
| 23 | | |
| 24 | | |
| 25 | ** | * Need to decide what to recommend for the elevation structure. |

Comments / Site Activities / Personnel Tracking

DAILY FIELD LOG

Project Information

| | |
|---------------------------|--------------------------|
| Project Name: <u>T-30</u> | Location: _____ |
| Project/Task No.: _____ | Weather: _____ |
| Date: <u>12/29/22</u> | Personnel: <u>GF, CB</u> |

Observations

| # | Time | Observation Description |
|----|----------------|--|
| 1 | *** | → Need to buy small pieces of strut to fit into the gap above the new AS rotameters. Also bolts to secure the new strut to the existing. |
| 2 | | |
| 3 | | |
| 4 | | → SVE stack options |
| 5 | | • #1) PVC stack using a fencepost for structural support. Easiest install, but only if stack can be shorter (10 ft?). Fence is only ~6 ft tall. |
| 6 | | |
| 7 | | |
| 8 | | • #2) Steel or PVC stack secured to the oxidizer, attaching to the existing vertical piece at the ex. |
| 9 | | Best to not replace the elbow w/ a tee to retain structural support of the existing valve assembly. |
| 10 | | |
| 11 | | |
| 12 | | * This should be feasible, but disassembly of painted piping likely won't be easy |
| 13 | | |
| 14 | | • #3) Stack outside the fence supported by the light post. |
| 15 | | Not sure the pushback this would receive might be our best bet if we end up needing a tall (20 ft?) stack. |
| 16 | | |
| 17 | | |
| 18 | | * NOTE: Intellishere advised against running vapors through the oxidizer while it is off. Primary concern was ruining the catalyst due to moisture. It would require keeping the process valve open & dilution valve closed & they said they'd only share the "how" of it if we put in writing that we wanted to do this & understood the risks. |
| 19 | | |
| 20 | | |
| 21 | | |
| 22 | | |
| 23 | | |
| 24 | | |
| 25 | 1730 | CB offsite |

Comments / Site Activities / Personnel Tracking

DAILY FIELD LOG

Project Information

Page 4 of 5

| | |
|---------------------------|--------------------------|
| Project Name: <u>T-30</u> | Location: _____ |
| Project/Task No.: _____ | Weather: _____ |
| Date: <u>12/28/22</u> | Personnel: <u>GF, CB</u> |

Observations

| Time | Observation Description |
|------|---|
| 1 | • PID had a Pump error on startup & was unusable. Called Larry @ Pine but he had no idea. He was able to drive a replacement out. |
| 2 | |
| 3 | |
| 4 | 1730 • Met Larry for new PID |
| 5 | 1745 • outlet not providing power @ the system. Had to reset the gfci to restore power |
| 6 | • Took all PID measurements. = 10.1 ppmv inlet - 1.2 ppmv outlet - Successfully got readings @ manifold again. Water wasn't fully back in the pipes/rotameters → Skipped SVE-5, which was so stuck that it was preventing flow again The Marine said the order for the float bumpers was in the works & the rep was still figuring it out. |
| 7 | |
| 8 | |
| 9 | |
| 10 | |
| 11 | |
| 12 | |
| 13 | |
| 14 | |
| 15 | |
| 16 | |
| 17 | 1815 • Talked to P Kalina to confirm plan. We shouldn't be turning the system off for extended periods w/o Ecology approval, but over the weekend until we get a plan in place should be fine. |
| 18 | 1830 • Shut the system down. Triggered an oxidizer alarm. • KOT back up to the 100% mark on the sightglass. It was previously drained down to 25% at 1715. Lots of water accumulating quickly. • Tried moving the float apparatus around in the sightglass |
| 19 | |
| 20 | |
| 21 | |
| 22 | |
| 23 | |
| 24 | |
| 25 | |

Comments / Site Activities / Personnel Tracking

DAILY FIELD LOG

Project Information

Page 5 of 5

| | |
|---------------------------|--------------------------|
| Project Name: <u>T-26</u> | Location: _____ |
| Project/Task No.: _____ | Weather: _____ |
| Date: <u>12/29/22</u> | Personnel: <u>GF, CB</u> |

Observations

| # | Time | Observation Description |
|----|------|--|
| 1 | | to make sure the bottom float isn't wedged & stuck down. No matter how I adjusted it, it would not float. We previously observed a dent in it, so it's possible it has a crack & filled w/ water. How? unknown. Maybe froze? |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | | |
| 6 | | |
| 7 | | → w/ that functioning the KOT can't self-drain. With it filling up in an hour it makes the system pretty unusable. |
| 8 | | |
| 9 | | • Pumped the KOT down to ~50%. |
| 10 | 1845 | • Clean up & lock up system |
| 11 | 1900 | • offsite |
| 12 | | <u>Take-aways</u> |
| 13 | | • Troubleshoot KOT float repair |
| 14 | | • Develop SVE stack plan |
| 15 | | • MC order new threaded SVE ball valves |
| 16 | | • MC order some small strut pieces? |
| 17 | | • Develop SVE hose plan & instruct MC on ordering |
| 18 | | • Keep system off until float is repaired, maybe until stack is built. |
| 19 | | |
| 20 | | |
| 21 | | |
| 22 | | |
| 23 | | GF 12/29/30 |
| 24 | | |
| 25 | | |

Comments / Site Activities / Personnel Tracking

PORT OF SEATTLE - TERMINAL 30

| SVE/AS & Oxidizer System Data Collection Form | | | |
|---|--------------------|---|--------------|
| Date: | 12/29/22 | Field Tech(s): | GR, CB |
| Actual Time: | 1547 | AS/SVE HMI Time: | 1623 |
| SVE/AS System | | | |
| SVE Blower VFD Setpoints (Hertz/Amps/Torque %) - VFD | 42/17.7/65.2 HMI | AS Blower VFD Setpoints (Hertz/Amps/Torque %) - VFD | 52/10.2/89.3 |
| SVE Blower Runtime (Hours) | 15730.0 HMI | AS Blower Runtime (Hours) - Sparge Blower | 9301.8 H |
| Transfer Pump Runtime (Hours) - MS Pump | 3.1 HMI | AS Heat Exchanger Runtime (Hours) | 929940 |
| Sparge Zone 1 Time Span(s) Operational: | 1900 - 1030 | Sparge Zone 4 Time Span(s) Operational: | 0730 - 1230 |
| Sparge Zone 2 Time Span(s) Operational: | 1000 - 0330 | Sparge Zone 5 Time Span(s) Operational: | 1200 - 1730 |
| Sparge Zone 3 Time Span(s) Operational: | 0300 - 0800 | Sparge Zone Active: | 5 |
| AS Blower Intake Pressure (" H2O) - DPI-500 | 1.0 | SVE Blower Filter Differential Pressure (" H2O) - DPI-200 | 0.25 |
| AS Blower Discharge Pressure (PSI) - PI-501 | 7.75 | SVE Blower Inlet Differential Pressure (" H2O) - FI-200 | 1.7 |
| AS Bleed Valve (# turns open) - | 1 | Transfer Pump Discharge Pressure (PSI) - PI-300 | 0 |
| AS Heat Exchanger Discharge Temp (°F) - TI-500 | 65 | SVE Blower Discharge Pressure (" H2O) - PI-400 | 9.8 |
| SVE Blower Inlet Temperature (°F) - TI-200 | 150 | SVE Blower Discharge Temperature (°F) - TI-400 | 100 |
| SVE Blower Inlet Vacuum (" H2O) - VI-200 | 7100 | SVE Blower Dilution Valve (# turns open) - | 0 |
| Oxidizer System | | | |
| Oxidizer Inlet Differential Pressure (" H2O) - FI-1 | 8.2 8.2 | Combustion Valve Position (%) | 8.7 HMI |
| Inlet Temperature (°F) | 670 HMI | Process Blower Runtime (Hours) | 22579 |
| Burner Chamber Temperature (°F) | 670 HMI | Combustion Fan Runtime (Hours) | 22580 HMI |
| Outlet Temperature (°F) | 652 HMI | Burner Runtime (Hours) | 22568 HMI |
| Inlet Limit Controller Temperature (°F) | 675 HMI | Processing Vapors Runtime (Hours) | 22551 HMI |
| Outlet Limit Controller Temperature (°F) | 648 HMI | Panel Temperature (°F) | 65 HMI |
| Process Fan Valve Position (Open/Closed) | open HMI | Flame Signal (Volts) | 5.0 HMI |
| Dilution Valve Position (%) | 0 | | |
| Other Components | | | |
| Knockout Tank Level (Sightglass % Full) ¹ | 100 | Propane Tank A Level (%) | 75 |
| Water Depth in Storage Tank ² (DTF/WD (calc in ft)) | ~0 | Propane Tank B Level (%) | 80 |
| NOTES: Transferred ~2-3 kots (100% down to ~25%) while onsite. | | | |

Abbreviations:

" H₂O = Inches of Water
 °F = Degrees Fahrenheit
 PSI = Pounds per Square Inch
 % = Percent

DTF - Depth to Fluid
 DTB - Depth to Bottom
 MP - Measuring Point
 WD - Water Depth

Notes:

1. Low float = 0% full. Mid float = 100% full.
2. Calculate the water depth by measuring DTF from the MP and then subtracting that from 6.92 ft (DTB).



PORT OF SEATTLE - TERMINAL 30

AS & SVE Manifold Readings

Date: 12/29/02 Time: 5:46
 Field Tech(s): G, CS Equipment I.D. #: 18993

Vapor Concentrations

Oxidizer Inlet VOC (ppmv) PID: 970 10.1
 Oxidizer Discharge VOC (ppmv) PID: 1.2

SVE Wells

| Well ID | Vacuum (H2O) | Flow (SCFMG) | Valve Pos. (% Open) | Dewater (Gal) | Comments | Well ID | Vacuum (H2O) | Flow (SCFMG) | Valve Pos. (% Open) | Dewater (Gal) | Comments |
|---------|--------------|--------------|---------------------|---------------|-----------------|---------|--------------|--------------|---------------------|---------------|----------------|
| HSVE-2 | 34 | 76 | 10 | | ✓ | SVE-10 | 80 | 23 | 100 | | bouncing |
| HSVE-3 | 40 | 72 | 10 | | ✓ | SVE-9 | 85 | 0 | 100 | 0.5 | *water dirty |
| SVE-4 | 81 | 17 | 100 | 0.5 | dirty bouncing | SVE-8 | 93 | 0 | 100 | 0.5 | no flow |
| SVE-5 | | | | | shock tank | SVE-6 | 84 | 12 | 100 | 0.5 | water bouncing |
| SVE-7 | 72 | 23 | 100 | | Water: bouncing | HSVE-1 | 34 | 75 | 10 | | ✓ |

PID
 17.6
 9.6
 4.8
 NM
 3.1

Psi
 16
 0.0
 0.0
 0.0
 0.2

Notes:
 SVE-6 + 8 pretty quickly filled up w/ water again.
 KOT filled almost fully in 1 hr, so lots of water currently coming through the system

AS Wells

| Well ID | Pressure (PSIG) | Flow (SCFMG) | Valve Pos. (% Open) | Comments | Well ID | Pressure (PSIG) | Flow (SCFMG) | Valve Pos. (% Open) | Comments |
|---------|-----------------|--------------|---------------------|--------------|---------|-----------------|--------------|---------------------|----------|
| Zone 2 | | | | | Zone 4 | | | | |
| AS-7 | | | | | AS-17 | | | | |
| AS-8 | | | | | AS-18 | | | | |
| AS-9 | | | | | AS-19 | | | | |
| AS-10 | | | | | AS-20 | | | | |
| AS-11 | | | | | AS-21 | | | | |
| | | | | | AS-22 | | | | |
| Zone 3 | | | | | Zone 1 | | | | |
| AS-12 | | | | | AS-1 | | | | |
| AS-13 | | | | | AS-2 | | | | |
| AS-14 | | | | | AS-3 | | | | |
| AS-15 | | | | | AS-4 | | | | |
| AS-16 | | | | | AS-5 | | | | |
| Zone 5 | | | | | AS-6 | | | | |
| AS-23 | 9.0 | 0 | 100 | Sticky float | | | | | |
| AS-24 | 8.0 | 1.4 | | | | | | | |
| AS-25 | 8.5 | 0 | | | | | | | |
| AS-26 | 9.0 | 1.2 | | | | | | | |
| AS-27 | 8.0 | 1.3 | | | | | | | |

Notes:

Abbreviations:

% = Percent
 " H₂O = Inches of water
 deg F - degrees Fahrenheit

N/A = Not applicable
 ppmv = Parts per million volume
 PSIG = Pounds per square inch gauge

SCFMG = Standard cubic feet per minute gauge





INSTRUMENT CALIBRATION REPORT

Pine Environmental Services LLC

3225 South 116th St.
Building 1 Suite 181
Tukwila, WA 98168
425-285-9102

Pine Environmental Services, Inc.

Instrument ID 18993
Description MiniRae 3000_V2.22A
Calibrated 12/29/2022 8:01:12PM

Manufacturer Rae Systems
Model Number PGM-7320
Serial Number/ Lot Number 592-906428
Location Seattle
Department

State Certified
Status Pass
Temp °C 22
Humidity % 41

Calibration Specifications

Group # 1
Group Name IsoButylene
Stated Accy Pct of Reading

Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.00

| <u>Nom In Val / In Val</u> | <u>In Type</u> | <u>Out Val</u> | <u>Out Type</u> | <u>Fnd As</u> | <u>Lft As</u> | <u>Dev%</u> | <u>Pass/Fail</u> |
|----------------------------|----------------|----------------|-----------------|---------------|---------------|-------------|------------------|
| 100.00 / 100.00 | PPM | 100.00 | PPM | 99.80 | 100.00 | 0.00% | Pass |

Test Instruments Used During the Calibration

(As Of Cal Entry Date)

| <u>Test Standard ID</u> | <u>Description</u> | <u>Manufacturer</u> | <u>Model Number</u> | <u>Serial Number / Lot Number</u> | <u>Last Cal Date / Opened Date</u> | <u>Next Cal Date / Expiration Date</u> |
|--|-------------------------------|---------------------|---------------------|-----------------------------------|--|--|
| SEA ISO 100PPM 304-402206886- 1 | Isobutylene (C4H8) 100 PPM | Airgas | x02ai99cp342066 | 304-402206886 -1 | | 9/16/2025 |

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Larry Lorenzano

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment
Please call 800-301-9663 for Technical Assistance



INSTRUMENT CALIBRATION REPORT

Pine Environmental Services LLC

3225 South 116th St.
Building 1 Suite 181
Tukwila, WA 98168
425-285-9102

Pine Environmental Services, Inc.

Instrument ID 46330
Description Solinst Pump
Calibrated 12/29/2022 1:49:00PM

| | |
|-----------------------|-----------------|
| Manufacturer Solinst | State Certified |
| Model Number Pump | Status Pass |
| Serial Number/ Lot na | Temp °C 17 |
| Number | |
| Location Seattle | Humidity % 49 |
| Department | |

Calibration Specifications

Group # 1
Group Name
Test Performed: Yes As Found Result: Pass As Left Result: Pass

Test Instruments Used During the Calibration

(As Of Cal Entry Date)

| <u>Test Standard ID</u> | <u>Description</u> | <u>Manufacturer</u> | <u>Model Number</u> | <u>Serial Number / Lot Number</u> | <u>Next Cal Date / Last Cal Date / Expiration Date / Opened Date</u> |
|-------------------------|--------------------|---------------------|---------------------|---------------------------------------|--|
|-------------------------|--------------------|---------------------|---------------------|---------------------------------------|--|

Notes about this calibration

Calibration Result Calibration Successful
Calibrated Jose Arroyo

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

**Note Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment
Please call 800-301-9663 for Technical Assistance**

AECOM Daily Tailgate Meeting Summary

Project information

| | |
|-------------------------|---------------|
| Project Name | T-30 |
| Project Number | 60681370 |
| Project Manager | Paul Kalina |
| Project Manager Phone # | 2063105097 |
| Muster Point location | Clubhouse |
| Meeting date | 12/29/2022 |
| Business Line | Environment |
| SH&E Manager | Tim Gilles |
| SH&E Manager Phone # | 3128335991 |
| First Aid Kit Location | Conex |
| Prepared by | Friedman, Gus |

Shift Summary

| | |
|--------------------------------|--|
| Location | Seattle |
| Attendees (Workers) | Friedman, Gus;Brown, Cary; |
| Attendees (Visitors) | |
| Tasks to be performed | Biweekly O&M SVE stack brainstorm |
| Hazards to be considered today | pressure, noise, motion, mechanical |
| Will there be Lone Workers? | No |
| Hierarchy of controls | engineering, administrativecontrols, ppe |
| Personal Protective Equipment | Task Specific: gloves Mandatory: safetyglasses, longpants, reflectivevest, workboots |
| High Risk Events | |
| | |

| | |
|---|--|
| Topic of the week | Know Your Car Tires |
| Other topics discussed | |
| Mid day reviews | |
| End of the day comments. The supervisor confirms that the site is being left in a safe condition and work crew checked out as fit unless otherwise specified here | All to completed safely and successfully. Had to troubleshoot a broken pipe and broken knockout tank float as well in addition to the expected scope. |
| Hazards | <ul style="list-style-type: none">• Mechanical• Motion• Noise• Pressure |

Appendix B
Vapor Sampling Field Forms

Vapor Sampling Field Form

Site Address: 1901 East Marginal Way South, Seattle, WA

Project No.: 60681370

Project: T-30

Date: 6/29/22

Field Personnel: N. Guyn, S. Brand

Surface Conditions: Overcast Breezy Dry 60's

| Sample ID | Sample Canister LAB ID | Flow Controller LAB ID | Sample Canister Size | Sample Start | | | Sample End | | | PID Field Reading |
|--------------------|------------------------|------------------------|----------------------|---|------|------|---|------|------|-------------------|
| | | | | Initial Canister Reading (in-Hg) ¹ | Time | Date | Final Canister Reading (in-Hg) ¹ | Time | Date | |
| Inlet - 062922 | 4183 | 305 | 1 L/hr | 28.5 | 1123 | 6/29 | 5.0 | 1128 | 6/29 | 18.4 |
| Discharge - 062922 | 9562 | 62 | 1 L/hr | 30.0 | 1133 | 6/29 | 5.0 | 1138 | 6/29 | 0.7 |

¹ Canisters measured using a standard vacuum gauge

Sample Collection Notes and General Observations:

Initial PID Field Readings were low Inlet - 0.0
 Discharge - 0.5

SVE on But AS off due to Thx Alarm 6/25/22

AS Back on after Warm cleared and re-sample PID readings after ≈ 30 min Inlet - 18.4
 Discharge - 0.7

These readings seem to be more inline with previous ones so proceed to sample collections

Sample collection went well with no issues.

T-30 Summa Can Vapor Sampling Field Form

Project: Terminal 30 Site Address: 1901 East Marginal Way South, Seattle, WA
 Date: 9/14/22 Field Personnel: GF, AC, CB
 Weather: 65 cloudy Weather Barometric Pressure (in Hg): 30
 Sample ID: Inlet-091422 (INLET/DISCHARGE-mmddyy)
 Sample Port Description: Dedicated oxidizer inlet vapor port

Conditions at Sample Port:

| Pressure (PSI) | Temperature (°F) | VOCs via PID (ppmv) | SVE Runtime (hrs) |
|----------------|------------------|---------------------|-------------------|
| 0 | 112°F | 4.5 | 13567.8 |

Before Sampling:

| | Yes or No (Y/N) |
|---|-----------------|
| Install clean tubing on the sample port | Y |
| Purge the tubing (30-60 seconds) | Y |

Summa Can Leak Test¹:

| Initial Canister Reading (in-Hg) | Duration of Test (2 min recommended) | Final Canister Reading (in-Hg) |
|----------------------------------|--------------------------------------|--------------------------------|
| 30 | 2 min | 30 |

¹ For the summa can leak test, connect the flow controller to the can with the cap nut secured. No air should enter the can when the can valve is opened. Once this is confirmed, open the summa can valve and record the initial vacuum. Wait for two minutes and then record the vacuum again. If the two readings do not match there is a leak and a new can and valve should be acquired before sampling.

Sampling Information²:

| Sample Canister LAB ID | Flow Controller LAB ID | Sample Canister Size | Initial Canister Reading (in-Hg) ³ | Sample Times | Sample Date(s) | Final Canister Reading (in-Hg) ³ |
|---|------------------------|----------------------|---|--------------|----------------|---|
| 3230 | 204 | 1L | 30 | Sample Start | | 5 |
| | | | | 1125 | 9/14/22 | |
| | | | | Sample End | | |
| Analyses Requested: TO-15 BTEXN; APH | | | | 1131 | 9/14/22 | |

² The flow controller should be for a 4-5 minute integrated sample

³ Canisters measured using a standard vacuum gauge

Sample Collection Notes and General Observations:

All good

T-30 Summa Can Vapor Sampling Field Form

Project: Terminal 30 Site Address: 1901 East Marginal Way South, Seattle, WA
 Date: 9/14/22 Field Personnel: AC, GF, CB
 Weather: 65 cloudy Weather Barometric Pressure (in Hg): 30
 Sample ID: Discharge 091422 (INLET/DISCHARGE-mmddyy)
 Sample Port Description: Dedicated oxidizer discharge vapor port

Conditions at Sample Port:

| Pressure (PSI) | Temperature (°F) | VOCs via PID (ppmv) | SVE Runtime (hrs) |
|----------------|------------------|---------------------|-------------------|
| 0 | N/A | 0.5 | 13567.8 |

Before Sampling:

| | Yes or No (Y/N) |
|---|-----------------|
| Install clean tubing on the sample port | Y |
| Purge the tubing (30-60 seconds) | Y |

Summa Can Leak Test¹:

| Initial Canister Reading (in-Hg) | Duration of Test (2 min recommended) | Final Canister Reading (in-Hg) |
|----------------------------------|--------------------------------------|--------------------------------|
| 29.25 | 2 min | 29.25 |

¹ For the summa can leak test, connect the flow controller to the can with the cap nut secured. No air should enter the can when the can valve is opened. Once this is confirmed, open the summa can valve and record the initial vacuum. Wait for two minutes and then record the vacuum again. If the two readings do not match there is a leak and a new can and valve should be acquired before sampling.

Sampling Information²:

| Sample Canister LAB ID | Flow Controller LAB ID | Sample Canister Size | Initial Canister Reading (in-Hg) ³ | Sample Times | Sample Date(s) | Final Canister Reading (in-Hg) ³ |
|--|------------------------|----------------------|---|--------------|----------------|---|
| 3540 | 206 | 1L | 29.25 | Sample Start | | 5 |
| | | | | 1125 | 9/14/22 | |
| | | | | Sample End | | |
| Analyses Requested: <u>TO-15 BTEXN, APH</u> | | | | 1131 | 9/14/22 | |

² The flow controller should be for a 4-5 minute integrated sample

³ Canisters measured using a standard vacuum gauge

Sample Collection Notes and General Observations:

All good

T-30 Vapor Sampling Field Form

Project: Terminal 30 Site Address: 1901 East Marginal Way South, Seattle, WA
 Date: 12/9/22 Field Personnel: GF, AB
 Weather: 40 Sun Weather Barometric Pressure (in Hg): 30
 Sample ID: Discharge - 120922 (INLET/DISCHARGE-mmddyy)
 Sample Port Description: SVE discharge/ox inlet sample port

Conditions at Sample Port:

| Pressure (PSI) | Temperature (°F) | VOCs via PID (ppmv) | SVE Runtime (hrs) |
|----------------|------------------|---------------------|-------------------|
| 0 | 637 | 1.0 | 15572.4 |

Before Sampling:

| | Yes or No (Y/N) |
|---|-----------------|
| Install clean tubing on the sampling port | Y |
| Purge the tubing (30-60 seconds) | N |

Summa Can Leak Test¹:

| Initial Canister Reading (in-Hg) | Duration of Test (2 min recommended) | Final Canister Reading (in-Hg) |
|----------------------------------|--------------------------------------|--------------------------------|
| 29 | 2 min | 29 |

¹ For the summa can leak test, connect the flow controller to the can with the cap nut secured. No air should enter the can when the can valve is opened. Once this is confirmed, open the summa can valve and record the initial vacuum. Wait for two minutes and then record the vacuum again. If the two readings do not match there is a leak and a new can and valve should be acquired before sampling.

Sampling Information²:

| Sample Canister LAB ID | Flow Controller LAB ID | Sample Canister Size | Initial Canister Reading (in-Hg) ³ | Time | Date | Final Canister Reading (in-Hg) ³ |
|------------------------|------------------------|----------------------|---|--------------|---------|---|
| 2295 | 101 | 14 | 29 | Sample Start | | 4 |
| | | | | 1032 | 12/9/22 | |
| | | | | Sample End | | |
| | | | | 1038 | 12/9/22 | |

² The flow controller should be for a 4-5 minute integrated sample

³ Canisters measured using a standard vacuum gauge

Sample Collection Notes and General Observations:

Analysis: AP4, TOLX-BTEX

T-30 Summa Can Vapor Sampling Field Form

Project: Terminal 30 Site Address: 1901 East Marginal Way South, Seattle, WA
 Date: 12/9/22 Field Personnel: GF, AB
 Weather: 40 sun Weather Barometric Pressure (in Hg): 30
 Sample ID: Inlet-120922 (INLET/DISCHARGE-mmddyy)
 Sample Port Description: SVE discharge/ox inlet sample port

Conditions at Sample Port:

| Pressure (PSI) | Temperature (°F) | VOCs via PID (ppmv) | SVE Runtime (hrs) |
|----------------|------------------|---------------------|-------------------|
| 9.8 | 97 | 11.6 | 15572.4 |

Before Sampling:

| | Yes or No (Y/N) |
|---|-----------------|
| Install clean tubing on the sample port | Y |
| Purge the tubing (30-60 seconds) | N |

Summa Can Leak Test¹:

| Initial Canister Reading (in-Hg) | Duration of Test (2 min recommended) | Final Canister Reading (in-Hg) |
|----------------------------------|--------------------------------------|--------------------------------|
| 30 | 2 min | 30 |

¹ For the summa can leak test, connect the flow controller to the can with the cap nut secured. No air should enter the can when the can valve is opened. Once this is confirmed, open the summa can valve and record the initial vacuum. Wait for two minutes and then record the vacuum again. If the two readings do not match there is a leak and a new can and valve should be acquired before sampling.

Sampling Information²:

| Sample Canister LAB ID | Flow Controller LAB ID | Sample Canister Size | Initial Canister Reading (in-Hg) ³ | Sample Times | Sample Date(s) | Final Canister Reading (in-Hg) ³ |
|---------------------------------------|------------------------|----------------------|---|--------------|----------------|---|
| 3252 | 111 | 1L | 30 | Sample Start | | 45 |
| | | | | 10:32 | 12/9/22 | |
| | | | | Sample End | | |
| Analyses Requested: APH, TOLX-BTEX | | | | 10:38 | 12/9/22 | |

² The flow controller should be for a 4-5 minute integrated sample

³ Canisters measured using a standard vacuum gauge

Sample Collection Notes and General Observations:

Appendix C
Vapor Sampling
Laboratory Analytical Reports

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Vineta Mills, M.S.
Eric Young, B.S.

5500 4th Avenue South
Seattle, WA 98108
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

December 22, 2022

Paul Kalina, Project Manager
AECOM
1111 3rd Ave, Suite 1600
Seattle, WA 98101

Dear Mr Kalina:

Included are the results from the testing of material submitted on December 9, 2022 from the T-30 Port of Seattle, F&BI 212171 project. There are 10 pages included in this report.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
c: Gus Friedman
AEC1222R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on December 9, 2022 by Friedman & Bruya, Inc. from the AECOM T-30 Port of Seattle, F&BI 212171 project. Samples were logged in under the laboratory ID's listed below.

| <u>Laboratory ID</u> | <u>AECOM</u> |
|----------------------|------------------|
| 212171 -01 | Inlet-120922 |
| 212171 -02 | Discharge-120922 |

Non-petroleum compounds identified in the air phase hydrocarbon (APH) ranges were subtracted per the MA-APH method.

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method MA-APH

| | | | |
|-------------------|--------------|-------------|-----------------------------------|
| Client Sample ID: | Inlet-120922 | Client: | AECOM |
| Date Received: | 12/09/22 | Project: | T-30 Port of Seattle, F&BI 212171 |
| Date Collected: | 12/09/22 | Lab ID: | 212171-01 1/38 |
| Date Analyzed: | 12/16/22 | Data File: | 121532.D |
| Matrix: | Air | Instrument: | GCMS7 |
| Units: | ug/m3 | Operator: | bat |

| | % | Lower | Upper |
|----------------------|-----------|--------|--------|
| Surrogates: | Recovery: | Limit: | Limit: |
| 4-Bromofluorobenzene | 93 | 70 | 130 |

| Compounds: | Concentration |
|-----------------------|---------------|
| | ug/m3 |
| APH EC5-8 aliphatics | 42,000 |
| APH EC9-12 aliphatics | 6,700 |
| APH EC9-10 aromatics | <950 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method MA-APH

| | | | |
|-------------------|------------------|-------------|-----------------------------------|
| Client Sample ID: | Discharge-120922 | Client: | AECOM |
| Date Received: | 12/09/22 | Project: | T-30 Port of Seattle, F&BI 212171 |
| Date Collected: | 12/09/22 | Lab ID: | 212171-02 1/5.0 |
| Date Analyzed: | 12/16/22 | Data File: | 121530.D |
| Matrix: | Air | Instrument: | GCMS7 |
| Units: | ug/m3 | Operator: | bat |

| | % | Lower | Upper |
|----------------------|-----------|--------|--------|
| Surrogates: | Recovery: | Limit: | Limit: |
| 4-Bromofluorobenzene | 83 | 70 | 130 |

| Compounds: | Concentration |
|-----------------------|---------------|
| | ug/m3 |
| APH EC5-8 aliphatics | <370 |
| APH EC9-12 aliphatics | 170 |
| APH EC9-10 aromatics | <120 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method MA-APH

| | | | |
|-------------------|----------------|-------------|-----------------------------------|
| Client Sample ID: | Method Blank | Client: | AECOM |
| Date Received: | Not Applicable | Project: | T-30 Port of Seattle, F&BI 212171 |
| Date Collected: | Not Applicable | Lab ID: | 02-2968 MB |
| Date Analyzed: | 12/15/22 | Data File: | 121511.D |
| Matrix: | Air | Instrument: | GCMS7 |
| Units: | ug/m3 | Operator: | bat |

| | % | Lower | Upper |
|----------------------|-----------|--------|--------|
| Surrogates: | Recovery: | Limit: | Limit: |
| 4-Bromofluorobenzene | 84 | 70 | 130 |

| Compounds: | Concentration |
|-----------------------|---------------|
| | ug/m3 |
| APH EC5-8 aliphatics | <75 |
| APH EC9-12 aliphatics | <25 |
| APH EC9-10 aromatics | <25 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

| | | | |
|-------------------|--------------|-------------|-----------------------------------|
| Client Sample ID: | Inlet-120922 | Client: | AECOM |
| Date Received: | 12/09/22 | Project: | T-30 Port of Seattle, F&BI 212171 |
| Date Collected: | 12/09/22 | Lab ID: | 212171-01 1/38 |
| Date Analyzed: | 12/16/22 | Data File: | 121532.D |
| Matrix: | Air | Instrument: | GCMS7 |
| Units: | ug/m3 | Operator: | bat |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|----------------------|-------------|--------------|--------------|
| 4-Bromofluorobenzene | 92 | 70 | 130 |

| Compounds: | Concentration | |
|--------------|---------------|------|
| | ug/m3 | ppbv |
| Benzene | <12 | <3.8 |
| Toluene | <720 | <190 |
| Ethylbenzene | <17 | <3.8 |
| m,p-Xylene | <33 | <7.6 |
| o-Xylene | <17 | <3.8 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

| | | | |
|-------------------|------------------|-------------|-----------------------------------|
| Client Sample ID: | Discharge-120922 | Client: | AECOM |
| Date Received: | 12/09/22 | Project: | T-30 Port of Seattle, F&BI 212171 |
| Date Collected: | 12/09/22 | Lab ID: | 212171-02 1/5.0 |
| Date Analyzed: | 12/16/22 | Data File: | 121530.D |
| Matrix: | Air | Instrument: | GCMS7 |
| Units: | ug/m3 | Operator: | bat |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|----------------------|-------------|--------------|--------------|
| 4-Bromofluorobenzene | 82 | 70 | 130 |

| Compounds: | Concentration | |
|--------------|---------------|------|
| | ug/m3 | ppbv |
| Benzene | <1.6 | <0.5 |
| Toluene | <94 | <25 |
| Ethylbenzene | <2.2 | <0.5 |
| m,p-Xylene | <4.3 | <1 |
| o-Xylene | <2.2 | <0.5 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

| | | | |
|-------------------|----------------|-------------|-----------------------------------|
| Client Sample ID: | Method Blank | Client: | AECOM |
| Date Received: | Not Applicable | Project: | T-30 Port of Seattle, F&BI 212171 |
| Date Collected: | Not Applicable | Lab ID: | 02-2968 MB |
| Date Analyzed: | 12/15/22 | Data File: | 121511.D |
| Matrix: | Air | Instrument: | GCMS7 |
| Units: | ug/m3 | Operator: | bat |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|----------------------|-------------|--------------|--------------|
| 4-Bromofluorobenzene | 83 | 70 | 130 |

| Compounds: | Concentration | |
|--------------|---------------|------|
| | ug/m3 | ppbv |
| Benzene | <0.32 | <0.1 |
| Toluene | <19 | <5 |
| Ethylbenzene | <0.43 | <0.1 |
| m,p-Xylene | <0.87 | <0.2 |
| o-Xylene | <0.43 | <0.1 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 12/22/22

Date Received: 12/09/22

Project: T-30 Port of Seattle, F&BI 212171

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES
FOR VOLATILES BY METHOD MA-APH**

Laboratory Code: 212171-02 1/5.0 (Duplicate)

| Analyte | Reporting Units | Sample Result | Duplicate Result | RPD (Limit 30) |
|-----------------------|--------------------|------------------|---------------------|-------------------|
| APH EC5-8 aliphatics | ug/m3 | <370 | <370 | nm |
| APH EC9-12 aliphatics | ug/m3 | 170 | 190 | 11 |
| APH EC9-10 aromatics | ug/m3 | <120 | <120 | nm |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|-----------------------|--------------------|----------------|----------------------------|------------------------|
| APH EC5-8 aliphatics | ug/m3 | 67 | 75 | 70-130 |
| APH EC9-12 aliphatics | ug/m3 | 67 | 92 | 70-130 |
| APH EC9-10 aromatics | ug/m3 | 67 | 97 | 70-130 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 12/22/22

Date Received: 12/09/22

Project: T-30 Port of Seattle, F&BI 212171

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES
FOR VOLATILES BY METHOD TO-15**

Laboratory Code: 212171-02 1/5.0 (Duplicate)

| Analyte | Reporting Units | Sample Result | Duplicate Result | RPD (Limit 30) |
|--------------|-----------------|---------------|------------------|----------------|
| Benzene | ug/m3 | <1.6 | <1.6 | nm |
| Toluene | ug/m3 | <94 | <94 | nm |
| Ethylbenzene | ug/m3 | <2.2 | <2.2 | nm |
| m,p-Xylene | ug/m3 | <4.3 | <4.3 | nm |
| o-Xylene | ug/m3 | <2.2 | <2.2 | nm |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|--------------|-----------------|-------------|----------------------|---------------------|
| Benzene | ug/m3 | 43 | 95 | 70-130 |
| Toluene | ug/m3 | 51 | 93 | 70-130 |
| Ethylbenzene | ug/m3 | 59 | 92 | 70-130 |
| m,p-Xylene | ug/m3 | 120 | 92 | 70-130 |
| o-Xylene | ug/m3 | 59 | 94 | 70-130 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht - The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

SAMPLE CHAIN OF CUSTODY

12/09/22

21217

Report To Paul Velina, Gus Friedman

Company FECON

Address 111 2nd Ave Ste 1600

City, State, ZIP Seattle, WA 98101

Phone 206-438-3709 mail Paul.Velina@fecon.com

Gus.Friedman@fecon.com

SAMPLERS (signature) EAG

PROJECT NAME & ADDRESS

T-30 Part of Seattle

PO #

NOTES:

INVOICE TO

Page # 1 of 1

RETURNAROUND TIME

Standard RUSH

Rush charges authorized by:

SAMPLE DISPOSAL

Default: Clean following final report delivery Hold (Fee may apply):

SAMPLE INFORMATION

ANALYSIS REQUESTED

| Sample Name | Lab ID | Canister ID | Flow Cont. ID | Reporting Level: IA=Indoor Air SG=Soil Gas (Circle One) | Date Sampled | Initial Vac. ("Hg) | Field Initial Time | Final Vac. ("Hg) | Field Final Time | TO15 Full Scan | TO15 BTEXN | TO15 cVOCs | APH | Helium | TO15 BTEX | Notes |
|-------------------------|-----------|-------------|---------------|---|----------------|--------------------|--------------------|------------------|------------------|----------------|------------|------------|-----|--------|-----------|-------|
| <u>Inlet-091122</u> | | <u>3252</u> | <u>111</u> | <u>IA</u> | <u>12/9/22</u> | <u>30</u> | | | | | | | | | <u>X</u> | |
| <u>Discharge-091122</u> | | <u>3252</u> | <u>111</u> | <u>IA / SG</u> | <u>12/9/22</u> | <u>30</u> | <u>10:32</u> | <u>5</u> | <u>10:36</u> | | | | | | <u>X</u> | |
| <u>Inlet-120922</u> | <u>01</u> | <u>3252</u> | <u>111</u> | <u>IA / SG</u> | <u>12/9/22</u> | <u>29</u> | <u>10:32</u> | <u>4</u> | <u>10:36</u> | | | | | | <u>X</u> | |
| <u>Discharge-120922</u> | <u>02</u> | <u>2295</u> | <u>101</u> | <u>IA / SG</u> | <u>12/9/22</u> | <u>29</u> | <u>10:32</u> | <u>4</u> | <u>10:36</u> | | | | | | <u>X</u> | |
| | | | | <u>IA / SG</u> | | | | | | | | | | | | |
| | | | | <u>IA / SG</u> | | | | | | | | | | | | |
| | | | | <u>IA / SG</u> | | | | | | | | | | | | |

Friedman & Bruya, Inc.

5500 4th Avenue South

Seattle, WA 98108

Ph. (206) 285-8282

Fax (206) 283-5044

FORMS\COCC\COCTO-15.DOC

| SIGNATURE | PRINT NAME | COMPANY | DATE | TIME |
|--------------------|---------------------|---------------------|-----------------|--------------|
| <u>[Signature]</u> | <u>Gus Friedman</u> | <u>FECON</u> | <u>12/9/22</u> | <u>15:28</u> |
| <u>[Signature]</u> | <u>ANH PHANI</u> | <u>ESB</u> | <u>12/09/22</u> | <u>15:28</u> |
| Received by: | | | | |
| Relinquished by: | | | | |
| Received by: | | | | |
| | | Samples received at | <u>20</u> | <u>°C</u> |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Vineta Mills, M.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

September 29, 2022

Paul Kalina, Project Manager
AECOM
1111 3rd Ave, Suite 1600
Seattle, WA 98101

Dear Mr Kalina:

Included are the results from the testing of material submitted on September 19, 2022 from the T-30 Port of Seattle, F&BI 209275 project. There are 10 pages included in this report.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
AEC0929R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on September 19, 2022 by Friedman & Bruya, Inc. from the AECOM T-30 Port of Seattle, F&BI 209275 project. Samples were logged in under the laboratory ID's listed below.

| <u>Laboratory ID</u> | <u>AECOM</u> |
|----------------------|------------------|
| 209275 -01 | Inlet-091422 |
| 209275 -02 | Discharge-091422 |

Non-petroleum compounds identified in the air phase hydrocarbon (APH) ranges were subtracted per the MA-APH method.

The APH EC5-8 aliphatics concentration in sample Inlet-091422 exceeded the calibration range of the instrument. The data were flagged accordingly.

All other quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method MA-APH

| | | | |
|-------------------|--------------|-------------|----------------------|
| Client Sample ID: | Inlet-091422 | Client: | AECOM |
| Date Received: | 09/19/22 | Project: | T-30 Port of Seattle |
| Date Collected: | 09/14/22 | Lab ID: | 209275-01 1/19 |
| Date Analyzed: | 09/23/22 | Data File: | 092322.D |
| Matrix: | Air | Instrument: | GCMS7 |
| Units: | ug/m3 | Operator: | bat |

| | % | Lower | Upper |
|----------------------|-----------|--------|--------|
| Surrogates: | Recovery: | Limit: | Limit: |
| 4-Bromofluorobenzene | 101 | 70 | 130 |

| Compounds: | Concentration |
|-----------------------|---------------|
| | ug/m3 |
| APH EC5-8 aliphatics | 24,000 ve |
| APH EC9-12 aliphatics | 8,100 |
| APH EC9-10 aromatics | <470 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method MA-APH

| | | | |
|-------------------|------------------|-------------|----------------------|
| Client Sample ID: | Discharge-091422 | Client: | AECOM |
| Date Received: | 09/19/22 | Project: | T-30 Port of Seattle |
| Date Collected: | 09/14/22 | Lab ID: | 209275-02 1/6.5 |
| Date Analyzed: | 09/23/22 | Data File: | 092321.D |
| Matrix: | Air | Instrument: | GCMS7 |
| Units: | ug/m3 | Operator: | bat |

| | % | Lower | Upper |
|----------------------|-----------|--------|--------|
| Surrogates: | Recovery: | Limit: | Limit: |
| 4-Bromofluorobenzene | 90 | 70 | 130 |

| Compounds: | Concentration |
|-----------------------|---------------|
| | ug/m3 |
| APH EC5-8 aliphatics | 710 |
| APH EC9-12 aliphatics | 1,200 |
| APH EC9-10 aromatics | <160 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method MA-APH

| | | | |
|-------------------|----------------|-------------|----------------------|
| Client Sample ID: | Method Blank | Client: | AECOM |
| Date Received: | Not Applicable | Project: | T-30 Port of Seattle |
| Date Collected: | Not Applicable | Lab ID: | 02-2178 MB |
| Date Analyzed: | 09/23/22 | Data File: | 092312.D |
| Matrix: | Air | Instrument: | GCMS7 |
| Units: | ug/m3 | Operator: | bat |

| | % | Lower | Upper |
|----------------------|-----------|--------|--------|
| Surrogates: | Recovery: | Limit: | Limit: |
| 4-Bromofluorobenzene | 90 | 70 | 130 |

| Compounds: | Concentration ug/m3 |
|-----------------------|------------------------|
| APH EC5-8 aliphatics | <75 |
| APH EC9-12 aliphatics | <25 |
| APH EC9-10 aromatics | <25 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

| | | | |
|-------------------|--------------|-------------|----------------------|
| Client Sample ID: | Inlet-091422 | Client: | AECOM |
| Date Received: | 09/19/22 | Project: | T-30 Port of Seattle |
| Date Collected: | 09/14/22 | Lab ID: | 209275-01 1/19 |
| Date Analyzed: | 09/23/22 | Data File: | 092322.D |
| Matrix: | Air | Instrument: | GCMS7 |
| Units: | ug/m3 | Operator: | bat |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|----------------------|-------------|--------------|--------------|
| 4-Bromofluorobenzene | 108 | 70 | 130 |

| Compounds: | Concentration | |
|--------------|---------------|------|
| | ug/m3 | ppbv |
| Benzene | <6.1 | <1.9 |
| Toluene | <360 | <95 |
| Ethylbenzene | <8.3 | <1.9 |
| m,p-Xylene | <17 | <3.8 |
| o-Xylene | <8.3 | <1.9 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

| | | | |
|-------------------|------------------|-------------|----------------------|
| Client Sample ID: | Discharge-091422 | Client: | AECOM |
| Date Received: | 09/19/22 | Project: | T-30 Port of Seattle |
| Date Collected: | 09/14/22 | Lab ID: | 209275-02 1/6.5 |
| Date Analyzed: | 09/23/22 | Data File: | 092321.D |
| Matrix: | Air | Instrument: | GCMS7 |
| Units: | ug/m3 | Operator: | bat |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|----------------------|-------------|--------------|--------------|
| 4-Bromofluorobenzene | 89 | 70 | 130 |

| Compounds: | Concentration | |
|--------------|---------------|-------|
| | ug/m3 | ppbv |
| Benzene | <2.1 | <0.65 |
| Toluene | <120 | <32 |
| Ethylbenzene | <2.8 | <0.65 |
| m,p-Xylene | <5.6 | <1.3 |
| o-Xylene | <2.8 | <0.65 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

| | | | |
|-------------------|----------------|-------------|----------------------|
| Client Sample ID: | Method Blank | Client: | AECOM |
| Date Received: | Not Applicable | Project: | T-30 Port of Seattle |
| Date Collected: | Not Applicable | Lab ID: | 02-2178 MB |
| Date Analyzed: | 09/23/22 | Data File: | 092312.D |
| Matrix: | Air | Instrument: | GCMS7 |
| Units: | ug/m3 | Operator: | bat |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|----------------------|-------------|--------------|--------------|
| 4-Bromofluorobenzene | 89 | 70 | 130 |

| Compounds: | Concentration | |
|--------------|---------------|------|
| | ug/m3 | ppbv |
| Benzene | <0.32 | <0.1 |
| Toluene | <19 | <5 |
| Ethylbenzene | <0.43 | <0.1 |
| m,p-Xylene | <0.87 | <0.2 |
| o-Xylene | <0.43 | <0.1 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/29/22

Date Received: 09/19/22

Project: T-30 Port of Seattle, F&BI 209275

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES
FOR VOLATILES BY METHOD MA-APH**

Laboratory Code: 209338-03 1/7.2 (Duplicate)

| Analyte | Reporting Units | Sample Result | Duplicate Result | RPD (Limit 30) |
|-----------------------|--------------------|------------------|---------------------|-------------------|
| APH EC5-8 aliphatics | ug/m3 | 770 | 700 | 10 |
| APH EC9-12 aliphatics | ug/m3 | 990 | 990 | 0 |
| APH EC9-10 aromatics | ug/m3 | <180 | <180 | nm |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|-----------------------|--------------------|----------------|----------------------------|------------------------|
| APH EC5-8 aliphatics | ug/m3 | 67 | 102 | 70-130 |
| APH EC9-12 aliphatics | ug/m3 | 67 | 121 | 70-130 |
| APH EC9-10 aromatics | ug/m3 | 67 | 96 | 70-130 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/29/22

Date Received: 09/19/22

Project: T-30 Port of Seattle, F&BI 209275

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES
FOR VOLATILES BY METHOD TO-15**

Laboratory Code: 209338-03 1/7.2 (Duplicate)

| Analyte | Reporting Units | Sample Result | Duplicate Result | RPD (Limit 30) |
|--------------|-----------------|---------------|------------------|----------------|
| Benzene | ug/m3 | 2.5 | 2.6 | 4 |
| Toluene | ug/m3 | <140 | <140 | nm |
| Ethylbenzene | ug/m3 | 21 | 21 | 0 |
| m,p-Xylene | ug/m3 | 81 | 82 | 1 |
| o-Xylene | ug/m3 | 85 | 87 | 2 |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|--------------|-----------------|-------------|----------------------|---------------------|
| Benzene | ug/m3 | 43 | 101 | 70-130 |
| Toluene | ug/m3 | 51 | 102 | 70-130 |
| Ethylbenzene | ug/m3 | 59 | 100 | 70-130 |
| m,p-Xylene | ug/m3 | 120 | 104 | 70-130 |
| o-Xylene | ug/m3 | 59 | 108 | 70-130 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht - The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

SAMPLE CHAIN OF CUSTODY

09/19/22

209275

SAMPLES (signature)

Report To Paul Kalina

Page # 1 of 1

TURNAROUND TIME

Company AECOM

PROJECT NAME & ADDRESS

PO #

Address 1111 3rd Ave Suite 1600

T-30 Port of Seattle

Standard
 RUSH
Rush charges authorized by:

City, State, ZIP Seattle, WA 98101

NOTES:

INVOICE TO

SAMPLE DISPOSAL
Default: Clean following final report delivery
 Hold (Fee may apply):

Phone 206-438-2700 Email Paul.Kalina@aecom.com

SAMPLE INFORMATION

ANALYSIS REQUESTED

| Sample Name | Lab ID | Canister ID | Flow Cont. ID | Reporting Level: IA=Indoor Air SG=Soil Gas (Circle One) | Date Sampled | Initial Vac. ("Hg) | Field Initial Time | Final Vac. ("Hg) | Field Final Time | TO15 Full Scan | TO15 BTEXN | TO15 cVOCs | APH | Helium | Notes |
|--------------------|--------|-------------|---------------|--|--------------|--------------------|--------------------|------------------|------------------|----------------|--------------|------------|-----|--------|-------|
| Inlet - 091422 | 01 | 3230 | 204 | IA / SG | 9/19/22 | 30 | 1125 | 5 | 1131 | | X | | X | X | |
| Discharge - 091422 | 02 | 3540 | 206 | IA / SG | 9/19/22 | 25/25 | 1125 | 5 | 1131 | | | | X | X | |
| | | | | IA / SG | | | | | | | | | | | |
| | | | | IA / SG | | | | | | | | | | | |
| | | | | IA / SG | | | | | | | | | | | |
| | | | | IA / SG | | | | | | | | | | | |
| | | | | IA / SG | | | | | | | | | | | |
| | | | | IA / SG | | | | | | | | | | | |
| | | | | IA / SG | | | | | | | | | | | |

| SIGNATURE | | PRINT NAME | | COMPANY | | DATE | | TIME | |
|--------------------------------------|--|--------------|--|---------------------|--|----------|--|-------|--|
| Relinquished by: <i>Gus Friedman</i> | | Gus Friedman | | AECOM | | 9/19/22 | | 12:51 | |
| Received by: <i>AWL</i> | | ANN H PHAN | | F8 B | | 09/19/22 | | 12:51 | |
| Relinquished by: | | | | | | | | | |
| Received by: | | | | Samples received at | | 1900 | | | |

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044
FORMS\COO\COCTR0-15.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Vineta Mills, M.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

July 11, 2022

Paul Kalina, Project Manager
AECOM
1111 3rd Ave, Suite 1600
Seattle, WA 98101

Dear Mr Kalina:

Included are the results from the testing of material submitted on June 29, 2022 from the NA (Non-PO), AECOM PN 60667994.3, F&BI 206518 project. There are 10 pages included in this report.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
AEC0711R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on June 29, 2022 by Friedman & Bruya, Inc. from the AECOM NA (Non-PO), AECOM PN 60667994.3, F&BI 206518 project. Samples were logged in under the laboratory ID's listed below.

| <u>Laboratory ID</u> | <u>AECOM</u> |
|----------------------|------------------|
| 206518 -01 | Inlet-062922 |
| 206518 -02 | Discharge-062922 |

Non-petroleum compounds identified in the air phase hydrocarbon (APH) ranges were subtracted per the MA-APH method.

The APH EC5-8 aliphatics concentration in sample Inlet-062922 exceeded the calibration range of the instrument. The data were flagged accordingly.

All other quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method MA-APH

| | | | |
|-------------------|--------------|-------------|-------------------------|
| Client Sample ID: | Inlet-062922 | Client: | AECOM |
| Date Received: | 06/29/22 | Project: | 60667994.3, F&BI 206518 |
| Date Collected: | 06/29/22 | Lab ID: | 206518-01 1/46 |
| Date Analyzed: | 07/02/22 | Data File: | 070128.D |
| Matrix: | Air | Instrument: | GCMS7 |
| Units: | ug/m3 | Operator: | bat |

| | % | Lower | Upper |
|----------------------|-----------|--------|--------|
| Surrogates: | Recovery: | Limit: | Limit: |
| 4-Bromofluorobenzene | 93 | 70 | 130 |

| Compounds: | Concentration |
|------------|---------------|
| | ug/m3 |

| | |
|-----------------------|-----------|
| APH EC5-8 aliphatics | 51,000 ve |
| APH EC9-12 aliphatics | 21,000 |
| APH EC9-10 aromatics | <1,100 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method MA-APH

| | | | |
|-------------------|------------------|-------------|-------------------------|
| Client Sample ID: | Discharge-062922 | Client: | AECOM |
| Date Received: | 06/29/22 | Project: | 60667994.3, F&BI 206518 |
| Date Collected: | 06/29/22 | Lab ID: | 206518-02 1/6 |
| Date Analyzed: | 07/02/22 | Data File: | 070127.D |
| Matrix: | Air | Instrument: | GCMS7 |
| Units: | ug/m3 | Operator: | bat |

| | % | Lower | Upper |
|----------------------|-----------|--------|--------|
| Surrogates: | Recovery: | Limit: | Limit: |
| 4-Bromofluorobenzene | 81 | 70 | 130 |

| Compounds: | Concentration |
|-----------------------|---------------|
| | ug/m3 |
| APH EC5-8 aliphatics | 500 |
| APH EC9-12 aliphatics | <150 |
| APH EC9-10 aromatics | <150 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method MA-APH

| | | | |
|-------------------|----------------|-------------|-------------------------|
| Client Sample ID: | Method Blank | Client: | AECOM |
| Date Received: | Not Applicable | Project: | 60667994.3, F&BI 206518 |
| Date Collected: | Not Applicable | Lab ID: | 02-1506 MB |
| Date Analyzed: | 07/01/22 | Data File: | 070111.D |
| Matrix: | Air | Instrument: | GCMS7 |
| Units: | ug/m3 | Operator: | bat |

| | % | Lower | Upper |
|----------------------|-----------|--------|--------|
| Surrogates: | Recovery: | Limit: | Limit: |
| 4-Bromofluorobenzene | 82 | 70 | 130 |

| Compounds: | Concentration |
|-----------------------|---------------|
| | ug/m3 |
| APH EC5-8 aliphatics | <75 |
| APH EC9-12 aliphatics | <25 |
| APH EC9-10 aromatics | <25 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

| | | | |
|-------------------|--------------|-------------|-------------------------|
| Client Sample ID: | Inlet-062922 | Client: | AECOM |
| Date Received: | 06/29/22 | Project: | 60667994.3, F&BI 206518 |
| Date Collected: | 06/29/22 | Lab ID: | 206518-01 1/46 |
| Date Analyzed: | 07/02/22 | Data File: | 070128.D |
| Matrix: | Air | Instrument: | GCMS7 |
| Units: | ug/m3 | Operator: | bat |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|----------------------|-------------|--------------|--------------|
| 4-Bromofluorobenzene | 95 | 70 | 130 |

| Compounds: | Concentration | |
|--------------|---------------|---------|
| | ug/m3 | ppbv |
| Benzene | <15 | <4.6 |
| Toluene | <870 | <230 |
| Ethylbenzene | 20 | 4.6 |
| m,p-Xylene | <40 | <9.2 |
| o-Xylene | <20 | <4.6 |
| Naphthalene | <2.6 j | <0.51 j |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

| | | | |
|-------------------|------------------|-------------|-------------------------|
| Client Sample ID: | Discharge-062922 | Client: | AECOM |
| Date Received: | 06/29/22 | Project: | 60667994.3, F&BI 206518 |
| Date Collected: | 06/29/22 | Lab ID: | 206518-02 1/6 |
| Date Analyzed: | 07/02/22 | Data File: | 070127.D |
| Matrix: | Air | Instrument: | GCMS7 |
| Units: | ug/m3 | Operator: | bat |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|----------------------|-------------|--------------|--------------|
| 4-Bromofluorobenzene | 82 | 70 | 130 |

| Compounds: | Concentration | |
|--------------|---------------|------|
| | ug/m3 | ppbv |
| Benzene | <1.9 | <0.6 |
| Toluene | <110 | <30 |
| Ethylbenzene | <2.6 | <0.6 |
| m,p-Xylene | <5.2 | <1.2 |
| o-Xylene | <2.6 | <0.6 |
| Naphthalene | <1.6 | <0.3 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

| | | | |
|-------------------|----------------|-------------|-------------------------|
| Client Sample ID: | Method Blank | Client: | AECOM |
| Date Received: | Not Applicable | Project: | 60667994.3, F&BI 206518 |
| Date Collected: | Not Applicable | Lab ID: | 02-1506 MB |
| Date Analyzed: | 07/01/22 | Data File: | 070111.D |
| Matrix: | Air | Instrument: | GCMS7 |
| Units: | ug/m3 | Operator: | bat |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|----------------------|-------------|--------------|--------------|
| 4-Bromofluorobenzene | 84 | 70 | 130 |

| Compounds: | Concentration | |
|--------------|---------------|----------|
| | ug/m3 | ppbv |
| Benzene | <0.32 | <0.1 |
| Toluene | <19 | <5 |
| Ethylbenzene | <0.43 | <0.1 |
| m,p-Xylene | <0.87 | <0.2 |
| o-Xylene | <0.43 | <0.1 |
| Naphthalene | <0.057 j | <0.011 j |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 07/11/22

Date Received: 06/29/22

Project: NA (Non-PO), AECOM PN 60667994.3, F&BI 206518

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES
FOR VOLATILES BY METHOD MA-APH**

Laboratory Code: 206542-01 1/5.4 (Duplicate)

| Analyte | Reporting Units | Sample Result | Duplicate Result | RPD (Limit 30) |
|-----------------------|--------------------|------------------|---------------------|-------------------|
| APH EC5-8 aliphatics | ug/m3 | 1,800 | 1,800 | 0 |
| APH EC9-12 aliphatics | ug/m3 | 1,000 | 1,000 | 0 |
| APH EC9-10 aromatics | ug/m3 | <130 | <130 | nm |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|-----------------------|--------------------|----------------|----------------------------|------------------------|
| APH EC5-8 aliphatics | ug/m3 | 67 | 87 | 70-130 |
| APH EC9-12 aliphatics | ug/m3 | 67 | 118 | 70-130 |
| APH EC9-10 aromatics | ug/m3 | 67 | 94 | 70-130 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 07/11/22

Date Received: 06/29/22

Project: NA (Non-PO), AECOM PN 60667994.3, F&BI 206518

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES
FOR VOLATILES BY METHOD TO-15**

Laboratory Code: 206542-01 1/5.4 (Duplicate)

| Analyte | Reporting Units | Sample Result | Duplicate Result | RPD (Limit 30) |
|--------------|-----------------|---------------|------------------|----------------|
| Benzene | ug/m3 | 3.1 | 3.1 | 0 |
| Toluene | ug/m3 | 100 | 110 | 10 |
| Ethylbenzene | ug/m3 | 4.1 | 4.1 | 0 |
| m,p-Xylene | ug/m3 | 7.3 | 7.4 | 1 |
| o-Xylene | ug/m3 | <2.3 | <2.3 | nm |
| Naphthalene | ug/m3 | <1.4 | <1.4 | nm |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|--------------|-----------------|-------------|----------------------|---------------------|
| Benzene | ug/m3 | 43 | 95 | 70-130 |
| Toluene | ug/m3 | 51 | 102 | 70-130 |
| Ethylbenzene | ug/m3 | 59 | 93 | 70-130 |
| m,p-Xylene | ug/m3 | 120 | 102 | 70-130 |
| o-Xylene | ug/m3 | 59 | 105 | 70-130 |
| Naphthalene | ug/m3 | 71 | 112 | 70-130 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht - The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

SAMPLE CHAIN OF CUSTODY *6/29/22*

206518

Report To Paul Kalin

Company AECOM

Address 1111 3rd Ave Suite 1600

City, State, ZIP Seattle, WA 98101

Phone 206 438 2700 Email Paul.Kalin@Acom.com

| | |
|---|----------------------------|
| SAMPLERS (signature) <u>N. Gwyn</u> | |
| PROJECT NAME & ADDRESS <u>T-30 Port of Seattle</u> | PO # |
| NOTES: | INVOICE TO <u>AECOM</u> |

Page # _____ of _____

TURNAROUND TIME

Standard
 RUSH

Rush charges authorized by: _____

SAMPLE DISPOSAL

Default: Clean after 3 days
 Archive (Fee may apply)

| SAMPLE INFORMATION | | | | | | | | | | | ANALYSIS REQUESTED | | | | | Notes |
|---------------------------|-----------|-------------|---------------|--|----------------|--------------------|--------------------|------------------|------------------|----------------|--------------------|------------|----------|--------|--|-------|
| Sample Name | Lab ID | Canister ID | Flow Cont. ID | Reporting Level: IA=Indoor Air SG=Soil Gas (Circle One) | Date Sampled | Initial Vac. ("Hg) | Field Initial Time | Final Vac. ("Hg) | Field Final Time | TO15 Full Scan | TO15 BTEXN | TO15 cVOCs | APH | Helium | | |
| <u>inlet - 062922</u> | <u>01</u> | <u>4183</u> | <u>305</u> | <u>IA / SG</u> | <u>6/29/22</u> | <u>28.5</u> | <u>1123</u> | <u>5.0</u> | <u>1128</u> | | <u>X</u> | | <u>X</u> | | | |
| <u>Discharge - 062922</u> | <u>02</u> | <u>9562</u> | <u>62</u> | <u>IA / SG</u> | <u>6/29/22</u> | <u>30.0</u> | <u>1133</u> | <u>5.0</u> | <u>1138</u> | | <u>X</u> | | <u>X</u> | | | |
| | | | | <u>IA / SG</u> | | | | | | | | | | | | |
| | | | | <u>IA / SG</u> | | | | | | | | | | | | |
| | | | | <u>IA / SG</u> | | | | | | | | | | | | |
| | | | | <u>IA / SG</u> | | | | | | | | | | | | |
| | | | | <u>IA / SG</u> | | | | | | | | | | | | |

Friedman & Bruya, Inc.
 3012 16th Avenue West
 Seattle, WA 98119-2029
 Ph. (206) 285-8282
 Fax (206) 283-5044

| SIGNATURE | PRINT NAME | COMPANY | DATE | TIME |
|---------------------------------------|------------------------|--------------|----------------|--------------|
| Relinquished by: <u>Robert G. Lee</u> | <u>Nick Gwyn Aecom</u> | <u>Aecom</u> | <u>6/29/22</u> | <u>12:25</u> |
| Received by: <u>W. Madden</u> | <u>Windy Madden</u> | <u>F+BI</u> | <u>6/29/22</u> | <u>12:25</u> |
| Relinquished by: | | | | |
| Received by: | | | | |

Samples received at 22°C

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Vineta Mills, M.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

April 19, 2022

Paul Kalina, Project Manager
AECOM
1111 3rd Ave, Suite 1600
Seattle, WA 98101

Dear Mr Kalina:

Included are the results from the testing of material submitted on March 31, 2022 from the T-30 Port of Seattle, F&BI 203576 project. There are 10 pages included in this report.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
AEC0419R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on March 31, 2022 by Friedman & Bruya, Inc. from the AECOM T-30 Port of Seattle, F&BI 203576 project. Samples were logged in under the laboratory ID's listed below.

| <u>Laboratory ID</u> | <u>AECOM</u> |
|----------------------|------------------|
| 203576 -01 | Inlet-033122 |
| 203576 -02 | Discharge-033122 |

Non-petroleum compounds identified in the air phase hydrocarbon (APH) ranges were subtracted per the MA-APH method.

The APH EC5-8 aliphatics concentration in sample Inlet-033122 exceeded the calibration range of the instrument. The data were flagged accordingly.

All other quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method MA-APH

| | | | |
|-------------------|--------------|-------------|----------------------|
| Client Sample ID: | Inlet-033122 | Client: | AECOM |
| Date Received: | 03/31/22 | Project: | T-30 Port of Seattle |
| Date Collected: | 04/14/22 | Lab ID: | 203576-01 1/42 |
| Date Analyzed: | 04/15/22 | Data File: | 041442.D |
| Matrix: | Air | Instrument: | GCMS7 |
| Units: | ug/m3 | Operator: | bat |

| | % | Lower | Upper |
|----------------------|-----------|--------|--------|
| Surrogates: | Recovery: | Limit: | Limit: |
| 4-Bromofluorobenzene | 104 | 70 | 130 |

| Compounds: | Concentration |
|-----------------------|---------------|
| | ug/m3 |
| APH EC5-8 aliphatics | 88,000 ve |
| APH EC9-12 aliphatics | 12,000 |
| APH EC9-10 aromatics | <1,000 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method MA-APH

| | | | |
|-------------------|------------------|-------------|----------------------|
| Client Sample ID: | Discharge-033122 | Client: | AECOM |
| Date Received: | 03/31/22 | Project: | T-30 Port of Seattle |
| Date Collected: | 04/14/22 | Lab ID: | 203576-02 1/6.1 |
| Date Analyzed: | 04/15/22 | Data File: | 041441.D |
| Matrix: | Air | Instrument: | GCMS7 |
| Units: | ug/m3 | Operator: | bat |

| | % | Lower | Upper |
|----------------------|-----------|--------|--------|
| Surrogates: | Recovery: | Limit: | Limit: |
| 4-Bromofluorobenzene | 94 | 70 | 130 |

| Compounds: | Concentration ug/m3 |
|-----------------------|------------------------|
| APH EC5-8 aliphatics | 1,600 |
| APH EC9-12 aliphatics | <150 |
| APH EC9-10 aromatics | <150 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method MA-APH

| | | | |
|-------------------|----------------|-------------|----------------------|
| Client Sample ID: | Method Blank | Client: | AECOM |
| Date Received: | Not Applicable | Project: | T-30 Port of Seattle |
| Date Collected: | Not Applicable | Lab ID: | 02-0801 mb |
| Date Analyzed: | 04/14/22 | Data File: | 041336.D |
| Matrix: | Air | Instrument: | GCMS7 |
| Units: | ug/m3 | Operator: | bat |

| | % | Lower | Upper |
|----------------------|-----------|--------|--------|
| Surrogates: | Recovery: | Limit: | Limit: |
| 4-Bromofluorobenzene | 92 | 70 | 130 |

| Compounds: | Concentration ug/m3 |
|-----------------------|------------------------|
| APH EC5-8 aliphatics | <75 |
| APH EC9-12 aliphatics | <25 |
| APH EC9-10 aromatics | <25 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

| | | | |
|-------------------|--------------|-------------|----------------------|
| Client Sample ID: | Inlet-033122 | Client: | AECOM |
| Date Received: | 03/31/22 | Project: | T-30 Port of Seattle |
| Date Collected: | 04/14/22 | Lab ID: | 203576-01 1/42 |
| Date Analyzed: | 04/15/22 | Data File: | 041442.D |
| Matrix: | Air | Instrument: | GCMS7 |
| Units: | ug/m3 | Operator: | bat |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|----------------------|-------------|--------------|--------------|
| 4-Bromofluorobenzene | 104 | 70 | 130 |

| Compounds: | Concentration | |
|--------------|---------------|------|
| | ug/m3 | ppbv |
| Benzene | <13 | <4.2 |
| Toluene | <790 | <210 |
| Ethylbenzene | <18 | <4.2 |
| m,p-Xylene | <36 | <8.4 |
| o-Xylene | <18 | <4.2 |
| Naphthalene | 4.4 | 0.84 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

| | | | |
|-------------------|------------------|-------------|----------------------|
| Client Sample ID: | Discharge-033122 | Client: | AECOM |
| Date Received: | 03/31/22 | Project: | T-30 Port of Seattle |
| Date Collected: | 04/14/22 | Lab ID: | 203576-02 1/6.1 |
| Date Analyzed: | 04/15/22 | Data File: | 041441.D |
| Matrix: | Air | Instrument: | GCMS7 |
| Units: | ug/m3 | Operator: | bat |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|----------------------|-------------|--------------|--------------|
| 4-Bromofluorobenzene | 95 | 70 | 130 |

| Compounds: | Concentration | |
|--------------|---------------|-------|
| | ug/m3 | ppbv |
| Benzene | <1.9 | <0.61 |
| Toluene | <110 | <30 |
| Ethylbenzene | <2.6 | <0.61 |
| m,p-Xylene | <5.3 | <1.2 |
| o-Xylene | <2.6 | <0.61 |
| Naphthalene | <1.6 | <0.3 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

| | | | |
|-------------------|----------------|-------------|----------------------|
| Client Sample ID: | Method Blank | Client: | AECOM |
| Date Received: | Not Applicable | Project: | T-30 Port of Seattle |
| Date Collected: | Not Applicable | Lab ID: | 02-0801 mb |
| Date Analyzed: | 04/14/22 | Data File: | 041336.D |
| Matrix: | Air | Instrument: | GCMS7 |
| Units: | ug/m3 | Operator: | bat |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|----------------------|-------------|--------------|--------------|
| 4-Bromofluorobenzene | 92 | 70 | 130 |

| Compounds: | Concentration | |
|--------------|---------------|-------|
| | ug/m3 | ppbv |
| Benzene | <0.32 | <0.1 |
| Toluene | <19 | <5 |
| Ethylbenzene | <0.43 | <0.1 |
| m,p-Xylene | <0.87 | <0.2 |
| o-Xylene | <0.43 | <0.1 |
| Naphthalene | <0.1 | <0.02 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/19/22

Date Received: 03/31/22

Project: T-30 Port of Seattle, F&BI 203576

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES
FOR VOLATILES BY METHOD MA-APH**

Laboratory Code: 203541-01 1/8.3 (Duplicate)

| Analyte | Reporting Units | Sample Result | Duplicate Result | RPD (Limit 30) |
|-----------------------|--------------------|------------------|---------------------|-------------------|
| APH EC5-8 aliphatics | ug/m3 | 930 | 810 | 14 |
| APH EC9-12 aliphatics | ug/m3 | 410 | 380 | 8 |
| APH EC9-10 aromatics | ug/m3 | <210 | <210 | nm |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|-----------------------|--------------------|----------------|----------------------------|------------------------|
| APH EC5-8 aliphatics | ug/m3 | 67 | 83 | 70-130 |
| APH EC9-12 aliphatics | ug/m3 | 67 | 119 | 70-130 |
| APH EC9-10 aromatics | ug/m3 | 67 | 104 | 70-130 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/19/22

Date Received: 03/31/22

Project: T-30 Port of Seattle, F&BI 203576

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES
FOR VOLATILES BY METHOD TO-15**

Laboratory Code: 203541-01 1/8.3 (Duplicate)

| Analyte | Reporting Units | Sample Result | Duplicate Result | RPD (Limit 30) |
|--------------|-----------------|---------------|------------------|----------------|
| Benzene | ug/m3 | 14 | 14 | 0 |
| Toluene | ug/m3 | <160 | <160 | nm |
| Ethylbenzene | ug/m3 | 4.4 | 4.3 | 2 |
| m,p-Xylene | ug/m3 | 16 | 15 | 6 |
| o-Xylene | ug/m3 | 6.1 | 5.9 | 3 |
| Naphthalene | ug/m3 | 5.6 | 5.7 | 2 |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|--------------|-----------------|-------------|----------------------|---------------------|
| Benzene | ug/m3 | 43 | 105 | 70-130 |
| Toluene | ug/m3 | 51 | 110 | 70-130 |
| Ethylbenzene | ug/m3 | 59 | 96 | 70-130 |
| m,p-Xylene | ug/m3 | 120 | 102 | 70-130 |
| o-Xylene | ug/m3 | 59 | 103 | 70-130 |
| Naphthalene | ug/m3 | 71 | 118 | 70-130 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht - The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

~~203576~~

SAMPLE CHAIN OF CUSTODY

~~03-31-22~~

Page # 1 of 1

TURNAROUND TIME

Standard

RUSH

Rush charges authorized by: _____

SAMPLE DISPOSAL

Default: Clean after 3 days

Archive (Fee may apply)

SAMPLERS (signature) *N. Gwyn*

~~_____~~

PROJECT NAME & ADDRESS

T-30 Part of Seattle

PO #

~~_____~~

NOTES:

INVOICE TO

AECOM

Report To *Paul Kalina*

Company *AECOM*

Address *1111 3rd Ave Ste 1600*

City, State, ZIP *Seattle, WA 98101*

Phone *206 438 2700* Email *Paul.Kalina@AECOM.com*

SAMPLE INFORMATION

ANALYSIS REQUESTED

| Sample Name | Lab ID | Canister ID | Flow Cont. ID | Reporting Level: IA=Indoor Air SG=Soil Gas (Circle One) | Date Sampled | Initial Vac. ("Hg) | Field Initial Time | Final Vac. ("Hg) | Field Final Time | TO15 Full Scan | TO15 BTEXN | TO15 cVOCs | APH | Helium | Notes |
|--------------------------|-----------|-------------|---------------|---|------------------------|--------------------|--------------------|------------------|------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|--------|-------|
| <i>Take - 033122</i> | <i>01</i> | <i>8394</i> | <i>18</i> | <i>IA / (SG)</i> | <i>3/31/22 > 30</i> | <i>1242</i> | <i>1248</i> | <i>-50</i> | <i>1253</i> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | | |
| <i>Discards - 033122</i> | <i>02</i> | <i>8538</i> | <i>01</i> | <i>IA / (SG)</i> | <i>3/31/22 - 245</i> | <i>1248</i> | <i>-50</i> | <i>1254</i> | | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | | |
| | | | | <i>IA / SG</i> | | | | | | | | | | | |
| | | | | <i>IA / SG</i> | | | | | | | | | | | |
| | | | | <i>IA / SG</i> | | | | | | | | | | | |
| | | | | <i>IA / SG</i> | | | | | | | | | | | |
| | | | | <i>IA / SG</i> | | | | | | | | | | | |
| | | | | <i>IA / SG</i> | | | | | | | | | | | |

Friedman & Bruya, Inc.

3012 16th Avenue West

Seattle, WA 98119-2029

Ph. (206) 285-8282

Fax (206) 283-5044

SIGNATURE

PRINT NAME

COMPANY

DATE

TIME

Relinquished by: *M. Gwyn*

Nate Gwyn

AECOM

3/31/22

1710

Received by: *[Signature]*

Yelena Aralvina

AE-B

3/31/22 1710

Relinquished by: _____

Received by: _____

Appendix D
Vapor Sampling Summary
Data Quality Review Reports

Memorandum

| | | | |
|---------|--|------|-------|
| To | Paul Kalina, Project Manager | Info | FINAL |
| Subject | Summary Data Quality Review Port of Seattle – T-30 Vapor Sampling – March 2022 | | |
| From | Amelia McArthur, Chemist Lucy Panteleeff, Chemist | | |
| Date | June 14, 2022 | | |

The summary data quality review of two vapor samples collected on March 31, 2022, has been completed. The samples were analyzed at Friedman & Bruya, Inc. located in Seattle, Washington for aliphatic hydrocarbons (APHs) by Massachusetts Department of Environmental Protection Method MA-APH, and benzene, toluene, ethylbenzene, total xylenes, and naphthalene (BTEX+N) by EPA Method TO-15. The laboratory provided a summary report containing sample results and associated quality assurance (QA) and quality control (QC) data for all samples. For this report, the sample identifications (IDs) do not include the sampling date suffixes (-033122). The following samples are associated with Friedman & Bruya, Inc. laboratory group 203576:

| Sample ID | Laboratory ID |
|------------------|---------------|
| Inlet-033122 | 203576 -01 |
| Discharge-033122 | 203576-02 |

Data were evaluated based on validation criteria established in the *National Functional Guidelines for Organic Superfund Methods Data Review*, November 2020.

The following data components were reviewed during the limited data validation procedure for compliance with method specific or laboratory control charted criteria where appropriate: chain of custody forms, holding times, method/trip/instrument blanks, surrogate recoveries, matrix spike/matrix spike duplicate recoveries, laboratory and field duplicate results, laboratory control sample/laboratory control sample duplicate recoveries, reporting limits, and electronic data deliverables.

A summary of qualifiers that may be assigned to results in these laboratory groups are included in Table 1. Qualifiers that may be assigned to results include:

- U - The analyte was analyzed for but was not detected above the reported sample quantitation limit.
- J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- UJ - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.
- DNR - Do Not Report. Another result is available that is more reliable or appropriate.



**Summary Data Quality Review
Port of Seattle - T 30
Vapor Sampling – March 2022
Laboratory Group: 203576**

Sample Receipt

Upon receipt by the laboratory, the sample container information was compared to the chain-of-custody (COC). No discrepancies related to sample identification were noted by the laboratory.

Organic Analyses

Samples were analyzed for APHs and BTEX+N by the methods identified in the introduction of this report.

1. Holding Times – Acceptable
2. Blanks – Acceptable
3. Surrogates – Acceptable
4. Laboratory Control Sample (LCS) – Acceptable
5. Laboratory Duplicate – Acceptable

General – Laboratory duplicates were performed using a sample from an unrelated project. Results were comparable.

6. Reporting Limits – Acceptable

The result for APH EC5-8 aliphatics in Inlet-062922 was qualified with the laboratory flag “ve” to indicate the analyte exceeded the calibration range of the instrument. The result for APH EC5-8 aliphatics was qualified as estimated and flagged ‘J’ due this instrument exceedance.

The reporting limits were raised for all analyses due to dilution and/or sample cannister pressure.

Overall Assessment of Data

The data reported in this laboratory group, as qualified, are considered to be usable for meeting project objectives. The completeness for Friedman & Bruya, Inc. laboratory group 203576 is 100%.

Table 1. Summary of Qualified Data

| Sample ID | Lab ID | Analyte | Result | Units | Final Result |
|------------------|---------------|----------------------|---------------|-------------------|---------------------|
| Inlet-033122 | 203576-01 | APH EC5-8 aliphatics | 88,000 | ug/m ³ | 88,000 J |

Memorandum

| | | | |
|---------|---|------|-------|
| To | Paul Kalina, Project Manager | Info | FINAL |
| Subject | Summary Data Quality Review Port of Seattle – T-30 Vapor Sampling – December 2022 | | |
| From | Lucy Panteleeff, Chemist Jennifer Garner, Chemist | | |
| Date | February 6, 2023 | | |

The summary data quality review of two vapor samples collected on September 14, 2022, has been completed. The samples were analyzed at Friedman & Bruya, Inc. located in Seattle, Washington for aliphatic hydrocarbons (APHs) by Massachusetts Department of Environmental Protection Method MA-APH, and benzene, toluene, ethylbenzene, and total xylenes (BTEX) by EPA Method TO-15. The laboratory provided a summary report containing sample results and associated quality assurance (QA) and quality control (QC) data for all samples. The following samples are associated with Friedman & Bruya, Inc. laboratory group 212171:

| Sample ID | Laboratory ID |
|------------------|---------------|
| Inlet-120922 | 212171 -01 |
| Discharge-120922 | 212171 -02 |

Data were evaluated based on validation criteria established in the *National Functional Guidelines for Organic Superfund Methods Data Review*, November 2020.

The following data components were reviewed during the limited data validation procedure for compliance with method specific or laboratory control charted criteria where appropriate: chain of custody forms, holding times, method/trip/instrument blanks, surrogate recoveries, matrix spike/matrix spike duplicate recoveries, laboratory and field duplicate results, laboratory control sample/laboratory control sample duplicate recoveries, reporting limits, and electronic data deliverables.

A summary of qualifiers that may be assigned to results in these laboratory groups are included in Table 1. Qualifiers that may be assigned to results include:

- U - The analyte was analyzed for but was not detected above the reported sample quantitation limit.
- J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- UJ - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.
- DNR - Do Not Report. Another result is available that is more reliable or appropriate.



**Summary Data Quality Review
Port of Seattle - T 30
Vapor Sampling – December 2022
Laboratory Group: 212171**

Sample Receipt

Upon receipt by the laboratory, the sample container information was compared to the chain-of-custody (COC). No discrepancies related to sample identification were noted by the laboratory.

Organic Analyses

Samples were analyzed for APHs and BTEX by the methods identified in the introduction of this report.

1. Holding Times – Acceptable
2. Blanks – Acceptable
3. Surrogates – Acceptable
4. Laboratory Control Sample (LCS) – Acceptable
5. Laboratory Duplicate – Acceptable

General – Laboratory duplicates were performed using Discharge-120922. Results were comparable.

6. Reporting Limits – Acceptable

General – The reporting limits were raised for all analyses due to dilution and/or sample cannister pressure.

Overall Assessment of Data

The data reported in this laboratory group, as qualified, are considered to be usable for meeting project objectives. The completeness for Friedman & Bruya, Inc. laboratory group 212171 is 100%.

Table 1. Summary of Qualified Data

| Sample ID | Lab ID | Analyte | Result | Units | Final Result |
|---|--------|---------|--------|-------|--------------|
| No Data Qualifiers Were Assigned Based on This Data Review. | | | | | |

Memorandum

| | | | |
|---------|---|------|-------|
| To | Paul Kalina, Project Manager | Info | Final |
| Subject | Summary Data Quality Review Port of Seattle – T-30 Vapor Sampling – June 2022 | | |
| From | Lucy Panteleeff, Chemist Jennifer Garner, Chemist | | |
| Date | October 12, 2022 | | |

The summary data quality review of two vapor samples collected on June 29, 2022, has been completed. The samples were analyzed at Friedman & Bruya, Inc. located in Seattle, Washington for aliphatic hydrocarbons (APHs) by Massachusetts Department of Environmental Protection Method MA-APH, and benzene, toluene, ethylbenzene, total xylenes, and naphthalene (BTEX+N) by EPA Method TO-15. The laboratory provided a summary report containing sample results and associated quality assurance (QA) and quality control (QC) data for all samples. The following samples are associated with Friedman & Bruya, Inc. laboratory group 206518:

| Sample ID | Laboratory ID |
|------------------|---------------|
| Inlet-062922 | 206518-01 |
| Discharge-062922 | 206518-02 |

Data were evaluated based on validation criteria established in the *National Functional Guidelines for Organic Superfund Methods Data Review*, November 2020.

The following data components were reviewed during the limited data validation procedure for compliance with method specific or laboratory control charted criteria where appropriate: chain of custody forms, holding times, method/trip/instrument blanks, surrogate recoveries, matrix spike/matrix spike duplicate recoveries, laboratory and field duplicate results, laboratory control sample/laboratory control sample duplicate recoveries, reporting limits, and electronic data deliverables.

A summary of qualifiers that may be assigned to results in these laboratory groups are included in Table 1. Qualifiers that may be assigned to results include:

- U - The analyte was analyzed for but was not detected above the reported sample quantitation limit.
- J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- UJ - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.
- DNR - Do Not Report. Another result is available that is more reliable or appropriate.



**Summary Data Quality Review
Port of Seattle - T 30
Vapor Sampling – June 2022
Laboratory Group: 206518**

Sample Receipt

Upon receipt by the laboratory, the sample container information was compared to the chain-of-custody (COC). No discrepancies related to sample identification were noted by the laboratory.

Organic Analyses

Samples were analyzed for APHs and BTEX+N by the methods identified in the introduction of this report.

1. Holding Times – Acceptable
2. Blanks – Acceptable
3. Surrogates – Acceptable
4. Laboratory Control Sample (LCS) – Acceptable
5. Laboratory Duplicate – Acceptable

General – Laboratory duplicates were performed using a sample from an unrelated project. Results were comparable.

6. Reporting Limits – Acceptable

The result for APH EC5-8 aliphatics in Inlet-062922 was qualified with the laboratory flag “ve” to indicate the analyte exceeded the calibration range of the instrument. The result for APH EC5-8 aliphatics was qualified as estimated and flagged ‘J’ due this instrument exceedance.

The reporting limits were raised for all analyses due to dilution and/or sample canister pressure.

Overall Assessment of Data

The data reported in this laboratory group, as qualified, are considered to be usable for meeting project objectives. The completeness for Friedman & Bruya, Inc. laboratory group 206518 is 100%.

Table 1. Summary of Qualified Data

| Sample ID | Lab ID | Analyte | Result | Units | Final Result |
|------------------|---------------|----------------------|---------------|-------------------|---------------------|
| Inlet-062922 | 206518-01 | APH EC5-8 aliphatics | 51,000 | ug/m ³ | 51,000 J |

Memorandum

| | | | |
|---------|--|------|-------|
| To | Paul Kalina, Project Manager | Info | Final |
| Subject | Summary Data Quality Review Port of Seattle – T-30 Vapor Sampling – September 2022 | | |
| From | Lucy Panteleeff, Chemist Jennifer Garner, Chemist | | |
| Date | October 12, 2022 | | |

The summary data quality review of two vapor samples collected on September 14, 2022, has been completed. The samples were analyzed at Friedman & Bruya, Inc. located in Seattle, Washington for aliphatic hydrocarbons (APHs) by Massachusetts Department of Environmental Protection Method MA-APH, and benzene, toluene, ethylbenzene, total xylenes, and naphthalene (BTEX+N) by EPA Method TO-15. The laboratory provided a summary report containing sample results and associated quality assurance (QA) and quality control (QC) data for all samples. The following samples are associated with Friedman & Bruya, Inc. laboratory group 209275:

| Sample ID | Laboratory ID |
|------------------|---------------|
| Inlet-091422 | 209275-01 |
| Discharge-091422 | 209275-02 |

Data were evaluated based on validation criteria established in the *National Functional Guidelines for Organic Superfund Methods Data Review*, November 2020.

The following data components were reviewed during the limited data validation procedure for compliance with method specific or laboratory control charted criteria where appropriate: chain of custody forms, holding times, method/trip/instrument blanks, surrogate recoveries, matrix spike/matrix spike duplicate recoveries, laboratory and field duplicate results, laboratory control sample/laboratory control sample duplicate recoveries, reporting limits, and electronic data deliverables.

A summary of qualifiers that may be assigned to results in these laboratory groups are included in Table 1. Qualifiers that may be assigned to results include:

- U - The analyte was analyzed for but was not detected above the reported sample quantitation limit.
- J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- UJ - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.
- DNR - Do Not Report. Another result is available that is more reliable or appropriate.



**Summary Data Quality Review
Port of Seattle - T 30
Vapor Sampling – September 2022
Laboratory Group: 209275**

Sample Receipt

Upon receipt by the laboratory, the sample container information was compared to the chain-of-custody (COC). No discrepancies related to sample identification were noted by the laboratory.

Organic Analyses

Samples were analyzed for APHs and BTEX+N by the methods identified in the introduction of this report.

1. Holding Times – Acceptable
2. Blanks – Acceptable
3. Surrogates – Acceptable
4. Laboratory Control Sample (LCS) – Acceptable
5. Laboratory Duplicate – Acceptable

General – Laboratory duplicates were performed using a sample from an unrelated project. Results were comparable.

6. Reporting Limits – Acceptable

APH by MA APH – The result for APH EC5-8 aliphatics in Inlet-062922 was qualified with the laboratory flag “ve” to indicate the analyte exceeded the calibration range of the instrument. The result for APH EC5-8 aliphatics was qualified as estimated and flagged ‘J’ due this instrument exceedance.

General – The reporting limits were raised for all analyses due to dilution and/or sample cannister pressure.

Overall Assessment of Data

The data reported in this laboratory group, as qualified, are considered to be usable for meeting project objectives. The completeness for Friedman & Bruya, Inc. laboratory group 209275 is 100%.

Table 1. Summary of Qualified Data

| Sample ID | Lab ID | Analyte | Result | Units | Final Result |
|------------------|---------------|----------------------|---------------|-------------------|---------------------|
| Inlet-091422 | 209275-01 | APH EC5-8 aliphatics | 24,000 ve | ug/m ³ | 24,000 J |

Appendix E
LNAPL Gauging and
Recovery Field Notes

Port of Seattle Terminal 30 LNAPL Gauging Event (January 18, 2022)

Avg

7.87

| Well ID | Time of Gauging | Depth to LNAPL (Feet BTOC) | Depth to Water (Feet BTOC) | LNAPL Thickness (Feet) | Corrected DTW ¹ (Feet BTOC) | Comments |
|---------|-----------------|----------------------------|----------------------------|------------------------|--|-------------------|
| MW-35 | --- | NM | NM | 0.00 | --- | Well inaccessible |
| MW-36 | 1736 | NM | 8.37 | 0.00 | 8.37 | -- |
| MW-36A | --- | NM | NM | 0.00 | --- | Well inaccessible |
| MW-39A | 1747 | ND | 8.07 | 0.00 | 8.07 | -- |
| MW-59 | 1708 | 7.80 | 8.19 | 0.39 | 7.91 | -- |
| MW-89 | --- | NM | NM | 0.00 | --- | Well inaccessible |
| MW-93 | 1644 | ND | 8.25 | 0.00 | 8.25 | -- |
| RW-1 | --- | NM | NM | 0.00 | --- | Well inaccessible |
| RW-12 | 1651 | 8.26 | 8.33 | 0.07 | 8.28 | -- |
| RW-101 | 1721 | ND | 7.29 | 0.00 | 7.29 | -- |
| RW-102 | --- | NM | NM | 0.00 | --- | Well inaccessible |
| RW-103 | 1657 | 7.12 | 8.41 | 1.29 | 7.47 | -- |
| RW-104 | 1736 | ND | 7.42 | 0.00 | 7.42 | -- |
| RW-105 | 1715 | ND | 7.67 | 0.00 | 7.67 | -- |
| RW-106 | 1705 | 7.26 | 9.11 | 1.85 | 7.76 | -- |
| RW-107 | 1649 | 7.56 | 9.01 | 1.45 | 7.95 | -- |
| RW-108 | 1637 | ND | 7.75 | 0.00 | 7.75 | -- |
| RW-109 | 1641 | ND | 7.97 | 0.00 | 7.97 | -- |
| RW-110 | 1645 | ND | 7.96 | 0.00 | 7.96 | -- |

Notes:

1. The DTW correction when LNAPL is present is based off of the specific gravity of petroleum, 0.7321.

Abbreviations

Feet BTOC = Feet below top of well casing.

LNAPL = Light Non-Aqueous Phase Liquid

ND = LNAPL not detected using interface probe.

NM = Not measured

TRACE, MINOR, VERY TRACE - Indications of LNAPL present, but no accurate measurement or below measurable amount.

--- = value not relevant

Indication of a well with measureable LNAPL >0.01 ft.

Port of Seattle Terminal 30 LNAPL Removal Event
 (February 17, 2022)

Avg DTW

8.65

Closest Low Tide:

Closest High Tide:

| Well ID | Initial Gauging | | | | | First Removal | | | | | | | Second Removal | | | | | | | Third Removal | | | | | | | End of Day | | | | | | | | | | |
|---------|-----------------|----------------------------------|---------------------------------|------------------------|---|-------------------------------------|---------------------------------|-------------------------------|-----------------|--------------------------|---------------------------|------------------------|-------------------------------------|---------------------------------|-------------------------------|-----------------|--------------------------|---------------------------|------------------------|-------------------------------------|---------------------------------|-------------------------------|-----------------|--------------------------|---------------------------|------------------------|---------------------------------------|----------------------------------|-------------------------------------|---------------------------------|-------------------------------|-----------------|--------------------------|---------------------------|------------------------|-----|-----|
| | Time of Gauging | Initial Depth to LNAPL (ft BTOC) | Initial Depth to Water (ft TOC) | LNAPL Thickness (feet) | Corrected Depth to Water ² (ft BTOC) | LNAPL Extraction Duration (Minutes) | Extraction Start Time (Approx.) | Extraction End Time (Approx.) | Time of Gauging | Depth to LNAPL (ft BTOC) | Depth to Water (feet TOC) | LNAPL Thickness (feet) | LNAPL Extraction Duration (Minutes) | Extraction Start Time (Approx.) | Extraction End Time (Approx.) | Time of Gauging | Depth to LNAPL (ft BTOC) | Depth to Water (feet TOC) | LNAPL Thickness (feet) | LNAPL Extraction Duration (Minutes) | Extraction Start Time (Approx.) | Extraction End Time (Approx.) | Time of Gauging | Depth to LNAPL (ft BTOC) | Depth to Water (feet TOC) | LNAPL Thickness (feet) | Time Lapse Since Extraction (minutes) | % of Initial LNAPL Thickness (%) | LNAPL Extraction Duration (Minutes) | Extraction Start Time (Approx.) | Extraction End Time (Approx.) | Time of Gauging | Depth to LNAPL (ft BTOC) | Depth to Water (feet TOC) | LNAPL Thickness (feet) | | |
| MW-35 | 1842 | 8.57 | 8.62 | 0.05 | 8.58 | 60 | 1905 | 2008 | 2020 | NL | 9.06 | NL | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| MW-36 | 1835 | ND | 8.93 | 0.00 | 8.93 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | |
| MW-36A | 1831 | ND | 9.40 | 0.00 | 9.40 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | |
| MW-39A | 1848 | ND | 8.91 | 0.00 | 8.91 | 20 | 2035 | 2120 | 2125 | 10.11 | 10.12 | 0.01 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | | |
| MW-59 | 1700 | 8.50 | 9.86 | 1.36 | 8.87 | 20 | 1700 | 1720 | 1922 | 9.42 | 9.43 | 0.01 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | | |
| MW-89 | 1908 | ND | 9.38 | 0.00 | 9.38 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | |
| MW-93 | 1855 | ND | 9.04 | 0.00 | 9.04 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | |
| RW-1 | 1859 | 8.38 | 8.44 | 0.06 | 8.40 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | |
| RW-12 | 1645 | 9.15 | 9.20 | 0.05 | 9.16 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | |
| RW-101 | 1923 | ND | 7.83 | 0.00 | 7.83 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | |
| RW-102 | 1620 | ND | 8.12 | 0.00 | 8.12 | 60 | 1818 | 1904 | 2016 | 8.47 | 8.49 | 0.02 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | | |
| RW-103 | --- | NM | NM | --- | --- | 60 | 1720 | 1810 | 1916 | 8.65 | 8.67 | 0.02 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| RW-104 | 1817 | ND | 7.90 | 0.00 | 7.90 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| RW-105 | 1820 | ND | 8.42 | 0.00 | 8.42 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| RW-106 | 1655 | 8.03 | 8.95 | 0.92 | 8.28 | 20 | 2010 | 2030 | 2035 | Trace | 9.05 | TRACE | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | | |
| RW-107 | 1642 | 8.40 | 9.05 | 0.65 | 8.58 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| RW-108 | 1800 | ND | 8.39 | 0.00 | 8.39 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| RW-109 | 1755 | ND | 8.71 | 0.00 | 8.71 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| RW-110 | 1739 | 8.85 | 8.87 | 0.02 | 8.86 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |

VACUUM TRUCK MEASURED AND APPROXIMATED TOTALS

| | |
|---|---------|
| Estimated volume in vac truck after completion of LNAPL recovery (prior to holding tank) (gal): | NM |
| Estimated volume in vac truck at end of day (including holding tank) (gal): | NM |
| Estimated combined volume, measured by DH the following day (gal): | 1104.16 |
| --> Estimated product portion (gal): | 31.48 |
| --> Estimated water portion (gal): | 1072.69 |

COMMENTS:

Guidelines:
 - If product thickness is 0.01 - 0.25 ft, vac for approx 20 min
 - If product thickness is 0.26 - 0.5 ft, vac for approx 30-40 min
 - If product thickness is greater than 0.51 ft, vac for approx 60 min
 - Repeat vac events until product thickness is <0.01 ft or three vac events have been completed
 - Perform an end-of-day DTW/product gauge for any well that initially had >0.25 ft of product

Abbreviations & Formatting
 BTOC = Feet below top of well casing.
 LNAPL = Light Non-Aqueous Phase Liquid
 ND = LNAPL not detected using interface probe.
 NA = Not Available (not able to detect or measure)
 TRACE, MINOR = LNAPL present, but no accurate measurement.

Notes:
 1. During the 10/6/22 Ops Meeting, agreed that wells measured <0.01 ft for 1 yr can be removed from monitoring schedule.
 2. The DTW correction when LNAPL is present is based off of the specific gravity of petroleum, 0.7321.

Red wells extracted by DH Environmental with vacuum truck.

Port of Seattle Terminal 30 LNAPL Gauging Event (April 14, 2022)

Closest Low Tide: 22:21

Avg

Closest High Tide: 16:20

8.74

| Well ID | Time of Gauging | Depth to LNAPL (Feet BTOC) | Depth to Water (Feet BTOC) | LNAPL Thickness (Feet) | Corrected DTW ¹ (Feet BTOC) | Comments |
|---------|-----------------|----------------------------|----------------------------|------------------------|--|--|
| MW-35 | 1951 | ND | 8.64 | 0.00 | 8.64 | --- |
| MW-36 | 1931 | ND | 9.17 | 0.00 | 9.17 | --- |
| MW-36A | 1928 | ND | 9.73 | 0.00 | 9.73 | --- |
| MW-39A | 1937 | ND | 9.40 | 0.00 | 9.40 | --- |
| MW-59 | 1857 | ND | 8.82 | 0.00 | 8.82 | A sheen was observed in the water in the monument. Well was re-gauged during low tide the following day and 0.01 ft of LNAPL was measured from 9.24 to 9.25 ft BTOC. |
| MW-89 | 1957 | ND | 9.92 | 0.00 | 9.92 | --- |
| MW-93 | 1940 | ND | 9.66 | 0.00 | 9.66 | --- |
| RW-1 | 1947 | 8.42 | 8.45 | 0.03 | 8.43 | LNAPL observed to be a dense layer. Probe was covered with a copper-brown layer on removal. |
| RW-12 | 1849 | 9.04 | 9.10 | 0.06 | 9.06 | --- |
| RW-101 | 1835 | ND | 7.83 | 0.00 | 7.83 | --- |
| RW-102 | 1837 | ND | 8.21 | 0.00 | 8.21 | --- |
| RW-103 | 1841 | 7.96 | 8.56 | 0.60 | 8.12 | --- |
| RW-104 | 1827 | ND | 7.86 | 0.00 | 7.86 | --- |
| RW-105 | 1859 | ND | 8.45 | 0.00 | 8.45 | --- |
| RW-106 | 1855 | 8.06 | 9.18 | 1.12 | 8.36 | --- |
| RW-107 | 1846 | 8.36 | 9.16 | 0.80 | 8.58 | --- |
| RW-108 | 1905 | ND | 8.47 | 0.00 | 8.47 | --- |
| RW-109 | 1912 | ND | 8.72 | 0.00 | 8.72 | --- |
| RW-110 | 1922 | ND | 8.70 | 0.00 | 8.70 | --- |

Notes:

1. The DTW correction when LNAPL is present is based off of the specific gravity of petroleum, 0.7321.

Abbreviations

Feet BTOC = Feet below top of well casing.

LNAPL = Light Non-Aqueous Phase Liquid

ND = LNAPL not detected using interface probe.

NM = Not measured

TRACE, MINOR, VERY TRACE - Indications of LNAPL present, but no accurate measurement or below measurable amount.

--- = value not relevant

Indication of a well with measureable LNAPL >0.01 ft.

Port of Seattle Terminal 30 LNAPL Removal Event
(May 12, 2022)

Avg DTW
9.10

Closest Low Tide: Closest High Tide:

| Well ID | Initial Gauging | | | | | First Removal | | | | | | | Second Removal | | | | | | | Third Removal | | | | | | | End of Day | | | | | | | | | | |
|---------|-----------------|----------------------------------|----------------------------------|------------------------|-------------------------------------|-------------------------------------|---------------------------------|-------------------------------|-----------------|--------------------------|---------------------------|------------------------|-------------------------------------|---------------------------------|-------------------------------|-----------------|--------------------------|---------------------------|------------------------|-------------------------------------|---------------------------------|-------------------------------|-----------------|--------------------------|---------------------------|------------------------|---------------------------------------|----------------------------------|-------------------------------------|---------------------------------|-------------------------------|-----------------|--------------------------|---------------------------|------------------------|----|----|
| | Time of Gauging | Initial Depth to LNAPL (Ft BTOC) | Initial Depth to Water (Ft BTOC) | LNAPL Thickness (Feet) | Corrected Depth to Water* (Ft BTOC) | LNAPL Extraction Duration (Minutes) | Extraction Start Time (Approx.) | Extraction End Time (Approx.) | Time of Gauging | Depth to LNAPL (Ft BTOC) | Depth to Water (Feet TOC) | LNAPL Thickness (Feet) | LNAPL Extraction Duration (Minutes) | Extraction Start Time (Approx.) | Extraction End Time (Approx.) | Time of Gauging | Depth to LNAPL (Ft BTOC) | Depth to Water (Feet TOC) | LNAPL Thickness (Feet) | LNAPL Extraction Duration (Minutes) | Extraction Start Time (Approx.) | Extraction End Time (Approx.) | Time of Gauging | Depth to LNAPL (Ft BTOC) | Depth to Water (Feet TOC) | LNAPL Thickness (Feet) | Time Lapse Since Extraction (minutes) | % of Initial LNAPL Thickness (%) | LNAPL Extraction Duration (Minutes) | Extraction Start Time (Approx.) | Extraction End Time (Approx.) | Time of Gauging | Depth to LNAPL (Ft BTOC) | Depth to Water (Feet TOC) | LNAPL Thickness (Feet) | | |
| MW-35 | 1831 | ND | 8.71 | 0.00 | 8.71 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MW-36 | 1858 | ND | 9.32 | 0.00 | 9.32 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MW-36A | 1853 | ND | 10.24 | 0.00 | 10.24 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MW-39A | 1915 | ND | 9.66 | 0.00 | 9.66 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MW-59 | 1706 | ND | 9.36 | 0.00 | 9.36 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MW-89 | 1932 | ND | 9.94 | 0.00 | 9.94 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MW-93 | 1910 | ND | 9.77 | 0.00 | 9.77 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| RW-1 | 1903 | 8.64 | 8.72 | 0.08 | 8.66 | 20 | 1916 | 1936 | 1938 | TRACE | 10.26 | <0.01 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| RW-12 | 1721 | 9.49 | 9.58 | 0.09 | 9.51 | 20 | 1744 | 1800 | 1804 | ND | 11 | 0.00 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| RW-101 | 1822 | ND | 7.96 | 0.00 | 7.96 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| RW-102 | 1618 | ND | 8.84 | 0.00 | 8.84 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| RW-103 | 1734 | 8.57 | 8.86 | 0.29 | 8.65 | 30 | 1844 | 1912 | 1919 | ND | 8.77 | 0.00 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 2032 | TRACE? | 8.6 | <0.01 | 73.00 | 0% | -- | -- | -- | -- | -- | -- | -- | -- |
| RW-104 | 1812 | ND | 7.97 | 0.00 | 7.97 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| RW-105 | 1815 | ND | 9.01 | 0.00 | 9.01 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| RW-106 | 1653 | 8.62 | 9.00 | 0.38 | 8.72 | 30 | 1707 | 1740 | 1745 | ND | 9.01 | 0.00 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 2024 | 8.82 | 8.84 | 0.02 | 164.00 | 5% | -- | -- | -- | -- | -- | -- | -- | -- |
| RW-107 | 1712 | 8.82 | 9.57 | 0.75 | 9.02 | 45 | 1800 | 1843 | 1847 | ND | 9.22 | 0.00 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 2037 | 9.09 | 9.35 | 0.26 | 110.00 | 35% | -- | -- | -- | -- | -- | -- | -- | -- |
| RW-108 | 1806 | ND | 9.05 | 0.00 | 9.05 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| RW-109 | 1751 | ND | 9.28 | 0.00 | 9.28 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| RW-110 | 1740 | ND | 9.21 | 0.00 | 9.21 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

| VACUUM TRUCK MEASURED AND APPROXIMATED TOTALS | |
|---|---------|
| Estimated volume in vac truck after completion of LNAPL recovery (prior to holding tank) (gal): | 343 gal |
| Estimated volume in vac truck at end of day (including holding tank) (gal): | 430 |
| Estimated combined volume, measured by DH the following day (gal): | 527.57 |
| --> Estimated product portion (gal): | 13.3 |
| --> Estimated water portion (gal): | 514.27 |

COMMENTS:
Event went smoothly. Initial round of removal successfully got all measurable LNAPL at each affected well. A second round was not necessary.

Guidelines:
- If product thickness is 0.01 - 0.25 ft, vac for approx 20 min
- If product thickness is 0.26 - 0.5 ft, vac for approx 30-40 min
- If product thickness is greater than 0.51 ft, vac for approx 60 min
- Repeat vac events until product thickness is <0.01 ft or three vac events have been completed
- Perform an end-of-day DTW/product gauge for any well that initially had >0.25 ft of product

Abbreviations & Formatting
BTOC = Feet below top of well casing.
LNAPL = Light Non-Aqueous Phase Liquid
ND = LNAPL not detected using interface probe.
NA = Not Available (not able to detect or measure)
TRACE, MINOR - LNAPL present, but no accurate measurement.

Red wells extracted by DH Environmental with vacuum truck.

Notes:
1. During the 10/6/22 Ops Meeting, agreed that wells measured <0.01 ft for 1 yr can be removed from monitoring schedule.
2. The DTW correction when LNAPL is present is based off of the specific gravity of petroleum, 0.7321.

Port of Seattle Terminal 30 LNAPL Gauging Event (June 20, 2022)

Closest Low Tide: 5:25 Avg
 Closest High Tide: 10:07 9.02

| Well ID | Time of Gauging | Depth to LNAPL (Feet BTOC) | Depth to Water (Feet BTOC) | LNAPL Thickness (Feet) | Corrected DTW ¹ (Feet BTOC) | Comments |
|---------|-----------------|----------------------------|----------------------------|------------------------|--|---|
| MW-35 | 8:31 | ND | 8.73 | 0.00 | 8.73 | -- |
| MW-36 | 9:47 | ND | 9.08 | 0.00 | 9.08 | -- |
| MW-36A | 9:50 | ND | 9.50 | 0.00 | 9.50 | -- |
| MW-39A | 9:59 | ND | 9.33 | 0.00 | 9.33 | -- |
| MW-59 | 9:20 | 8.68 | 8.80 | 0.12 | 8.71 | -- |
| MW-89 | 10:14 | ND | 9.48 | 0.00 | 9.48 | -- |
| MW-93 | 10:06 | ND | 9.41 | 0.00 | 9.41 | -- |
| RW-1 | 10:08 | 8.57 | 8.65 | 0.08 | 8.59 | LNAPL observed to be a dense layer. Probe was covered with a copper-brown layer on removal. |
| RW-12 | 9:25 | 9.20 | 9.21 | 0.01 | 9.20 | -- |
| RW-101 | 8:40 | ND | 8.50 | 0.00 | 8.50 | -- |
| RW-102 | 8:53 | ND | 8.80 | 0.00 | 8.80 | -- |
| RW-103 | 9:32 | ND | 8.74 | 0.00 | 8.74 | No J-plug / cap |
| RW-104 | 8:38 | ND | 8.58 | 0.00 | 8.58 | -- |
| RW-105 | 8:50 | ND | 8.96 | 0.00 | 8.96 | -- |
| RW-106 | 9:02 | ND | 8.76 | 0.00 | 8.76 | -- |
| RW-107 | 9:14 | ND | 9.03 | 0.00 | 9.03 | No J-plug / cap |
| RW-108 | 8:44 | ND | 9.04 | 0.00 | 9.04 | -- |
| RW-109 | 9:00 | ND | 9.70 | 0.00 | 9.70 | -- |
| RW-110 | 9:09 | ND | 9.31 | 0.00 | 9.31 | -- |
| MW-64 | 9:38 | ND | 8.55 | 0.00 | 8.55 | Vault slightly damaged, lip bent over lid. |

Notes:

1. The DTW correction when LNAPL is present is based off of the specific gravity of petroleum, 0.7321.

Abbreviations

Feet BTOC = Feet below top of well casing.

LNAPL = Light Non-Aqueous Phase Liquid

ND = LNAPL not detected using interface probe.

NM = Not measured

TRACE, MINOR, VERY TRACE - Indications of LNAPL present, but no accurate measurement or below measurable amount.

--- = value not relevant

Indication of a well with measureable LNAPL >0.01 ft.

Port of Seattle Terminal 30 LNAPL Removal Event
(July 14, 2022)

Avg DTW
8.82

| Well ID | Initial Gauging | | | | 8.83 | First Removal | | | | Post-Removal | | | | Second Removal | | | | End of Day | | | | | | |
|---|-----------------|----------------------------------|----------------------------------|------------------------|-------------------------|-------------------------------------|---------------------------------|-------------------------------|---|-----------------|--------------------------|---------------------------|------------------------|---|---------------------------------|-------------------------------|-----------------|---------------------------------------|---------------------------------------|-----------------|--------------------------|--------------------------|------------------------|---------------------------------------|
| | Time of Gauging | Initial Depth to LNAPL (Ft BTOC) | Initial Depth to Water (Ft BTOC) | LNAPL Thickness (Feet) | Corrected DTW (Ft BTOC) | LNAPL Extraction Duration (Minutes) | Extraction Start Time (Approx.) | Extraction End Time (Approx.) | Estimated Total Fluid Removal (Gallons) | Time of Gauging | Depth to LNAPL (Ft BTOC) | Depth to Water (Feet TOC) | LNAPL Thickness (Feet) | LNAPL Extraction Duration (Minutes) | Extraction Start Time (Approx.) | Extraction End Time (Approx.) | Time of Gauging | Post-Removal Depth to LNAPL (Ft BTOC) | Post-Removal Depth to Water (Ft BTOC) | Time of Gauging | Depth to LNAPL (Ft BTOC) | Depth to Water (Ft BTOC) | LNAPL Thickness (Feet) | Time Lapse Since Extraction (minutes) |
| MW-35 | 1714 | ND | 8.80 | 0 | 8.80 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| MW-36 | 1815 | ND | 9.00 | 0 | 9.00 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| MW-36A | 1817 | ND | 9.87 | 0 | 9.87 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| MW-39A | 1718 | ND | 8.50 | 0 | 8.50 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| MW-59 | 1648 | ND | 9.12 | 0 | 9.12 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| MW-89 | 1812 | ND | 9.32 | 0 | 9.32 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| MW-93 | 1722 | ND | 8.74 | 0 | 8.74 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| RW-1 | 1806 | 8.51 | 8.60 | 0.09 | 8.53 | 20 | 2027 | 2047 | NM | 2048 | ND | 10.55 | 0 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| RW-12 | 1820 | 9.45 | 9.58 | 0.13 | 9.49 | 20 | 1956 | 2016 | NM | 2018 | ND | 10.01 | 0 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| RW-101 | 1708 | ND | 8.15 | 0 | 8.15 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| RW-102 | 1706 | ND | 8.61 | 0 | 8.61 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| RW-103 | 1644 | 8.4 | 8.67 | 0.27 | 8.47 | 30 | 1835 | 1905 | NM | 1912 | ND | 8.63 | 0 | --- | --- | --- | --- | --- | --- | 2142 | 8.48 | 8.49 | 0.01 | 157 |
| RW-104 | 1712 | ND | 8.13 | 0 | 8.13 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| RW-105 | 1703 | ND | 8.76 | 0 | 8.76 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| RW-106 | 1651 | 8.45 | 9.27 | 0.82 | 8.67 | 45 | 1741 | 1826 | NM | 1827 | ND | 8.87 | 0 | --- | --- | --- | --- | --- | --- | 2140 | 8.67 | 8.74 | 0.07 | 194 |
| RW-107 | 1629 | 8.78 | 9.39 | 0.61 | 8.95 | 45 | 1650 | 1735 | NM | 1736 | ND | 8.98 | 0 | --- | --- | --- | --- | --- | --- | 2145 | 8.86 | 9.28 | 0.42 | 250 |
| RW-108 | 1659 | ND | 8.72 | 0 | 8.72 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| RW-109 | 1654 | ND | 8.96 | 0 | 8.96 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| RW-110 | 1656 | ND | 9.04 | 0 | 9.04 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| VACUUM TRUCK MEASURED AND APPROXIMATED TOTALS | | | | | | | | | | | | | | | | | | | | | | | | |
| Estimated volume in vac truck after completion of LNAPL recovery (prior to holding tank) (gal): | | | | | | | | | | | | | | ~350 | | | | | | | | | | |
| Estimated volume in vac truck at end of day (including holding tank) (gal): | | | | | | | | | | | | | | ~425 | | | | | | | | | | |
| Estimated combined volume, measured by DH the following day (gal): | | | | | | | | | | | | | | 439.55 | | | | | | | | | | |
| --> Estimated product portion (gal): | | | | | | | | | | | | | | 10.12 | | | | | | | | | | |
| --> Estimated water portion (gal): | | | | | | | | | | | | | | 429.43 | | | | | | | | | | |
| Guidelines: | | | | | | | | | | | | | | Notes: | | | | | | | | | | |
| - If product thickness is 0.01 - 0.25 ft, vac for approx 20 min | | | | | | | | | | | | | | BTOC = Below top of well casing | | | | | | | | | | |
| - If product thickness is 0.26 - 0.5 ft, vac for approx 30-40 min | | | | | | | | | | | | | | LNAPL = Light Non-Aqueous Phase Liquid | | | | | | | | | | |
| - If product thickness is greater than 0.51 ft, vac for approx 60 min | | | | | | | | | | | | | | ND = LNAPL not detected using interface probe | | | | | | | | | | |
| - Repeat vac events until product thickness is <0.01 ft or three vac events have been completed | | | | | | | | | | | | | | NM = Not Measured | | | | | | | | | | |
| - Perform an end-of-day DTW/product gauge for any well that initially had >0.25 ft of product | | | | | | | | | | | | | | TRACE = LNAPL present but no accurate measurement | | | | | | | | | | |
| Red wells extracted by DH Environmental with vacuum truck. | | | | | | | | | | | | | | --- = measurement not needed | | | | | | | | | | |
| | | | | | | | | | | | | | | COMMENTS: | | | | | | | | | | |
| | | | | | | | | | | | | | | Low Low Tide 1155 -4.01 | | | | | | | | | | |
| | | | | | | | | | | | | | | High High Tide 1933 12.29 | | | | | | | | | | |
| | | | | | | | | | | | | | | High Low Tide 0050 7.17 | | | | | | | | | | |
| | | | | | | | | | | | | | | 7/15 | | | | | | | | | | |
| | | | | | | | | | | | | | | MW-93 well difficult to gauge due to bubbling/gurgling water level even after turning off system. | | | | | | | | | | |
| | | | | | | | | | | | | | | Stinger from Vac Truck lost down RW-103 but we eventually were able to fish it out and continue vacing. | | | | | | | | | | |

Port of Seattle Terminal 30 LNAPL Gauging Event (August 11, 2022)

Closest Low Tide: 10:53

Avg

Closest High Tide: 18:25

8.98

| Well ID | Time of Gauging | Depth to LNAPL (Feet BTOC) | Depth to Water (Feet BTOC) | LNAPL Thickness (Feet) | Corrected DTW ¹ (Feet BTOC) | Comments |
|---------|-----------------|----------------------------|----------------------------|------------------------|--|----------|
| MW-35 | 17:11 | 8.86 | 8.87 | 0.01 | 8.86 | -- |
| MW-36 | 17:12 | ND | 9.13 | 0.00 | 9.13 | -- |
| MW-36A | 17:14 | ND | 9.85 | 0.00 | 9.85 | -- |
| MW-39A | 17:19 | ND | 6.65 | 0.00 | 6.65 | -- |
| MW-59 | 16:50 | ND | 9.17 | 0.00 | 9.17 | -- |
| MW-89 | 17:23 | ND | 9.95 | 0.00 | 9.95 | -- |
| MW-93 | 17:18 | ND | 6.18 | 0.00 | 6.18 | -- |
| RW-1 | 17:16 | 8.81 | 8.87 | 0.06 | 8.83 | -- |
| RW-12 | 16:45 | 9.42 | 9.59 | 0.17 | 9.47 | -- |
| RW-101 | 16:57 | ND | 8.95 | 0.00 | 8.95 | -- |
| RW-102 | 16:40 | ND | 9.10 | 0.00 | 9.10 | -- |
| RW-103 | 16:51 | ND | 8.99 | 0.00 | 8.99 | -- |
| RW-104 | 17:00 | ND | 8.82 | 0.00 | 8.82 | -- |
| RW-105 | 16:53 | ND | 9.25 | 0.00 | 9.25 | -- |
| RW-106 | 16:48 | 9.03 | 9.08 | 0.05 | 9.04 | -- |
| RW-107 | 16:42 | 9.31 | 9.80 | 0.49 | 9.44 | -- |
| RW-108 | 17:02 | ND | 9.38 | 0.00 | 9.38 | -- |
| RW-109 | 17:06 | ND | 9.92 | 0.00 | 9.92 | -- |
| RW-110 | 17:08 | ND | 9.60 | 0.00 | 9.60 | -- |

Notes:

1. The DTW correction when LNAPL is present is based off of the specific gravity of petroleum, 0.7321.

Abbreviations

Feet BTOC = Feet below top of well casing.

LNAPL = Light Non-Aqueous Phase Liquid

ND = LNAPL not detected using interface probe.

NM = Not measured

TRACE, MINOR, VERY TRACE - Indications of LNAPL present, but no accurate measurement or below measurable amount.

--- = value not relevant

Indication of a well with measureable LNAPL >0.01 ft.

Port of Seattle Terminal 30 LNAPL Removal Event
(September 8, 2022)

Avg
9.53

| Well ID | Initial Gauging | | | | | First Removal | | | Post-Removal | | | | Second Removal | | | | | | Third Removal | | | | | | End of Day | | | | | | | |
|---------|-----------------|----------------------------------|----------------------------------|------------------------|----------------------|-------------------------------------|---------------------------------|-------------------------------|-----------------|--------------------------|---------------------------|------------------------|-------------------------------------|---------------------------------|-------------------------------|-----------------|---------------------------------------|---------------------------------------|------------------------|-------------------------------------|---------------------------------|-------------------------------|-----------------|---------------------------------------|---------------------------------------|------------------------|-----------------|--------------------------|--------------------------|------------------------|---------------------------------------|-----|
| | Time of Gauging | Initial Depth to LNAPL (Ft BTOC) | Initial Depth to Water (Ft BTOC) | LNAPL Thickness (Feet) | Corrected DTW (Feet) | LNAPL Extraction Duration (Minutes) | Extraction Start Time (Approx.) | Extraction End Time (Approx.) | Time of Gauging | Depth to LNAPL (Ft BTOC) | Depth to Water (Feet TOC) | LNAPL Thickness (Feet) | LNAPL Extraction Duration (Minutes) | Extraction Start Time (Approx.) | Extraction End Time (Approx.) | Time of Gauging | Post-Removal Depth to LNAPL (Ft BTOC) | Post-Removal Depth to Water (Ft BTOC) | LNAPL Thickness (Feet) | LNAPL Extraction Duration (Minutes) | Extraction Start Time (Approx.) | Extraction End Time (Approx.) | Time of Gauging | Post-Removal Depth to LNAPL (Ft BTOC) | Post-Removal Depth to Water (Ft BTOC) | LNAPL Thickness (Feet) | Time of Gauging | Depth to LNAPL (Ft BTOC) | Depth to Water (Ft BTOC) | LNAPL Thickness (Feet) | Time Lapse Since Extraction (minutes) | |
| MW-35 | 1719 | 9.11 | 9.11 | Sheen | 9.11 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | |
| MW-36 | 1741 | ND | 9.35 | 0.00 | 9.35 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | |
| MW-36A | 1739 | ND | 10.02 | 0.00 | 10.02 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | |
| MW-39A | 1743 | ND | 10.32 | 0.00 | 10.32 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | |
| MW-59 | 1656 | 9.39 | 9.58 | 0.19 | 9.44 | 20 | 1834 | 1854 | 1856 | 9.58 | 9.59 | 0.01 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 2132 | 9.38 | 9.41 | 0.03 | 158 | |
| MW-89 | 1745 | ND | 10.11 | 0.00 | 10.11 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | |
| MW-93 | 1747 | ND | 10.60 | 0.00 | 10.60 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | |
| RW-1 | 1749 | 9.11 | 9.21 | 0.10 | 9.14 | 15 | 2027 | 2042 | 2045 | 10.63 | 10.64 | 0.01 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | |
| RW-12 | 1647 | 9.55 | 9.87 | 0.32 | 9.64 | 35 | 1729 | 1804 | 1805 | 9.55 | 9.57 | 0.02 | 22 | 1956 | 2018 | 2019 | 11.05 | 11.05 | Sheen | --- | --- | --- | --- | --- | --- | --- | 2134 | 10.08 | 10.12 | 0.04 | 76 | |
| RW-101 | 1713 | ND | 9.04 | 0.00 | 9.04 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | |
| RW-102 | 1711 | ND | 9.24 | 0.00 | 9.24 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | |
| RW-103 | 1644 | ND | 9.11 | 0.00 | 9.11 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | |
| RW-104 | 1715 | ND | 8.95 | 0.00 | 8.95 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | |
| RW-105 | 1710 | ND | 9.37 | 0.00 | 9.37 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | |
| RW-106 | 1654 | 9.15 | 9.19 | 0.04 | 9.16 | 20 | 1854 | 1914 | 1916 | 9.62 | 9.63 | 0.01 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 2131 | 9.40 | 9.42 | 0.02 | 137 | |
| RW-107 | 1640 | 9.41 | 9.90 | 0.49 | 9.54 | 40 | 1645 | 1725 | 1728 | 9.85 | 10.26 | 0.41 | 30 | 1804 | 1834 | 1836 | 9.91 | 10.31 | 0.40 | 41 | 1915 | 1956 | 1958 | 10.03 | 10.40 | 0.37 | 2136 | 9.64 | 10.03 | 0.39 | 93 | |
| RW-108 | 1707 | ND | 9.38 | 0.00 | 9.38 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| RW-109 | 1701 | ND | 9.75 | 0.00 | 9.75 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| RW-110 | 1703 | ND | 9.76 | 0.00 | 9.76 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

| VACUUM TRUCK MEASURED AND APPROXIMATED TOTALS | |
|---|--------|
| Estimated volume in vac truck after completion of LNAPL recovery (prior to holding tank) (gal): | NM |
| Estimated volume in vac truck at end of day (including holding tank) (gal): | ~700 |
| Estimated combined volume, measured by DH the following day (gal): | 647.71 |
| --> Estimated product portion (gal): | 11.14 |
| --> Estimated water portion (gal): | 636.56 |

| COMMENTS: |
|--|
| Low Low Tide 0949 -1.70' High High Tide 1713 11.46' High Low Tide 2247 5.45' |
| Vaced on RW-107 multiple times with little success of removing product, not sure why this was happening (perhaps something with high tide) verified that we were vacing up product kept adjusting stinger lenth with little success in removing significant product. |

Guidelines:
 - If product thickness is 0.01 - 0.25 ft, vac for approx 20 min
 - If product thickness is 0.26 - 0.5 ft, vac for approx 30-40 min
 - If product thickness is greater than 0.51 ft, vac for approx 60 min
 - Repeat vac events until product thickness is <0.01 ft or three vac events have been completed
 - Perform an end-of-day DTW/product gauge for any well that initially had >0.25 ft of product

Notes:
 BTOC = Below top of well casing
 LNAPL = Light Non-Aqueous Phase Liquid
 ND = LNAPL not detected using interface probe
 NM = Not Measured
 TRACE = LNAPL present but no accurate measurement
 --- = measurement not needed

Red wells extracted by DH Environmental with vacuum truck.

Port of Seattle Terminal 30 LNAPL Gauging Event (October 13, 2022)

Closest Low Tide: 19:11

Avg

Closest High Tide: 14:04

9.44

| Well ID | Time of Gauging | Depth to LNAPL (Feet BTOC) | Depth to Water (Feet BTOC) | LNAPL Thickness (Feet) | Corrected DTW ¹ (Feet BTOC) | Comments |
|---------|--|----------------------------|----------------------------|------------------------|--|---|
| MW-35 | 17:19 | 9.42 | 9.44 | 0.02 | 9.43 | Strong odor |
| MW-36 | 17:58 | ND | 9.48 | 0.00 | 9.48 | Strong odor |
| MW-36A | <i>Removed from LNAPL monitoring protocol following 9/8/22 event</i> | | | | | |
| MW-39A | <i>Removed from LNAPL monitoring protocol following 9/8/22 event</i> | | | | | |
| MW-59 | 17:37 | ND | 9.40 | 0.00 | 9.40 | -- |
| MW-89 | <i>Removed from LNAPL monitoring protocol following 9/8/22 event</i> | | | | | |
| MW-93 | <i>Removed from LNAPL monitoring protocol following 9/8/22 event</i> | | | | | |
| RW-1 | 18:12 | 9.13 | 9.19 | 0.06 | 9.15 | Very strong odor |
| RW-12 | 17:52 | 9.71 | 10.00 | 0.29 | 9.79 | Strong odor |
| RW-101 | <i>Removed from LNAPL monitoring protocol following 9/8/22 event</i> | | | | | |
| RW-102 | <i>Removed from LNAPL monitoring protocol following 9/8/22 event</i> | | | | | |
| RW-103 | 17:45 | ND | 9.23 | 0.00 | 9.23 | -- |
| RW-104 | 17:27 | ND | 9.15 | 0.00 | 9.15 | No cap on stinger (~4 in above well cap). Procurement underway. |
| RW-105 | <i>Removed from LNAPL monitoring protocol following 9/8/22 event</i> | | | | | |
| RW-106 | 17:40 | 9.27 | 9.28 | 0.01 | 9.27 | -- |
| RW-107 | 17:47 | 9.55 | 9.96 | 0.41 | 9.66 | No cap on stinger (~4 in above well cap). Procurement underway. |
| RW-108 | <i>Removed from LNAPL monitoring protocol following 9/8/22 event</i> | | | | | |
| RW-109 | <i>Removed from LNAPL monitoring protocol following 9/8/22 event</i> | | | | | |
| RW-110 | 18:07 | ND | 9.89 | 0.00 | 9.89 | Moderate odor |

Notes:

1. The DTW correction when LNAPL is present is based off of the specific gravity of petroleum, 0.7321.

Abbreviations

Feet BTOC = Feet below top of well casing.

LNAPL = Light Non-Aqueous Phase Liquid

ND = LNAPL not detected using interface probe.

NM = Not measured

TRACE, MINOR, VERY TRACE - Indications of LNAPL present, but no accurate measurement or below measurable amount.

--- = value not relevant

Indication of a well with measureable LNAPL >0.01 ft.

Port of Seattle Terminal 30 LNAPL Gauging Event (November 10, 2022)

Closest Low Tide: 23:54

Avg

Closest High Tide: 16:51

8.68

| Well ID | Time of Gauging | Depth to LNAPL (Feet BTOC) | Depth to Water (Feet BTOC) | LNAPL Thickness (Feet) | Corrected DTW ¹ (Feet BTOC) | Comments |
|---------|--|----------------------------|----------------------------|------------------------|--|---|
| MW-35 | 18:00 | 9.07 | 9.07 | 0.00 | 9.07 | Sheen |
| MW-36 | 18:41 | ND | 9.27 | 0.00 | 9.27 | This marks 1 year of no product present |
| MW-36A | <i>Removed from LNAPL monitoring protocol following 9/8/22 event</i> | | | | | |
| MW-39A | <i>Removed from LNAPL monitoring protocol following 9/8/22 event</i> | | | | | |
| MW-59 | 18:17 | ND | 8.59 | 0.00 | 8.59 | -- |
| MW-89 | <i>Removed from LNAPL monitoring protocol following 9/8/22 event</i> | | | | | |
| MW-93 | <i>Removed from LNAPL monitoring protocol following 9/8/22 event</i> | | | | | |
| RW-1 | 18:49 | 8.99 | 9.06 | 0.07 | 9.01 | -- |
| RW-12 | 18:30 | 9.16 | 9.49 | 0.33 | 9.25 | Monument silted in |
| RW-101 | <i>Removed from LNAPL monitoring protocol following 9/8/22 event</i> | | | | | |
| RW-102 | <i>Removed from LNAPL monitoring protocol following 9/8/22 event</i> | | | | | |
| RW-103 | 18:21 | 8.13 | 8.41 | 0.28 | 8.21 | -- |
| RW-104 | 18:04 | ND | 8.31 | 0.00 | 8.31 | -- |
| RW-105 | <i>Removed from LNAPL monitoring protocol following 9/8/22 event</i> | | | | | |
| RW-106 | 18:07 | 7.11 | 9.20 | 2.09 | 7.68 | The interface probe gave a fast beep starting at 9.05 ft btoc, and a slower beep at 9.35 ft. 9.20 ft is the average of the two. |
| RW-107 | 18:24 | 8.60 | 8.78 | 0.18 | 8.65 | -- |
| RW-108 | <i>Removed from LNAPL monitoring protocol following 9/8/22 event</i> | | | | | |
| RW-109 | <i>Removed from LNAPL monitoring protocol following 9/8/22 event</i> | | | | | |
| RW-110 | 18:33 | ND | 8.80 | 0.00 | 8.80 | -- |

Notes:

1. The DTW correction when LNAPL is present is based off of the specific gravity of petroleum, 0.7321.

Abbreviations

Feet BTOC = Feet below top of well casing.

LNAPL = Light Non-Aqueous Phase Liquid

ND = LNAPL not detected using interface probe.

NM = Not measured

TRACE, MINOR, VERY TRACE - Indications of LNAPL present, but no accurate measurement or below measurable amount.

--- = value not relevant

Indication of a well with measurable LNAPL >0.01 ft.

Port of Seattle Terminal 30 LNAPL Removal Event
(December 8, 2022)

Avg DTW:

8.79

| Well ID | Initial Gauging | | | | | First Removal | | | Post-Removal | | | | Second Removal | | | | | | Third Removal | | | | | | End of Day | | | | | |
|---------|---|----------------------------------|----------------------------------|------------------------|---------------------------|-------------------------------------|---------------------------------|-------------------------------|-----------------|--------------------------|---------------------------|------------------------|-------------------------------------|---------------------------------|-------------------------------|-----------------|---------------------------------------|---------------------------------------|------------------------|-------------------------------------|---------------------------------|-------------------------------|---------------------------------------|---------------------------------------|------------------------|-----------------|--------------------------|--------------------------|------------------------|---------------------------------------|
| | Time of Gauging | Initial Depth to LNAPL (Ft BTOC) | Initial Depth to Water (Ft BTOC) | LNAPL Thickness (Feet) | Corrected DTW (Feet BTOC) | LNAPL Extraction Duration (Minutes) | Extraction Start Time (Approx.) | Extraction End Time (Approx.) | Time of Gauging | Depth to LNAPL (Ft BTOC) | Depth to Water (Feet TOC) | LNAPL Thickness (Feet) | LNAPL Extraction Duration (Minutes) | Extraction Start Time (Approx.) | Extraction End Time (Approx.) | Time of Gauging | Post-Removal Depth to LNAPL (Ft BTOC) | Post-Removal Depth to Water (Ft BTOC) | LNAPL Thickness (Feet) | LNAPL Extraction Duration (Minutes) | Extraction Start Time (Approx.) | Extraction End Time (Approx.) | Post-Removal Depth to LNAPL (Ft BTOC) | Post-Removal Depth to Water (Ft BTOC) | LNAPL Thickness (Feet) | Time of Gauging | Depth to LNAPL (Ft BTOC) | Depth to Water (Ft BTOC) | LNAPL Thickness (Feet) | Time Lapse Since Extraction (minutes) |
| MW-35 | 1750 | 9.04 | 9.07 | 0.03 | 9.05 | 20 | 1955 | 2015 | 2032 | -- | 10.52 | 0.0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MW-36 | Removed from LNAPL monitoring protocol following 11/10/22 event | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MW-36A | Removed from LNAPL monitoring protocol following 09/08/22 event | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MW-39A | Removed from LNAPL monitoring protocol following 09/08/22 event | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MW-59 | 1651 | 9.1 | 9.15 | 0.05 | 9.11 | 20 | 1705 | 1725 | 1813 | -- | 9.14 | 0.0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| MW-89 | Removed from LNAPL monitoring protocol following 09/08/22 event | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MW-93 | Removed from LNAPL monitoring protocol following 09/08/22 event | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RW-1 | 1753 | 8.64 | 8.68 | 0.04 | 8.65 | 20 | 2040 | 2100 | 2105 | -- | 10.14 | 0.0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| RW-12 | 1732 | 9.25 | 9.63 | 0.38 | 9.35 | 45 | 1845 | 1930 | 1951 | 9.4 | 9.55 | 0.15 | 20 | 2015 | 2030 | 2035 | 10.4 | 10.4 | <0.01 | -- | -- | -- | -- | -- | -- | 2135 | 9.69 | 9.72 | 0.03 | 65 |
| RW-101 | Removed from LNAPL monitoring protocol following 09/08/22 event | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RW-102 | Removed from LNAPL monitoring protocol following 09/08/22 event | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RW-103 | 1716 | 8.4 | 8.55 | 0.15 | 8.44 | 20 | 1755 | 1815 | 1841 | -- | 8.42 | 0.0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| RW-104 | 1743 | -- | 8.12 | 0.00 | 8.12 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| RW-105 | Removed from LNAPL monitoring protocol following 09/08/22 event | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RW-106 | 1653 | 8.5 | 8.82 | 0.32 | 8.59 | 30 | 1725 | 1755 | 1815 | -- | 8.65 | 0.0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| RW-107 | 1729 | 8.74 | 9.18 | 0.44 | 8.86 | 30 | 1815 | 1845 | 1925 | 8.75 | 8.89 | 0.14 | 20 | 1930 | 1950 | 2011 | -- | 8.8 | 0.0 | -- | -- | -- | -- | -- | 2130 | 8.8 | 8.92 | 0.12 | 100 | |
| RW-108 | Removed from LNAPL monitoring protocol following 09/08/22 event | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RW-109 | Removed from LNAPL monitoring protocol following 09/08/22 event | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RW-110 | 1736 | -- | 8.97 | 0.00 | 8.97 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |

VACUUM TRUCK MEASURED AND APPROXIMATED TOTALS

| | |
|---|---|
| Estimated volume in vac truck after completion of LNAPL recovery (prior to holding tank) (gal): | NM, est ~1328 assuming 1000 gal from the poly tank |
| Estimated volume in vac truck at end of day (including holding tank) (gal): | 2328 |
| Estimated combined volume, measured by DH the following day (gal): | 2369.32 |
| --> Estimated product portion (gal): | 48.55 |
| --> Estimated water portion (gal): | 2320.77 |

COMMENTS:

| |
|--|
| |
|--|

- Guidelines:**
- If product thickness is 0.01 - 0.25 ft, vac for approx 20 min
 - If product thickness is 0.26 - 0.5 ft, vac for approx 30-40 min
 - If product thickness is greater than 0.51 ft, vac for approx 60 min
 - Repeat vac events until product thickness is <0.01 ft or three vac events have been completed
 - Perform an end-of-day DTW/product gauge for any well that initially had >0.25 ft of product

- Abbreviations & Formatting**
- BTOC = Feet below top of well casing.
 - LNAPL = Light Non-Aqueous Phase Liquid
 - ND = LNAPL not detected using interface probe.
 - NA = Not Available (not able to detect or measure)
 - TRACE, MINOR - LNAPL present, but no accurate measurement.
 - Red wells extracted by DH Environmental with vacuum truck.

- Notes:**
1. During the 10/6/22 Ops Meeting, agreed that wells measured <0.01 ft for 1 yr can be removed from monitoring schedule.
 2. The DTW correction when LNAPL is present is based off of the specific gravity of petroleum, 0.7321.

Appendix F
Groundwater Sampling
Field Forms

Americas

Daily Tailgate Meeting

S3AM-209-FM5

Instructions: Conduct meeting prior to sending crews to individual tasks. Require attendance of all AECOM employees and subcontractors. Invite personnel from simultaneous operations for coordination purposes. Review scope of work and briefly discuss required and applicable topics. **This meeting is a daily refresher, not a full orientation.** Task-specific discussions associated with Task Hazard Assessment (THA) follow this meeting at the task location immediately before individual task is started.

| |
|---|
| AECOM Supervisor Name: Paul Kalina |
| Phone Number: |
| AECOM SH&E Rep. Name: Andrew Paynter |
| Phone Number: |
| Meeting Leader: Gus Friedman |

| | | |
|----------------------|------------------------------------|------------------------|
| Date: 4/14/22 | Project Name/Location: T-30 | Project Number: |
|----------------------|------------------------------------|------------------------|

Today's Scope of Work:
 LNAP gauging; RW-11A sampling (Day 1 spring '22 sampling)

| | | | |
|-------------------------------|--------------------------------|------------------------------------|----------------------------|
| Muster Point Location: | First Aid Kit Location: | Fire Extinguisher Location: | Spill Kit Location: |
|-------------------------------|--------------------------------|------------------------------------|----------------------------|

| 1. Required Topics | 2. Discuss if Applicable to Today's Work |
|--|--|
| <input checked="" type="checkbox"/> Fitness for Duty requirements, all sign in / sign out <input checked="" type="checkbox"/> Required training (incl. task specific) completed and current <input checked="" type="checkbox"/> SH&E Plan onsite - understood, reviewed, signed by all (incl. scope, preplanning hazard assessments / risk registers, controls, procedures, requirements, etc.) <input checked="" type="checkbox"/> Task Hazard Assessments (THAs) are to be reviewed and completed for each task immediately prior to conducting <input checked="" type="checkbox"/> STOP WORK Right & Responsibility- all task changes/changed conditions re-assess with THA <input checked="" type="checkbox"/> Requirement to report to supervisor any injury, illness, damage, near miss, unsafe act / condition <input checked="" type="checkbox"/> Emergency Response Plan – including muster point, first aid kit, fire extinguisher, clinic/hospital location <input checked="" type="checkbox"/> Personal Protective Equipment (PPE) - Required items per hazard assessments in good condition / in use by all <input checked="" type="checkbox"/> Equipment/machinery inspected (documented as required) and in good condition - operators properly trained/certified <input checked="" type="checkbox"/> Work area set up and demarcation/ barricades in place to protect workers, site staff, and the public <input checked="" type="checkbox"/> Required checklists/records available, understood (describe): <input checked="" type="checkbox"/> Lessons Learned / SH&E improvements (describe): | <input checked="" type="checkbox"/> <input type="checkbox"/> Check <input checked="" type="checkbox"/> as reviewed or mark <input type="checkbox"/> as not applicable <input type="checkbox"/> <input checked="" type="checkbox"/> Biological/ Chemical / Electrical Hazards <input checked="" type="checkbox"/> <input type="checkbox"/> Ergonomics - Lifting, Body Position <input type="checkbox"/> <input checked="" type="checkbox"/> Lock Out/ Tag Out Short Service Employees - visual identifier and mentor/ oversight assignment <input type="checkbox"/> <input checked="" type="checkbox"/> Simultaneous/ Neighbouring Operations <input type="checkbox"/> <input checked="" type="checkbox"/> Slip/ Trip/ Fall Hazards <input type="checkbox"/> <input checked="" type="checkbox"/> Specialized PPE Needs <input type="checkbox"/> <input checked="" type="checkbox"/> Traffic Control <input type="checkbox"/> <input checked="" type="checkbox"/> Waste Management/ Decontamination <input type="checkbox"/> <input checked="" type="checkbox"/> Weather Hazards / Heat Stress / Cold Stress <input type="checkbox"/> <input checked="" type="checkbox"/> Subcontractor Requirements (e.g., JHAs, THAs, procedures, reporting, etc.) <input type="checkbox"/> <input checked="" type="checkbox"/> Work Permits / Plans required (e.g., Fall Protection, Confined Space, Hot Work, Critical Lifts, etc.); in place, understood (identify/attach): <input type="checkbox"/> <input checked="" type="checkbox"/> Other Topics (describe/attach): <input type="checkbox"/> <input checked="" type="checkbox"/> Client specific requirements (describe): |

| 3. Daily Check Out by Site Supervisor | |
|--|---|
| Describe incidents, near misses, observations or Stop Work interventions from today: | Describe Lessons Learned/ Improvement Areas from today: |

The site is being left in a safe condition and work crew checked out as fit unless otherwise specified as above.

| | | |
|---|----------------------|--|
| Site Supervisor Name Gus Friedman | Signature | Date 4/14/22 Time (at end of day / shift) |
|---|----------------------|--|

Worker Acknowledgement / Sign In Sign Out sheets applicable to this meeting are on reverse and, if applicable, attached.

Daily Tailgate Meeting (S3AM-209-FM5)
 Revision 9 January 15, 2019

PRINTED COPIES ARE UNCONTROLLED. CONTROLLED COPY IS AVAILABLE ON COMPANY INTRANET.

All employees:

- **STOP WORK** if concerned / uncertain about safety / hazard or additional precaution is not recorded on the THA.
- **Be alert and communicate any changes in personnel or conditions at the worksite to the supervisor.**
- **Reassess task, hazards, & mitigations on an ongoing basis; amend the THA if needed.**

SITE WORKERS (including AECOM Contractors and Subcontractors): Your signature below means that you understand:

- * The requirement to participate in creating, reviewing, & updating hazard assessments (THA) applicable to your task(s).
- * The hazards & control measures associated with each task you are about to perform.
- * The permit to work requirements applicable to the work you are about to perform (if it includes permitted activities).
- * That no tasks or work is to be performed without a hazard assessment.
- * Your authority & obligation to "Stop Work" intervene, speak up/ listen up.

Your initials (right columns) certify that you arrived & departed fit for duty, & have reported all incidents/near misses; meaning:

- * You are physically and mentally fit for duty and have inspected your required PPE to ensure satisfactory condition.
- * You are not under the influence of any type of medication, drugs, or alcohol that could affect your ability to work safely.
- * You are aware of your responsibility to immediately report any illness, injury (regardless of where or when it occurred), or impairment/fatigue issue to the AECOM Supervisor.
- * You signed out as fit / uninjured unless you have otherwise informed the AECOM Supervisor.

| Print Name & Company | Signature | Initials & Sign In Time | Initials & Sign Out Time |
|----------------------|---------------------|-------------------------|--------------------------|
| Gus Friedman AECOM | <i>Gus Friedman</i> | In & Fit 1645 GF | Out & Fit |
| None Gary | <i>None Gary</i> | In & Fit 1645 NG | Out & Fit |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |

(Attach additional Site Worker sign-in/out sheets if needed) Identify number of attached sheets: _____

| SITE VISITOR / SITE REPRESENTATIVE | | | | |
|------------------------------------|--------------|--------------|----------------|-----------|
| Name | Company Name | Arrival Time | Departure Time | Signature |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

DAILY FIELD LOG

Project Information

| | |
|---------------------------|---------------------------|
| Project Name: <u>P-30</u> | Location: <u>Seattle</u> |
| Project/Task No.: _____ | Weather: <u>45 cloudy</u> |
| Date: <u>4/14/22</u> | Personnel: <u>GF, NG</u> |

Observations

| Time | Observation Description |
|------|---|
| 1 | 081645 Onsite, 2 nd Thursday, no port activity |
| 2 | scope: LNAPL gauging, RW-11A sampling. Will return to |
| 3 | site tomorrow for MW-89 sampling. |
| 4 | Tailgate: ergonomics. traffic hazards minimal |
| 5 | • System shut off. SVE hr meter 10785.6 |
| 6 | AS hr meter 5176.0 |
| 7 | Last zone on: Zone 4. Pressures 6.5-7.5 |
| 8 | • Amy successfully uncovered RW-101. Flows 1.5-4.3 |
| 9 | • NG will sample, GF will gauge. |
| 10 | • NG starting on 11A |
| 11 | • GF labeling monuments |
| 12 | - main LNAPL group is D319-D328 |
| 13 | - MW-36 btw zone C309-C310, btw the labels & outside |
| 14 | container area. |
| 15 | - MW-31A & -93 are outside of container stalls, shouldn't |
| 16 | be covered. |
| 17 | - MW-89 is at A257, outside container stall. |
| 18 | * has MW-36 been decommissioned? Can't find it, but there |
| 19 | is a patch where it could have been. It is on the |
| 20 | 2-year Sampling Schedule (would be sampled this fall) |
| 21 | • we need to sample MW-89 tomorrow & it is not |
| 22 | out on apron as initially thought. Need to |
| 23 | contact Amy to avoid work @ A257 tomorrow |
| 24 | @ 12:45 |
| 25 | 1810 NG collected samples @ RW-11A |

Comments / Site Activities / Personnel Tracking

DAILY FIELD LOG

Project Information

| | |
|---------------------------|------------------|
| Project Name: <u>7-30</u> | Location: _____ |
| Project/Task No.: _____ | Weather: _____ |
| Date: <u>4/14/22</u> | Personnel: _____ |

Observations

| # | Time | Observation Description |
|----|------|---|
| 1 | 2000 | Finished gauging the LNAPL wells |
| 2 | | ** Several on the list were crossed off during last |
| 3 | | event & we aren't sure why. Covered by container? No |
| 4 | | longer needing gauging? MW-35, -36A, and -1. And |
| 5 | | RW-102. |
| 6 | | ** Several wells on the list are not indicated as free |
| 7 | | product gauging or product recovery wells on the |
| 8 | | figure. Why are they included? MW-35, -36A, & RW-1. |
| 9 | | Same list as above minus RW-102. |
| 10 | | ** We re-read the comp d & seems unclear if gauging |
| 11 | | between recovery events is required. Double check |
| 12 | | this. |
| 13 | 2005 | Returned to system to see if rotameters can be |
| 14 | | removed for cleaning. Confirmed both styles can. |
| 15 | | Plan to come back tomorrow to attempt cleaning. |
| 16 | | * Email Marina to ensure system does not get |
| 17 | | restarted. |
| 18 | 2040 | GF, NG offsite |
| 19 | | |
| 20 | | |
| 21 | | |
| 22 | | |
| 23 | | |
| 24 | | |
| 25 | | |

Comments / Site Activities / Personnel Tracking

Gauging April 14

Port of Seattle Terminal 30 LNAPL Removal Event (February 17, 2022)

| Location | Time of Gauging | Initial Depth to LNAPL (Feet TOC) | Initial Depth to Water (Feet TOC) | LNAPL Thickness (Feet) | First Removal | | | Post Removal | | |
|---|-----------------|--------------------------------------|--------------------------------------|------------------------------|--|--|--|-----------------|------------------------------|------------------------------|
| | | | | | LNAPL Extraction Duration (Minutes) | Extraction Start/End Times (Approx.) | Estimated Total Fluid Removal (Gallons) | Time of Gauging | Depth to LNAPL (Feet TOC) | Depth to Water (Feet TOC) |
| MW-35 | 1951 | NA | 8.64 | 0 | | | | | | |
| MW-36 | 1931 | NA | 9.17 | 0 | | | | | | |
| MW-36A | 1928 | NA | 9.73 | 0 | | | | | | |
| MW-39A | 1937 | NA | 9.40 | 0 | | | | | | |
| MW-59 | 1857 | NA | 8.82 | 0 | water in manometer w/ a screen. | | | | | |
| MW-89 ³ | 1957 | NA | 9.92 | 0 | | | | | | |
| MW-93 | 1940 | NA | 9.66 | 0 | | | | | | |
| RW-1 | 1947 | 8.42 | 8.45 | 0.03 | dense layer | | | | | |
| RW-12 | 1849 | 9.04 | 9.10 | 0.06 | | | | | | |
| RW-101 | 1835 | NA | 7.83 | 0 | | | | | | |
| RW-102 | 1837 | NA | 8.81 | 0 | | | | | | |
| RW-103 | 1841 | 7.96 | 8.56 | 0.60 | | | | | | |
| RW-104 | 1827 | NA | 7.56 | 0 | | | | | | |
| RW-105 | 1859 | NA | 8.45 | 0 | | | | | | |
| RW-106 | 1855 | 8.06 | 9.18 | 1.12 | | | | | | |
| RW-107 | 1846 | 8.36 | 9.16 | 0.80 | | | | | | |
| RW-108 | 1905 | NA | 8.47 | 0 | | | | | | |
| RW-109 | 1912 | NA | 8.72 | 0 | | | | | | |
| RW-110 | 1922 | NA | 8.70 | 0 | | | | | | |
| VACUUM TRUCK MEASURED AND APPROXIMATED TOTALS ⁹ : | | | | | | | | | | |
| COMBINED APPROXIMATED TOTALS IN VACUUM TRUCK (INCLUDING HOLDING TANK) ¹⁰ : | | | | | | | | | | |
| COMBINED APPROXIMATED TOTALS AS MEASURED BY DH ON 11/12/2021 | | | | | | | | | | |

Notes:

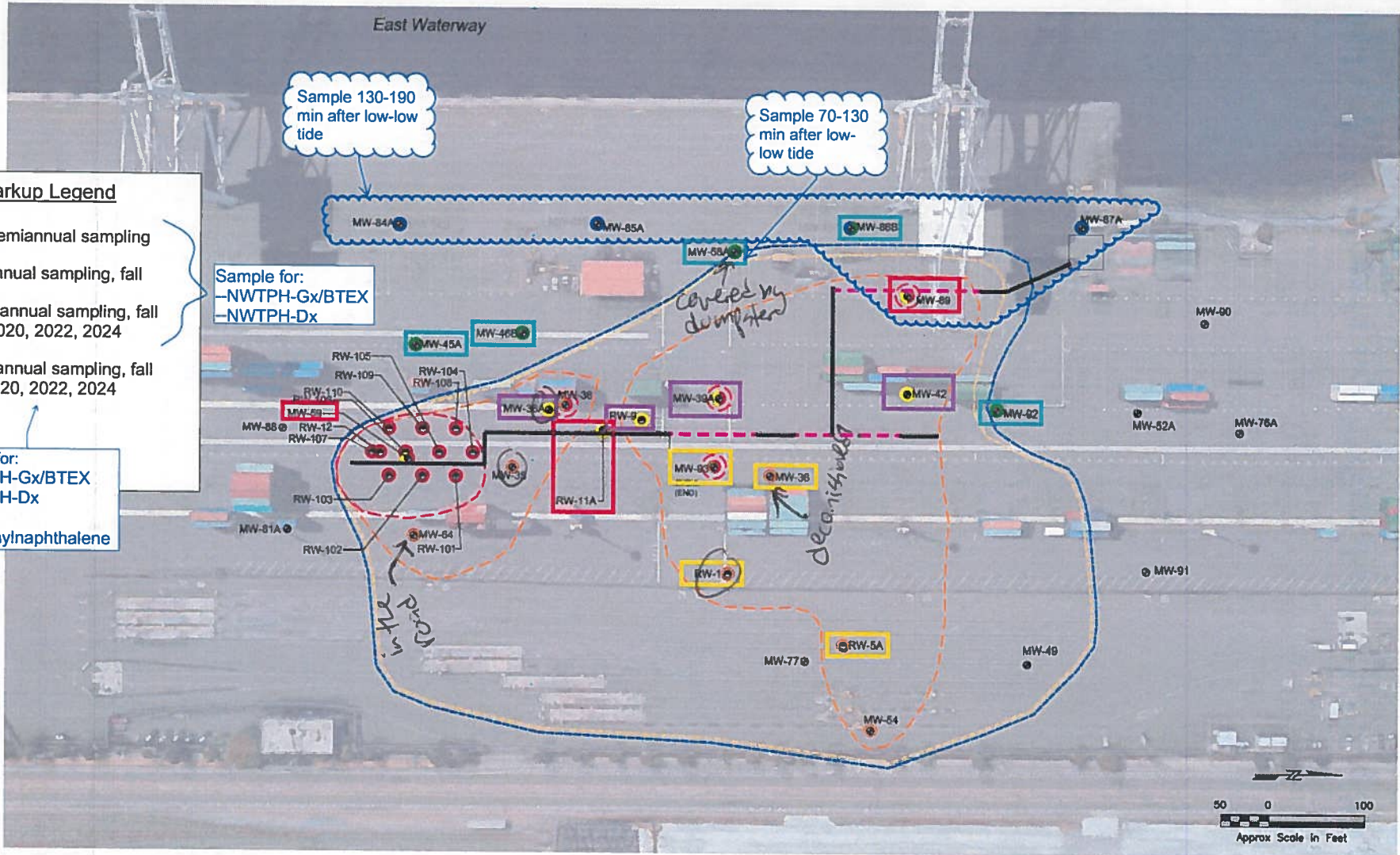
1. Feet TOC = Feet below top of well casing.
2. LNAPL = Light Non-Aqueous Phase Liquid
3. Groundwater measurements taken at throughout the evening
4. NL = LNAPL not detected using interface probe.
5. For drum vacuumed wells, total removals calculated from drum volumes from each well post-recovery at each well.
6. NA - Not Available (not able to detect or measure)
7. TRACE, MINOR, VERY TRACE - Indications of LNAPL present, but no accurate measurement or below measurable amount.
8. MW-35 total depth tagged at 13.90-ft TOC.
9. DH Vacuum Truck removal volumes only (stick measured in vac truck tank).
10. Approximately 163-gallons of oily water (total fluids) in the holding tank prior to removal.

Red wells extracted by DH Environmental with vacuum truck.

on Feb 17 2022.

No activity in March,
lack the funding

re-gauged on 4/15 during low tide
DTP : 9.24 ft btoc
DTW : 9.25 ft btoc
LNAPL thickness : 0.01 Ft



Markup Legend

- semiannual sampling
- annual sampling, fall
- biannual sampling, fall 2020, 2022, 2024
- biannual sampling, fall 2020, 2022, 2024

Sample for:

- NWTPH-Gx/BTEX
- NWTPH-Dx

Sample for:

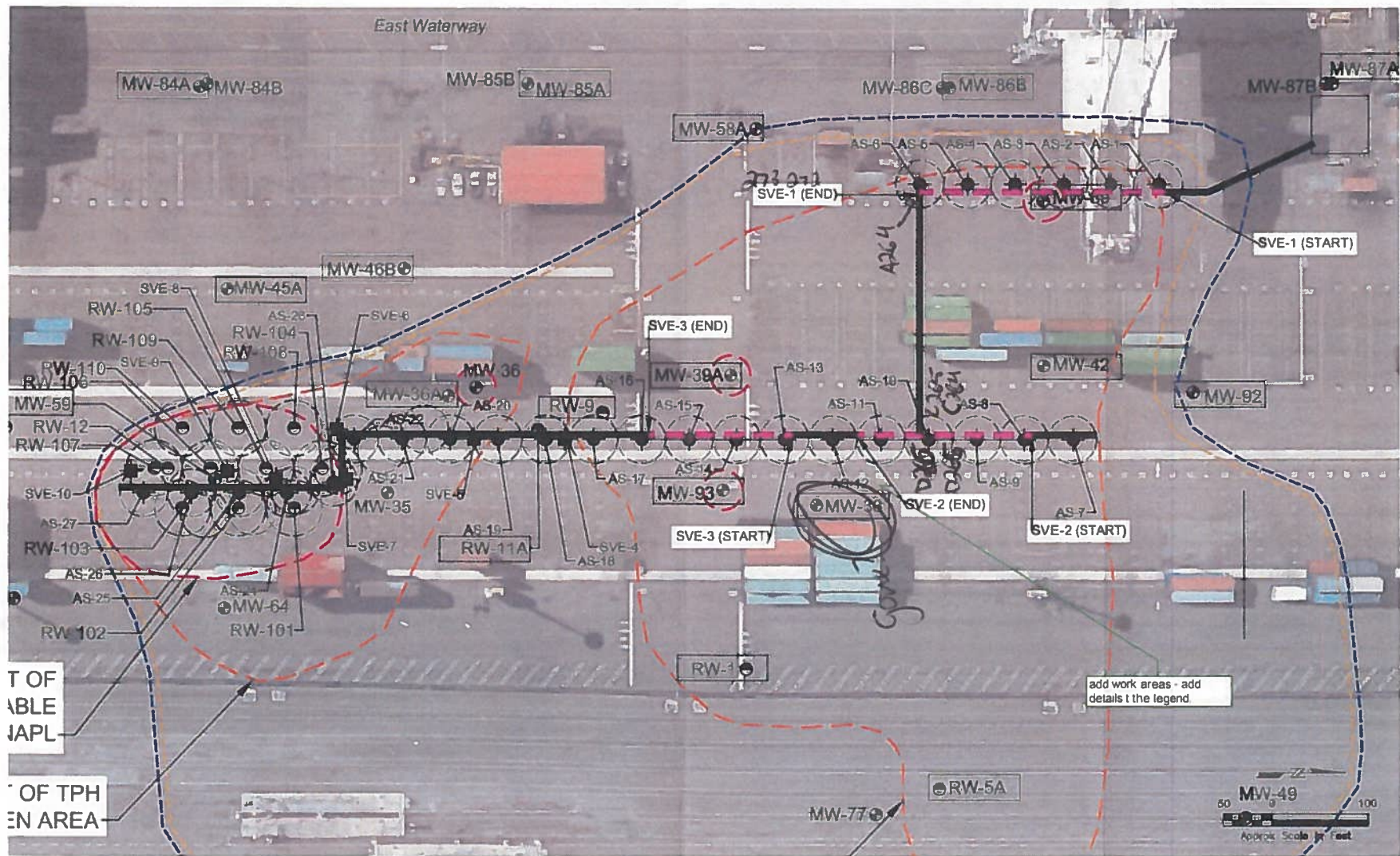
- NWTPH-Gx/BTEX
- NWTPH-Dx
- PAH
- 2-methylnaphthalene

LEGEND

- MONITORING WELL
- PRODUCT RECOVERY WELL
- PERFORMANCE MONITORING WELL
- INTERIOR MONITORING WELL
- CPOC MONITORING WELL
- SHORELINE MONITORING WELL
- FREE PRODUCT GAUGING WELL



| | | |
|--|------------|-------------------------------|
| Compliance Monitoring Plan Terminal 30 Cleanup Action | | Compliance Monitoring Network |
| DATE: 12/2/2017 | DRAWN: BTS | Figure 4 |



LEGEND

- ◆ AS WELL
- SVE WELL (VERTICAL)
- MONITORING WELL
- PRODUCT RECOVERY WELL
- DECOMMISSIONED MONITORING WELL

- CPOC GROUNDWATER WELL
- INTERIOR GROUNDWATER WELL
- PERFORMANCE GROUNDWATER WELL

Engineering Design Report
Terminal 30 Cleanup Action

AS/SVE System Layout

Americas

Daily Tailgate Meeting

S3AM-209-FM5

Instructions: Conduct meeting prior to sending crews to individual tasks. Require attendance of all AECOM employees and subcontractors. Invite personnel from simultaneous operations for coordination purposes. Review scope of work and briefly discuss required and applicable topics. **This meeting is a daily refresher, not a full orientation.** Task-specific discussions associated with Task Hazard Assessment (THA) follow this meeting at the task location immediately before individual task is started.

| | |
|----------------------------------|----------------|
| AECOM Supervisor Name: | Paul Kulina |
| Phone Number: | |
| AECOM SH&E Rep. Name: | Andrew Paynter |
| Phone Number: | |
| Meeting Leader: | Gus Friedman |

| | | |
|----------------------|-----------------------------------|------------------------|
| Date: 4/15/22 | Project Name/Location: T30 | Project Number: |
|----------------------|-----------------------------------|------------------------|

Today's Scope of Work:
 • Clean system rotameters
 • Sample NW-89 for day 2 of Spring Sampling

| | | | |
|---|---|--|---------------------------------|
| Muster Point Location: Front gate | First Aid Kit Location: Corex | Fire Extinguisher Location: System enclosure | Spill Kit Location: - |
|---|---|--|---------------------------------|

| | |
|--|--|
| <p>1. Required Topics</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Fitness for Duty requirements, all sign in / sign out <input type="checkbox"/> Required training (incl. task specific) completed and current <input checked="" type="checkbox"/> SH&E Plan onsite - understood, reviewed, signed by all (incl. scope, preplanning hazard assessments / risk registers controls, procedures, requirements, etc.) <input checked="" type="checkbox"/> Task Hazard Assessments (THAs) are to be reviewed and completed for each task immediately prior to conducting <input type="checkbox"/> STOP WORK Right & Responsibility- all task changes/changed conditions re-assess with THA <input type="checkbox"/> Requirement to report to supervisor any injury, illness, damage, near miss, unsafe act / condition <input type="checkbox"/> Emergency Response Plan – including muster point, first aid kit, fire extinguisher, clinic/hospital location <input checked="" type="checkbox"/> Personal Protective Equipment (PPE) - Required items per hazard assessments in good condition / in use by all <input type="checkbox"/> Equipment/machinery inspected (documented as required) and in good condition - operators properly trained/certified <input type="checkbox"/> Work area set up and demarcation/ barricades in place to protect workers, site staff, and the public <input type="checkbox"/> Required checklists/records available, understood (describe): <input checked="" type="checkbox"/> Lessons Learned / SH&E improvements (describe) | <p>2. Discuss if Applicable to Today's Work</p> <p><input checked="" type="checkbox"/> <input type="checkbox"/> Check <input checked="" type="checkbox"/> as reviewed or mark <input type="checkbox"/> as not applicable</p> <ul style="list-style-type: none"> <input type="checkbox"/> <input checked="" type="checkbox"/> Biological/ Chemical / Electrical Hazards <input type="checkbox"/> <input type="checkbox"/> Ergonomics - Lifting, Body Position <input type="checkbox"/> <input checked="" type="checkbox"/> Lock Out/ Tag Out Short Service Employees - visual identifier and mentor/ oversight assignment <input checked="" type="checkbox"/> <input type="checkbox"/> Simultaneous/ Neighbouring Operations <input checked="" type="checkbox"/> <input type="checkbox"/> Slip/ Trip/ Fall Hazards <input type="checkbox"/> <input checked="" type="checkbox"/> Specialized PPE Needs <input type="checkbox"/> <input type="checkbox"/> Traffic Control <input type="checkbox"/> <input checked="" type="checkbox"/> Waste Management/ Decontamination <input checked="" type="checkbox"/> <input type="checkbox"/> Weather Hazards / Heat Stress / Cold Stress <input type="checkbox"/> <input checked="" type="checkbox"/> Subcontractor Requirements (e.g., JHAs, THAs, procedures, reporting, etc.) <input type="checkbox"/> <input checked="" type="checkbox"/> Work Permits / Plans required (e.g., Fall Protection Confined Space, Hot Work, Critical Lifts etc.): in place, understood (identify/attach): <input type="checkbox"/> <input checked="" type="checkbox"/> Other Topics (describe/attach): <input type="checkbox"/> <input checked="" type="checkbox"/> Client specific requirements (describe): |
|--|--|

| | |
|--|---|
| 3. Daily Check Out by Site Supervisor | |
| Describe incidents, near misses, observations or Stop Work interventions from today: | Describe Lessons Learned/ Improvement Areas from today: |
| | |

The site is being left in a safe condition and work crew checked out as fit unless otherwise specified as above.

| | | |
|---|----------------------|--|
| Site Supervisor Name Gus Friedman | Signature | Date 4/15/22 Time (at end of day / shift) |
|---|----------------------|--|

Worker Acknowledgement / Sign In Sign Out sheets applicable to this meeting are on reverse and, if applicable, attached.

All employees:

- **STOP WORK** if concerned / uncertain about safety / hazard or additional precaution is not recorded on the THA.
- **Be alert and communicate any changes in personnel or conditions at the worksite to the supervisor.**
- **Reassess task, hazards, & mitigations on an ongoing basis; amend the THA if needed.**

SITE WORKERS (including AECOM Contractors and Subcontractors): Your signature below means that you understand:

- * The requirement to participate in creating, reviewing, & updating hazard assessments (THA) applicable to your task(s).
- * The hazards & control measures associated with each task you are about to perform.
- * The permit to work requirements applicable to the work you are about to perform (if it includes permitted activities).
- * That no tasks or work is to be performed without a hazard assessment.
- * Your authority & obligation to "Stop Work" intervene, speak up/ listen up.

Your initials (right columns) certify that you arrived & departed fit for duty, & have reported all incidents/near misses; meaning:

- * You are physically and mentally fit for duty and have inspected your required PPE to ensure satisfactory condition.
- * You are not under the influence of any type of medication, drugs, or alcohol that could affect your ability to work safely.
- * You are aware of your responsibility to immediately report any illness, injury (regardless of where or when it occurred), or impairment/fatigue issue to the AECOM Supervisor.
- * You signed out as fit / uninjured unless you have otherwise informed the AECOM Supervisor.

| Print Name & Company | Signature | Initials & Sign In Time | Initials & Sign Out Time |
|----------------------|---------------------|-------------------------|--------------------------|
| Nate Guyer Aecom | <i>Nate Guyer</i> | In & Fit NZJ 0915 | Out & Fit |
| Gus Friedman AECOM | <i>Gus Friedman</i> | In & Fit GF 0925 | Out & Fit |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |
| | | In & Fit | Out & Fit |

(Attach additional Site Worker sign-in/out sheets if needed) Identify number of attached sheets: _____

SITE VISITOR / SITE REPRESENTATIVE

| Name | Company Name | Arrival Time | Departure Time | Signature |
|------|--------------|--------------|----------------|-----------|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

DAILY FIELD LOG

Project Information

Page 1 of 3

| | |
|---------------------------|------------------------------|
| Project Name: <u>T-30</u> | Location: <u>Seattle</u> |
| Project/Task No.: _____ | Weather: <u>45, overcast</u> |
| Date: <u>4/15/22</u> | Personnel: <u>GF, NG</u> |

Observations

| Time | Observation Description |
|---------|---|
| 1 0925 | • GF onsite, NG already onsite prepping materials |
| 2 | • Scope: clean rotameters |
| 3 | Sample MW-59 (Spring sampling Day 2) |
| 4 | • Tailgate: traffic hazards - part activity is live |
| 5 | • Called Amy Spenberg to confirm part want need to |
| 6 | work around MW-59 this afternoon and she confirmed |
| 7 | → Also OK'd re-gauging MW-59 during lunch hour / low |
| 8 | tide. PK + RK were curious if LNAPL might present now |
| 9 | even though it didn't at high tide last night. |
| 10 | • SVE-10 has a crack in the bottom piece that threads |
| 11 | into the rotameter column (King model 0-60 SCFM) |
| 12 1135 | • GF + NG to gauge MW-59 again (low tide 1105) |
| 13 | → product at 9.24 ft btlc to product |
| 14 | water at 9.25 ft btlc |
| 15 | 0.01 ft of product |
| 16 1145 | • Back to cleaning rotameters |
| 17 | • Not all SVE pressure gauges are reading zero |
| 18 | SVE-4: 13" H ₂ O |
| 19 | SVE-5: 7" H ₂ O |
| 20 | SVE-7: 15" H ₂ O |
| 21 | SVE-10: 27" H ₂ O |
| 22 | SVE-9: 10" H ₂ O |
| 23 | SVE-6: 7" H ₂ O |
| 24 | SVE-6: 8" H ₂ O |
| 25 | • All AS gauges are zeroed out. |

all replaced w/ spares from core x

7 total. Can't adjust; need replacing.

Winters brand 0-100" H₂O bottom mount.

→ Still needs replacing. Order more gauge's.

Comments / Site Activities / Personnel Tracking

DAILY FIELD LOG

Project Information

Page 2 of 3

| | |
|---------------------------|--------------------------|
| Project Name: <u>T-30</u> | Location: _____ |
| Project/Task No.: _____ | Weather: _____ |
| Date: <u>4/15/22</u> | Personnel: <u>GF, NL</u> |

Observations

| Time | Observation Description |
|------|---|
| 1 | 1215 |
| 2 | • PVC nipple at base of SVE-8 rotameter snapped during removal of upper valve - fit was too tight. |
| 3 | • Same thing broken on SVE-5, though unclear if break was pre-existing. |
| 4 | |
| 5 | 1315 |
| 6 | • Called Marina to see if we can use the spare pressure gauges in the corex + order replacement nipples. No answer, left message |
| 7 | |
| 8 | 1415 |
| 9 | • Called Marina again, still no answer. Went ahead and installed the 6 spires we had on site. SVE-6 still needs a replacement. |
| 10 | |
| 11 | 1415 |
| 12 | • On SVE-5 and -9, the lower rotameter rod sheath and o-ring bumper were missing, allowing the float to drop all the way to bottom. PK recommends calling King to see if replacement parts are available. |
| 13 | |
| 14 | |
| 15 | → If we have to replace SVE-10 due to the crack in the base, we could steal the sheath/stopper from it |
| 16 | |
| 17 | 1530 |
| 18 | • Place order for 4 new 3/8" 40" close nipples with Ferguson. Won't be ready for pickup until Monday. |
| 19 | • SVE-7 removed for cleaning and its nipple broke as well if the valve is in there too tight, all the strain of removing it falls on the nipple at the base |
| 20 | |
| 21 | |
| 22 | • Call PK he gives the go-ahead to restart system at EOD with those 3 SVE wells closed off. Will return Monday morning to troubleshoot the fix |
| 23 | |
| 24 | |
| 25 | 1600 |
| | • Diameter of rotameter rod: "1/8" |

Comments / Site Activities / Personnel Tracking

DAILY FIELD LOG

Project Information

Page 3 of 3

| | |
|---------------------------|--------------------------|
| Project Name: <u>T-30</u> | Location: _____ |
| Project/Task No.: _____ | Weather: _____ |
| Date: <u>4/15/22</u> | Personnel: <u>GF, NG</u> |

Observations

| # | Time | Observation Description |
|----|------|---|
| 1 | | • Length of top bumper sleath: $\frac{3}{4}$ " |
| 2 | | bottom bumper sleath: $\frac{1}{2}$ " |
| 3 | 1610 | • Did not clean SVE -1, -2, or -3 as they were not fouled |
| 4 | | • Valves reinstalled on SVE -5, -7, and -8 in the OCF position. |
| 5 | | |
| 6 | | • NG finished cleaning AS rotameters. Several had deformed |
| 7 | | O-rings that need replacing. Order a pack of spares? |
| 8 | | → AS-12, AS-13, AS-27 at least. |
| 9 | | • ~12 gal of rinse water emptied into poly tank |
| 10 | 1620 | • Alarms on HMI wait clear for restart. PAH on SVE blower, also VAL. |
| 11 | | |
| 12 | | • Call PK, CB, no one is sure. Will leave system off until return to site Monday to finish repairs. |
| 13 | | |
| 14 | 1635 | • Clean up, lock up |
| 15 | 1645 | • GF, NG off site |
| 16 | | |
| 17 | | |
| 18 | | |
| 19 | | |
| 20 | | |
| 21 | | |
| 22 | | |
| 23 | | |
| 24 | | |
| 25 | | |

GF

Comments / Site Activities / Personnel Tracking

SAMPLE CHAIN OF CUSTODY

Report To Paul Kalina
 Company AECOM
 Address 1111 3rd Ave, Suite 1600
 City, State, ZIP Seattle, WA 98101
 Phone 206-438-2700 Email Paul.Kalina@Aecom.com

| | |
|--|------------|
| SAMPLERS (signature) <u>None of Gm</u> | |
| PROJECT NAME <u>T-30</u> | PO # |
| REMARKS | INVOICE TO |
| Project specific RLs? - Yes / No | |

Page # 1 of 1

| | |
|---|--|
| TURNAROUND TIME | |
| <input checked="" type="checkbox"/> Standard turnaround | |
| <input type="checkbox"/> RUSH | |
| Rush charges authorized by: _____ | |
| SAMPLE DISPOSAL | |
| <input type="checkbox"/> Archive samples | |
| <input type="checkbox"/> Other _____ | |
| Default: Dispose after 30 days | |

| Sample ID | Lab ID | Date Sampled | Time Sampled | Sample Type | # of Jars | ANALYSES REQUESTED | | | | | | | | | | Notes | | |
|-----------------|--------|--------------|--------------|-------------|-----------|--------------------|----------|---------------|------------|---------------|---------------|---------------|--|--|--|-------|--|--|
| | | | | | | NWTPH-Dx | NWTPH-Gx | BTEX EPA 8021 | NWTPH-HCID | VOCs EPA 8260 | PAHs EPA 8270 | PCBs EPA 8082 | | | | | | |
| RW-11A-0422 | | 4/14/22 | 1810 | GW | 4 | X | X | X | | | | | | | | | | with & without * Silica gel cleanup on DX |
| RW-11A-0422-MS | | 4/14/22 | 1810 | GW | 4 | X | X | X | | | | | | | | | | |
| RW-11A-0422-MSD | | 4/14/22 | 1810 | GW | 4 | X | X | X | | | | | | | | | | |
| MW-100-0422 | | 4/15/22 | 1230 | GW | 4 | X | X | X | | | | | | | | | | |
| MW-89-0422 | | 4/15/22 | 1330 | GW | 4 | X | X | X | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |

Friedman & Bruya, Inc.
 Ph. (206) 285-8282

| SIGNATURE | PRINT NAME | COMPANY | DATE | TIME |
|-------------------------------------|------------------------|----------------|----------------|-------------|
| Relinquished by: <u>[Signature]</u> | <u>GUS Friedman</u> | <u>AECOM</u> | <u>4/15/22</u> | <u>1710</u> |
| Received by: <u>[Signature]</u> | <u>Yelena Aravkine</u> | <u>F&B</u> | <u>4/15/22</u> | <u>1710</u> |
| Relinquished by: | | | | |
| Received by: | | | | |

DAILY FIELD LOG

Project Information

Page 1 of 2

| | |
|---------------------------|--------------------------------------|
| Project Name: <u>7-30</u> | Location: <u>Seattle</u> |
| Project/Task No.: | Weather: <u>70 sunny & smoky</u> |
| Date: <u>10/13/02</u> | Personnel: <u>GF, AC, ER</u> |

Observations

| Time | Observation Description |
|------|---|
| 1 | 1630 GF & ER arrive onsite. AC already here from system |
| 2 | of M earlier in the day. |
| 3 | → system shut down ~ 1550. only SVE had been on; AS |
| 4 | scope: Oct LNAPL gauging down for 71 week |
| 5 | Oct gw sampling |
| 6 | • Safety tailgate. Terminal has stop-work active, so |
| 7 | traffic hazards are minimal. Exposure hazards to |
| 8 | LNAPL. Ergonomic hazards during sampling |
| 9 | • AC & ER distribute supplies & equipment & go over |
| 10 | the gauging & sampling plan |
| 11 | 1730 • AC & ER LNAPL gauge |
| 12 | 1730 • GF started sampling at MW-93 |
| 13 | → MW-93-1022 sampled at 1900 |
| 14 | 1820 • ER started sampling at MW-36A |
| 15 | → MW-36A-1022 sampled at 1920 |
| 16 | 1845 • AC started sampling at RW-11A. RW-11A-1022 & Dup1-1022 |
| 17 | 1950 • GF started sampling at MW-92. Very hard to find, along |
| 18 | w/ MW-42. Neither marked. MW-42 had old tubing |
| 19 | in the well. |
| 20 | → MW-92-1022 sampled at 2045 |
| 21 | 2000 ER started sampling at MW-46B. Had to remove old CRETE |
| 22 | → MW-46B-1022 sampled at 2100 tubing. |
| 23 | 2030 AC started sampling at RW-9 |
| 24 | → RW-9-1022 sampled at 2117 |
| 25 | 2105 GF started sampling at MW-42 |

Comments / Site Activities / Personnel Tracking

DAILY FIELD LOG

Project Information

Page 2 of 2

| | |
|---------------------------|------------------------------|
| Project Name: <u>T-30</u> | Location: _____ |
| Project/Task No.: _____ | Weather: _____ |
| Date: <u>10/13/22</u> | Personnel: <u>GF, AC, ER</u> |

Observations

| Time | Observation Description |
|------|--|
| 1 | → DTB measured after sampling: 19.1 ft bgs |
| 2 | → MW-42-1022 Sampled at 2203 |
| 3 | 2125 ER started sampling MW-45A |
| 4 | → MW-45A-1022 Sampled at 2200 w/ MS/MSD |
| 5 | 2245 GF located & started setting up on RW-5A in middle of entry road |
| 6 | |
| 7 | → RW-5A-1022 Sampled at 2220 at 2340 |
| 8 | → Monument was filled w/ ~ 3 inches of fine dirt, covering the well cap. Dirt scooped out as much as possible, to ~ 1 in below well lip. |
| 9 | |
| 10 | |
| 11 | 2250 ER offsite for the night |
| 12 | 2305 AC offsite for the night |
| 13 | ~2145 AC started sampling at MW-39A |
| 14 | → MW-39A-1022 Sampled at 2229 |
| 15 | 2400 GF finished at RW-5A. It needs a new 4-in J-plug. The turbidity sensor on the KSI also may have gone haywire at the end, jumping between ~60 to 300 then back to 100 in the span of 30 seconds or so, after stabilizing around 300. |
| 16 | All other parameters were stable, so I sampled it. |
| 17 | |
| 18 | |
| 19 | |
| 20 | |
| 21 | 0015 System restarted. Had to clear a fault on the AS VFD & press "start" on the VFD itself to turn the AS system back on. Fault code was F0009. |
| 22 | |
| 23 | |
| 24 | |
| 25 | 0030 GF offsite. System gate & conax were all locked. |

Comments / Site Activities / Personnel Tracking

GF

Port of Seattle Terminal 30 -- LNAPL Gauging Event

| | |
|---------------------------------------|-----------------------------------|
| Field Technician(s): ER, AC | Client: Port of Seattle |
| Date: 10/13/2022 | Location: Terminal 30, Seattle |
| Project Number: 60681370 | Weather: 60s, sunny, smog. |
| Closest High Tide: 1404 | Closest Low Tide: 1911 |

| Location | Time of Gauging | Depth to LNAPL (Feet BTOC) | Depth to Water (Feet BTOC) | LNAPL Thickness (Feet) | Comments |
|----------|-----------------|----------------------------|----------------------------|------------------------|-------------------|
| MW-35 | 1719 | 9.42 | 9.44 | 0.02 | strong odor |
| MW-36 | 1758 | ND | 9.48 | - | strong odor |
| MW-59 | 1737 | 8 ND | 9.40 | - | |
| RW-1 | 1812 | 9.13 | 9.19 | 0.06 | Very Strong Odor |
| RW-12 | 1752 | 9.71 | 10.00 | 0.29 | strong odor |
| RW-103 | 1745 | ND | 9.23 | - | no lid on well is |
| RW-104 | 1727 | ND | 9.15 | - | |
| RW-106 | 1748 | 9.27 | 9.28 | 0.01 | Trace/minor LNAPL |
| RW-107 | 1747 | 9.55 | 9.96 | 0.41 | no lid |
| RW-110 | 1807 | ND | 9.89 | - | moderate odor |

Notes:

1. Feet BTOC = Feet below top of well casing.
2. LNAPL = Light Non-Aqueous Phase Liquid
3. ND = LNAPL not detected using interface probe.
4. NA - Not Available (not able to detect or measure)
5. TRACE, MINOR - Indications of LNAPL present, but no accurate measurement or below measurable amount.
6. During the 10/6/22 Ops Meeting, agreed that wells measured <0.01 ft for 1 yr can be removed from monitoring schedule. This pertained to MW-36A, -39A, -89, -93, and RW-101, -102, -105, -108, and -109.

Port of Seattle Terminal 30 -- Biannual Interior Well Gauging Event

| | |
|--|---------------------------------------|
| Field Technician(s): AC, ER, GF | Client: Port of Seattle |
| Date: 16-13-2022 | Location: Terminal 30, Seattle |
| Project Number: 60681370 | Weather: |
| Closest High Tide: | Closest Low Tide: |

| Location | Time of Gauging | Depth to LNAPL (Feet BTOC) | Depth to Water (Feet BTOC) | LNAPL Thickness (Feet) | Comments |
|--------------------|-----------------|----------------------------|----------------------------|------------------------|---|
| MW-35 ¹ | | | | | Gauging information can be found in the LNAPL gauging field form |
| MW-36 ¹ | | | | | Gauging information can be found in the LNAPL gauging field form |
| MW-54 | 1819 | — | 8.69 | 0 | Good condition; some dirt built up in monument |
| MW-64 | 1733 | — | 9.18 | 0 | Monument warped but still functional. Strong odor but no product detected |

Abbreviations:

BTOC = below top of well casing

LNAPL = Light Non-Aqueous Phase Liquid

NA - Not Available (not able to detect or measure)

ND = LNAPL not detected using interface probe.

TRACE, MINOR - Indications of LNAPL present, but no accurate measurement or below measurable amount.

Notes:

1. Well is in the LNAPL gauging protocol due to LNAPL measured >0.01 ft within the last year.

LOW-FLOW GROUND WATER SAMPLING FORM

Project Name: T-30
 Project Number: 60681370
 Date: 10/13/22
 Weather: 60°F

Well ID: MW-36A
 Sample ID: MW-36A-1022 [Well ID-MMY]
 Well Condition: fair
 Sampled by: ER

PRE-PURGE INFORMATION

Initial Depth to Water* (ft btoc): 10.0'
 Depth to Product* (ft btoc): NIA
 Product Thickness (ft): -
 Water Column (ft): 10.5'
 Water Volume in Well (gal): _____
 Inner Casing Diameter (Inch): 2
 Inner Casing Material: PVC

Purge/Sample Method: Low-Flow
 Purge/Sample Equipment: Peristaltic Pump
 Total Well Depth* (ft bgs): 20.5
 Screened Interval* (ft bgs): 5-20
 Tubing Inlet Depth* (ft): _____
 Sampling Tube Material: LPDE

Pipe equipment IDs

Probe: 7481
VSI: 46376

PURGING INFORMATION

Start Purge Time: 1849

| Time | Purge Rate (mL/min) | Depth to Water (ft) | Volume Purged (gal) | Temp (°C) | Conductivity (µS/m) | Dissolved Oxygen (mg/L) | pH (SI Units) | ORP mV | Turbidity (NTU) | Comments |
|------|---------------------|---------------------|---------------------|-----------|---------------------|-------------------------|---------------|--------|-----------------|------------------------------|
| 1850 | ~200 | 10.0 | 0 | 19.8 | 1984 | 31.7 | 6.84 | -87.8 | 270 | turbidity all over the plate |
| 1858 | 200 | 11.1 | ~0.5 | 19.9 | 1966 | 1.14 | 6.95 | -117.8 | 210 | " " |
| 1856 | ~150 | 11.08 | ~0.75 | 19.8 | 1954 | 0.76 | 6.99 | -126.5 | 125 | |
| 1859 | ~150 | 11.05 | ~1 | 19.7 | 1947 | 0.48 | 7.00 | -131.3 | 132 | |
| 1902 | ~150 | 11.05 | ~1.05 | 19.6 | 1931 | 0.31 | 7.01 | -135 | 97 | |
| 1905 | ~150 | 11.05 | ~1.05 | 19.6 | 1920 | 0.25 | 7.01 | -137 | 85 | |
| 1908 | ~150 | 11.7 | ~1.3 | 19.5 | 1911 | 0.22 | 7.01 | -138.2 | 80 | |
| 1911 | ~150 | 11.7 | ~1.5 | 19.5 | 1905 | 0.20 | 7.00 | -138.9 | 79 | |
| 1914 | ~150 | 11.7 | ~1.5 | 19.4 | 1902 | 0.19 | 6.99 | -139 | 73 | |
| | | | | | | | | | | |
| | | | | | | | | | | |

SAMPLING INFORMATION

| Sample ID(s) | Sample time(s) | Analysis | Method | Container | No. of bottles | Preservative |
|--------------|----------------|----------|--------------|--------------|----------------|--------------|
| MW-36A-1022 | 1920 | Gx/BTEX | NWTPH-G/BTEX | 40 mL VOA | 3 | HCL |
| | | Dx | NWTPH-Dx | 500 mL Amber | 1 | - |

STABILIZATION RANGES

Dissolved Oxygen: +/- 10%
 Conductivity: +/- 10%
 Temperature: +/- 10%
 pH: +/- 0.1 unit
 Redox Potential: +/- 10%
 Turbidity: +/- 10%

USEFUL INFORMATION

* = Measured from top of inner casing
 DTW - Depth to Water
 Initial purge 15 minutes, then measure at 3 minute intervals
 Water Levels Measured with an Electronic Water Level Meter
 Field parameter meter calibration results are recorded in the field book.

COMMENTS & OBSERVATIONS: (slow recharge, turbidity, odor, sheen, PID readings)

2" casing: 1 ft = 0.164 gal = 0.62 L
 4" casing: 1 ft = 0.656 gal = 2.48 L
 1 gal = 3785.4 mL

LOW-FLOW GROUND WATER SAMPLING FORM

Project Name: T-30
 Project Number: 60681370
 Date: 10-13-22
 Weather: _____ °F

Well ID: MW-39A
 Sample ID: MW-39A-1022 [Well ID-MMY]
 Well Condition: Good
 Sampled by: AC

PRE-PURGE INFORMATION

Initial Depth to Water* (ft btoc): 9.23
 Depth to Product* (ft btoc): —
 Product Thickness (ft): _____
 Water Column (ft): _____
 Water Volume in Well (gal): _____
 Inner Casing Diameter (Inch): 2
 Inner Casing Material: PVC

Purge/Sample Method: Low-Flow
 Purge/Sample Equipment: Peristaltic Pump
 Total Well Depth* (ft bgs): 20.5
 Screened Interval* (ft bgs): 5-20
 Tubing Inlet Depth* (ft): 15 ft
 Sampling Tube Material: LPDE

*Pine (Interface Probe ID: 40206)
 KSI ID: 51292*

PURGING INFORMATION

Start Purge Time: 2151

| Time | Purge Rate (mL/min) | Depth to Water (ft) | Volume Purged (gal) | Temp (°C) | Conductivity (mS/m) | Dissolved Oxygen (mg/L) | pH (SI Units) | ORP mV | Turbidity (NTU) | Comments |
|------|---------------------|---------------------|---------------------|-----------|---------------------|-------------------------|---------------|--------|-----------------|----------|
| 2154 | 250 | 9.27 | ↓ 2 | 21.1 | 1.574 | 1.20 | 7.05 | -128.2 | 15.82 | |
| 2159 | 150 | 9.25 | | 21.2 | 1.558 | 0.38 | 7.04 | -135.5 | 11.33 | |
| 2204 | 150 | 9.25 | | 21.0 | 1.526 | 0.22 | 7.01 | -139.1 | 10.24 | |
| 2209 | 150 | 9.25 | | 20.9 | 1.493 | 0.15 | 6.99 | -141.1 | 9.99 | |
| 2214 | 150 | 9.25 | | 20.9 | 1.461 | 0.13 | 6.96 | -141.5 | 9.44 | |
| 2217 | 150 | 9.25 | | 20.9 | 1.452 | 0.11 | 6.95 | -141.7 | 9.39 | |
| 2220 | 150 | 9.25 | | 20.9 | 1.440 | 0.11 | 6.93 | -141.6 | 9.26 | |
| 2223 | 150 | 9.25 | | 20.8 | 1.433 | 0.11 | 6.93 | -141.7 | 9.22 | |
| 2226 | 150 | 9.25 | | 20.8 | 1.426 | 0.10 | 6.92 | -141.8 | 9.46 | |
| | | | | | | | | | | |

SAMPLING INFORMATION

| Sample ID(s) | Sample time(s) | Analysis | Method | Container | No. of bottles | Preservative |
|--------------|----------------|----------|--------------|--------------|----------------|--------------|
| MW-39A-1022 | 2229 | Gx/BTEX | NWTPH-G/BTEX | 40 mL VOA | 3 | HCL |
| | | Dx | NWTPH-Dx | 500 mL Amber | 1 | — |

STABILIZATION RANGES

Dissolved Oxygen: +/- 10%
 Conductivity: +/- 10%
 Temperature: +/- 10%
 pH: +/- 0.1 unit
 Redox Potential: +/- 10%
 Turbidity: +/- 10%

USEFUL INFORMATION

* = Measured from top of inner casing
 DTW - Depth to Water
 Initial purge 15 minutes, then measure at 3 minute intervals
 Water Levels Measured with an Electronic Water Level Meter
 Field parameter meter calibration results are recorded in the field book.

COMMENTS & OBSERVATIONS: (slow recharge, turbidity, odor, sheen, PID readings)

2" casing: 1 ft = 0.164 gal = 0.62 L
 4" casing: 1 ft = 0.656 gal = 2.48 L
 1 gal = 3785.4 mL

LOW-FLOW GROUND WATER SAMPLING FORM

Project Name: T-30
 Project Number: 60681370
 Date: 10/13/22
 Weather: 60 °F Smoke

Well ID: MW-42
 Sample ID: MW-42-1022 [Well ID-MMYY]
 Well Condition: Good
 Sampled by: GIF

PRE-PURGE INFORMATION

Initial Depth to Water* (ft btoc): 9.92
 Depth to Product* (ft btoc): 0
 Product Thickness (ft): 0
 Water Column (ft): 9.18
 Water Volume in Well (gal): 1.51
 Inner Casing Diameter (Inch): 2
 Inner Casing Material: PVC

Purge/Sample Method: Low-Flow
 Purge/Sample Equipment: Peristaltic Pump
 Total Well Depth* (ft bgs): Assumed ~20 ft bgs.
 Screened Interval* (ft bgs): Unknown. Assumed to match other wells on site, ~5-20 ft bgs.
 Tubing Inlet Depth* (ft): 13.5
 Sampling Tube Material: LPDE

DTB = 19.1 ft bgs

PURGING INFORMATION

Start Purge Time: 2125

*Pipe Equipment
 YSI: 038335
 Probe: 32690*

| Time | Purge Rate (mL/min) | Depth to Water (ft) | Volume Purged (gal) | Temp (°C) | Conductivity (mS/m) | Dissolved Oxygen (mg/L) | pH (SI Units) | ORP mV | Turbidity (NTU) | Comments |
|------|---------------------|---------------------|---------------------|-----------|---------------------|-------------------------|---------------|--------|-----------------|----------|
| 2135 | | 10.76 | | 19.2 | 1498 | 0.44 | 6.75 | -96.8 | 2.8 | |
| 2140 | | 10.80 | | 19.2 | 1500 | 0.34 | 6.74 | -103.3 | 9.2 | |
| 2145 | | 10.81 | | 19.2 | 1500 | 0.28 | 6.73 | -108.1 | 27.0 | |
| 2150 | | 10.83 | | 19.1 | 1498 | 0.25 | 6.73 | -111.9 | 42.0 | |
| 2153 | | 10.84 | | 19.1 | 1496 | 0.24 | 6.73 | -113.0 | 47.2 | |
| 2156 | | 10.84 | | 19.1 | 1497 | 0.23 | 6.73 | -114.4 | 49.9 | |
| 2159 | | 10.85 | | 19.1 | 1496 | 0.23 | 6.73 | -115.8 | 51.9 | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

*Sampled
GIF*

SAMPLING INFORMATION

| Sample ID(s) | Sample time(s) | Analysis | Method | Container | No. of bottles | Preservative |
|--------------|----------------|----------|--------------|--------------|----------------|--------------|
| MW-42-1022 | 2203 | Gx/BTEX | NWTPH-G/BTEX | 40 mL VOA | 3 | HCL |
| | | Dx | NWTPH-Dx | 500 mL Amber | 1 | - |

STABILIZATION RANGES

- Dissolved Oxygen: +/- 10%
- Conductivity: +/- 10%
- Temperature: +/- 10%
- pH: +/- 0.1 unit
- Redox Potential: +/- 10%
- Turbidity: +/- 10%

USEFUL INFORMATION

* = Measured from top of inner casing
 DTW - Depth to Water
 Initial purge 15 minutes, then measure at 3 minute intervals
 Water Levels Measured with an Electronic Water Level Meter
 Field parameter meter calibration results are recorded in the field book.

COMMENTS & OBSERVATIONS: (slow recharge, turbidity, odor, sheen, PID readings)

purge water has an odor. No sheen, no color.

2" casing: 1 ft = 0.164 gal = 0.62 L
 4" casing: 1 ft = 0.656 gal = 2.48 L
 1 gal = 3785.4 mL

LOW-FLOW GROUND WATER SAMPLING FORM

Project Name: T-30
 Project Number: 60681370
 Date: 10/13/22
 Weather: 60 °F

Well ID: MW-45A + MS/MSD
 Sample ID: MW-45A-1022 [Well ID-MMYY]
 Well Condition: Muddy
 Sampled by: ER

PRE-PURGE INFORMATION

Initial Depth to Water* (ft btoc): 10.15
 Depth to Product* (ft btoc): —
 Product Thickness (ft): —
 Water Column (ft): 9.95
 Water Volume in Well (gal): _____
 Inner Casing Diameter (Inch): 2
 Inner Casing Material: PVC

Purge/Sample Method: Low-Flow
 Purge/Sample Equipment: Peristaltic Pump
 Total Well Depth* (ft bgs): 20.1
 Screened Interval* (ft bgs): 5.1-20.1
 Tubing Inlet Depth* (ft): _____
 Sampling Tube Material: LPDE

Pipe Equipment JDS
Probe: 7481
YSI: 46376

PURGING INFORMATION

Start Purge Time: 2129

| Time | Purge Rate (mL/min) | Depth to Water (ft) | Volume Purged (gal) | Temp (°C) | Conductivity (µS/cm) | Dissolved Oxygen (mg/L) | pH (SI Units) | ORP mV | Turbidity (NTU) | Comments |
|------|---------------------|---------------------|---------------------|-----------|----------------------|-------------------------|---------------|--------|-----------------|----------|
| 2127 | N150 | 10.40 | — | 17.7 | 866 | 0.60 | 6.70 | -47.6 | 15.27 | |
| 2137 | N150 | 10.40 | 0.5 | 17.8 | 859 | 0.29 | 6.67 | -72.6 | 9.81 | |
| 2147 | N150 | 10.48 | 1.0 | 17.7 | 866 | 0.22 | 6.70 | -86.1 | 7.57 | |
| 2150 | N150 | 10.48 | 1.25 | 17.7 | 871 | 0.20 | 6.71 | -89.7 | 6.55 | |
| 2153 | N150 | 10.51 | 1.5 | 17.7 | 875 | 0.19 | 6.73 | -93.4 | 6.87 | |
| 2156 | N150 | 10.51 | 1.75 | 17.6 | 876 | 0.19 | 6.73 | -95.1 | 6.45 | |
| | | | | | | | | | | |
| | | | | | | | | | | |
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SAMPLING INFORMATION

| Sample ID(s) | Sample time(s) | COC | Method | Container | No. of bottles | Preservative |
|--------------|----------------|----------------------------|--------------|--------------|----------------|--------------|
| MW-45A-1022 | 2200 | Gx/BTEX | NWTPH-G/BTEX | 40 mL VOA | 9 = 3 + 6 | HCL |
| | | Dx | NWTPH-Dx | 500 mL Amber | 3 = 1 + 2 | — |
| | | PAHs & 2-methylnaphthalene | SVOCs | 1 L Amber | 3 = 1 + 2 | — |

STABILIZATION RANGES

Dissolved Oxygen: +/- 10%
 Conductivity: +/- 10%
 Temperature: +/- 10%
 pH: +/- 0.1 unit
 Redox Potential: +/- 10%
 Turbidity: +/- 10%

USEFUL INFORMATION

* = Measured from top of inner casing
 DTW - Depth to Water
 Initial purge 15 minutes, then measure at 3 minute intervals
 Water Levels Measured with an Electronic Water Level Meter
 Field parameter meter calibration results are recorded in the field book.

COMMENTS & OBSERVATIONS: (slow recharge, turbidity, odor, sheen, PID readings)

2" casing: 1 ft = 0.164 gal = 0.62 L
 4" casing: 1 ft = 0.656 gal = 2.48 L
 1 gal = 3785.4 mL

*spl. ID = same for all +
 MS (MSD)*

LOW-FLOW GROUND WATER SAMPLING FORM

Project Name: T-30
 Project Number: 60681370
 Date: 10/13/22
 Weather: ~60 °F

Well ID: MW-468
 Sample ID: MW-468-1022 (Well ID-MMYY)
 Well Condition: good
 Sampled by: ER

PRE-PURGE INFORMATION

Initial Depth to Water* (ft btoc): 9.77
 Depth to Product* (ft btoc): NA
 Product Thickness (ft): NA
 Water Column (ft): 10.53
 Water Volume in Well (gal): _____
 Inner Casing Diameter (Inch): 2
 Inner Casing Material: PVC

Purge/Sample Method: Low-Flow
 Purge/Sample Equipment: Peristaltic Pump
 Total Well Depth* (ft bgs): 20.3
 Screened Interval* (ft bgs): 5.3-20.3
 Tubing Inlet Depth* (ft): _____

Sampling Tube Material: LPDE
19" 20.80
- 9.77
10.53
Pipe equipment + IDs
Probe: 7481
YSI: 46376

PURGING INFORMATION

Start Purge Time: 2020

| Time | Purge Rate (mL/min) | Depth to Water (ft) | Volume Purged (gal) | Temp (°C) | Conductivity (µS/m) | Dissolved Oxygen (mg/L) | pH (SI Units) | ORP mV | Turbidity (NTU) | Comments |
|------|---------------------|---------------------|---------------------|-----------|---------------------|-------------------------|---------------|--------|-----------------|----------|
| 2025 | ~150 | 10.47 | 0 | 17.6 | 1088 | 2.52 | 6.80 | -26.9 | 13.75 | |
| 2028 | ~150 | 10.45 | 0.25 | 17.8 | 1092 | 2.32 | 6.74 | -33.4 | 12.5 | |
| 2031 | ~150 | 10.45 | 0.5 | 18.0 | 1092 | 2.18 | 6.71 | -41.7 | 11.58 | |
| 2034 | ~150 | 10.45 | 0.6 | 17.8 | 1091 | 1.84 | 6.70 | -46.9 | 7.85 | |
| 2037 | ~150 | 10.48 | 0.75 | 17.8 | 1089 | 1.70 | 6.69 | -50.6 | 7.02 | |
| 2040 | ~150 | 10.49 | 0.85 | 17.8 | 1085 | 1.59 | 6.69 | -53.9 | 6.38 | |
| 2043 | ~150 | 10.52 | 1.0 | 17.8 | 1081 | 1.46 | 6.69 | -56.0 | 6.20 | |
| 2046 | ~150 | 10.55 | 1.15 | 17.8 | 1077 | 1.29 | 6.70 | -58.2 | 6.36 | |
| 2049 | ~150 | 10.58 | 1.30 | 17.8 | 1077 | 1.18 | 6.70 | -60.0 | 6.45 | |
| 2052 | ~150 | 10.61 | 1.45 | 17.7 | 1078 | 1.08 | 6.70 | -61.9 | 6.30 | |
| 2055 | ~150 | 10.64 | 1.60 | 17.7 | 1080 | 1.01 | 6.71 | -63.5 | 6.45 | |

SAMPLING INFORMATION

| Sample ID(s) | Sample time(s) | COC | Method | Container | No. of bottles | Preservative |
|--------------|----------------|----------------------------|--------------|--------------|----------------|--------------|
| MW-468-1022 | 200 | Gx/BTEX | NWTPH-G/BTEX | 40 mL VOA | 3 | HCL |
| | | Dx | NWTPH-Dx | 500 mL Amber | 1 | -- |
| | | PAHs & 2-methylnaphthalene | SVOCs | 1 L Amber | 1 | -- |

STABILIZATION RANGES

Dissolved Oxygen: +/- 10%
 Conductivity: +/- 10%
 Temperature: +/- 10%
 pH: +/- 0.1 unit
 Redox Potential: +/- 10%
 Turbidity: +/- 10%

USEFUL INFORMATION

* = Measured from top of inner casing
 DTW - Depth to Water
 Initial purge 15 minutes, then measure at 3 minute intervals
 Water Levels Measured with an Electronic Water Level Meter
 Field parameter meter calibration results are recorded in the field book.

COMMENTS & OBSERVATIONS: (slow recharge, turbidity, odor, sheen, PID readings)

2" casing: 1 ft = 0.164 gal = 0.62 L
 4" casing: 1 ft = 0.656 gal = 2.48 L
 1 gal = 3785.4 mL

LOW-FLOW GROUND WATER SAMPLING FORM

Project Name: T-30 Well ID: MW-92
 Project Number: 60681370 Sample ID: MW-92-1022 [Well ID-MMY] 22
 Date: 10/13/22 Well Condition: Good
 Weather: 60 °F smoky Sampled by: GR

PRE-PURGE INFORMATION

Initial Depth to Water* (ft btoc): 9.81 Purge/Sample Method: Low-Flow
 Depth to Product* (ft btoc): 0 Purge/Sample Equipment: Peristaltic Pump
 Product Thickness (ft): 0 Total Well Depth* (ft bgs): 20
 Water Column (ft): 10.19 Screened Interval* (ft bgs): 5-20
 Water Volume in Well (gal): 1.67 Tubing Inlet Depth* (ft): 12.5 ft bgs
 Inner Casing Diameter (Inch): 2 Sampling Tube Material: LPDE
 Inner Casing Material: PVC

Pipe Equipment
VST: 638335
Probe: 32690

PURGING INFORMATION

Start Purge Time: 2000

| Time | Purge Rate (mL/min) | Depth to Water (ft) | Volume Purged (gal) | Temp (°C) | Conductivity (µS/cm) | Dissolved Oxygen (mg/L) | pH (SI Units) | ORP mV | Turbidity (NTU) | Comments |
|----------------|---------------------|---------------------|---------------------|-----------|----------------------|-------------------------|---------------|--------|-----------------|----------|
| 2010 | 250 | 9.90 | | 18.2 | 951 | 0.48 | 6.68 | -139.3 | 1.9 | slight |
| 2015 | " | 9.93 | | 18.0 | 945 | 0.36 | 6.65 | -137.2 | 38.1 | no odor, |
| 2020 | " | 9.93 | | 17.9 | 943 | 0.32 | 6.64 | -136.1 | 47.3 | maybe a |
| 2025 | " | " | | 17.9 | 941 | 0.29 | 6.61 | -134.6 | 85.8 | slight |
| 2028 | " | " | | 17.9 | 939 | 0.25 | 6.61 | -134.1 | 85.3 | sheen. |
| 2031 | " | " | | 17.9 | 938 | 0.24 | 6.61 | -133.8 | 137.0 | |
| 2034 | " | " | | 17.8 | 936 | 0.23 | 6.60 | -133.3 | 219.5 | |
| 2037 | " | " | | 17.8 | 935 | 0.22 | 6.60 | -133.1 | 235.2 | |
| 2041 | " | " | | 17.8 | 933 | 0.20 | 6.60 | -132.6 | 253.1 | good |
| <u>SAMPLED</u> | | | | | | | | | | |

SAMPLING INFORMATION

| Sample ID(s) | Sample time(s) | COC | Method | Container | No. of bottles | Preservative |
|--------------|----------------|----------------------------|--------------|--------------|----------------|--------------|
| MW-92-1022 | 2045 | Gx/BTEX | NWTPH-G/BTEX | 40 mL VOA | 3 | HCL |
| | | Dx | NWTPH-Dx | 500 mL Amber | 1 | - |
| | | PAHs & 2-methylnaphthalene | SVOCs | 1 L Amber | 1 | - |

STABILIZATION RANGES

Dissolved Oxygen: +/- 10%
 Conductivity: +/- 10%
 Temperature: +/- 10%
 pH: +/- 0.1 unit
 Redox Potential: +/- 10%
 Turbidity: +/- 10%

USEFUL INFORMATION

* = Measured from top of inner casing
 DTW - Depth to Water
 Initial purge 15 minutes, then measure at 3 minute intervals
 Water Levels Measured with an Electronic Water Level Meter
 Field parameter meter calibration results are recorded in the field book.

COMMENTS & OBSERVATIONS: (slow recharge, turbidity, odor, sheen, PID readings)

Slight odor at times. Slight sheen, but could have been residual from the bucket.

2" casing: 1 ft = 0.164 gal = 0.62 L
 4" casing: 1 ft = 0.656 gal = 2.48 L
 1 gal = 3785.4 mL

LOW-FLOW GROUND WATER SAMPLING FORM

Project Name: T-30
 Project Number: 60681370
 Date: 10/13/22
 Weather: Sun, smoke 70°F

Well ID: MW-93
 Sample ID: MW-93-1022 [Well ID-MMYY]
 Well Condition: Good
 Sampled by: GFP

PRE-PURGE INFORMATION

Initial Depth to Water* (ft btoc): 9.73
 Depth to Product* (ft btoc): 0
 Product Thickness (ft): 0
 Water Column (ft): 10.77
 Water Volume in Well (gal): 1.77
 Inner Casing Diameter (Inch): 2
 Inner Casing Material: PVC

Purge/Sample Method: Low-Flow
 Purge/Sample Equipment: Peristaltic Pump
 Total Well Depth* (ft bgs): 20.5
 Screened Interval* (ft bgs): 5-20
 Tubing Inlet Depth* (ft): 12.5 ft bgs
 Sampling Tube Material: LPDE

PURGING INFORMATION

Start Purge Time: 1805

| Time | Purge Rate (ml/min) | Depth to Water (ft) | Volume Purged (gal) | Temp (°C) | specific Conductivity (µS/cm) | Dissolved Oxygen (mg/L) | pH (SI Units) | ORP mV | Turbidity (NTU) | Comments |
|------|---------------------|---------------------|---------------------|-----------|-------------------------------|-------------------------|---------------|--------|-----------------|----------|
| 1815 | 200 | 9.80 | | 21.2 | 1277 | 2.05 | 6.52 | -107.9 | 58.6 | |
| 1820 | " | 9.85 | | 20.6 | 1267 | 1.63 | 6.49 | -97.7 | 95.0 | |
| 1825 | " | 9.83 | | 20.5 | 1259 | 1.52 | 6.48 | -93.5 | 87.4 | |
| 1830 | " | 9.81 | | 20.6 | 1244 | 1.31 | 6.47 | -85.5 | 59.1 | |
| 1835 | " | 9.80 | | 20.6 | 1231 | 1.15 | 6.46 | -82.1 | 85.0 | |
| 1840 | " | 9.77 | | 20.5 | 1223 | 1.03 | 6.45 | -79.8 | 75.1 | |
| 1845 | " | 9.76 | | 20.5 | 1214 | 0.94 | 6.45 | -76.9 | 90.9 | |
| 1848 | " | 9.75 | | 20.5 | 1209 | 0.90 | 6.45 | -75.7 | 100.3 | |
| 1853 | " | 9.75 | | 20.5 | 1204 | 0.78 | 6.44 | -73.4 | 104.1 | |
| 1856 | " | 9.74 | | 20.5 | 1201 | 0.73 | 6.44 | -72.5 | 108.2 | |
| 1859 | " | 9.74 | | 20.5 | 1198 | 0.68 | 6.44 | -71.6 | 103.8 | GOOD ✓ |

SAMPLING INFORMATION

| Sample ID(s) | Sample time(s) | Analysis | Method | Container | No. of bottles | Preservative |
|--------------|----------------|----------|--------------|--------------|----------------|--------------|
| MW-93-1022 | 1900 | Gx/BTEX | NWTPH-G/BTEX | 40 mL VOA | 3 | HCL |
| | | Dx | NWTPH-Dx | 500 mL Amber | 1 | - |

STABILIZATION RANGES

Dissolved Oxygen: +/- 10%
 Conductivity: +/- 10%
 Temperature: +/- 10%
 pH: +/- 0.1 unit
 Redox Potential: +/- 10%
 Turbidity: +/- 10%

USEFUL INFORMATION

* = Measured from top of inner casing
 DTW - Depth to Water
 Initial purge 15 minutes, then measure at 3 minute intervals
 Water Levels Measured with an Electronic Water Level Meter
 Field parameter meter calibration results are recorded in the field book.

COMMENTS & OBSERVATIONS: (slow recharge, turbidity, odor, sheen, PID readings)

No noticeable odor, color, or sheen.

2" casing: 1 ft = 0.164 gal = 0.62 L
 4" casing: 1 ft = 0.656 gal = 2.48 L
 1 gal = 3785.4 mL

LOW-FLOW GROUND WATER SAMPLING FORM

Project Name: T-30
 Project Number: 60681370
 Date: 10/13/22
 Weather: 60 °F smoky

Well ID: RW-5A
 Sample ID: RW-5A-1022 [Well ID-MMY]
 Well Condition: Well is good, monument full of dirt.
 Sampled by: G.F. Needs a new 5-plug (4-in)

PRE-PURGE INFORMATION

Initial Depth to Water* (ft btoc): 8.83
 Depth to Product* (ft btoc): -
 Product Thickness (ft): 0
 Water Column (ft): ~10.27
 Water Volume in Well (gal): ~~10.27~~ 0.74
 Inner Casing Diameter (Inch): 4
 Inner Casing Material: PVC

Purge/Sample Method: Low-Flow
 Purge/Sample Equipment: Peristaltic Pump
 Total Well Depth* (ft bgs): 20
 Screened Interval* (ft bgs): 5-20
 Tubing Inlet Depth* (ft): 12.5 ft bgs
 Sampling Tube Material: LPDE

YGS: 038235
 OWI probe: 32690

PURGING INFORMATION

Start Purge Time: 2255

| Time | Purge Rate (mL/min) | Depth to Water (ft) | Volume Purged (gal) | Temp (°C) | Conductivity (mS/cm) | Dissolved Oxygen (mg/L) | pH (SI Units) | ORP mV | Turbidity (NTU) | Comments |
|----------------|---------------------|---------------------|---------------------|-----------|----------------------|-------------------------|---------------|--------|-----------------|--|
| 2305 | | 8.87 | | 17.3 | 917 | 0.39 | 6.81 | -129.8 | 17.8 | |
| 2310 | | 8.88 | | 17.2 | 914 | 0.31 | 6.79 | -131.7 | 35.4 | |
| 2315 | | " | | 17.0 | 907 | 0.27 | 6.80 | -133.3 | 52.7 | |
| 2320 | | " | | 16.8 | 900 | 0.24 | 6.80 | -135.2 | 73.7 | |
| 2323 | | " | | 16.7 | 895 | 0.23 | 6.80 | -136.1 | 83.0 | |
| 2326 | | " | | 16.6 | 886 | 0.21 | 6.80 | -137.4 | 106.8 | |
| 2329 | | " | | 16.6 | 881 | 0.20 | 6.80 | -138.1 | 294 | |
| 2332 | | " | | 16.6 | 879 | 0.20 | 6.80 | -138.4 | 300.2 | good |
| 2335 | | " | | 16.6 | 878 | 0.20 | 6.80 | -138.6 | 320.5 | good |
| SAMPLED | | | | | | | | | | see comments below. Turbidity likely really in the 100 NTU range. |

SAMPLING INFORMATION

| Sample ID(s) | Sample time(s) | Analysis | Method | Container | No. of bottles | Preservative |
|--------------|----------------|----------|--------------|--------------|----------------|--------------|
| RW-5A-1022 | 2340 | Gx/BTEX | NWTPH-G/BTEX | 40 mL VOA | 3 | HCL |
| | | Dx | NWTPH-Dx | 500 mL Amber | 1 | - |

STABILIZATION RANGES

Dissolved Oxygen: +/- 10%
 Conductivity: +/- 10%
 Temperature: +/- 10%
 pH: +/- 0.1 unit
 Redox Potential: +/- 10%
 Turbidity: +/- 10%

USEFUL INFORMATION

* = Measured from top of inner casing
 DTW - Depth to Water
 Initial purge 15 minutes, then measure at 3 minute intervals
 Water Levels Measured with an Electronic Water Level Meter
 Field parameter meter calibration results are recorded in the field book.

COMMENTS & OBSERVATIONS: (slow recharge, turbidity, odor, sheen, PID readings)

0.8 ft from ground surface to TOC. DTW initially ~9.73 ft bgs. ~2.25 ft water initially above tubing inlet. Turbidity sensor might be off - dropped from 320 down to 50 right before sampling.

2" casing: 1 ft = 0.164 gal = 0.62 L
 4" casing: 1 ft = 0.656 gal = 2.48 L
 1 gal = 3785.4 mL

LOW-FLOW GROUND WATER SAMPLING FORM

Project Name: T-30
 Project Number: 60681370
 Date: 10/13/22
 Weather: 64 °F

Well ID: RW-11A + Dup 1
 Sample ID: RW-11A-1022 [Well ID-MMYY]
 Well Condition: Good
 Sampled by: AK

PRE-PURGE INFORMATION

Initial Depth to Water* (ft btoc): 9.65
 Depth to Product* (ft btoc): NA
 Product Thickness (ft): —
 Water Column (ft): _____
 Water Volume in Well (gal): _____
 Inner Casing Diameter (Inch): 4
 Inner Casing Material: PVC

Purge/Sample Method: Low-Flow
 Purge/Sample Equipment: Peristaltic Pump
 Total Well Depth* (ft bgs): 20
 Screened Interval* (ft bgs): 5-20
 Tubing Inlet Depth* (ft): 15 ft
 Sampling Tube Material: LPDE

Interface Probe ID: 40206) Pine
 YSI ID: 51292

PURGING INFORMATION

Start Purge Time: 1909

| Time | Purge Rate (mL/min) | Depth to Water (ft) | Volume Purged (gal) | Temp (°C) | Conductivity (mS/m) | Dissolved Oxygen (mg/L) | pH (SI Units) | ORP mV | Turbidity (NTU) | Comments |
|------|---------------------|---------------------|---------------------|-----------|---------------------|-------------------------|---------------|--------|-----------------|----------|
| 1911 | 300 | 9.78 | | 21.3 | 1.388 | 0.99 | 6.97 | 19.4 | 3.81 | |
| 1916 | 200 | 9.87 | | 21.4 | 1.383 | 0.46 | 6.96 | -5.2 | 4.56 | |
| 1921 | 150 | 9.89 | | 21.3 | 1.382 | 0.36 | 6.96 | -14.2 | 4.23 | |
| 1926 | 150 | 9.89 | | 21.4 | 1.384 | 0.28 | 6.95 | -23.7 | 4.99 | |
| 1931 | 150 | 9.90 | | 21.3 | 1.387 | 0.26 | 6.94 | -26.9 | 4.34 | |
| 1934 | 150 | 9.90 | | 21.3 | 1.387 | 0.25 | 6.94 | -21.4 | 3.08 | |
| 1937 | 150 | 9.91 | | 21.3 | 1.388 | 0.23 | 6.93 | -28.1 | 3.10 | |
| 1940 | 150 | 9.90 | ↓ | 21.2 | 1.390 | 0.22 | 6.92 | -29.4 | 3.45 | |
| | | | 1.25 | | | | | | | |

SAMPLING INFORMATION

| Sample ID(s) | Sample time(s) | Analysis | Method | Container | No. of bottles | Preservative |
|--------------|----------------|----------|--------------|--------------|----------------|--------------|
| RW-11A-1022 | 1943 | Gx/BTEX | NWTPH-G/BTEX | 40 mL VOA | 3 | HCL |
| Dup1 -1022 | 2000 | Dx | NWTPH-Dx | 500 mL Amber | 1 | -- |

STABILIZATION RANGES

Dissolved Oxygen: +/- 10%
 Conductivity: +/- 10%
 Temperature: +/- 10%
 pH: +/- 0.1 unit
 Redox Potential: +/- 10%
 Turbidity: +/- 10%

USEFUL INFORMATION

* = Measured from top of inner casing
 DTW - Depth to Water
 Initial purge 15 minutes, then measure at 3 minute intervals
 Water Levels Measured with an Electronic Water Level Meter
 Field parameter meter calibration results are recorded in the field book.

COMMENTS & OBSERVATIONS: (slow recharge, turbidity, odor, sheen, PID readings)

2" casing: 1 ft = 0.164 gal = 0.62 L
 4" casing: 1 ft = 0.656 gal = 2.48 L
 1 gal = 3785.4 mL



INSTRUMENT CALIBRATION REPORT

Pine Environmental Services LLC

7332 S. Alton Way, Bldg. 13, Suite E.
Centennial, CO 80112
Toll-free: (866) 960-PINE (7463)

Pine Environmental Services, Inc.

Instrument ID 51292
Description Pro DSS Display
Calibrated 10/10/2022 4:54:48PM

| | |
|--|------------------------|
| Manufacturer YSI | State Certified |
| Model Number Pro DSS | Status Pass |
| Serial Number/ Lot Number 21D221618 | Temp °C 25 |
| Location Colorado | Humidity % 16 |
| Department | |

Calibration Specifications

| <u>Group #</u> | <u>Group Name</u> | <u>Stated Accy</u> | <u>Range Acc %</u> | <u>Reading Acc %</u> | <u>Plus/Minus</u> | <u>Nom In Val / In Val</u> | <u>In Type</u> | <u>Out Val</u> | <u>Out Type</u> | <u>Fnd As</u> | <u>Lft As</u> | <u>Dev%</u> | <u>Pass/Fail</u> |
|----------------|-------------------|--------------------|--------------------|----------------------|-------------------|----------------------------|----------------|----------------|-----------------|---------------|---------------|-------------|------------------|
|----------------|-------------------|--------------------|--------------------|----------------------|-------------------|----------------------------|----------------|----------------|-----------------|---------------|---------------|-------------|------------------|

Test Instruments Used During the Calibration

(As Of Cal Entry Date)

| <u>Test Standard ID</u> | <u>Description</u> | <u>Manufacturer</u> | <u>Model Number</u> | <u>Serial Number / Lot Number</u> | <u>Last Cal Date / Expiration Date</u> | <u>Next Cal Date / Expiration Date</u> | <u>Opened Date</u> |
|-------------------------|--------------------|---------------------|---------------------|-----------------------------------|--|--|--------------------|
|-------------------------|--------------------|---------------------|---------------------|-----------------------------------|--|--|--------------------|

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Kevin Morin

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment
Please call 800-301-9663 for Technical Assistance



INSTRUMENT CALIBRATION REPORT

Pine Environmental Services LLC

7332 S. Alton Way, Bldg. 13, Suite E.
Centennial, CO 80112
Toll-free: (866) 960-PINE (7463)

Pine Environmental Services, Inc.

Instrument ID 51293
Description YSI Pro DSS Sonde
Calibrated 10/10/2022 4:54:10PM

| | | | | | | | |
|---|-----------------------------|----------------|-----------------|---------------|---------------|-------------|------------------|
| Group # 5 | Range Acc % 0.0000 | | | | | | |
| Group Name Dissolved Oxygen Span | Reading Acc % 3.0000 | | | | | | |
| Stated Accy Pct of Reading | Plus/Minus 0.00 | | | | | | |
| Nom In Val / In Val | In Type | Out Val | Out Type | Fnd As | Lft As | Dev% | Pass/Fail |
| 100.00 / 100.00 | % | 100.00 | % | 102.30 | 100.00 | 0.00% | Pass |

| <u>Test Instruments Used During the Calibration</u> | | | | | <u>(As Of Cal Entry Date)</u> | |
|---|-----------------------------------|-----------------------------------|---------------------|-----------------------------------|------------------------------------|--|
| <u>Test Standard ID</u> | <u>Description</u> | <u>Manufacturer</u> | <u>Model Number</u> | <u>Serial Number / Lot Number</u> | <u>Last Cal Date / Opened Date</u> | <u>Next Cal Date / Expiration Date</u> |
| CO 126/124 NTU (22A214...) | CO 126/124 YSI NTU 21L21440187 | YSI | 607300 | 22A21460130 | | 1/30/2023 |
| CO AUTO CAL 0NTU/PH4 18262406 | CO AUTO CAL 0NTU/PH4 18262406 | AMCOCLEAR | | 18262406 | | |
| CO COND 1.413(2GG653) | 1413 COND STND LOT | AquaPhoenix Scientific | 31986 | 2GG653 | | 7/30/2023 |
| CO ORP 240MV(2GI207) | ORP SOLUTION 240 mV | Pine Environmental Services, Inc. | 32001 | 2GI207 | | 6/1/2023 |
| CO PH 4 1GF009 | CO PH 7 | AquaPhoenix Scientific | | 1GF009 | | 6/1/2023 |
| CO PH10 1GD492 | CO PH10 | AquaPhoenix Scientific | | 1GD492 | | 4/1/2023 |
| CO PH7 1GF460 | CO PH 7 | AquaPhoenix Scientific | BU5007-T | | | 6/1/2023 |
| CO ZERO DO | CO Zero Dissolved Oxygen Solution | Hanna | HI7040L | S0021/18 | | 3/1/2023 |

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Kevin Morin



INSTRUMENT CALIBRATION REPORT

Pine Environmental Services LLC

7332 S. Alton Way, Bldg. 13, Suite E.
Centennial, CO 80112

Toll-free: (866) 960-PINE (7463)

Pine Environmental Services, Inc.

Instrument ID 51293
Description YSI Pro DSS Sonde
Calibrated 10/10/2022 4:54:10PM

Manufacturer YSI
Model Number Pro DSS
Serial Number/ Lot Number 21E100011
Location Colorado
Department

State Certified
Status Pass
Temp °C 25
Humidity % 16

Calibration Specifications

Group # 1
Group Name PH
Stated Accy Pct of Reading
Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.00

| <u>Nom In Val / In Val</u> | <u>In Type</u> | <u>Out Val</u> | <u>Out Type</u> | <u>Fnd As</u> | <u>Lft As</u> | <u>Dev%</u> | <u>Pass/Fail</u> |
|----------------------------|----------------|----------------|-----------------|---------------|---------------|-------------|------------------|
| 7.00 / 7.00 | PH | 7.00 | PH | 6.94 | 7.00 | 0.00% | Pass |
| 4.00 / 4.00 | PH | 4.00 | PH | 4.23 | 4.00 | 0.00% | Pass |
| 10.00 / 10.00 | PH | 10.00 | PH | 9.83 | 10.00 | 0.00% | Pass |

Group # 2
Group Name Turbidity
Stated Accy Pct of Reading
Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.00

| <u>Nom In Val / In Val</u> | <u>In Type</u> | <u>Out Val</u> | <u>Out Type</u> | <u>Fnd As</u> | <u>Lft As</u> | <u>Dev%</u> | <u>Pass/Fail</u> |
|----------------------------|----------------|----------------|-----------------|---------------|---------------|-------------|------------------|
| 0.00 / 0.00 | NTU | 0.00 | NTU | 0.00 | 0.00 | 0.00% | Pass |
| 124.00 / 124.00 | NTU | 124.00 | NTU | 126.00 | 124.00 | 0.00% | Pass |

Group # 3
Group Name Conductivity
Stated Accy Pct of Reading
Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.000

| <u>Nom In Val / In Val</u> | <u>In Type</u> | <u>Out Val</u> | <u>Out Type</u> | <u>Fnd As</u> | <u>Lft As</u> | <u>Dev%</u> | <u>Pass/Fail</u> |
|----------------------------|----------------|----------------|-----------------|---------------|---------------|-------------|------------------|
| 1.413 / 1.413 | ms/cm | 1.413 | ms/cm | 1.430 | 1.413 | 0.00% | Pass |

Group # 4
Group Name Redox (ORP)
Stated Accy Pct of Reading
Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.00

| <u>Nom In Val / In Val</u> | <u>In Type</u> | <u>Out Val</u> | <u>Out Type</u> | <u>Fnd As</u> | <u>Lft As</u> | <u>Dev%</u> | <u>Pass/Fail</u> |
|----------------------------|----------------|----------------|-----------------|---------------|---------------|-------------|------------------|
| 240.00 / 240.00 | mv | 240.00 | mv | 243.50 | 240.00 | 0.00% | Pass |

Group # 5
Group Name Dissolved Oxygen Span
Stated Accy Pct of Reading
Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.00

| <u>Nom In Val / In Val</u> | <u>In Type</u> | <u>Out Val</u> | <u>Out Type</u> | <u>Fnd As</u> | <u>Lft As</u> | <u>Dev%</u> | <u>Pass/Fail</u> |
|----------------------------|----------------|----------------|-----------------|---------------|---------------|-------------|------------------|
|----------------------------|----------------|----------------|-----------------|---------------|---------------|-------------|------------------|

INSTRUMENT CALIBRATION REPORT



Pine Environmental Services LLC

3225 South 116th St.
Building 1 Suite 181
Tukwila, WA 98168
425-285-9102

Pine Environmental Services, Inc.

Instrument ID 40206
Description Solinst IP (200 ft)
Calibrated 10/11/2022 5:41:18PM

| | |
|---|------------------------|
| Manufacturer Solinst | State Certified |
| Model Number N/A | Status Pass |
| Serial Number/ Lot Number 312227 | Temp °C 23 |
| Location Seattle | Humidity % 43 |
| Department | |

Calibration Specifications

| Group # | Group Name | Stated Accy | Range Acc % | Reading Acc % | Plus/Minus | | | | |
|----------------------------|----------------|----------------|-----------------|---------------|---------------|-------------|------------------|--|--|
| <u>Nom In Val / In Val</u> | <u>In Type</u> | <u>Out Val</u> | <u>Out Type</u> | <u>Fnd As</u> | <u>Lft As</u> | <u>Dev%</u> | <u>Pass/Fail</u> | | |

Test Instruments Used During the Calibration

(As Of Cal Entry Date)

| <u>Test Standard ID</u> | <u>Description</u> | <u>Manufacturer</u> | <u>Model Number</u> | <u>Serial Number / Lot Number</u> | <u>Last Cal Date/ Expiration Date</u> | <u>Next Cal Date / Expiration Date</u> | <u>Opened Date</u> |
|-------------------------|--------------------|---------------------|---------------------|-----------------------------------|---------------------------------------|--|--------------------|
|-------------------------|--------------------|---------------------|---------------------|-----------------------------------|---------------------------------------|--|--------------------|

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Larry Lorenzano

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment
Please call 800-301-9663 for Technical Assistance

INSTRUMENT CALIBRATION REPORT



Pine Environmental Services LLC

3225 South 116th St.
Building 1 Suite 181
Tukwila, WA 98168
425-285-9102

Pine Environmental Services, Inc.

Instrument ID 51630
Description Pine Environmental Peristaltic Pump
Calibrated 10/11/2022 1:03:56PM

| | |
|---|------------------------|
| Manufacturer Pine Environmental Services, Inc. | State Certified |
| Model Number | Status Pass |
| Serial Number/ Lot Number n/a | Temp °C 23 |
| Location Seattle | Humidity % 46 |
| Department | |

Calibration Specifications

Group # 1
Group Name
Test Performed: Yes **As Found Result:** Pass **As Left Result:** Pass

Test Instruments Used During the Calibration

(As Of Cal Entry Date)

| <u>Test Standard ID</u> | <u>Description</u> | <u>Manufacturer</u> | <u>Model Number</u> | <u>Serial Number / Lot Number</u> | <u>Next Cal Date / Last Cal Date/ Expiration Date</u> | <u>Opened Date</u> |
|-------------------------|--------------------|---------------------|---------------------|---------------------------------------|---|--------------------|
|-------------------------|--------------------|---------------------|---------------------|---------------------------------------|---|--------------------|

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Larry Lorenzano

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INSTRUMENT CALIBRATION REPORT



Pine Environmental Services LLC

3225 South 116th St.
Building 1 Suite 181
Tukwila, WA 98168
425-285-9102

Pine Environmental Services, Inc.

Instrument ID 38335
Description YSI PRO DSS Display
Calibrated 10/12/2022 1:03:53PM

| | |
|--|------------------------|
| Manufacturer YSI | State Certified |
| Model Number PRO DSS Display | Status Pass |
| Serial Number/ Lot Number 16M101962 | Temp °C 22 |
| Location Seattle | Humidity % 44 |
| Department | |

Calibration Specifications

Group # 1
Group Name Dataloging
Test Performed: Yes **As Found Result:** Pass **As Left Result:** Pass

Test Instruments Used During the Calibration

| <u>Test Standard ID</u> | <u>Description</u> | <u>Manufacturer</u> | <u>Model Number</u> | <u>Serial Number / Lot Number</u> | <u>(As Of Cal Entry Date)</u> | |
|-------------------------|--------------------|---------------------|---------------------|-----------------------------------|-----------------------------------|---------------------------------------|
| | | | | | <u>Last Cal Date/ Opened Date</u> | <u>Next Cal Date/ Expiration Date</u> |

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Jose Arroyo

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

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Please call 800-301-9663 for Technical Assistance

INSTRUMENT CALIBRATION REPORT



Pine Environmental Services LLC

3225 South 116th St.
Building 1 Suite 181
Tukwila, WA 98168
425-285-9102

Pine Environmental Services, Inc.

Instrument ID 34563
Description YSI ProDSS Sonde
Calibrated 10/12/2022 1:07:11PM

| | | | |
|-----------------------------------|----------------|-----------------------------|------------------|
| Group # 5 | | Range Acc % 0.0000 | |
| Group Name ORP | | Reading Acc % 3.0000 | |
| Stated Accy Pct of Reading | | Plus/Minus 0.00 | |
| Nom In Val / In Val | In Type | Out Val | Out Type |
| 240.00 / 240.00 | mv | 240.00 | mv |
| | | Fnd As | Lft As |
| | | 230.00 | 240.00 |
| | | Dev% | Pass/Fail |
| | | 0.00% | Pass |

| <u>Test Instruments Used During the Calibration</u> | | | | | <u>(As Of Cal Entry Date)</u> | |
|---|--------------------------------------|---------------------------|-----------------------------|-----------------------------------|------------------------------------|--|
| <u>Test Standard ID</u> | <u>Description</u> | <u>Manufacturer</u> | <u>Model Number</u> | <u>Serial Number / Lot Number</u> | <u>Last Cal Date / Opened Date</u> | <u>Next Cal Date / Expiration Date</u> |
| SEA AUTOCAL 22140172 | SEA AUTOCAL AMCO Clear | GFS | 8483 | 22140172 | | 4/30/2023 |
| SEA COND 1.413 µS/CM 2GE259 | Conductivity solution 1.413 µS/cm | AquaPhoenix Scientific | Conductivity 1.413 mS/cm | 2GE259 | | 5/31/2023 |
| SEA NTU 126 22G22290021 | SEA 126 NTU turbidity for YSI | YSI | 607300 | 22G22290021 | | 7/31/2023 |
| SEA ORP 240 2GG459 | 240 mV ORP Solution | AquaPhoenix Scientific | 32001 | 2GG459 | | 4/30/2023 |
| SEA PH 10 2GGG018 | pH 10 Buffer Solution | AquaPhoenix Scientific | 32034 | 2GGG018 | | 7/24/2024 |
| SEA PH 7 2GB314 | pH 7 Buffer Solution | AquaPhoenix Scientific | 32025 | 2GB314 | | 2/29/2024 |
| SEA PH4 2GG184 | pH 4 Buffer Solution | AquaPhoenix Scientific | 32017 | 2GG184 | | 7/31/2024 |

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Jose Arroyo

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

**Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment
Please call 800-301-9663 for Technical Assistance**

INSTRUMENT CALIBRATION REPORT



Pine Environmental Services LLC

3225 South 116th St.
Building 1 Suite 181
Tukwila, WA 98168
425-285-9102

Pine Environmental Services, Inc.

Instrument ID 34563
Description YSI ProDSS Sonde
Calibrated 10/12/2022 1:07:11PM

| | |
|--|------------------------|
| Manufacturer YSI | State Certified |
| Model Number Pro DSS Sonde | Status Pass |
| Serial Number/ Lot Number 18C104218 | Temp °C 22 |
| Location Seattle | Humidity % 45 |
| Department | |

Calibration Specifications

| <u>Nom In Val / In Val</u> | <u>In Type</u> | <u>Out Val</u> | <u>Out Type</u> | <u>Fnd As</u> | <u>Lft As</u> | <u>Dev%</u> | <u>Pass/Fail</u> |
|------------------------------------|----------------|----------------|-----------------|-----------------------------|---------------|-------------|------------------|
| Group # 1 | | | | Range Acc % 0.0000 | | | |
| Group Name Ph | | | | Reading Acc % 3.0000 | | | |
| Stated Accy Pct of Reading | | | | Plus/Minus 0.00 | | | |
| 7.00 / 7.00 | PH | 7.00 | PH | 7.36 | 7.02 | 0.29% | Pass |
| 4.00 / 4.00 | PH | 4.00 | PH | 4.01 | 4.00 | 0.00% | Pass |
| 10.00 / 10.00 | PH | 10.00 | PH | 10.87 | 10.05 | 0.50% | Pass |
| Group # 2 | | | | Range Acc % 0.0000 | | | |
| Group Name Condivity | | | | Reading Acc % 3.0000 | | | |
| Stated Accy Pct of Reading | | | | Plus/Minus 0.000 | | | |
| 1.413 / 1.413 | ms/cm | 1.413 | ms/cm | 1.195 | 1.413 | 0.00% | Pass |
| Group # 3 | | | | Range Acc % 0.0000 | | | |
| Group Name Turbidity | | | | Reading Acc % 3.0000 | | | |
| Stated Accy Pct of Reading | | | | Plus/Minus 0.00 | | | |
| 0.00 / 0.00 | NTU | 0.00 | NTU | -0.30 | 0.00 | 0.00% | Pass |
| 124.00 / 124.00 | NTU | 124.00 | NTU | 41.80 | 124.00 | 0.00% | Pass |
| Group # 4 | | | | Range Acc % 0.0000 | | | |
| Group Name Dissolved Oxygen | | | | Reading Acc % 3.0000 | | | |
| Stated Accy Pct of Reading | | | | Plus/Minus 0.00 | | | |
| 100.00 / 100.00 | % | 100.00 | % | 101.40 | 100.00 | 0.00% | Pass |
| Group # 5 | | | | Range Acc % 0.0000 | | | |
| Group Name ORP | | | | Reading Acc % 3.0000 | | | |
| Stated Accy Pct of Reading | | | | Plus/Minus 0.00 | | | |

INSTRUMENT CALIBRATION REPORT



Pine Environmental Services LLC

3225 South 116th St.
Building 1 Suite 181
Tukwila, WA 98168
425-285-9102

Pine Environmental Services, Inc.

Instrument ID 46801
Description Geotech Peristaltic Pump
Calibrated 10/11/2022 1:06:32PM

| | |
|---|------------------------|
| Manufacturer Pine Environmental Services, Inc. | State Certified |
| Model Number Geopump | Status Pass |
| Serial Number/ Lot Number n/a | Temp °C 23 |
| Location Seattle | Humidity % 46 |
| Department | |

Calibration Specifications

Group # 1
Group Name PERISTALSIS AND FUNCTIONAL TEST
Test Performed: Yes **As Found Result:** Pass **As Left Result:** Pass

Test Instruments Used During the Calibration

(As Of Cal Entry Date)

| <u>Test Standard ID</u> | <u>Description</u> | <u>Manufacturer</u> | <u>Model Number</u> | <u>Serial Number / Lot Number</u> | <u>Next Cal Date / Expiration Date</u> |
|-------------------------|--------------------|---------------------|---------------------|-----------------------------------|--|
|-------------------------|--------------------|---------------------|---------------------|-----------------------------------|--|

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Larry Lorenzano

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

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INSTRUMENT CALIBRATION REPORT



Pine Environmental Services LLC

3225 South 116th St.
Building 1 Suite 181
Tukwila, WA 98168
425-285-9102

Pine Environmental Services, Inc.

Instrument ID 32690
Description Solinst Interface
Calibrated 10/11/2022 5:40:48PM

| | |
|---|------------------------|
| Manufacturer Solinst | State Certified |
| Model Number IP | Status Pass |
| Serial Number/ Lot Number 251523 | Temp °C 23 |
| Location Seattle | Humidity % 43 |
| Department | |

Calibration Specifications

Group # 1
Group Name
Test Performed: Yes **As Found Result:** Pass **As Left Result:** Pass

Test Instruments Used During the Calibration

(As Of Cal Entry Date)

| <u>Test Standard ID</u> | <u>Description</u> | <u>Manufacturer</u> | <u>Model Number</u> | <u>Serial Number / Lot Number</u> | <u>Next Cal Date / Last Cal Date/ Expiration Date Opened Date</u> |
|-------------------------|--------------------|---------------------|---------------------|---------------------------------------|---|
|-------------------------|--------------------|---------------------|---------------------|---------------------------------------|---|

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Larry Lorenzano

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Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment
Please call 800-301-9663 for Technical Assistance

INSTRUMENT CALIBRATION REPORT



Pine Environmental Services LLC

3225 South 116th St.
Building 1 Suite 181
Tukwila, WA 98168
425-285-9102

Pine Environmental Services, Inc.

Instrument ID 7481
Description Solinst Interface
Calibrated 10/11/2022 5:40:10PM

| | |
|---|------------------------|
| Manufacturer Solinst | State Certified |
| Model Number IP 200' | Status Pass |
| Serial Number/ Lot Number 286714 | Temp °C 24 |
| Location Seattle | Humidity % 43 |
| Department | |

Calibration Specifications

Group # 1
Group Name
Test Performed: Yes **As Found Result:** Pass **As Left Result:** Pass

Test Instruments Used During the Calibration

(As Of Cal Entry Date)

| <u>Test Standard ID</u> | <u>Description</u> | <u>Manufacturer</u> | <u>Model Number</u> | <u>Serial Number / Lot Number</u> | <u>Next Cal Date / Expiration Date</u> |
|-------------------------|--------------------|---------------------|---------------------|-----------------------------------|--|
|-------------------------|--------------------|---------------------|---------------------|-----------------------------------|--|

Last Cal Date/ Opened Date

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Larry Lorenzano

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment
Please call 800-301-9663 for Technical Assistance

INSTRUMENT CALIBRATION REPORT



Pine Environmental Services LLC

3225 South 116th St.
Building 1 Suite 181
Tukwila, WA 98168
425-285-9102

Pine Environmental Services, Inc.

Instrument ID 46376
Description Pro DSS Display
Calibrated 10/6/2022 12:47:34PM

Manufacturer YSI
Model Number Pro DSS
Serial Number/ Lot Number 19D104639
Location Seattle
Department

State Certified
Status Pass
Temp °C 21
Humidity % 56

Calibration Specifications

| Group # | Group Name | Stated Accy | Range Acc % | Reading Acc % | Plus/Minus | Dev% | Pass/Fail |
|----------------------------|----------------|----------------|-----------------|---------------|---------------|-------------|------------------|
| <u>Nom In Val / In Val</u> | <u>In Type</u> | <u>Out Val</u> | <u>Out Type</u> | <u>Fnd As</u> | <u>Lft As</u> | <u>Dev%</u> | <u>Pass/Fail</u> |

Test Instruments Used During the Calibration

(As Of Cal Entry Date)

| <u>Test Standard ID</u> | <u>Description</u> | <u>Manufacturer</u> | <u>Model Number</u> | <u>Serial Number / Lot Number</u> | <u>Last Cal Date / Expiration Date</u> | <u>Next Cal Date / Expiration Date</u> |
|-------------------------|--------------------|---------------------|---------------------|-----------------------------------|--|--|
|-------------------------|--------------------|---------------------|---------------------|-----------------------------------|--|--|

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Jose Arroyo

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment
Please call 800-301-9663 for Technical Assistance

INSTRUMENT CALIBRATION REPORT



Pine Environmental Services LLC

3225 South 116th St.
Building 1 Suite 181
Tukwila, WA 98168
425-285-9102

Pine Environmental Services, Inc.

Instrument ID 46873
Description YSI Pro DSS
Calibrated 10/6/2022 12:43:56PM

| | | | | | | | |
|----------------------------|----------------------|----------------|-----------------|---------------|---------------|-------------|------------------|
| Group # | 5 | Range Acc % | 0.0000 | | | | |
| Group Name | Disolved Oxygen Span | Reading Acc % | 3.0000 | | | | |
| Stated Accy | Pct of Reading | Plus/Minus | 0.00 | | | | |
| <u>Nom In Val / In Val</u> | <u>In Type</u> | <u>Out Val</u> | <u>Out Type</u> | <u>Fnd As</u> | <u>Lft As</u> | <u>Dev%</u> | <u>Pass/Fail</u> |
| 100.00 / 100.00 | % | 100.00 | % | 105.10 | 100.00 | 0.00% | Pass |

| <u>Test Instruments Used During the Calibration</u> | | | | <u>(As Of Cal Entry Date)</u> | |
|---|--------------------------------------|---------------------------|-----------------------------|-----------------------------------|--|
| <u>Test Standard ID</u> | <u>Description</u> | <u>Manufacturer</u> | <u>Model Number</u> | <u>Serial Number / Lot Number</u> | <u>Next Cal Date / Expiration Date</u> |
| SEA AUTOCAL 22140172 | SEA AUTOCAL AMCO Clear | GFS | 8483 | 22140172 | 4/30/2023 |
| SEA COND 1.413 µS/CM 2GE259 | Conductivity solution 1.413 µS/cm | AquaPhoenix Scientific | Conductivity 1.413 mS/cm | 2GE259 | 5/31/2023 |
| SEA NTU 126 22C2205179 | SEA 126 NTU turbidity for YSI | YSI | 607300 | 22C2205179 | 3/31/2023 |
| SEA ORP 240 2GB110 | 240 mV ORP Solution | AquaPhoenix Scientific | 32001 | 2GB110 | 11/30/2022 |
| SEA PH 10 2GGG018 | pH 10 Buffer Solution | AquaPhoenix Scientific | 32034 | 2GGG018 | 7/24/2024 |
| SEA PH 7 2GB314 | pH 7 Buffer Solution | AquaPhoenix Scientific | 32025 | 2GB314 | 2/29/2024 |
| SEA PH4 2GG184 | pH 4 Buffer Solution | AquaPhoenix Scientific | 32017 | 2GG184 | 7/31/2024 |

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Jose Arroyo

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Please call 800-301-9663 for Technical Assistance**

INSTRUMENT CALIBRATION REPORT



Pine Environmental Services LLC

3225 South 116th St.
Building 1 Suite 181
Tukwila, WA 98168
425-285-9102

Pine Environmental Services, Inc.

Instrument ID 46873
Description YSI Pro DSS
Calibrated 10/6/2022 12:43:56PM

| | |
|--|------------------------|
| Manufacturer YSI | State Certified |
| Model Number Pro DSS | Status Pass |
| Serial Number/ Lot Number 19K104044 | Temp °C 21 |
| Location Seattle | Humidity % 56 |
| Department | |

Calibration Specifications

| | | | | Range Acc % | | | |
|---|----------------|----------------|-----------------|---------------|---------------|-------------|------------------|
| | | | | Reading Acc % | | | |
| | | | | Plus/Minus | | | |
| <u>Nom In Val / In Val</u> | <u>In Type</u> | <u>Out Val</u> | <u>Out Type</u> | <u>Fnd As</u> | <u>Lft As</u> | <u>Dev%</u> | <u>Pass/Fail</u> |
| Group # 1 | | | | 0.0000 | | | |
| Group Name PH | | | | 3.0000 | | | |
| Stated Accy Pct of Reading | | | | 0.00 | | | |
| 7.00 / 7.00 | PH | 7.00 | PH | 7.12 | 7.02 | 0.29% | Pass |
| 4.00 / 4.00 | PH | 4.00 | PH | 3.89 | 4.00 | 0.00% | Pass |
| 10.00 / 10.00 | PH | 10.00 | PH | 10.37 | 10.05 | 0.50% | Pass |
| Group # 2 | | | | 0.0000 | | | |
| Group Name Turbidity | | | | 3.0000 | | | |
| Stated Accy Pct of Reading | | | | 0.00 | | | |
| 0.00 / 0.00 | NTU | 0.00 | NTU | 1.20 | 0.00 | 0.00% | Pass |
| 124.00 / 124.00 | NTU | 124.00 | NTU | 127.51 | 124.02 | 0.02% | Pass |
| Group # 3 | | | | 0.0000 | | | |
| Group Name Conductivity | | | | 3.0000 | | | |
| Stated Accy Pct of Reading | | | | 0.0000 | | | |
| 1.413 / 1.413 | ms/cm | 1.413 | ms/cm | 1.174 | 1.413 | 0.00% | Pass |
| Group # 4 | | | | 0.0000 | | | |
| Group Name Redox (ORP) | | | | 3.0000 | | | |
| Stated Accy Pct of Reading | | | | 0.00 | | | |
| 240.00 / 240.00 | mv | 240.00 | mv | 238.90 | 240.00 | 0.00% | Pass |
| Group # 5 | | | | 0.0000 | | | |
| Group Name Dissolved Oxygen Span | | | | 3.0000 | | | |
| Stated Accy Pct of Reading | | | | 0.00 | | | |

INSTRUMENT CALIBRATION REPORT



Pine Environmental Services LLC

3225 South 116th St.
Building 1 Suite 181
Tukwila, WA 98168
425-285-9102

Pine Environmental Services, Inc.

Instrument ID 33239
Description Geo Pump
Calibrated 10/11/2022 1:07:19PM

| | |
|--------------------------------------|------------------------|
| Manufacturer Geotech | State Certified |
| Model Number 23672 | Status Pass |
| Serial Number/ Lot Number n/a | Temp °C 23 |
| Location Seattle | Humidity % 46 |
| Department | |

Calibration Specifications

Group # 1
Group Name Functional Test
Test Performed: Yes **As Found Result: Pass** **As Left Result: Pass**

Test Instruments Used During the Calibration

(As Of Cal Entry Date)

| <u>Test Standard ID</u> | <u>Description</u> | <u>Manufacturer</u> | <u>Model Number</u> | <u>Serial Number / Lot Number</u> | <u>Next Cal Date / Last Cal Date / Expiration Date / Opened Date</u> |
|-------------------------|--------------------|---------------------|---------------------|-----------------------------------|--|
|-------------------------|--------------------|---------------------|---------------------|-----------------------------------|--|

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Larry Lorenzano

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Please call 800-301-9663 for Technical Assistance

AECOM Daily Tailgate Meeting Summary

Project information

| | |
|-------------------------|-----------------|
| Project Name | T-30 |
| Project Number | 60681370 |
| Project Manager | Paul Kalina |
| Project Manager Phone # | 2063105097 |
| Muster Point location | Clubhouse |
| Meeting date | 10/13/2022 |
| Business Line | Environment |
| SH&E Manager | Tim Gilles |
| SH&E Manager Phone # | 3128335991 |
| First Aid Kit Location | Conex |
| Prepared by | Corley, Antonio |

Meeting Summary

| | |
|--------------------------------|--|
| Attendees | |
| Location | SODO |
| Tasks to be performed | Bi-weekly system O&M |
| Hazards to be considered today | pressure, noise, motion, electrical |
| Will there be Lone Workers? | Yes |
| Hierarchy of controls | administrativecontrols, ppe |
| Personal Protective Equipment | Task Specific: gloves, earprotection, sunscreen Mandatory: hardhat, safetyglasses, longpants, reflectivevest, workboots |
| High Risk Events | <ul style="list-style-type: none"> • Impact by vehicle or mobile equipment • Contact with moving parts of machinery • Uncontrolled release of stored energy |
| Topic of the week | Is your car parked properly - turn off, curbs, windows closed, reverse |

| | |
|------------------------|--|
| Topic of the week | parking |
| Other topics discussed | |
| Hazards | <ul style="list-style-type: none">• Motion• Noise• Pressure• Electrical |

DAILY FIELD LOG

Project Information

Page 1 of 4

| | |
|---------------------------|------------------------------------|
| Project Name: <u>T-30</u> | Location: <u>Seattle</u> |
| Project/Task No.: _____ | Weather: <u>SS, Smokey / Sunny</u> |
| Date: <u>10/19/22</u> | Personnel: <u>GF, CB</u> |

Observations

| # | Time | Observation Description |
|----|------|--|
| 1 | 0710 | • Arrive onsite, CB already here. |
| 2 | | • Scope: GW sample the 3 remaining tidal wells |
| 3 | | Troubleshoot the AS VFD |
| 4 | | • Safety tailgate: Traffic hazards are the most significant |
| 5 | | as the Port is operational today. |
| 6 | | SVE system ON on arrival, but AS system was down |
| 7 | | due to another VFD high temp fault. AS hr meter |
| 8 | | at 8030. |
| 9 | | → SVE system left ON for sampling |
| 10 | 0730 | • GF + CB set up on MW-58A. Target sample 70-130 min |
| 11 | | today's ^{after the} low-low tide. Today's low-low tide was 0640, |
| 12 | | so sample window was 0750-0850. |
| 13 | | → MW-58A-1022 sampled at 0823. |
| 14 | | • Some small rust-colored flecks were observed |
| 15 | | in the VOA samples that were not previously |
| 16 | | detected in the purgewater. |
| 17 | 0850 | • GF set up on MW-80B, and CB on MW-89. |
| 18 | | Both have target sample periods of 130-190 min |
| 19 | | after low-low tide, translating to 0850-0950. |
| 20 | | → MW-80B-1022 sampled at 0940. at |
| 21 | | → DUP 2-1022 sampled at "1200" |
| 22 | | → MW-89-1022 sampled at 0949. PH ^{was} and |
| 23 | | lower than ^{the} all other wells on site (3.75 vs ~7) |
| 24 | | and temp was higher (22.5°C vs ~19°C) |
| 25 | 1030 | • VFD troubleshooting |

Comments / Site Activities / Personnel Tracking

DAILY FIELD LOG

Project Information

Page 2 of 4

| | |
|---------------------------|--------------------------|
| Project Name: <u>T-30</u> | Location: <u>Seattle</u> |
| Project/Task No.: _____ | Weather: <u>60°</u> |
| Date: <u>10/19/22</u> | Personnel: <u>GF, CB</u> |

Observations

| Time | Observation Description |
|------|--|
| 1 | • VFD would not restart when we tested it on arrival, but immediately did when we pressed the "start" button at 1050. Not sure why. |
| 2 | |
| 3 | |
| 4 | <ul style="list-style-type: none"> • With heat exchanger OFF, temp switch is shutting the system down in the 100-110°F range, TAH fault. • The anemometer is measuring the air velocity out of the heat exchanger between ~150-650 fpm, depending where in the opening it is held. Lowest velocity is in the middle, & highest is to the right (Southern) side. → opening is 2.3 ft x 0.83 ft = 1.94 sf → Flow rate range = 290-1150 cfm → Sorage cabinet is ~3' x 6' x 4.25' = 76.5 cf. That means we're getting 3.75-15 air exchanges per minute. NOTE: vendor said the heat exchange should do 1700 cfm, assuming it has the motor he thought it would. Haven't confirmed. |
| 5 | |
| 6 | |
| 7 | |
| 8 | |
| 9 | |
| 10 | |
| 11 | |
| 12 | |
| 13 | |
| 14 | |
| 15 | |
| 16 | NOTE: vendor said the heat exchange should do |
| 17 | 1700 cfm, assuming it has the motor |
| 18 | he thought it would. Haven't confirmed. |
| 19 | 1155 • With the AS cabinet fully open, the heat exchanger |
| 20 | was keeping temps ~62°F. Ambient temps ~58°F. |
| 21 | 1157 • Cabinet doors closed to see effect on temps |
| 22 | 1224 → 72° on the thermometer. An A2010 code appeared |
| 23 | on the AS VFD, which is the lesser high temp |
| 24 | alarm. VFD stays on w/ it active. There doesn't appear |
| 25 | to be any reason to doubt the thermometer's accuracy. |

Comments / Site Activities / Personnel Tracking

DAILY FIELD LOG

Project Information

Page 3 of 4

| | |
|---------------------------|--------------------------|
| Project Name: <u>T-20</u> | Location: _____ |
| Project/Task No.: _____ | Weather: _____ |
| Date: <u>10/19/22</u> | Personnel: <u>GF, CB</u> |

Observations

| Time | Observation Description |
|------|--|
| 1 | The AS motor is warm but not hot to the touch. The |
| 2 | SVE motor is significantly hotter. Its discharge air |
| 3 | is ~100°F. |
| 4 | → A2010 code spontaneously stopped flashing, despite |
| 5 | no marked change in operation, ~12:50. |
| 6 | 12:25 • GF installed snubbers on all vertical SVE well leaders |
| 7 | (SVE-4-10). They work great, stabilizing previously very |
| 8 | unstable readings. Prior to install, one gauge was |
| 9 | estimated to be at 48 in H ₂ O, with a range of 42-54. |
| 10 | With the snubber installed, it was stable at 47 in H ₂ O. |
| 11 | → the horizontal SVE wells do not have the same vacuum |
| 12 | fluctuation and snubbers are not needed. |
| 13 | • GF installed a snubber & the new 0-15 in H ₂ O gauge |
| 14 | at the SVE discharge port, in place of the 0-100 in H ₂ O |
| 15 | gauge that always read 0. The new gauge reads |
| 16 | a steady 10.9 in H ₂ O. |
| 17 | → When the gauge was zeroed in its needle rotated |
| 18 | counterclockwise to 10.9, passing the bottom of |
| 19 | the gauge. Seemed odd, but was reproducible, with |
| 20 | and without the snubber. |
| 21 | → there are 4 snubbers left as spares. |
| 22 | 13:00 • New ball valves for the mag gauges are onsite but they |
| 23 | are 1/4" NPT and need to be 1/8". |
| 24 | • CB is troubleshooting the VFD. Eventually calls ABB |
| 25 | (the manufacturer) & determines that the motor is humming |

Comments / Site Activities / Personnel Tracking

DAILY FIELD LOG

Project Information

Page 4 of 4

| | |
|---------------------------|--------------------------|
| Project Name: <u>T-30</u> | Location: _____ |
| Project/Task No.: _____ | Weather: _____ |
| Date: <u>10/19/22</u> | Personnel: <u>GF, CB</u> |

Observations

| Time | Observation Description |
|------|--|
| 1 | to work too hard with the bleed valve at its current position. Full-load Amps are 9.6 but it was running at 10.5 and higher. ABB recommends using a current loop to determine whether it is actually sending that many amps to the motor. If it is, the motor has an issue. If it isn't, the VFD has an issue. I can try this during O+M on next Weds. |
| 2 | |
| 3 | |
| 4 | |
| 5 | |
| 6 | |
| 7 | |
| 8 | → in the meantime, we opened the bleed valve more to drop the amps down to 10 or so. Hopefully this avoids the faults |
| 9 | |
| 10 | |
| 11 | → we also confirmed there is no actual temp sensor in the motor it is communicating with. |
| 12 | → Cory has detailed notes on all of this |
| 13 | |
| 14 | 1430 • The temp sensor has an adjustable dial that has been set to 120°F. However, we observed TAT shutdowns earlier in the day when temps were 100-100F. We increased the dial to 130°F to compensate. |
| 15 | |
| 16 | |
| 17 | |
| 18 | 1515 • CB took a call for another project, but will stick around to check on the system when he is done. It was in the zone 2/zone 5 overlap period, and everything was running smoothly. |
| 19 | |
| 20 | |
| 21 | |
| 22 | • GF off site |
| 23 | |
| 24 | |
| 25 | } GF |

Comments / Site Activities / Personnel Tracking

LOW-FLOW GROUND WATER SAMPLING FORM

Project Name: T-30
 Project Number: 60681370
 Date: 10/19/22
 Weather: 50 cloudy°F

Well ID: MW-58A
 Sample ID: MW-58A-1022 [Well ID-MMY]
 Well Condition: Fair
 Sampled by: GF, CB

PRE-PURGE INFORMATION

Initial Depth to Water* (ft btoc): 10.93 @ 7:36
 Depth to Product* (ft btoc): -
 Product Thickness (ft): 0
 Water Column (ft): ~13.77
 Water Volume in Well (gal): ~2.26
 Inner Casing Diameter (Inch): 2
 Inner Casing Material: PVC

Purge/Sample Method: Low-Flow
 Purge/Sample Equipment: Peristaltic Pump
 Total Well Depth* (ft bgs): 25
 Screened Interval* (ft bgs): 5-25
 Tubing Inlet Depth* (ft): 18
 Sampling Tube Material: LPDE

Pipe Equipment:
YSI: 51292
Probe: 402026

PURGING INFORMATION

Start Purge Time: 7:42

****Tidal well, sample 70-130 min after the low-low tide

06:40

| Time | Purge Rate (mL/min) | Depth to Water (ft) | Volume Purged (gal) | Temp (°C) | Conductivity (mS/m) | Dissolved Oxygen (mg/L) | pH (SI Units) | ORP mV | Turbidity (NTU) | Comments |
|---------------------|---------------------|---------------------|---------------------|-----------|---------------------|-------------------------|---------------|--------|-----------------|----------|
| 0752 | 200 | 10.98 | | 19.2 | 1173 | 0.29 | 6.76 | -116.1 | 55.7 | |
| 0802 | " | 10.99 | | 19.2 | 1164 | 0.20 | 6.77 | -122.1 | 14.7 | |
| 0807 | " | " | | 19.2 | 1161 | 0.17 | 6.77 | -123.3 | 16.1 | |
| 0814 | " | 11.00 | | 19.2 | 1159 | 0.14 | 6.77 | -123.9 | 18.7 | |
| 0817 | " | 11.02 | | 19.1 | 1157 | 0.13 | 6.77 | -124.0 | 17.7 | |
| 0821 | " | | | 19.2 | 1157 | 0.12 | 6.76 | -124.2 | 17.5 | |
| <u>SAMPLED 0823</u> | | | | | | | | | | |
| <u>GF</u> | | | | | | | | | | |

SAMPLING INFORMATION

| Sample ID(s) | Sample time(s) | COC | Method | Container | No. of bottles | Preservative |
|--------------------|----------------|----------------------------|--------------|--------------|----------------|--------------|
| <u>MW-58A-1022</u> | <u>0823</u> | Gx/BTEX | NWTPH-G/BTEX | 40 mL VOA | 3 | HCL |
| | | Dx | NWTPH-Dx | 500 mL Amber | 1 | - |
| | | PAHs & 2-methylnaphthalene | SVOCs | 1 L Amber | 1 | - |

STABILIZATION RANGES

Dissolved Oxygen: +/- 10%
 Conductivity: +/- 10%
 Temperature: +/- 10%
 pH: +/- 0.1 unit
 Redox Potential: +/- 10%
 Turbidity: +/- 10%

COMMENTS & OBSERVATIONS: (slow recharge, turbidity, odor, sheen, PID readings)

Grass odor present
rust-colored flecks visible in VOAs that were not observed at end of purging.

USEFUL INFORMATION

* = Measured from top of inner casing
 DTW - Depth to Water
 Initial purge 15 minutes, then measure at 3 minute intervals
 Water Levels Measured with an Electronic Water Level Meter
 Field parameter meter calibration results are recorded in the field book.

2" casing: 1 ft = 0.164 gal = 0.62 L
 4" casing: 1 ft = 0.656 gal = 2.48 L
 1 gal = 3785.4 mL

LOW-FLOW GROUND WATER SAMPLING FORM

Project Name: T-30
 Project Number: 60681370
 Date: 10/19/22
 Weather: _____ °F

Well ID: MW-86B + Dup 2
 Sample ID: MW-86B-1022 [Well ID-MMYY]
 Well Condition: Fair
 Sampled by: GF

PRE-PURGE INFORMATION

Initial Depth to Water* (ft btoc): 12.03
 Depth to Product* (ft btoc): -
 Product Thickness (ft): 0
 Water Column (ft): ~7.07
 Water Volume in Well (gal): 1.16
 Inner Casing Diameter (Inch): 2
 Inner Casing Material: PVC

Purge/Sample Method: Low-Flow
 Purge/Sample Equipment: Peristaltic Pump
 Total Well Depth* (ft bgs): 20
 Screened Interval* (ft bgs): 5-20
 Tubing Inlet Depth* (ft): 16 bgs
 Sampling Tube Material: LPDE

Pipe Equipment
YSI: 51292
Probe: 40206

PURGING INFORMATION

Start Purge Time: 0907

****Tidal well, sample 130-190 min after the low-low tide

0640

| Time | Purge Rate (mL/min) | Depth to Water (ft) | Volume Purged (gal) | Temp (°C) | Conductivity (mS/m) | Dissolved Oxygen (mg/L) | pH (SI Units) | ORP mV | Turbidity (NTU) | Comments |
|-----------------|---------------------|---------------------|---------------------|-----------|---------------------|-------------------------|---------------|--------|-----------------|----------|
| 0917 | 200 | 12.02 | | 18.8 | 2022 | 0.29 | 7.16 | -90.4 | 527 | |
| 0927 | " | 12.54 | | 18.8 | 1946 | 0.20 | 7.14 | -109.1 | 334 | |
| 0932 | " | 12.51 | | 18.8 | 1931 | 0.17 | 7.14 | -114.0 | 2.41 | |
| 0935 | " | 12.49 | | 18.8 | 1921 | 0.16 | 7.14 | -114.9 | 1.44 | |
| 0938 | " | 12.48 | | 18.6 | 1917 | 0.15 | 7.13 | -116.8 | 1.07 | |
| — SAMPLE 0940 — | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

GF

SAMPLING INFORMATION

| Sample ID(s) | Sample time(s) | COC | Method | Container | No. of bottles | Preservative |
|--------------|----------------|----------------------------|--------------|--------------|----------------|--------------|
| MW-86B-1022 | 0940 1200 | Gx/BTEX | NWTPH-G/BTEX | 40 mL VOA | 3 3 | HCL |
| Dup 2-1022 | | Dx | NWTPH-Dx | 500 mL Amber | 1 1 | - |
| | | PAHs & 2-methylnaphthalene | SVOCs | 1 L Amber | 1 1 | - |

For Dup 2

STABILIZATION RANGES

Dissolved Oxygen: +/- 10%
 Conductivity: +/- 10%
 Temperature: +/- 10%
 pH: +/- 0.1 unit
 Redox Potential: +/- 10%
 Turbidity: +/- 10%

USEFUL INFORMATION

* = Measured from top of inner casing
 DTW - Depth to Water
 Initial purge 15 minutes, then measure at 3 minute intervals
 Water Levels Measured with an Electronic Water Level Meter
 Field parameter meter calibration results are recorded in the field book.

COMMENTS & OBSERVATIONS: (slow recharge, turbidity, odor, sheen, PID readings)
 N/A

2" casing: 1 ft = 0.164 gal = 0.62 L
 4" casing: 1 ft = 0.656 gal = 2.48 L
 1 gal = 3785.4 mL

LOW-FLOW GROUND WATER SAMPLING FORM

Project Name: T-30
 Project Number: 60681370
 Date: Oct 19, 2022
 Weather: ~55 °F

Well ID: MW-89
 Sample ID: MW-89-1022 [Well ID-MMY] GOOD
 Well Condition: GOOD
 Sampled by: Cary Broom

PRE-PURGE INFORMATION

Initial Depth to Water* (ft btoc): 10.53
 Depth to Product* (ft btoc): NP
 Product Thickness (ft): NP
 Water Column (ft): ASX 10.191
 Water Volume in Well (gal): 5.626 CB
 Inner Casing Diameter (Inch): 2
 Inner Casing Material: PVC

Purge/Sample Method: Low-Flow
 Purge/Sample Equipment: Peristaltic Pump
 Total Well Depth* (ft bgs): 20 19.6
 Screened Interval* (ft bgs): 5-20
 Tubing Inlet Depth* (ft bgs): ~14 (tubing won't go deeper)
 Sampling Tube Material: LPDE

PURGING INFORMATION

Start Purge Time: 909

****Tidal well, sample 130-190 min after the low-low tide

| Time | Purge Rate (mL/min) | Depth to Water (ft) | Volume Purged (gal) | Temp (°C) | Conductivity (mS/m) | Dissolved Oxygen (mg/L) | pH (SI Units) | ORP mV | Turbidity (NTU) | Comments |
|---|---------------------|---------------------|---------------------|-----------|---------------------|-------------------------|---------------|--------|-----------------|----------|
| 916 | 280 | 10.91 | | 23.2 | 2801 | 3.99 | 3.95 | 226 | 8.5 | |
| 925 | 230 | 10.83 | | 22.3 | 2757 | 4.64 | 3.76 | 292 | 8.6 | |
| 933 | 250 | 10.81 | | 22.5 | 2719 | 4.96 | 3.76 | 311 | 7.1 | |
| 936 | 200 | 10.80 | | 22.1 | 2700 | 5.07 | 3.76 | 319 | 8.8 | |
| 940 | 200 | 10.80 | | 22.2 | 2692 | 5.11 | 3.76 | 324 | 7.4 | |
| 943 | 200 | 10.80 | | 22.1 | 2688 | 5.14 | 3.76 | 327 | 4.5 | |
| Switch to 2nd YSI to confirm Temp & pH Readings | | | | | | | | | | |
| 948 | 200 | 10.7 | | 22.4 | 2947 | 5.26 | 3.48 | 227 | 1.2 | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

SAMPLING INFORMATION

| Sample ID(s) | Sample time(s) | Analysis | Method | Container | No. of bottles | Preservative |
|--------------|----------------|----------|--------------|--------------|----------------|--------------|
| MW-89-1022 | 949 | Gx/BTEX | NWTPH-G/BTEX | 40 mL VOA | 3 | HCL |
| | | Dx | NWTPH-Dx | 500 mL Amber | 1 | - |

STABILIZATION RANGES

Dissolved Oxygen: +/- 10%
 Conductivity: +/- 10%
 Temperature: +/- 10%
 pH: +/- 0.1 unit
 Redox Potential: +/- 10%
 Turbidity: +/- 10%

USEFUL INFORMATION

* = Measured from top of inner casing
 DTW - Depth to Water
 Initial purge 15 minutes, then measure at 3 minute intervals
 Water Levels Measured with an Electronic Water Level Meter
 Field parameter meter calibration results are recorded in the field book.

COMMENTS & OBSERVATIONS: (slow recharge, turbidity, odor, sheen, PID readings)

~3 gallons removed from well MW-89

2" casing: 1 ft = 0.164 gal = 0.62 L
 4" casing: 1 ft = 0.656 gal = 2.48 L
 1 gal = 3785.4 mL

Pipe Equipment
YSI: 46376
Probe: 7481

SAMPLE CHAIN OF CUSTODY

Report To Paul Kalina
 Company AECOM
 Address 1111 3rd Ave
 City, State, ZIP Seattle, WA 98101
 Phone 206-310-5097 Email Paul.kalina@aecom.com
Gus.friedman@aecom.com

| | |
|---|------------|
| SAMPLERS (signature) <u>Gus</u> | |
| PROJECT NAME <u>T-30</u> | PO # |
| REMARKS | INVOICE TO |
| Project specific RLs? - Yes / <u>No</u> | |

Page # 1 of 1

TURNAROUND TIME
 Standard turnaround
 RUSH
 Rush charges authorized by: _____

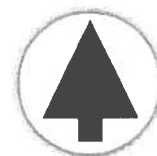
SAMPLE DISPOSAL
 Archive samples
 Other _____
 Default: Dispose after 30 days

| Sample ID | Lab ID | Date Sampled | Time Sampled | Sample Type | # of Jars | ANALYSES REQUESTED | | | | | | | | | | Notes | | | |
|-------------|--------|--------------|--------------|-------------|-----------|--------------------|----------|---------------|------------|---------------|---------------|---------------|---------------|--|---|-------|--|--|--------------------------------------|
| | | | | | | NWTPH-Dx | NWTPH-Gx | BTEX EPA 8021 | NWTPH-HCID | VOCs EPA 8260 | PAHs EPA 8270 | PCBs EPA 8082 | BTEX EPA 8260 | | | | | | |
| MW-89-1022 | | 10/19/22 | 0949 | gw | 4 | x | x | | | | | | | | | | | | |
| MW-58A-1022 | | 10/19/22 | 0823 | gw | 5 | x | x | | | | | | x | | x | | | | PAHs include 2-methyl naphthalene |
| MW-86B-1022 | | 10/19/22 | 0940 | gw | 5 | x | x | | | | | | x | | x | | | | |
| Dup2-1022 | | 10/19/22 | 1200 | gw | 5 | x | x | | | | | | x | | x | | | | |
| | | | | | | | | | | | | | | | | | | | |

Analyze Dx both with and without SGC

Friedman & Bruya, Inc.
 Ph. (206) 285-8282

| SIGNATURE | PRINT NAME | COMPANY | DATE | TIME |
|---------------------------------|---------------------|--------------|-----------------|-------------|
| Relinquished by: <u>Gus</u> | <u>Gus Friedman</u> | <u>AECOM</u> | <u>10/19/22</u> | <u>1640</u> |
| Received by: <u>Wesley Eard</u> | <u>Wesley Eard</u> | <u>FBI</u> | <u>10/19/22</u> | <u>1646</u> |
| Relinquished by: | | | | |
| Received by: | | | | |



INSTRUMENT CALIBRATION REPORT

Pine Environmental Services LLC

7332 S. Alton Way, Bldg. 13, Suite E.
Centennial, CO 80112
Toll-free: (866) 960-PINE (7463)

Pine Environmental Services, Inc.

Instrument ID 51292
Description Pro DSS Display
Calibrated 10/10/2022 4:54:48PM

| | |
|--|------------------------|
| Manufacturer YSI | State Certified |
| Model Number Pro DSS | Status Pass |
| Serial Number/ Lot Number 21D221618 | Temp °C 25 |
| Location Colorado | Humidity % 16 |
| Department | |

Calibration Specifications

| <u>Group #</u> | <u>Group Name</u> | <u>Stated Accy</u> | <u>Range Acc %</u> | <u>Reading Acc %</u> | <u>Plus/Minus</u> | <u>Nom In Val / In Val</u> | <u>In Type</u> | <u>Out Val</u> | <u>Out Type</u> | <u>Fnd As</u> | <u>Lft As</u> | <u>Dev%</u> | <u>Pass/Fail</u> |
|----------------|-------------------|--------------------|--------------------|----------------------|-------------------|----------------------------|----------------|----------------|-----------------|---------------|---------------|-------------|------------------|
|----------------|-------------------|--------------------|--------------------|----------------------|-------------------|----------------------------|----------------|----------------|-----------------|---------------|---------------|-------------|------------------|

Test Instruments Used During the Calibration

(As Of Cal Entry Date)

| <u>Test Standard ID</u> | <u>Description</u> | <u>Manufacturer</u> | <u>Model Number</u> | <u>Serial Number / Lot Number</u> | <u>Last Cal Date / Expiration Date</u> | <u>Next Cal Date / Expiration Date</u> |
|-------------------------|--------------------|---------------------|---------------------|-----------------------------------|--|--|
|-------------------------|--------------------|---------------------|---------------------|-----------------------------------|--|--|

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Kevin Morin

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment
Please call 800-301-9663 for Technical Assistance



INSTRUMENT CALIBRATION REPORT

Pine Environmental Services LLC

7332 S. Alton Way, Bldg. 13, Suite E.
Centennial, CO 80112

Toll-free: (866) 960-PINE (7463)

Pine Environmental Services, Inc.

Instrument ID 51293

Description YSI Pro DSS Sonde

Calibrated 10/10/2022 4:54:10PM

| | | | | | | | |
|---|-----------------------------|----------------|-----------------|---------------|---------------|-------------|------------------|
| Group # 5 | Range Acc % 0.0000 | | | | | | |
| Group Name Dissolved Oxygen Span | Reading Acc % 3.0000 | | | | | | |
| Stated Accy Pct of Reading | Plus/Minus 0.00 | | | | | | |
| Nom In Val / In Val | In Type | Out Val | Out Type | Fnd As | Lft As | Dev% | Pass/Fail |
| 100.00 / 100.00 | % | 100.00 | % | 102.30 | 100.00 | 0.00% | Pass |

| <u>Test Instruments Used During the Calibration</u> | | | | | <u>(As Of Cal Entry Date)</u> | |
|---|--------------------------------------|---|---------------------|-----------------------------------|------------------------------------|--|
| <u>Test Standard ID</u> | <u>Description</u> | <u>Manufacturer</u> | <u>Model Number</u> | <u>Serial Number / Lot Number</u> | <u>Last Cal Date / Opened Date</u> | <u>Next Cal Date / Expiration Date</u> |
| CO 126/124 NTU (22A214...) | CO 126/124 YSI NTU 21L21440187 | YSI | 607300 | 22A21460130 | | 1/30/2023 |
| CO AUTO CAL 0NTU/PH4 18262406 | CO AUTO CAL 0NTU/PH4 18262406 | AMCOCLEAR | | 18262406 | | |
| CO COND 1.413(2GG653) | 1413 COND STND LOT | AquaPhoenix Scientific | 31986 | 2GG653 | | 7/30/2023 |
| CO ORP 240MV(2GI207) | ORP SOLUTION 240 mV | Pine Environmental Services, Inc. | 32001 | 2GI207 | | 6/1/2023 |
| CO PH 4 1GF009 | CO PH 7 | AquaPhoenix Scientific | | 1GF009 | | 6/1/2023 |
| CO PH10 1GD492 | CO PH10 | AquaPhoenix Scientific | | 1GD492 | | 4/1/2023 |
| CO PH7 1GF460 | CO PH 7 | AquaPhoenix Scientific | BU5007-T | | | 6/1/2023 |
| CO ZERO DO | CO Zero Dissolved Oxygen Solution | Hanna | HI7040L | S0021/18 | | 3/1/2023 |

Notes about this calibration

Calibration Result Calibration Successful

Who Calibrated Kevin Morin



INSTRUMENT CALIBRATION REPORT

Pine Environmental Services LLC

7332 S. Alton Way, Bldg. 13, Suite E.
Centennial, CO 80112

Toll-free: (866) 960-PINE (7463)

Pine Environmental Services, Inc.

Instrument ID 51293
Description YSI Pro DSS Sonde
Calibrated 10/10/2022 4:54:10PM

Manufacturer YSI
Model Number Pro DSS
Serial Number/ Lot Number 21E100011
Location Colorado
Department

State Certified
Status Pass
Temp °C 25
Humidity % 16

Calibration Specifications

Group # 1
Group Name PH
Stated Accy Pct of Reading

Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.00

| <u>Nom In Val / In Val</u> | <u>In Type</u> | <u>Out Val</u> | <u>Out Type</u> | <u>Fnd As</u> | <u>Lft As</u> | <u>Dev%</u> | <u>Pass/Fail</u> |
|----------------------------|----------------|----------------|-----------------|---------------|---------------|-------------|------------------|
| 7.00 / 7.00 | PH | 7.00 | PH | 6.94 | 7.00 | 0.00% | Pass |
| 4.00 / 4.00 | PH | 4.00 | PH | 4.23 | 4.00 | 0.00% | Pass |
| 10.00 / 10.00 | PH | 10.00 | PH | 9.83 | 10.00 | 0.00% | Pass |

Group # 2
Group Name Turbidity
Stated Accy Pct of Reading

Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.00

| <u>Nom In Val / In Val</u> | <u>In Type</u> | <u>Out Val</u> | <u>Out Type</u> | <u>Fnd As</u> | <u>Lft As</u> | <u>Dev%</u> | <u>Pass/Fail</u> |
|----------------------------|----------------|----------------|-----------------|---------------|---------------|-------------|------------------|
| 0.00 / 0.00 | NTU | 0.00 | NTU | 0.00 | 0.00 | 0.00% | Pass |
| 124.00 / 124.00 | NTU | 124.00 | NTU | 126.00 | 124.00 | 0.00% | Pass |

Group # 3
Group Name Conductivity
Stated Accy Pct of Reading

Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.000

| <u>Nom In Val / In Val</u> | <u>In Type</u> | <u>Out Val</u> | <u>Out Type</u> | <u>Fnd As</u> | <u>Lft As</u> | <u>Dev%</u> | <u>Pass/Fail</u> |
|----------------------------|----------------|----------------|-----------------|---------------|---------------|-------------|------------------|
| 1.413 / 1.413 | ms/cm | 1.413 | ms/cm | 1.430 | 1.413 | 0.00% | Pass |

Group # 4
Group Name Redox (ORP)
Stated Accy Pct of Reading

Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.00

| <u>Nom In Val / In Val</u> | <u>In Type</u> | <u>Out Val</u> | <u>Out Type</u> | <u>Fnd As</u> | <u>Lft As</u> | <u>Dev%</u> | <u>Pass/Fail</u> |
|----------------------------|----------------|----------------|-----------------|---------------|---------------|-------------|------------------|
| 240.00 / 240.00 | mv | 240.00 | mv | 243.50 | 240.00 | 0.00% | Pass |

Group # 5
Group Name Dissolved Oxygen Span
Stated Accy Pct of Reading

Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.00

| <u>Nom In Val / In Val</u> | <u>In Type</u> | <u>Out Val</u> | <u>Out Type</u> | <u>Fnd As</u> | <u>Lft As</u> | <u>Dev%</u> | <u>Pass/Fail</u> |
|----------------------------|----------------|----------------|-----------------|---------------|---------------|-------------|------------------|
|----------------------------|----------------|----------------|-----------------|---------------|---------------|-------------|------------------|

INSTRUMENT CALIBRATION REPORT



Pine Environmental Services LLC

3225 South 116th St.
Building 1 Suite 181
Tukwila, WA 98168
425-285-9102

Pine Environmental Services, Inc.

Instrument ID 40206
Description Solinst IP (200 ft)
Calibrated 10/11/2022 5:41:18PM

| | |
|---|------------------------|
| Manufacturer Solinst | State Certified |
| Model Number N/A | Status Pass |
| Serial Number/ Lot Number 312227 | Temp °C 23 |
| Location Seattle | Humidity % 43 |
| Department | |

Calibration Specifications

| Group # | Group Name | Stated Accy | Range Acc % | Reading Acc % | Plus/Minus | | | | |
|----------------------------|----------------|----------------|-----------------|---------------|---------------|-------------|------------------|--|--|
| <u>Nom In Val / In Val</u> | <u>In Type</u> | <u>Out Val</u> | <u>Out Type</u> | <u>Fnd As</u> | <u>Lft As</u> | <u>Dev%</u> | <u>Pass/Fail</u> | | |

Test Instruments Used During the Calibration

(As Of Cal Entry Date)

| <u>Test Standard ID</u> | <u>Description</u> | <u>Manufacturer</u> | <u>Model Number</u> | <u>Serial Number / Lot Number</u> | <u>Last Cal Date/ Expiration Date</u> | <u>Next Cal Date / Expiration Date</u> | <u>Opened Date</u> |
|-------------------------|--------------------|---------------------|---------------------|-----------------------------------|---------------------------------------|--|--------------------|
|-------------------------|--------------------|---------------------|---------------------|-----------------------------------|---------------------------------------|--|--------------------|

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Larry Lorenzano

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment
Please call 800-301-9663 for Technical Assistance

INSTRUMENT CALIBRATION REPORT



Pine Environmental Services LLC

3225 South 116th St.
Building 1 Suite 181
Tukwila, WA 98168
425-285-9102

Pine Environmental Services, Inc.

Instrument ID 51630
Description Pine Environmental Peristaltic Pump
Calibrated 10/11/2022 1:03:56PM

| | |
|---|------------------------|
| Manufacturer Pine Environmental Services, Inc. | State Certified |
| Model Number | Status Pass |
| Serial Number/ Lot Number n/a | Temp °C 23 |
| Location Seattle | Humidity % 46 |
| Department | |

Calibration Specifications

Group # 1
Group Name
Test Performed: Yes **As Found Result:** Pass **As Left Result:** Pass

Test Instruments Used During the Calibration

(As Of Cal Entry Date)

| <u>Test Standard ID</u> | <u>Description</u> | <u>Manufacturer</u> | <u>Model Number</u> | <u>Serial Number / Lot Number</u> | <u>Next Cal Date / Last Cal Date/ Expiration Date</u> | <u>Opened Date</u> |
|-------------------------|--------------------|---------------------|---------------------|---------------------------------------|---|--------------------|
|-------------------------|--------------------|---------------------|---------------------|---------------------------------------|---|--------------------|

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Larry Lorenzano

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INSTRUMENT CALIBRATION REPORT



Pine Environmental Services LLC

3225 South 116th St.
Building 1 Suite 181
Tukwila, WA 98168
425-285-9102

Pine Environmental Services, Inc.

Instrument ID 46801
Description Geotech Peristaltic Pump
Calibrated 10/11/2022 1:06:32PM

| | |
|---|------------------------|
| Manufacturer Pine Environmental Services, Inc. | State Certified |
| Model Number Geopump | Status Pass |
| Serial Number/ Lot Number n/a | Temp °C 23 |
| Location Seattle | Humidity % 46 |
| Department | |

Calibration Specifications

Group # 1
Group Name PERISTALSIS AND FUNCTIONAL TEST
Test Performed: Yes **As Found Result:** Pass **As Left Result:** Pass

Test Instruments Used During the Calibration

(As Of Cal Entry Date)

| <u>Test Standard ID</u> | <u>Description</u> | <u>Manufacturer</u> | <u>Model Number</u> | <u>Serial Number / Lot Number</u> | <u>Next Cal Date / Expiration Date</u> |
|-------------------------|--------------------|---------------------|---------------------|-----------------------------------|--|
|-------------------------|--------------------|---------------------|---------------------|-----------------------------------|--|

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Larry Lorenzano

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INSTRUMENT CALIBRATION REPORT



Pine Environmental Services LLC

3225 South 116th St.
Building 1 Suite 181
Tukwila, WA 98168
425-285-9102

Pine Environmental Services, Inc.

Instrument ID 7481
Description Solinst Interface
Calibrated 10/11/2022 5:40:10PM

| | |
|---|------------------------|
| Manufacturer Solinst | State Certified |
| Model Number IP 200' | Status Pass |
| Serial Number/ Lot Number 286714 | Temp °C 24 |
| Location Seattle | Humidity % 43 |
| Department | |

Calibration Specifications

Group # 1
Group Name
Test Performed: Yes **As Found Result:** Pass **As Left Result:** Pass

Test Instruments Used During the Calibration

(As Of Cal Entry Date)

| <u>Test Standard ID</u> | <u>Description</u> | <u>Manufacturer</u> | <u>Model Number</u> | <u>Serial Number / Lot Number</u> | <u>Next Cal Date / Last Cal Date/ Expiration Date Opened Date</u> |
|-------------------------|--------------------|---------------------|---------------------|---------------------------------------|---|
|-------------------------|--------------------|---------------------|---------------------|---------------------------------------|---|

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Larry Lorenzano

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

**Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment
Please call 800-301-9663 for Technical Assistance**

INSTRUMENT CALIBRATION REPORT



Pine Environmental Services LLC

3225 South 116th St.
Building 1 Suite 181
Tukwila, WA 98168
425-285-9102

Pine Environmental Services, Inc.

Instrument ID 46376
Description Pro DSS Display
Calibrated 10/6/2022 12:47:34PM

Manufacturer YSI
Model Number Pro DSS
Serial Number/ Lot Number 19D104639
Location Seattle
Department

State Certified
Status Pass
Temp °C 21
Humidity % 56

Calibration Specifications

| Group # | Group Name | Stated Accy | Range Acc % | Reading Acc % | Plus/Minus | Dev% | Pass/Fail |
|----------------------------|----------------|----------------|-----------------|---------------|---------------|-------------|------------------|
| <u>Nom In Val / In Val</u> | <u>In Type</u> | <u>Out Val</u> | <u>Out Type</u> | <u>Fnd As</u> | <u>Lft As</u> | <u>Dev%</u> | <u>Pass/Fail</u> |

Test Instruments Used During the Calibration

(As Of Cal Entry Date)

| <u>Test Standard ID</u> | <u>Description</u> | <u>Manufacturer</u> | <u>Model Number</u> | <u>Serial Number / Lot Number</u> | <u>Last Cal Date / Opened Date</u> | <u>Next Cal Date / Expiration Date</u> |
|-------------------------|--------------------|---------------------|---------------------|-----------------------------------|------------------------------------|--|
|-------------------------|--------------------|---------------------|---------------------|-----------------------------------|------------------------------------|--|

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Jose Arroyo

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment
Please call 800-301-9663 for Technical Assistance

INSTRUMENT CALIBRATION REPORT



Pine Environmental Services LLC

3225 South 116th St.
Building 1 Suite 181
Tukwila, WA 98168
425-285-9102

Pine Environmental Services, Inc.

Instrument ID 46873
Description YSI Pro DSS
Calibrated 10/6/2022 12:43:56PM

| | | | |
|---|----------------|-----------------------------|------------------|
| Group # 5 | | Range Acc % 0.0000 | |
| Group Name Dissolved Oxygen Span | | Reading Acc % 3.0000 | |
| Stated Accy Pct of Reading | | Plus/Minus 0.00 | |
| <u>Nom In Val / In Val</u> | <u>In Type</u> | <u>Out Val</u> | <u>Out Type</u> |
| 100.00 / 100.00 | % | 100.00 | % |
| | | <u>Fnd As</u> | <u>Lft As</u> |
| | | 105.10 | 100.00 |
| | | <u>Dev%</u> | <u>Pass/Fail</u> |
| | | 0.00% | Pass |

| <u>Test Instruments Used During the Calibration</u> | | | | | <u>(As Of Cal Entry Date)</u> | |
|---|--------------------------------------|---------------------------|-----------------------------|-----------------------------------|------------------------------------|--|
| <u>Test Standard ID</u> | <u>Description</u> | <u>Manufacturer</u> | <u>Model Number</u> | <u>Serial Number / Lot Number</u> | <u>Last Cal Date / Opened Date</u> | <u>Next Cal Date / Expiration Date</u> |
| SEA AUTOCAL 22140172 | SEA AUTOCAL AMCO Clear | GFS | 8483 | 22140172 | | 4/30/2023 |
| SEA COND 1.413 µS/CM 2GE259 | Conductivity solution 1.413 µS/cm | AquaPhoenix Scientific | Conductivity 1.413 mS/cm | 2GE259 | | 5/31/2023 |
| SEA NTU 126 22C2205179 | SEA 126 NTU turbidity for YSI | YSI | 607300 | 22C2205179 | | 3/31/2023 |
| SEA ORP 240 2GB110 | 240 mV ORP Solution | AquaPhoenix Scientific | 32001 | 2GB110 | | 11/30/2022 |
| SEA PH 10 2GGG018 | pH 10 Buffer Solution | AquaPhoenix Scientific | 32034 | 2GGG018 | | 7/24/2024 |
| SEA PH 7 2GB314 | pH 7 Buffer Solution | AquaPhoenix Scientific | 32025 | 2GB314 | | 2/29/2024 |
| SEA PH4 2GG184 | pH 4 Buffer Solution | AquaPhoenix Scientific | 32017 | 2GG184 | | 7/31/2024 |

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Jose Arroyo

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

**Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment
Please call 800-301-9663 for Technical Assistance**

INSTRUMENT CALIBRATION REPORT



Pine Environmental Services LLC

3225 South 116th St.
Building 1 Suite 181
Tukwila, WA 98168
425-285-9102

Pine Environmental Services, Inc.

Instrument ID 46873
Description YSI Pro DSS
Calibrated 10/6/2022 12:43:56PM

| | |
|--|------------------------|
| Manufacturer YSI | State Certified |
| Model Number Pro DSS | Status Pass |
| Serial Number/ Lot Number 19K104044 | Temp °C 21 |
| Location Seattle | Humidity % 56 |
| Department | |

Calibration Specifications

| Group # 1 | | | | Range Acc % | | | |
|----------------------------------|----------------|----------------|-----------------|---------------|---------------|-------------|------------------|
| Group Name PH | | | | Reading Acc % | | | |
| Stated Accy Pct of Reading | | | | Plus/Minus | | | |
| <u>Nom In Val / In Val</u> | <u>In Type</u> | <u>Out Val</u> | <u>Out Type</u> | <u>Fnd As</u> | <u>Lft As</u> | <u>Dev%</u> | <u>Pass/Fail</u> |
| 7.00 / 7.00 | PH | 7.00 | PH | 7.12 | 7.02 | 0.29% | Pass |
| 4.00 / 4.00 | PH | 4.00 | PH | 3.89 | 4.00 | 0.00% | Pass |
| 10.00 / 10.00 | PH | 10.00 | PH | 10.37 | 10.05 | 0.50% | Pass |
| Group # 2 | | | | Range Acc % | | | |
| Group Name Turbidity | | | | Reading Acc % | | | |
| Stated Accy Pct of Reading | | | | Plus/Minus | | | |
| <u>Nom In Val / In Val</u> | <u>In Type</u> | <u>Out Val</u> | <u>Out Type</u> | <u>Fnd As</u> | <u>Lft As</u> | <u>Dev%</u> | <u>Pass/Fail</u> |
| 0.00 / 0.00 | NTU | 0.00 | NTU | 1.20 | 0.00 | 0.00% | Pass |
| 124.00 / 124.00 | NTU | 124.00 | NTU | 127.51 | 124.02 | 0.02% | Pass |
| Group # 3 | | | | Range Acc % | | | |
| Group Name Conductivity | | | | Reading Acc % | | | |
| Stated Accy Pct of Reading | | | | Plus/Minus | | | |
| <u>Nom In Val / In Val</u> | <u>In Type</u> | <u>Out Val</u> | <u>Out Type</u> | <u>Fnd As</u> | <u>Lft As</u> | <u>Dev%</u> | <u>Pass/Fail</u> |
| 1.413 / 1.413 | ms/cm | 1.413 | ms/cm | 1.174 | 1.413 | 0.00% | Pass |
| Group # 4 | | | | Range Acc % | | | |
| Group Name Redox (ORP) | | | | Reading Acc % | | | |
| Stated Accy Pct of Reading | | | | Plus/Minus | | | |
| <u>Nom In Val / In Val</u> | <u>In Type</u> | <u>Out Val</u> | <u>Out Type</u> | <u>Fnd As</u> | <u>Lft As</u> | <u>Dev%</u> | <u>Pass/Fail</u> |
| 240.00 / 240.00 | mv | 240.00 | mv | 238.90 | 240.00 | 0.00% | Pass |
| Group # 5 | | | | Range Acc % | | | |
| Group Name Dissolved Oxygen Span | | | | Reading Acc % | | | |
| Stated Accy Pct of Reading | | | | Plus/Minus | | | |
| <u>Nom In Val / In Val</u> | <u>In Type</u> | <u>Out Val</u> | <u>Out Type</u> | <u>Fnd As</u> | <u>Lft As</u> | <u>Dev%</u> | <u>Pass/Fail</u> |
| | | | | | | | |

AECOM Daily Tailgate Meeting Summary

Project information

| | |
|-------------------------|---------------|
| Project Name | T-30 |
| Project Number | 60681370 |
| Project Manager | Paul Kalina |
| Project Manager Phone # | 2063105097 |
| Muster Point location | Clubhouse |
| Meeting date | 10/19/2022 |
| Business Line | Environment |
| SH&E Manager | Tim Gilles |
| SH&E Manager Phone # | 3128335991 |
| First Aid Kit Location | Conex |
| Prepared by | Friedman, Gus |

Shift Summary

| | |
|--------------------------------|--|
| Location | SODO |
| Attendees (Workers) | Brown, Cary;Friedman, Gus; |
| Attendees (Visitors) | |
| Tasks to be performed | Tidal well gw sampling AS VFD troubleshooting |
| Hazards to be considered today | noise, motion, mechanical, electrical |
| Will there be Lone Workers? | No |
| Hierarchy of controls | engineering, ppe |
| Personal Protective Equipment | Task Specific: gloves Mandatory: safetyglasses, longpants, reflectivevest, workboots |
| High Risk Events | |
| | |

| | |
|--|---|
| Topic of the week | Hearing Conservation |
| Other topics discussed | Traffic hazards Crane operation awareness |
| Mid day reviews | |
| End of the day comments.The supervisor confirms that the site is being left in a safe condition and work crew checked out as fit unless otherwise specified here | All wells sampled within the required time periods. Progress made troubleshooting VFD |
| Hazards | <ul style="list-style-type: none"> • Mechanical • Motion • Noise • Electrical |

Appendix G
Groundwater Sampling
Laboratory Analytical Reports

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Vineta Mills, M.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

April 25, 2022

Paul Kalina, Project Manager
AECOM
1111 3rd Ave, Suite 1600
Seattle, WA 98101

Dear Mr Kalina:

Included are the results from the testing of material submitted on April 15, 2022 from the T-30, F&BI 204253 project. There are 8 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
AEC0425R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on April 15, 2022 by Friedman & Bruya, Inc. from the AECOM T-30, F&BI 204253 project. Samples were logged in under the laboratory ID's listed below.

| <u>Laboratory ID</u> | <u>AECOM</u> |
|----------------------|-----------------|
| 204253 -01 | RW-11A-0422 |
| 204253 -02 | RW-11A-0422-MS |
| 204253 -03 | RW-11A-0422-MSD |
| 204253 -04 | MW-100-0422 |
| 204253 -05 | MW-89-0422 |

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/25/22
Date Received: 04/15/22
Project: T-30, F&BI 204253
Date Extracted: 04/20/22
Date Analyzed: 04/20/22 and 04/22/22

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES
FOR BENZENE, TOLUENE, ETHYLBENZENE,
XYLENES AND TPH AS GASOLINE
USING METHODS 8021B AND NWTPH-Gx**

Results Reported as ug/L (ppb)

| <u>Sample ID</u> Laboratory ID | <u>Benzene</u> | <u>Toluene</u> | <u>Ethyl Benzene</u> | <u>Total Xylenes</u> | <u>Gasoline Range</u> | <u>Surrogate (% Recovery)</u> (Limit 52-124) |
|-----------------------------------|----------------|----------------|----------------------|----------------------|-----------------------|---|
| RW-11A-0422 204253-01 | <1 | <1 | <1 | <3 | <100 | 80 |
| RW-11A-0422-MS 204253-02 | <1 | <1 | <1 | <3 | <100 | 70 |
| RW-11A-0422-MSD 204253-03 | <1 | <1 | <1 | <3 | <100 | 70 |
| MW-100-0422 204253-04 | <1 | 6.8 | 1.4 | 7.7 | 170 | 92 |
| MW-89-0422 204253-05 | <1 | <1 | <1 | <3 | <100 | 87 |
| Method Blank 02-880 MB | <1 | <1 | <1 | <3 | <100 | 85 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/25/22
Date Received: 04/15/22
Project: T-30, F&BI 204253
Date Extracted: 04/21/22
Date Analyzed: 04/21/22

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES
FOR TOTAL PETROLEUM HYDROCARBONS AS
DIESEL AND MOTOR OIL
USING METHOD NWTPH-D_x
Sample Extracts Passed Through a
Silica Gel Column Prior to Analysis
Results Reported as ug/L (ppb)**

| <u>Sample ID</u> Laboratory ID | <u>Diesel Range</u> (C ₁₀ -C ₂₅) | <u>Motor Oil Range</u> (C ₂₅ -C ₃₆) | <u>Surrogate</u> <u>(% Recovery)</u> (Limit 41-152) |
|-----------------------------------|--|---|---|
| RW-11A-0422 204253-01 | <50 | <250 | 71 |
| RW-11A-0422-MS 204253-02 | 71 | <250 | 131 |
| RW-11A-0422-MSD 204253-03 | <50 | <250 | 91 |
| MW-100-0422 204253-04 | <50 | <250 | 109 |
| MW-89-0422 204253-05 | 54 | <250 | 110 |
| Method Blank 02-962 MB | <50 | <250 | 115 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/25/22
Date Received: 04/15/22
Project: T-30, F&BI 204253
Date Extracted: 04/19/22
Date Analyzed: 04/19/22

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES
FOR TOTAL PETROLEUM HYDROCARBONS AS
DIESEL AND MOTOR OIL
USING METHOD NWTPH-D_x**
Results Reported as ug/L (ppb)

| <u>Sample ID</u> Laboratory ID | <u>Diesel Range</u> (C ₁₀ -C ₂₅) | <u>Motor Oil Range</u> (C ₂₅ -C ₃₆) | <u>Surrogate</u> (% Recovery) (Limit 41-152) |
|-----------------------------------|--|---|--|
| RW-11A-0422 204253-01 | 1,700 x | 440 x | 79 |
| RW-11A-0422-MS 204253-02 | 2,600 x | 700 x | 133 |
| RW-11A-0422-MSD 204253-03 | 2,400 x | 650 x | 107 |
| MW-100-0422 204253-04 | 910 x | 480 x | 118 |
| MW-89-0422 204253-05 | 780 x | 440 x | 125 |
| Method Blank 02-962 MB | <50 | <250 | 118 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/25/22

Date Received: 04/15/22

Project: T-30, F&BI 204253

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER
SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE,
XYLENES, AND TPH AS GASOLINE
USING METHOD 8021B AND NWTPH-G_x**

Laboratory Code: 204285-01 (Duplicate)

| Analyte | Reporting Units | Sample Result | Duplicate Result | RPD (Limit 20) |
|--------------|-----------------|---------------|------------------|----------------|
| Benzene | ug/L (ppb) | <1 | <1 | nm |
| Toluene | ug/L (ppb) | <1 | <1 | nm |
| Ethylbenzene | ug/L (ppb) | <1 | <1 | nm |
| Xylenes | ug/L (ppb) | <3 | <3 | nm |
| Gasoline | ug/L (ppb) | <100 | <100 | nm |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|--------------|-----------------|-------------|----------------------|---------------------|
| Benzene | ug/L (ppb) | 50 | 82 | 65-118 |
| Toluene | ug/L (ppb) | 50 | 81 | 72-122 |
| Ethylbenzene | ug/L (ppb) | 50 | 86 | 73-126 |
| Xylenes | ug/L (ppb) | 150 | 85 | 74-118 |
| Gasoline | ug/L (ppb) | 1,000 | 86 | 69-134 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/25/22

Date Received: 04/15/22

Project: T-30, F&BI 204253

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER
SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS
DIESEL EXTENDED USING METHOD NWTPH-D_x**

Laboratory Code: Laboratory Control Sample Silica Gel

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Percent Recovery LCSD | Acceptance Criteria | RPD (Limit 20) |
|-----------------|--------------------|----------------|----------------------------|-----------------------------|------------------------|-------------------|
| Diesel Extended | ug/L (ppb) | 2,500 | 92 | 108 | 63-142 | 16 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/25/22

Date Received: 04/15/22

Project: T-30, F&BI 204253

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER
SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS
DIESEL EXTENDED USING METHOD NWTPH-D_x**

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Percent Recovery LCSD | Acceptance Criteria | RPD (Limit 20) |
|-----------------|--------------------|----------------|----------------------------|-----------------------------|------------------------|-------------------|
| Diesel Extended | ug/L (ppb) | 2,500 | 100 | 104 | 63-142 | 4 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht - The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

204253

SAMPLE CHAIN OF CUSTODY 04-15-22

EOB/WW3

Report To Paul Kellin
 Company AECOM
 Address 1111 3rd Ave, Suite 1600
 City, State, ZIP Seattle, WA 98101
 Phone 206-438-2708 Email: Paul.Kellin@Aecom.com

SAMPLERS (signature) Paul Kellin
 PROJECT NAME T-30 PO #
 REMARKS
 INVOICE TO

Page # 1 of 1
 TURNAROUND TIME
 Standard turnaround
 RUSH
 Rush charges authorized by:
 SAMPLE DISPOSAL
 Archive samples
 Other
 Default: Dispose after 30 days

| Sample ID | Lab ID | Date Sampled | Time Sampled | Sample Type | # of Jars | ANALYSES REQUESTED | | | | | | | Notes | | |
|-------------------|--------|--------------|--------------|-------------|-----------|--------------------|----------|-------------------------------|------------|---------------|---------------|---------------|-------|--|---------------------------|
| | | | | | | NWTPH-Dx | NWTPH-Gx | BTEX EPA 8021 8022 8024 | NWTPH-HCID | VOCs EPA 8260 | PAHs EPA 8270 | PCBs EPA 8082 | | | |
| RW-11A-0422 | 01A-D | 4/14/22 | 1810 | Gw | 4 | X | X | X | | | | | | | * Sites get cleanup on DX |
| RW-11A-0422-MS | 02 | 4/14/22 | 1810 | Gw | 4 | X | X | X | | | | | | | |
| RW-11A-0422-MSD03 | 03 | 4/14/22 | 1810 | Gw | 4 | X | X | X | | | | | | | |
| MW-1D0-0422 | 04 | 4/15/22 | 1230 | Gw | 4 | X | X | X | | | | | | | |
| MW-89-0422 | 05 | 4/15/22 | 1330 | Gw | 4 | X | X | X | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |

| SIGNATURE | | PRINT NAME | | COMPANY | | DATE | TIME |
|------------------|-----------------------|----------------|-------|---------------------|------|------|------|
| Relinquished by: | <u>Gus Friedman</u> | Gus Friedman | AECOM | 4/14/22 | 1710 | | |
| Received by: | <u>Yelena Aravine</u> | Yelena Aravine | AECOM | 4/15/22 | 1710 | | |
| Relinquished by: | | | | | | | |
| Received by: | | | | Samples received at | 500 | | |

Friedman & Bruya, Inc.
 Ph. (206) 285-8282

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Vineta Mills, M.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

October 21, 2022

Paul Kalina, Project Manager
AECOM
1111 3rd Ave, Suite 1600
Seattle, WA 98101

Dear Mr Kalina:

Included are the results from the testing of material submitted on October 14, 2022 from the T-30, F&BI 210207 project. There are 25 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures

c: Gus Friedman, Lucy Panteleeff
AEC1021R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on October 14, 2022 by Friedman & Bruya, Inc. from the AECOM T-30, F&BI 210207 project. Samples were logged in under the laboratory ID's listed below.

| <u>Laboratory ID</u> | <u>AECOM</u> |
|----------------------|--------------|
| 210207 -01 | RW-11A-1022 |
| 210207 -02 | MW-36A-1022 |
| 210207 -03 | MW-39A-1022 |
| 210207 -04 | MW-42-1022 |
| 210207 -05 | RW-9-1022 |
| 210207 -06 | MW-93-1022 |
| 210207 -07 | RW-5A-1022 |
| 210207 -08 | MW-45A-1022 |
| 210207 -09 | MW-46B-1022 |
| 210207 -10 | MW-92-1022 |
| 210207 -11 | Dup1-1022 |

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/21/22
Date Received: 10/14/22
Project: T-30, F&BI 210207
Date Extracted: 10/18/22
Date Analyzed: 10/18/22

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES
FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE
USING METHOD NWTPH-Gx**
Results Reported as ug/L (ppb)

| <u>Sample ID</u> Laboratory ID | <u>Gasoline Range</u> | <u>Surrogate</u> <u>(% Recovery)</u> (Limit 51-134) |
|-----------------------------------|-----------------------|---|
| RW-11A-1022 210207-01 | <100 | 94 |
| MW-36A-1022 210207-02 | <100 | 91 |
| MW-39A-1022 210207-03 | <100 | 93 |
| MW-42-1022 210207-04 | 260 | 103 |
| RW-9-1022 210207-05 | <100 | 94 |
| MW-93-1022 210207-06 | <100 | 87 |
| RW-5A-1022 210207-07 | 110 | 101 |
| MW-45A-1022 210207-08 | <100 | 92 |
| MW-46B-1022 210207-09 | <100 | 92 |
| MW-92-1022 210207-10 | <100 | 90 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/21/22
Date Received: 10/14/22
Project: T-30, F&BI 210207
Date Extracted: 10/18/22
Date Analyzed: 10/18/22

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES
FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE
USING METHOD NWTPH-Gx**
Results Reported as ug/L (ppb)

| <u>Sample ID</u> Laboratory ID | <u>Gasoline Range</u> | <u>Surrogate</u> <u>(% Recovery)</u> (Limit 51-134) |
|-----------------------------------|-----------------------|---|
| Dup1-1022 210207-11 | <100 | 91 |
| Method Blank 02-2512 mb | <100 | 92 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/21/22
 Date Received: 10/14/22
 Project: T-30, F&BI 210207
 Date Extracted: 10/17/22
 Date Analyzed: 10/17/22

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES
 FOR TOTAL PETROLEUM HYDROCARBONS AS
 DIESEL AND MOTOR OIL
 USING METHOD NWTPH-D_x
 Results Reported as ug/L (ppb)**

| <u>Sample ID</u> Laboratory ID | <u>Diesel Range</u> (C ₁₀ -C ₂₅) | <u>Motor Oil Range</u> (C ₂₅ -C ₃₆) | <u>Surrogate</u> (% Recovery) (Limit 41-152) |
|-----------------------------------|--|---|--|
| RW-11A-1022 210207-01 | 4,800 | 410 x | 133 |
| MW-36A-1022 210207-02 | 4,900 | 460 x | 138 |
| MW-39A-1022 210207-03 | 6,800 x | 1,200 x | 140 |
| MW-42-1022 210207-04 | 5,600 x | 1,400 x | 135 |
| RW-9-1022 210207-05 | 9,500 x | 2,000 x | ip |
| MW-93-1022 210207-06 | 2,300 x | 590 x | 122 |
| RW-5A-1022 210207-07 | 1,400 x | 310 x | 112 |
| MW-45A-1022 210207-08 1/1.2 | 1,100 x | <300 | 127 |
| MW-46B-1022 210207-09 | 890 x | <250 | 123 |
| MW-92-1022 210207-10 | 2,400 x | 410 x | 122 |
| Dup1-1022 210207-11 | 4,900 | 510 x | 122 |
| Method Blank 02-2529 MB | <50 | <250 | 110 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

| | | | |
|-------------------|-------------|-------------|-------------------|
| Client Sample ID: | RW-11A-1022 | Client: | AECOM |
| Date Received: | 10/14/22 | Project: | T-30, F&BI 210207 |
| Date Extracted: | 10/17/22 | Lab ID: | 210207-01 |
| Date Analyzed: | 10/17/22 | Data File: | 101710.D |
| Matrix: | Water | Instrument: | GCMS11 |
| Units: | ug/L (ppb) | Operator: | JCM |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|-----------------------|-------------|--------------|--------------|
| 1,2-Dichloroethane-d4 | 102 | 78 | 126 |
| Toluene-d8 | 99 | 84 | 115 |
| 4-Bromofluorobenzene | 101 | 72 | 130 |

| Compounds: | Concentration ug/L (ppb) |
|--------------|-----------------------------|
| Benzene | <0.35 |
| Toluene | <1 |
| Ethylbenzene | <1 |
| m,p-Xylene | <2 |
| o-Xylene | <1 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

| | | | |
|-------------------|-------------|-------------|-------------------|
| Client Sample ID: | MW-36A-1022 | Client: | AECOM |
| Date Received: | 10/14/22 | Project: | T-30, F&BI 210207 |
| Date Extracted: | 10/17/22 | Lab ID: | 210207-02 |
| Date Analyzed: | 10/17/22 | Data File: | 101711.D |
| Matrix: | Water | Instrument: | GCMS11 |
| Units: | ug/L (ppb) | Operator: | JCM |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|-----------------------|-------------|--------------|--------------|
| 1,2-Dichloroethane-d4 | 112 | 78 | 126 |
| Toluene-d8 | 101 | 84 | 115 |
| 4-Bromofluorobenzene | 99 | 72 | 130 |

| Compounds: | Concentration ug/L (ppb) |
|--------------|-----------------------------|
| Benzene | <0.35 |
| Toluene | <1 |
| Ethylbenzene | <1 |
| m,p-Xylene | <2 |
| o-Xylene | <1 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

| | | | |
|-------------------|-------------|-------------|-------------------|
| Client Sample ID: | MW-39A-1022 | Client: | AECOM |
| Date Received: | 10/14/22 | Project: | T-30, F&BI 210207 |
| Date Extracted: | 10/17/22 | Lab ID: | 210207-03 |
| Date Analyzed: | 10/17/22 | Data File: | 101712.D |
| Matrix: | Water | Instrument: | GCMS11 |
| Units: | ug/L (ppb) | Operator: | JCM |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|-----------------------|-------------|--------------|--------------|
| 1,2-Dichloroethane-d4 | 107 | 78 | 126 |
| Toluene-d8 | 96 | 84 | 115 |
| 4-Bromofluorobenzene | 102 | 72 | 130 |

| Compounds: | Concentration ug/L (ppb) |
|--------------|-----------------------------|
| Benzene | <0.35 |
| Toluene | <1 |
| Ethylbenzene | <1 |
| m,p-Xylene | <2 |
| o-Xylene | <1 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

| | | | |
|-------------------|------------|-------------|-------------------|
| Client Sample ID: | MW-42-1022 | Client: | AECOM |
| Date Received: | 10/14/22 | Project: | T-30, F&BI 210207 |
| Date Extracted: | 10/17/22 | Lab ID: | 210207-04 |
| Date Analyzed: | 10/17/22 | Data File: | 101713.D |
| Matrix: | Water | Instrument: | GCMS11 |
| Units: | ug/L (ppb) | Operator: | JCM |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|-----------------------|-------------|--------------|--------------|
| 1,2-Dichloroethane-d4 | 117 | 78 | 126 |
| Toluene-d8 | 96 | 84 | 115 |
| 4-Bromofluorobenzene | 99 | 72 | 130 |

| Compounds: | Concentration ug/L (ppb) |
|--------------|-----------------------------|
| Benzene | 0.35 |
| Toluene | <1 |
| Ethylbenzene | <1 |
| m,p-Xylene | <2 |
| o-Xylene | <1 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

| | | | |
|-------------------|------------|-------------|-------------------|
| Client Sample ID: | RW-9-1022 | Client: | AECOM |
| Date Received: | 10/14/22 | Project: | T-30, F&BI 210207 |
| Date Extracted: | 10/17/22 | Lab ID: | 210207-05 |
| Date Analyzed: | 10/17/22 | Data File: | 101714.D |
| Matrix: | Water | Instrument: | GCMS11 |
| Units: | ug/L (ppb) | Operator: | JCM |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|-----------------------|-------------|--------------|--------------|
| 1,2-Dichloroethane-d4 | 100 | 78 | 126 |
| Toluene-d8 | 90 | 84 | 115 |
| 4-Bromofluorobenzene | 102 | 72 | 130 |

| Compounds: | Concentration ug/L (ppb) |
|--------------|-----------------------------|
| Benzene | <0.35 |
| Toluene | <1 |
| Ethylbenzene | <1 |
| m,p-Xylene | <2 |
| o-Xylene | <1 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

| | | | |
|-------------------|------------|-------------|-------------------|
| Client Sample ID: | MW-93-1022 | Client: | AECOM |
| Date Received: | 10/14/22 | Project: | T-30, F&BI 210207 |
| Date Extracted: | 10/17/22 | Lab ID: | 210207-06 |
| Date Analyzed: | 10/17/22 | Data File: | 101715.D |
| Matrix: | Water | Instrument: | GCMS11 |
| Units: | ug/L (ppb) | Operator: | JCM |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|-----------------------|-------------|--------------|--------------|
| 1,2-Dichloroethane-d4 | 107 | 78 | 126 |
| Toluene-d8 | 97 | 84 | 115 |
| 4-Bromofluorobenzene | 95 | 72 | 130 |

| Compounds: | Concentration ug/L (ppb) |
|--------------|-----------------------------|
| Benzene | <0.35 |
| Toluene | <1 |
| Ethylbenzene | <1 |
| m,p-Xylene | <2 |
| o-Xylene | <1 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

| | | | |
|-------------------|------------|-------------|-------------------|
| Client Sample ID: | RW-5A-1022 | Client: | AECOM |
| Date Received: | 10/14/22 | Project: | T-30, F&BI 210207 |
| Date Extracted: | 10/17/22 | Lab ID: | 210207-07 |
| Date Analyzed: | 10/17/22 | Data File: | 101716.D |
| Matrix: | Water | Instrument: | GCMS11 |
| Units: | ug/L (ppb) | Operator: | JCM |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|-----------------------|-------------|--------------|--------------|
| 1,2-Dichloroethane-d4 | 102 | 78 | 126 |
| Toluene-d8 | 99 | 84 | 115 |
| 4-Bromofluorobenzene | 107 | 72 | 130 |

| Compounds: | Concentration ug/L (ppb) |
|--------------|-----------------------------|
| Benzene | <0.35 |
| Toluene | <1 |
| Ethylbenzene | <1 |
| m,p-Xylene | <2 |
| o-Xylene | <1 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

| | | | |
|-------------------|-------------|-------------|-------------------|
| Client Sample ID: | MW-45A-1022 | Client: | AECOM |
| Date Received: | 10/14/22 | Project: | T-30, F&BI 210207 |
| Date Extracted: | 10/17/22 | Lab ID: | 210207-08 |
| Date Analyzed: | 10/17/22 | Data File: | 101720.D |
| Matrix: | Water | Instrument: | GCMS11 |
| Units: | ug/L (ppb) | Operator: | JCM |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|-----------------------|-------------|--------------|--------------|
| 1,2-Dichloroethane-d4 | 103 | 78 | 126 |
| Toluene-d8 | 102 | 84 | 115 |
| 4-Bromofluorobenzene | 105 | 72 | 130 |

| Compounds: | Concentration ug/L (ppb) |
|--------------|-----------------------------|
| Benzene | <0.35 |
| Toluene | <1 |
| Ethylbenzene | <1 |
| m,p-Xylene | <2 |
| o-Xylene | <1 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

| | | | |
|-------------------|-------------|-------------|-------------------|
| Client Sample ID: | MW-46B-1022 | Client: | AECOM |
| Date Received: | 10/14/22 | Project: | T-30, F&BI 210207 |
| Date Extracted: | 10/17/22 | Lab ID: | 210207-09 |
| Date Analyzed: | 10/17/22 | Data File: | 101717.D |
| Matrix: | Water | Instrument: | GCMS11 |
| Units: | ug/L (ppb) | Operator: | JCM |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|-----------------------|-------------|--------------|--------------|
| 1,2-Dichloroethane-d4 | 106 | 78 | 126 |
| Toluene-d8 | 102 | 84 | 115 |
| 4-Bromofluorobenzene | 103 | 72 | 130 |

| Compounds: | Concentration ug/L (ppb) |
|--------------|-----------------------------|
| Benzene | <0.35 |
| Toluene | <1 |
| Ethylbenzene | <1 |
| m,p-Xylene | <2 |
| o-Xylene | <1 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

| | | | |
|-------------------|------------|-------------|-------------------|
| Client Sample ID: | MW-92-1022 | Client: | AECOM |
| Date Received: | 10/14/22 | Project: | T-30, F&BI 210207 |
| Date Extracted: | 10/17/22 | Lab ID: | 210207-10 |
| Date Analyzed: | 10/17/22 | Data File: | 101718.D |
| Matrix: | Water | Instrument: | GCMS11 |
| Units: | ug/L (ppb) | Operator: | JCM |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|-----------------------|-------------|--------------|--------------|
| 1,2-Dichloroethane-d4 | 107 | 78 | 126 |
| Toluene-d8 | 107 | 84 | 115 |
| 4-Bromofluorobenzene | 108 | 72 | 130 |

| Compounds: | Concentration ug/L (ppb) |
|--------------|-----------------------------|
| Benzene | <0.35 |
| Toluene | <1 |
| Ethylbenzene | <1 |
| m,p-Xylene | <2 |
| o-Xylene | <1 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

| | | | |
|-------------------|------------|-------------|-------------------|
| Client Sample ID: | Dup1-1022 | Client: | AECOM |
| Date Received: | 10/14/22 | Project: | T-30, F&BI 210207 |
| Date Extracted: | 10/17/22 | Lab ID: | 210207-11 |
| Date Analyzed: | 10/17/22 | Data File: | 101719.D |
| Matrix: | Water | Instrument: | GCMS11 |
| Units: | ug/L (ppb) | Operator: | JCM |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|-----------------------|-------------|--------------|--------------|
| 1,2-Dichloroethane-d4 | 107 | 78 | 126 |
| Toluene-d8 | 101 | 84 | 115 |
| 4-Bromofluorobenzene | 99 | 72 | 130 |

| Compounds: | Concentration ug/L (ppb) |
|--------------|-----------------------------|
| Benzene | <0.35 |
| Toluene | <1 |
| Ethylbenzene | <1 |
| m,p-Xylene | <2 |
| o-Xylene | <1 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

| | | | |
|-------------------|----------------|-------------|-------------------|
| Client Sample ID: | Method Blank | Client: | AECOM |
| Date Received: | Not Applicable | Project: | T-30, F&BI 210207 |
| Date Extracted: | 10/17/22 | Lab ID: | 02-2484 mb |
| Date Analyzed: | 10/17/22 | Data File: | 101707.D |
| Matrix: | Water | Instrument: | GCMS11 |
| Units: | ug/L (ppb) | Operator: | LM |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|-----------------------|-------------|--------------|--------------|
| 1,2-Dichloroethane-d4 | 112 | 78 | 126 |
| Toluene-d8 | 102 | 84 | 115 |
| 4-Bromofluorobenzene | 100 | 72 | 130 |

| Compounds: | Concentration ug/L (ppb) |
|--------------|-----------------------------|
| Benzene | <0.35 |
| Toluene | <1 |
| Ethylbenzene | <1 |
| m,p-Xylene | <2 |
| o-Xylene | <1 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270E

| | | | |
|-------------------|-------------|-------------|-------------------|
| Client Sample ID: | MW-45A-1022 | Client: | AECOM |
| Date Received: | 10/14/22 | Project: | T-30, F&BI 210207 |
| Date Extracted: | 10/17/22 | Lab ID: | 210207-08 |
| Date Analyzed: | 10/17/22 | Data File: | 101719.D |
| Matrix: | Water | Instrument: | GCMS12 |
| Units: | ug/L (ppb) | Operator: | JCM |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|----------------------|-------------|--------------|--------------|
| Nitrobenzene-d5 | 69 | 11 | 173 |
| 2-Fluorobiphenyl | 76 | 44 | 108 |
| 2,4,6-Tribromophenol | 114 | 10 | 140 |
| Terphenyl-d14 | 91 | 50 | 150 |

| Compounds: | Concentration ug/L (ppb) |
|------------------------|-----------------------------|
| Naphthalene | <0.2 |
| 2-Methylnaphthalene | <0.2 |
| 1-Methylnaphthalene | <0.2 |
| Acenaphthylene | <0.02 |
| Acenaphthene | 3.7 |
| Fluorene | 0.039 |
| Phenanthrene | <0.02 |
| Anthracene | <0.02 |
| Fluoranthene | <0.02 |
| Pyrene | <0.02 |
| Benz(a)anthracene | <0.02 |
| Chrysene | <0.02 |
| Benzo(a)pyrene | <0.02 |
| Benzo(b)fluoranthene | <0.02 |
| Benzo(k)fluoranthene | <0.02 |
| Indeno(1,2,3-cd)pyrene | <0.02 |
| Dibenz(a,h)anthracene | <0.02 |
| Benzo(g,h,i)perylene | <0.04 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270E

| | | | |
|-------------------|-------------|-------------|-------------------|
| Client Sample ID: | MW-46B-1022 | Client: | AECOM |
| Date Received: | 10/14/22 | Project: | T-30, F&BI 210207 |
| Date Extracted: | 10/17/22 | Lab ID: | 210207-09 |
| Date Analyzed: | 10/17/22 | Data File: | 101720.D |
| Matrix: | Water | Instrument: | GCMS12 |
| Units: | ug/L (ppb) | Operator: | JCM |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|----------------------|-------------|--------------|--------------|
| Nitrobenzene-d5 | 68 | 11 | 173 |
| 2-Fluorobiphenyl | 77 | 44 | 108 |
| 2,4,6-Tribromophenol | 113 | 10 | 140 |
| Terphenyl-d14 | 87 | 50 | 150 |

| Compounds: | Concentration ug/L (ppb) |
|------------------------|-----------------------------|
| Naphthalene | <0.2 |
| 2-Methylnaphthalene | <0.2 |
| 1-Methylnaphthalene | <0.2 |
| Acenaphthylene | <0.02 |
| Acenaphthene | 0.29 |
| Fluorene | <0.02 |
| Phenanthrene | <0.02 |
| Anthracene | <0.02 |
| Fluoranthene | <0.02 |
| Pyrene | <0.02 |
| Benz(a)anthracene | <0.02 |
| Chrysene | <0.02 |
| Benzo(a)pyrene | <0.02 |
| Benzo(b)fluoranthene | <0.02 |
| Benzo(k)fluoranthene | <0.02 |
| Indeno(1,2,3-cd)pyrene | <0.02 |
| Dibenz(a,h)anthracene | <0.02 |
| Benzo(g,h,i)perylene | <0.04 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270E

| | | | |
|-------------------|------------|-------------|-------------------|
| Client Sample ID: | MW-92-1022 | Client: | AECOM |
| Date Received: | 10/14/22 | Project: | T-30, F&BI 210207 |
| Date Extracted: | 10/17/22 | Lab ID: | 210207-10 |
| Date Analyzed: | 10/17/22 | Data File: | 101721.D |
| Matrix: | Water | Instrument: | GCMS12 |
| Units: | ug/L (ppb) | Operator: | JCM |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|----------------------|-------------|--------------|--------------|
| Nitrobenzene-d5 | 65 | 11 | 173 |
| 2-Fluorobiphenyl | 61 | 44 | 108 |
| 2,4,6-Tribromophenol | 101 | 10 | 140 |
| Terphenyl-d14 | 90 | 50 | 150 |

| Compounds: | Concentration ug/L (ppb) |
|------------------------|-----------------------------|
| Naphthalene | <0.2 |
| 2-Methylnaphthalene | <0.2 |
| 1-Methylnaphthalene | <0.2 |
| Acenaphthylene | <0.02 |
| Acenaphthene | <0.02 |
| Fluorene | <0.02 |
| Phenanthrene | <0.02 |
| Anthracene | <0.02 |
| Fluoranthene | <0.02 |
| Pyrene | <0.02 |
| Benz(a)anthracene | <0.02 |
| Chrysene | <0.02 |
| Benzo(a)pyrene | <0.02 |
| Benzo(b)fluoranthene | <0.02 |
| Benzo(k)fluoranthene | <0.02 |
| Indeno(1,2,3-cd)pyrene | <0.02 |
| Dibenz(a,h)anthracene | <0.02 |
| Benzo(g,h,i)perylene | <0.04 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270E

| | | | |
|-------------------|----------------|-------------|-------------------|
| Client Sample ID: | Method Blank | Client: | AECOM |
| Date Received: | Not Applicable | Project: | T-30, F&BI 210207 |
| Date Extracted: | 10/17/22 | Lab ID: | 02-2530 mb |
| Date Analyzed: | 10/17/22 | Data File: | 101716.D |
| Matrix: | Water | Instrument: | GCMS12 |
| Units: | ug/L (ppb) | Operator: | JCM |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|----------------------|-------------|--------------|--------------|
| Nitrobenzene-d5 | 97 | 11 | 173 |
| 2-Fluorobiphenyl | 92 | 44 | 108 |
| 2,4,6-Tribromophenol | 111 | 10 | 140 |
| Terphenyl-d14 | 97 | 50 | 150 |

| Compounds: | Concentration ug/L (ppb) |
|------------------------|-----------------------------|
| Naphthalene | <0.2 |
| 2-Methylnaphthalene | <0.2 |
| 1-Methylnaphthalene | <0.2 |
| Acenaphthylene | <0.02 |
| Acenaphthene | <0.02 |
| Fluorene | <0.02 |
| Phenanthrene | <0.02 |
| Anthracene | <0.02 |
| Fluoranthene | <0.02 |
| Pyrene | <0.02 |
| Benz(a)anthracene | <0.02 |
| Chrysene | <0.02 |
| Benzo(a)pyrene | <0.02 |
| Benzo(b)fluoranthene | <0.02 |
| Benzo(k)fluoranthene | <0.02 |
| Indeno(1,2,3-cd)pyrene | <0.02 |
| Dibenz(a,h)anthracene | <0.02 |
| Benzo(g,h,i)perylene | <0.04 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/21/22

Date Received: 10/14/22

Project: T-30, F&BI 210207

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER
SAMPLES FOR TPH AS GASOLINE
USING METHOD NWTPH-Gx**

Laboratory Code: 210207-08 (Matrix Spike)

| Analyte | Reporting Units | Spike Level | Sample Result | Percent Recovery MS | Percent Recovery MSD | Acceptance Criteria | RPD (Limit 20) |
|----------|--------------------|----------------|------------------|---------------------------|----------------------------|------------------------|-------------------|
| Gasoline | ug/L (ppb) | 1,000 | 1,200 | 118 | 107 | 53-117 | 10 |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|----------|--------------------|----------------|----------------------------|------------------------|
| Gasoline | ug/L (ppb) | 1,000 | 106 | 69-134 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/21/22

Date Received: 10/14/22

Project: T-30, F&BI 210207

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER
SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS
DIESEL EXTENDED USING METHOD NWTPH-D_x**

Laboratory Code: 210207-08 (Matrix Spike)

| Analyte | Reporting Units | Spike Level | Sample Result | Percent Recovery MS | Percent Recovery MSD | Acceptance Criteria | RPD (Limit 20) |
|-----------------|--------------------|----------------|------------------|---------------------------|----------------------------|------------------------|-------------------|
| Diesel Extended | ug/L (ppb) | 2,500 | 1,200 | 104 | 104 | 50-150 | 0 |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|-----------------|--------------------|----------------|----------------------------|------------------------|
| Diesel Extended | ug/L (ppb) | 2,500 | 80 | 63-142 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/21/22
 Date Received: 10/14/22
 Project: T-30, F&BI 210207

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER
 SAMPLES FOR VOLATILES BY EPA METHOD 8260D**

Laboratory Code: 210207-08 (Matrix Spike)

| Analyte | Reporting Units | Spike Level | Sample Result | Percent Recovery MS | Percent Recovery MSD | Acceptance Criteria | RPD (Limit 20) |
|--------------|-----------------|-------------|---------------|---------------------|----------------------|---------------------|----------------|
| Benzene | ug/L (ppb) | 10 | <0.35 | 102 | 104 | 50-150 | 2 |
| Toluene | ug/L (ppb) | 10 | <1 | 99 | 105 | 50-150 | 6 |
| Ethylbenzene | ug/L (ppb) | 10 | <1 | 96 | 102 | 50-150 | 6 |
| m,p-Xylene | ug/L (ppb) | 20 | <2 | 96 | 101 | 50-150 | 5 |
| o-Xylene | ug/L (ppb) | 10 | <1 | 92 | 99 | 50-150 | 7 |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Percent Recovery LCSD | Acceptance Criteria | RPD (Limit 20) |
|--------------|-----------------|-------------|----------------------|-----------------------|---------------------|----------------|
| Benzene | ug/L (ppb) | 10 | 103 | 106 | 70-130 | 3 |
| Toluene | ug/L (ppb) | 10 | 102 | 103 | 70-130 | 1 |
| Ethylbenzene | ug/L (ppb) | 10 | 104 | 107 | 70-130 | 3 |
| m,p-Xylene | ug/L (ppb) | 20 | 103 | 106 | 70-130 | 3 |
| o-Xylene | ug/L (ppb) | 10 | 105 | 107 | 70-130 | 2 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/21/22
 Date Received: 10/14/22
 Project: T-30, F&BI 210207

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER
 SAMPLES FOR SEMIVOLATILES BY EPA METHOD 8270E**

Laboratory Code: 210207-08 (Matrix Spike)

| Analyte | Reporting Units | Spike Level | Sample Result | Percent Recovery | | Acceptance Criteria | RPD (Limit 20) |
|------------------------|-----------------|-------------|---------------|------------------|------|---------------------|----------------|
| | | | | MS | MSD | | |
| Naphthalene | ug/L (ppb) | 5 | <0.2 | 70 | 74 | 50-150 | 6 |
| 2-Methylnaphthalene | ug/L (ppb) | 5 | <0.2 | 77 | 82 | 50-150 | 6 |
| 1-Methylnaphthalene | ug/L (ppb) | 5 | <0.2 | 76 | 83 | 50-150 | 9 |
| Acenaphthylene | ug/L (ppb) | 5 | <0.02 | 76 | 80 | 50-150 | 5 |
| Acenaphthene | ug/L (ppb) | 5 | 3.7 | 42 b | 63 b | 50-150 | 40 b |
| Fluorene | ug/L (ppb) | 5 | 0.039 | 80 | 83 | 50-150 | 4 |
| Phenanthrene | ug/L (ppb) | 5 | <0.02 | 80 | 86 | 50-150 | 7 |
| Anthracene | ug/L (ppb) | 5 | <0.02 | 82 | 84 | 50-150 | 2 |
| Fluoranthene | ug/L (ppb) | 5 | <0.02 | 83 | 88 | 50-150 | 6 |
| Pyrene | ug/L (ppb) | 5 | <0.02 | 78 | 82 | 50-150 | 5 |
| Benz(a)anthracene | ug/L (ppb) | 5 | <0.02 | 80 | 87 | 50-150 | 8 |
| Chrysene | ug/L (ppb) | 5 | <0.02 | 80 | 85 | 50-150 | 6 |
| Benzo(a)pyrene | ug/L (ppb) | 5 | <0.02 | 82 | 88 | 50-150 | 7 |
| Benzo(b)fluoranthene | ug/L (ppb) | 5 | <0.02 | 83 | 90 | 50-150 | 8 |
| Benzo(k)fluoranthene | ug/L (ppb) | 5 | <0.02 | 80 | 87 | 50-150 | 8 |
| Indeno(1,2,3-cd)pyrene | ug/L (ppb) | 5 | <0.02 | 84 | 84 | 50-150 | 0 |
| Dibenz(a,h)anthracene | ug/L (ppb) | 5 | <0.02 | 83 | 82 | 50-150 | 1 |
| Benzo(g,h,i)perylene | ug/L (ppb) | 5 | <0.04 | 80 | 78 | 50-150 | 3 |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery | |
|------------------------|-----------------|-------------|------------------|---------------------|
| | | | LCS | Acceptance Criteria |
| Naphthalene | ug/L (ppb) | 5 | 81 | 62-97 |
| 2-Methylnaphthalene | ug/L (ppb) | 5 | 85 | 64-101 |
| 1-Methylnaphthalene | ug/L (ppb) | 5 | 86 | 64-93 |
| Acenaphthylene | ug/L (ppb) | 5 | 88 | 70-130 |
| Acenaphthene | ug/L (ppb) | 5 | 86 | 70-130 |
| Fluorene | ug/L (ppb) | 5 | 91 | 70-130 |
| Phenanthrene | ug/L (ppb) | 5 | 89 | 70-130 |
| Anthracene | ug/L (ppb) | 5 | 92 | 70-130 |
| Fluoranthene | ug/L (ppb) | 5 | 95 | 70-130 |
| Pyrene | ug/L (ppb) | 5 | 88 | 70-130 |
| Benz(a)anthracene | ug/L (ppb) | 5 | 92 | 70-130 |
| Chrysene | ug/L (ppb) | 5 | 93 | 70-130 |
| Benzo(a)pyrene | ug/L (ppb) | 5 | 91 | 70-130 |
| Benzo(b)fluoranthene | ug/L (ppb) | 5 | 91 | 70-130 |
| Benzo(k)fluoranthene | ug/L (ppb) | 5 | 92 | 70-130 |
| Indeno(1,2,3-cd)pyrene | ug/L (ppb) | 5 | 93 | 70-130 |
| Dibenz(a,h)anthracene | ug/L (ppb) | 5 | 93 | 70-130 |
| Benzo(g,h,i)perylene | ug/L (ppb) | 5 | 92 | 70-130 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht - The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

210207

Report To Paul Velina

Company AE com

Address 111 3rd Ave

City, State, ZIP Seattle, WA 98101

Phone 206-310-5097 Email Paul.Velina@ae.com

Project specific RIs? - Yes / No
gus.friedman@ae.com

SAMPLE CHAIN OF CUSTODY

10/14/22

W2/E03

Page # 1 of 2

SAMPLERS (signature)
Gus Friedman

PROJECT NAME

T-30

PO #

REMARKS

INVOICE TO
Paul Velina

TURNAROUND TIME
 Standard turnaround
 RUSH
 Rush charges authorized by: _____
 SAMPLE DISPOSAL
 Archive samples
 Other _____
 Default Dispose after 30 days

| Sample ID | Lab ID | Date Sampled | Time Sampled | Sample Type | # of Jars | ANALYSES REQUESTED | | | | | | | Notes | | |
|-------------|--------|--------------|--------------|-------------|-----------|--------------------|----------|---------------|------------|---------------|---------------|---------------|-------|--|--|
| | | | | | | NWTPH-Dx | NWTPH-Gx | BTEX EPA 8021 | NWTPH-HCID | VOCs EPA 8260 | PAHs EPA 8270 | PCBs EPA 8082 | | | |
| RM-11A-1022 | 01A-D | 10/13/22 | 1943 | gw | 4 | X | X | | | | | | | | |
| MS-36A-1022 | 02 | 10/13/22 | 1920 | gw | 4 | X | X | | | | | | | | |
| MS-39A-1022 | 03 | 10/13/22 | 2229 | gw | 4 | X | X | | | | | | | | |
| MS-42-1022 | 04 | 10/13/22 | 2203 | gw | 4 | X | X | | | | | | | | |
| RM-9-1022 | 05 | 10/13/22 | 2117 | gw | 4 | X | X | | | | | | | | |
| MS-93-1022 | 06 | 10/13/22 | 1900 | gw | 4 | X | X | | | | | | | | |
| RM-5A-1022 | 07 | 10/13/22 | 2340 | gw | 4 | X | X | | | | | | | | |
| MS-45A-1022 | 08A-0 | 10/13/22 | 2206 | gw | 15 | X | X | | | | | | | | |
| MS-46B-1022 | 09A-E | 10/13/22 | 2100 | gw | 5 | X | X | | | | | | | | |
| MS-92-1022 | 10 | 10/13/22 | 2045 | gw | 5 | X | X | | | | | | | | |

| | | | | | | | | | |
|---------------------|--|---------------------|--|---------------------|--|-----------------|--|--------------|--|
| SIGNATURE | | PRINT NAME | | COMPANY | | DATE | | TIME | |
| <u>Gus Friedman</u> | | <u>Gus Friedman</u> | | <u>AE com</u> | | <u>10/14/22</u> | | <u>12:40</u> | |
| Received by: | | AMNH PHAN | | ES B | | <u>10/14/22</u> | | <u>12:40</u> | |
| Relinquished by: | | | | | | | | | |
| Received by: | | | | Samples received at | | <u>OC</u> | | | |

Friedman & Bryga, Inc.
Ph. (206) 285-8282

SAMPLE CHAIN OF CUSTODY

210207

10/14/22

W2/E03

Page # 2 of 2

Report To Paul Valina

Company AECOM

Address 1111 3rd Ave

City, State, ZIP Seattle, WA 98101

Phone 206-310-5097 Email Paul.Valina@aecom.com

gs.friedman@aecom.com

SAMPLERS (signature) GS

PROJECT NAME T-3D

PO #

REMARKS

INVOICE TO Paul Valina

Project specific RIs? - Yes / No (No)

ANALYSES REQUESTED

| Sample ID | Lab ID | Date Sampled | Time Sampled | Sample Type | # of Jars | NWTPH-Dx | NWTPH-Gx | BTEX EPA 8021 | NWTPH-HCID | VOCs EPA 8260 | PAHs EPA 8270 | PCBs EPA 8082 | Notes |
|------------|--------|--------------|--------------|-------------|-----------|----------|----------|---------------|------------|---------------|---------------|---------------|-------|
| Dup 1-1022 | 11 A-D | 10/15/22 | 2000 | gm | 4 | X | X | | | | | X | |
| | | | | | | | | | | | | | |
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|----------------------------|--------------------|--------------|-----------------|--------------|
| SIGNATURE | PRINT NAME | COMPANY | DATE | TIME |
| Relinquished by: <u>GS</u> | <u>GS Friedman</u> | <u>AECOM</u> | <u>10/14/22</u> | <u>12:40</u> |
| Received by: <u>Paul</u> | <u>ANHPHANI</u> | <u>ESB</u> | <u>10/14/22</u> | <u>12:40</u> |
| Relinquished by: | | | | |
| Received by: | | | | |

Friedman & Bruya, Inc.
Ph. (206) 285-8282

SAMPLE DISPOSAL

Standard turnaround

RUSH

Rush charges authorized by: _____

Archive samples

Other _____

Default

Dispose after 30 days

Samples received at 00

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Vineta Mills, M.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

October 26, 2022

Paul Kalina, Project Manager
AECOM
1111 3rd Ave, Suite 1600
Seattle, WA 98101

Dear Mr Kalina:

Included are the additional results from the testing of material submitted on October 14, 2022 from the T-30, F&BI 210207 project. There are 4 pages included in this report.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures

c: Gus Friedman, Lucy Panteleeff
AEC1026R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on October 14, 2022 by Friedman & Bruya, Inc. from the AECOM T-30, F&BI 210207 project. Samples were logged in under the laboratory ID's listed below.

| <u>Laboratory ID</u> | <u>AECOM</u> |
|----------------------|--------------|
| 210207 -01 | RW-11A-1022 |
| 210207 -02 | MW-36A-1022 |
| 210207 -03 | MW-39A-1022 |
| 210207 -04 | MW-42-1022 |
| 210207 -05 | RW-9-1022 |
| 210207 -06 | MW-93-1022 |
| 210207 -07 | RW-5A-1022 |
| 210207 -08 | MW-45A-1022 |
| 210207 -09 | MW-46B-1022 |
| 210207 -10 | MW-92-1022 |
| 210207 -11 | Dup1-1022 |

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/26/22
 Date Received: 10/14/22
 Project: T-30, F&BI 210207
 Date Extracted: 10/17/22
 Date Analyzed: 10/24/22

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES
 FOR TOTAL PETROLEUM HYDROCARBONS AS
 DIESEL AND MOTOR OIL
 USING METHOD NWTPH-D_x
 Sample Extracts Passed Through a
 Silica Gel Column Prior to Analysis
 Results Reported as ug/L (ppb)**

| <u>Sample ID</u> Laboratory ID | <u>Diesel Range</u> (C ₁₀ -C ₂₅) | <u>Motor Oil Range</u> (C ₂₅ -C ₃₆) | <u>Surrogate</u> <u>(% Recovery)</u> (Limit 41-152) |
|-----------------------------------|--|---|---|
| RW-11A-1022 210207-01 | <50 | <250 | 113 |
| MW-36A-1022 210207-02 | 180 | <250 | 123 |
| MW-39A-1022 210207-03 | 110 | <250 | 112 |
| MW-42-1022 210207-04 | 120 | <250 | 120 |
| RW-9-1022 210207-05 | 200 | <250 | 125 |
| MW-93-1022 210207-06 | <50 | <250 | 109 |
| RW-5A-1022 210207-07 | 84 | <250 | 111 |
| MW-45A-1022 210207-08 1/1.2 | 72 | <300 | 129 |
| MW-46B-1022 210207-09 | 73 | <250 | 122 |
| MW-92-1022 210207-10 | 81 | <250 | 125 |
| Dup1-1022 210207-11 | <50 | <250 | 116 |
| Method Blank 02-2529 MB | <50 | <250 | 115 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/26/22

Date Received: 10/14/22

Project: T-30, F&BI 210207

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER
SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS
DIESEL EXTENDED USING METHOD NWTPH-D_x**

Laboratory Code: 210207-08 (Matrix Spike) Silica Gel

| Analyte | Reporting Units | Spike Level | Sample Result | Percent Recovery MS | Percent Recovery MSD | Acceptance Criteria | RPD (Limit 20) |
|-----------------|--------------------|----------------|------------------|---------------------------|----------------------------|------------------------|-------------------|
| Diesel Extended | ug/L (ppb) | 2,500 | <50 | 103 | 128 | 50-150 | 22 vo |

Laboratory Code: Laboratory Control Sample Silica Gel

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|-----------------|--------------------|----------------|----------------------------|------------------------|
| Diesel Extended | ug/L (ppb) | 2,500 | 80 | 63-142 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht - The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

SAMPLE CHAIN OF CUSTODY

10/14/22

VW2/E03

Page # 1 of 2

210207
Report To Paul Velina

Company FECON

Address 111 25th Ave

City, State, ZIP Seattle, WA 98101

Phone 206-310-5097 Email Paul.Velina@econ.com

Gus Friedman@econ.com
Project specific RLS? - Yes / NO

SAMPLERS (signature)
Gus Friedman

PROJECT NAME

T-30

PO #

REMARKS

INVOICE TO
Paul Velina

TURNAROUND TIME
 Standard turnaround
 RUSH
 Rush charges authorized by: _____
 SAMPLE DISPOSAL
 Archive samples
 Other _____
 Default Dispose after 30 days

| Sample ID | Lab ID | Date Sampled | Time Sampled | Sample Type | # of Jars | ANALYSES REQUESTED | | | | | | | | | |
|-------------|--------|--------------|--------------|-------------|-----------|--------------------|----------|---------------|------------|---------------|---------------|---------------|---------------|-------|--|
| | | | | | | NWTPH-Dx | NWTPH-Gx | BTEX EPA 8021 | NWTPH-HCID | VOCs EPA 8260 | PAHs EPA 8270 | PCBs EPA 8082 | BTEX EPA 8260 | Notes | |
| RM-11A-1022 | 01A-D | 10/13/22 | 1943 | gw | 4 | X | X | | | | | | X | | ✓ per CF Notes 10/21 |
| MS-36A-1022 | 02 | 10/13/22 | 1920 | gw | 4 | X | X | | | | | | X | | ✓ PMT's of water 2-weeks in 10/21/22 |
| MS-39A-1022 | 03 | 10/13/22 | 2229 | gw | 4 | X | X | | | | | | X | | ✓ |
| MS-42-1022 | 04 | 10/13/22 | 2203 | gw | 4 | X | X | | | | | | X | | ✓ |
| MS-9-1022 | 05 | 10/13/22 | 2117 | gw | 4 | X | X | | | | | | X | | ✓ |
| MS-93-1022 | 06 | 10/13/22 | 1900 | gw | 4 | X | X | | | | | | X | | ✓ |
| MS-5A-1022 | 07 | 10/13/22 | 2340 | gw | 4 | X | X | | | | | | X | | ✓ |
| MS-45A-1022 | 08 A-Q | 10/13/22 | 2200 | gw | 15 | X | X | | | | | | X | | ✓ MS/MS |
| MS-46B-1022 | 09 A-E | 10/13/22 | 2100 | gw | 5 | X | X | | | | | | X | | ✓ |
| MS-92-1022 | 10 | 10/13/22 | 2045 | gw | 5 | X | X | | | | | | X | | ✓ |

Friedman & Bruya, Inc.
Ph. (206) 285-8282

| | | | | |
|---------------------|---------------------|---------------------|-----------------|--------------|
| SIGNATURE | PRINT NAME | COMPANY | DATE | TIME |
| <u>Gus Friedman</u> | <u>Gus Friedman</u> | <u>FECON</u> | <u>10/14/22</u> | <u>12:40</u> |
| Relinquished by: | | | | |
| Received by: | <u>ANH PHAN</u> | <u>FECON</u> | <u>10/14/22</u> | <u>12:40</u> |
| Relinquished by: | | | | |
| Received by: | | Samples received at | <u>OC</u> | |

25

210207

SAMPLE CHAIN OF CUSTODY

10/14/22 W2/E03

Report To Paul Valina

Page # 2 of 2

Company AECOM

SAMPLERS (signature) Gas

PROJECT NAME

TURNAROUND TIME

Address 1111 2nd Ave

T-3D

PO #

Standard turnaround
 RUSH
Rush charges authorized by:

City, State, ZIP Seattle, WA 98101

REMARKS

INVOICE TO Paul Valina

Phone 206-310-5097 Email Paul.Valina@aecom.com

Project specific RI's? - Yes / No (No)

SAMPLE DISPOSAL
 Archive samples
 Other
 Default Dispose after 30 days

| Sample ID | Lab ID | Date Sampled | Time Sampled | Sample Type | # of Jars | ANALYSES REQUESTED | | | | | | | | | | Notes | | |
|------------|--------|--------------|--------------|-------------|-----------|--------------------|----------|---------------|------------|---------------|---------------|---------------|---------------|-----------|--|-------|--|----------|
| | | | | | | NWTPH-Dx | NWTPH-Gx | BTEX EPA 8021 | NWTPH-HCID | VOCs EPA 8260 | PAHs EPA 8270 | PCBs EPA 8082 | BTEX EPA 8060 | Dr w/ SRC | | | | |
| Dup 1-1022 | 11A-D | 10/15/22 | 2000 | gwa | 4 | X | X | | | | | | | | | | | 1-per BT |
| | | | | | | | | | | | | | | | | | | 10/14 |
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Friedman & Bruya, Inc.
Ph. (206) 285-8282

| | | | | | | | |
|------------------|--|---------------------|--|---------------------|--|-----------------|--------------|
| SIGNATURE | | PRINT NAME | | COMPANY | | DATE | TIME |
| <u>Gas</u> | | <u>Gas Friedman</u> | | <u>AECOM</u> | | <u>10/14/22</u> | <u>12:40</u> |
| Received by: | | ANHPHAN | | EGB | | <u>10/14/22</u> | <u>12:40</u> |
| Relinquished by: | | | | | | | |
| Received by: | | | | Samples received at | | <u>0C</u> | |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Vineta Mills, M.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

October 26, 2022

Paul Kalina, Project Manager
AECOM
1111 3rd Ave, Suite 1600
Seattle, WA 98101

Dear Mr Kalina:

Included are the results from the testing of material submitted on October 19, 2022 from the T-30, F&BI 210273 project. There are 19 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures

c: Gus Friedman, Lucy Pantaleef
AEC1026R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on October 19, 2022 by Friedman & Bruya, Inc. from the AECOM T-30, F&BI 210273 project. Samples were logged in under the laboratory ID's listed below.

| <u>Laboratory ID</u> | <u>AECOM</u> |
|----------------------|--------------|
| 210273 -01 | MW-89-1022 |
| 210273 -02 | MW-58A-1022 |
| 210273 -03 | MW-86B-1022 |
| 210273 -04 | Dup 2-1022 |

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/26/22
Date Received: 10/19/22
Project: T-30, F&BI 210273
Date Extracted: 10/20/22
Date Analyzed: 10/21/22

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES
FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE
USING METHOD NWTPH-G_x**
Results Reported as ug/L (ppb)

| <u>Sample ID</u> Laboratory ID | <u>Gasoline Range</u> | <u>Surrogate</u> <u>(% Recovery)</u> (Limit 51-134) |
|-----------------------------------|-----------------------|---|
| MW-89-1022 210273-01 | <100 | 91 |
| MW-58A-1022 210273-02 | 130 | 99 |
| MW-86B-1022 210273-03 | <100 | 92 |
| Dup 2-1022 210273-04 | <100 | 93 |
| Method Blank 02-2516 MB | <100 | 90 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/26/22
Date Received: 10/19/22
Project: T-30, F&BI 210273
Date Extracted: 10/20/22
Date Analyzed: 10/24/22

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES
FOR TOTAL PETROLEUM HYDROCARBONS AS
DIESEL AND MOTOR OIL
USING METHOD NWTPH-D_x
Sample Extracts Passed Through a
Silica Gel Column Prior to Analysis
Results Reported as ug/L (ppb)**

| <u>Sample ID</u> Laboratory ID | <u>Diesel Range</u> (C ₁₀ -C ₂₅) | <u>Motor Oil Range</u> (C ₂₅ -C ₃₆) | <u>Surrogate</u> <u>(% Recovery)</u> (Limit 41-152) |
|-----------------------------------|--|---|---|
| MW-89-1022 210273-01 | 61 | <250 | 114 |
| MW-58A-1022 210273-02 | 240 | <250 | 124 |
| MW-86B-1022 210273-03 | 63 | <250 | 113 |
| Dup 2-1022 210273-04 | 89 | <250 | 117 |
| Method Blank 02-2551 MB | <50 | <250 | 104 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/26/22
Date Received: 10/19/22
Project: T-30, F&BI 210273
Date Extracted: 10/20/22
Date Analyzed: 10/20/22

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES
FOR TOTAL PETROLEUM HYDROCARBONS AS
DIESEL AND MOTOR OIL
USING METHOD NWTPH-D_x**
Results Reported as ug/L (ppb)

| <u>Sample ID</u> Laboratory ID | <u>Diesel Range</u> (C ₁₀ -C ₂₅) | <u>Motor Oil Range</u> (C ₂₅ -C ₃₆) | <u>Surrogate</u> (% Recovery) (Limit 41-152) |
|-----------------------------------|--|---|--|
| MW-89-1022 210273-01 | 550 x | <250 | 114 |
| MW-58A-1022 210273-02 | 6,300 x | 900 x | ip |
| MW-86B-1022 210273-03 | 1,600 x | 400 x | 128 |
| Dup 2-1022 210273-04 | 1,600 x | 420 x | 127 |
| Method Blank 02-2551 MB | <50 | <250 | 114 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

| | | | |
|-------------------|------------|-------------|-------------------|
| Client Sample ID: | MW-89-1022 | Client: | AECOM |
| Date Received: | 10/19/22 | Project: | T-30, F&BI 210273 |
| Date Extracted: | 10/20/22 | Lab ID: | 210273-01 |
| Date Analyzed: | 10/20/22 | Data File: | 102021.D |
| Matrix: | Water | Instrument: | GCMS11 |
| Units: | ug/L (ppb) | Operator: | LM |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|-----------------------|-------------|--------------|--------------|
| 1,2-Dichloroethane-d4 | 100 | 78 | 126 |
| Toluene-d8 | 100 | 84 | 115 |
| 4-Bromofluorobenzene | 97 | 72 | 130 |

| Compounds: | Concentration ug/L (ppb) |
|--------------|-----------------------------|
| Benzene | <0.35 |
| Toluene | <1 |
| Ethylbenzene | <1 |
| m,p-Xylene | <2 |
| o-Xylene | <1 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

| | | | |
|-------------------|-------------|-------------|-------------------|
| Client Sample ID: | MW-58A-1022 | Client: | AECOM |
| Date Received: | 10/19/22 | Project: | T-30, F&BI 210273 |
| Date Extracted: | 10/20/22 | Lab ID: | 210273-02 |
| Date Analyzed: | 10/20/22 | Data File: | 102022.D |
| Matrix: | Water | Instrument: | GCMS11 |
| Units: | ug/L (ppb) | Operator: | LM |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|-----------------------|-------------|--------------|--------------|
| 1,2-Dichloroethane-d4 | 103 | 78 | 126 |
| Toluene-d8 | 101 | 84 | 115 |
| 4-Bromofluorobenzene | 109 | 72 | 130 |

| Compounds: | Concentration ug/L (ppb) |
|--------------|-----------------------------|
| Benzene | <0.35 |
| Toluene | <1 |
| Ethylbenzene | <1 |
| m,p-Xylene | <2 |
| o-Xylene | <1 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

| | | | |
|-------------------|-------------|-------------|-------------------|
| Client Sample ID: | MW-86B-1022 | Client: | AECOM |
| Date Received: | 10/19/22 | Project: | T-30, F&BI 210273 |
| Date Extracted: | 10/20/22 | Lab ID: | 210273-03 |
| Date Analyzed: | 10/20/22 | Data File: | 102023.D |
| Matrix: | Water | Instrument: | GCMS11 |
| Units: | ug/L (ppb) | Operator: | LM |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|-----------------------|-------------|--------------|--------------|
| 1,2-Dichloroethane-d4 | 98 | 78 | 126 |
| Toluene-d8 | 104 | 84 | 115 |
| 4-Bromofluorobenzene | 99 | 72 | 130 |

| Compounds: | Concentration ug/L (ppb) |
|--------------|-----------------------------|
| Benzene | <0.35 |
| Toluene | <1 |
| Ethylbenzene | <1 |
| m,p-Xylene | <2 |
| o-Xylene | <1 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

| | | | |
|-------------------|------------|-------------|-------------------|
| Client Sample ID: | Dup 2-1022 | Client: | AECOM |
| Date Received: | 10/19/22 | Project: | T-30, F&BI 210273 |
| Date Extracted: | 10/20/22 | Lab ID: | 210273-04 |
| Date Analyzed: | 10/20/22 | Data File: | 102024.D |
| Matrix: | Water | Instrument: | GCMS11 |
| Units: | ug/L (ppb) | Operator: | LM |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|-----------------------|-------------|--------------|--------------|
| 1,2-Dichloroethane-d4 | 100 | 78 | 126 |
| Toluene-d8 | 100 | 84 | 115 |
| 4-Bromofluorobenzene | 101 | 72 | 130 |

| Compounds: | Concentration ug/L (ppb) |
|--------------|-----------------------------|
| Benzene | <0.35 |
| Toluene | <1 |
| Ethylbenzene | <1 |
| m,p-Xylene | <2 |
| o-Xylene | <1 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

| | | | |
|-------------------|----------------|-------------|-------------------|
| Client Sample ID: | Method Blank | Client: | AECOM |
| Date Received: | Not Applicable | Project: | T-30, F&BI 210273 |
| Date Extracted: | 10/20/22 | Lab ID: | 02-2490 mb |
| Date Analyzed: | 10/20/22 | Data File: | 102007.D |
| Matrix: | Water | Instrument: | GCMS11 |
| Units: | ug/L (ppb) | Operator: | LM |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|-----------------------|-------------|--------------|--------------|
| 1,2-Dichloroethane-d4 | 104 | 78 | 126 |
| Toluene-d8 | 106 | 84 | 115 |
| 4-Bromofluorobenzene | 98 | 72 | 130 |

| Compounds: | Concentration ug/L (ppb) |
|--------------|-----------------------------|
| Benzene | <0.35 |
| Toluene | <1 |
| Ethylbenzene | <1 |
| m,p-Xylene | <2 |
| o-Xylene | <1 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270E

| | | | |
|-------------------|-------------|-------------|-------------------|
| Client Sample ID: | MW-58A-1022 | Client: | AECOM |
| Date Received: | 10/19/22 | Project: | T-30, F&BI 210273 |
| Date Extracted: | 10/20/22 | Lab ID: | 210273-02 |
| Date Analyzed: | 10/20/22 | Data File: | 102020.D |
| Matrix: | Water | Instrument: | GCMS12 |
| Units: | ug/L (ppb) | Operator: | JCM |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|----------------------|-------------|--------------|--------------|
| Nitrobenzene-d5 | 69 | 11 | 173 |
| 2-Fluorobiphenyl | 66 | 44 | 108 |
| 2,4,6-Tribromophenol | 86 | 10 | 140 |
| Terphenyl-d14 | 87 | 50 | 150 |

| Compounds: | Concentration ug/L (ppb) |
|------------------------|-----------------------------|
| Naphthalene | <0.2 |
| 2-Methylnaphthalene | <0.2 |
| 1-Methylnaphthalene | <0.2 |
| Acenaphthylene | <0.02 |
| Acenaphthene | 2.8 |
| Fluorene | <0.02 |
| Phenanthrene | <0.02 |
| Anthracene | <0.02 |
| Fluoranthene | <0.02 |
| Pyrene | <0.02 |
| Benz(a)anthracene | <0.02 |
| Chrysene | <0.02 |
| Benzo(a)pyrene | <0.02 |
| Benzo(b)fluoranthene | <0.02 |
| Benzo(k)fluoranthene | <0.02 |
| Indeno(1,2,3-cd)pyrene | <0.02 |
| Dibenz(a,h)anthracene | <0.02 |
| Benzo(g,h,i)perylene | <0.04 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270E

| | | | |
|-------------------|-------------|-------------|-------------------|
| Client Sample ID: | MW-86B-1022 | Client: | AECOM |
| Date Received: | 10/19/22 | Project: | T-30, F&BI 210273 |
| Date Extracted: | 10/20/22 | Lab ID: | 210273-03 |
| Date Analyzed: | 10/20/22 | Data File: | 102021.D |
| Matrix: | Water | Instrument: | GCMS12 |
| Units: | ug/L (ppb) | Operator: | JCM |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|----------------------|-------------|--------------|--------------|
| Nitrobenzene-d5 | 70 | 11 | 173 |
| 2-Fluorobiphenyl | 82 | 44 | 108 |
| 2,4,6-Tribromophenol | 105 | 10 | 140 |
| Terphenyl-d14 | 90 | 50 | 150 |

| Compounds: | Concentration ug/L (ppb) |
|------------------------|-----------------------------|
| Naphthalene | <0.2 |
| 2-Methylnaphthalene | <0.2 |
| 1-Methylnaphthalene | <0.2 |
| Acenaphthylene | <0.02 |
| Acenaphthene | 0.96 |
| Fluorene | <0.02 |
| Phenanthrene | <0.02 |
| Anthracene | <0.02 |
| Fluoranthene | 0.084 |
| Pyrene | 0.060 |
| Benz(a)anthracene | <0.02 |
| Chrysene | <0.02 |
| Benzo(a)pyrene | <0.02 |
| Benzo(b)fluoranthene | <0.02 |
| Benzo(k)fluoranthene | <0.02 |
| Indeno(1,2,3-cd)pyrene | <0.02 |
| Dibenz(a,h)anthracene | <0.02 |
| Benzo(g,h,i)perylene | <0.04 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270E

| | | | |
|-------------------|------------|-------------|-------------------|
| Client Sample ID: | Dup 2-1022 | Client: | AECOM |
| Date Received: | 10/19/22 | Project: | T-30, F&BI 210273 |
| Date Extracted: | 10/20/22 | Lab ID: | 210273-04 |
| Date Analyzed: | 10/20/22 | Data File: | 102022.D |
| Matrix: | Water | Instrument: | GCMS12 |
| Units: | ug/L (ppb) | Operator: | JCM |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|----------------------|-------------|--------------|--------------|
| Nitrobenzene-d5 | 66 | 11 | 173 |
| 2-Fluorobiphenyl | 82 | 44 | 108 |
| 2,4,6-Tribromophenol | 109 | 10 | 140 |
| Terphenyl-d14 | 92 | 50 | 150 |

| Compounds: | Concentration ug/L (ppb) |
|------------------------|-----------------------------|
| Naphthalene | <0.2 |
| 2-Methylnaphthalene | <0.2 |
| 1-Methylnaphthalene | <0.2 |
| Acenaphthylene | <0.02 |
| Acenaphthene | 2.6 |
| Fluorene | <0.02 |
| Phenanthrene | <0.02 |
| Anthracene | <0.02 |
| Fluoranthene | 0.041 |
| Pyrene | 0.028 |
| Benz(a)anthracene | <0.02 |
| Chrysene | <0.02 |
| Benzo(a)pyrene | <0.02 |
| Benzo(b)fluoranthene | <0.02 |
| Benzo(k)fluoranthene | <0.02 |
| Indeno(1,2,3-cd)pyrene | <0.02 |
| Dibenz(a,h)anthracene | <0.02 |
| Benzo(g,h,i)perylene | <0.04 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270E

| | | | |
|-------------------|----------------|-------------|-------------------|
| Client Sample ID: | Method Blank | Client: | AECOM |
| Date Received: | Not Applicable | Project: | T-30, F&BI 210273 |
| Date Extracted: | 10/20/22 | Lab ID: | 02-2550 mb2 |
| Date Analyzed: | 10/20/22 | Data File: | 102017.D |
| Matrix: | Water | Instrument: | GCMS12 |
| Units: | ug/L (ppb) | Operator: | JCM |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|----------------------|-------------|--------------|--------------|
| Nitrobenzene-d5 | 84 | 11 | 173 |
| 2-Fluorobiphenyl | 83 | 44 | 108 |
| 2,4,6-Tribromophenol | 97 | 10 | 140 |
| Terphenyl-d14 | 99 | 50 | 150 |

| Compounds: | Concentration ug/L (ppb) |
|------------------------|-----------------------------|
| Naphthalene | <0.2 |
| 2-Methylnaphthalene | <0.2 |
| 1-Methylnaphthalene | <0.2 |
| Acenaphthylene | <0.02 |
| Acenaphthene | <0.02 |
| Fluorene | <0.02 |
| Phenanthrene | <0.02 |
| Anthracene | <0.02 |
| Fluoranthene | <0.02 |
| Pyrene | <0.02 |
| Benz(a)anthracene | <0.02 |
| Chrysene | <0.02 |
| Benzo(a)pyrene | <0.02 |
| Benzo(b)fluoranthene | <0.02 |
| Benzo(k)fluoranthene | <0.02 |
| Indeno(1,2,3-cd)pyrene | <0.02 |
| Dibenz(a,h)anthracene | <0.02 |
| Benzo(g,h,i)perylene | <0.04 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/26/22

Date Received: 10/19/22

Project: T-30, F&BI 210273

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER
SAMPLES FOR TPH AS GASOLINE
USING METHOD NWTPH-G_x**

Laboratory Code: 210263-07 (Duplicate)

| Analyte | Reporting Units | Sample Result | Duplicate Result | RPD (Limit 20) |
|----------|--------------------|------------------|---------------------|-------------------|
| Gasoline | ug/L (ppb) | 250 | 270 | 8 |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|----------|--------------------|----------------|----------------------------|------------------------|
| Gasoline | ug/L (ppb) | 1,000 | 115 | 69-134 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/26/22

Date Received: 10/19/22

Project: T-30, F&BI 210273

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER
SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS
DIESEL EXTENDED USING METHOD NWTPH-D_x**

Laboratory Code: Laboratory Control Sample Silica Gel

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Percent Recovery LCSD | Acceptance Criteria | RPD (Limit 20) |
|-----------------|--------------------|----------------|----------------------------|-----------------------------|------------------------|-------------------|
| Diesel Extended | ug/L (ppb) | 2,500 | 72 | 76 | 63-142 | 5 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/26/22

Date Received: 10/19/22

Project: T-30, F&BI 210273

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER
SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS
DIESEL EXTENDED USING METHOD NWTPH-D_x**

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Percent Recovery LCSD | Acceptance Criteria | RPD (Limit 20) |
|-----------------|--------------------|----------------|----------------------------|-----------------------------|------------------------|-------------------|
| Diesel Extended | ug/L (ppb) | 2,500 | 84 | 79 | 63-142 | 6 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/26/22

Date Received: 10/19/22

Project: T-30, F&BI 210273

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER
SAMPLES FOR VOLATILES BY EPA METHOD 8260D**

Laboratory Code: 210275-01 (Matrix Spike)

| Analyte | Reporting Units | Spike Level | Sample Result | Percent | |
|--------------|--------------------|----------------|------------------|----------------|------------------------|
| | | | | Recovery MS | Acceptance Criteria |
| Benzene | ug/L (ppb) | 10 | <0.35 | 99 | 50-150 |
| Toluene | ug/L (ppb) | 10 | <1 | 101 | 50-150 |
| Ethylbenzene | ug/L (ppb) | 10 | <1 | 101 | 50-150 |
| m,p-Xylene | ug/L (ppb) | 20 | <2 | 101 | 50-150 |
| o-Xylene | ug/L (ppb) | 10 | <1 | 100 | 50-150 |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent | | Acceptance Criteria | RPD (Limit 20) |
|--------------|--------------------|----------------|-----------------|------------------|------------------------|-------------------|
| | | | Recovery LCS | Recovery LCSD | | |
| Benzene | ug/L (ppb) | 10 | 102 | 98 | 70-130 | 4 |
| Toluene | ug/L (ppb) | 10 | 104 | 99 | 70-130 | 5 |
| Ethylbenzene | ug/L (ppb) | 10 | 105 | 100 | 70-130 | 5 |
| m,p-Xylene | ug/L (ppb) | 20 | 105 | 100 | 70-130 | 5 |
| o-Xylene | ug/L (ppb) | 10 | 104 | 98 | 70-130 | 6 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/26/22

Date Received: 10/19/22

Project: T-30, F&BI 210273

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER
SAMPLES FOR SEMIVOLATILES BY EPA METHOD 8270E**

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Percent Recovery LCSD | Acceptance Criteria | RPD (Limit 20) |
|------------------------|--------------------|----------------|----------------------------|-----------------------------|------------------------|-------------------|
| Naphthalene | ug/L (ppb) | 5 | 79 | 77 | 62-97 | 3 |
| 2-Methylnaphthalene | ug/L (ppb) | 5 | 80 | 75 | 64-101 | 6 |
| 1-Methylnaphthalene | ug/L (ppb) | 5 | 81 | 76 | 64-93 | 6 |
| Acenaphthylene | ug/L (ppb) | 5 | 87 | 84 | 70-130 | 4 |
| Acenaphthene | ug/L (ppb) | 5 | 85 | 83 | 70-130 | 2 |
| Fluorene | ug/L (ppb) | 5 | 87 | 83 | 70-130 | 5 |
| Phenanthrene | ug/L (ppb) | 5 | 90 | 89 | 70-130 | 1 |
| Anthracene | ug/L (ppb) | 5 | 88 | 86 | 70-130 | 2 |
| Fluoranthene | ug/L (ppb) | 5 | 92 | 90 | 70-130 | 2 |
| Pyrene | ug/L (ppb) | 5 | 89 | 85 | 70-130 | 5 |
| Benzo(a)anthracene | ug/L (ppb) | 5 | 89 | 86 | 70-130 | 3 |
| Chrysene | ug/L (ppb) | 5 | 90 | 88 | 70-130 | 2 |
| Benzo(a)pyrene | ug/L (ppb) | 5 | 90 | 87 | 70-130 | 3 |
| Benzo(b)fluoranthene | ug/L (ppb) | 5 | 92 | 89 | 70-130 | 3 |
| Benzo(k)fluoranthene | ug/L (ppb) | 5 | 92 | 88 | 70-130 | 4 |
| Indeno(1,2,3-cd)pyrene | ug/L (ppb) | 5 | 86 | 83 | 70-130 | 4 |
| Dibenz(a,h)anthracene | ug/L (ppb) | 5 | 86 | 87 | 70-130 | 1 |
| Benzo(g,h,i)perylene | ug/L (ppb) | 5 | 85 | 85 | 70-130 | 0 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht - The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

210273

SAMPLE CHAIN OF CUSTODY 10-19-22

Report No. Paul Kalina

Company AELCOM

Address 111 3rd Ave

City, State, ZIP Seattle WA 98101

Phone 206-310-5097 Email Paul.Kalina@aelcom.com

Gus.Friedman@aelcom.com

Project specific RI's? - Yes / No

SAMPLERS (signature) Gus

PROJECT NAME

T-30

REMARKS

INVOICE TO

P0 #

Page # 1 of 1

TURNOVER TIME

Standard turnaround

RUSH

Rush charges authorized by:

SAMPLE DISPOSAL

Archive samples

Other

Default: Dispose after 30 days

ANALYSES REQUESTED

| Sample ID | Lab ID | Date Sampled | Time Sampled | Sample Type | # of Jars | NWTPH-Dx | NWTPH-Gx | BTEX EPA 8021 | NWTPH-HCID | VOCs EPA 8260 | PAHs EPA 8270 | PCBs EPA 8082 | BTEX EPA 8260 | DATE | TIME |
|-------------|--------|--------------|--------------|-------------|-----------|----------|----------|---------------|------------|---------------|---------------|---------------|---------------|------|------|
| MW-89-1022 | 014-D | 10/19/22 | 0949 | gw | 4 | X | X | | | | | | X | | |
| MW-58A-1022 | 024-E | 10/19/22 | 0833 | gw | 5 | X | X | | | X | X | | X | | |
| MW-58B-1022 | 03 | 10/19/22 | 0940 | gw | 5 | X | X | | | X | X | | X | | |
| Dupa-1022 | 01-L | 10/19/22 | 1200 | gw | 5 | X | X | | | X | X | | X | | |

✓ per GE
Notes

PAHs include
2-methyl naphthalene

SIGNATURE

Relinquished by: Gus

Received by: Wesley Ewald

PRINT NAME

Gus Friedman

Wesley Ewald

COMPANY

AELCOM

#81

DATE

10/19/22

TIME

1040

Received by:

Samples received at 8 0 C

Friedman & Bruya, Inc.
Ph. (206) 285-8282

NR

Appendix H
Groundwater Sampling Summary
Data Quality Review Reports

Memorandum

| | | | |
|---------|--|------|-------|
| To | Paul Kalina, Project Manager | Info | FINAL |
| Subject | Summary Data Quality Review Port of Seattle – T-30 April 2022 Groundwater Sampling | | |
| From | Lucy Panteleeff, Chemist Jennifer B. Garner, Chemist | | |
| Date | September 19, 2022 | | |

The summary data quality review of three groundwater samples collected on April 14, 2022, has been completed. The samples were analyzed at Freidman and Bruya, Incorporated (F&BI) located in Seattle, Washington for benzene, toluene, ethylbenzene, and total xylenes (BTEX) by EPA Method 8021B and total petroleum hydrocarbons (TPHs) by Washington State Department of Ecology Methods NWTPH-Gx (gasoline-range TPH) and NWTPH-Dx (diesel-range and motor oil-range TPH) with silica gel cleanup and NWTPH-Dx (diesel-range and motor oil-range TPH) without silica gel cleanup. The laboratory provided a summary report containing sample results and associated quality assurance (QA) and quality control (QC) data for all samples. For this report, the sample identifications (IDs) do not include the sampling date suffixes (-0422). The following samples are associated with F&BI laboratory group 204253:

| Sample ID | Laboratory ID | Requested Analyses |
|---------------------------------------|---------------|--------------------------|
| RW-11A-0422 | 204253-01 | BTEX, NWTPH-Gx, NWTPH-Dx |
| MW-100-0422 (duplicate of MW-89-0422) | 204253-04 | BTEX, NWTPH-Gx, NWTPH-Dx |
| MW-89-0422 | 204253-05 | BTEX, NWTPH-Gx, NWTPH-Dx |

Data were evaluated based on laboratory QC criteria and validation criteria established in the *National Functional Guidelines for Organic Superfund Methods Data Review*, November 2020.

The following data components were reviewed during the limited data validation procedure for compliance with method specific or laboratory control charted criteria where appropriate: chain of custody forms, holding times, method/trip/instrument blanks, surrogate recoveries, matrix spike/matrix spike duplicate recoveries, laboratory and field duplicate results, laboratory control sample/laboratory control sample duplicate recoveries, reporting limits, and electronic data deliverables.

A summary of qualifiers that may be assigned to results in these laboratory groups are included in Table 1. Qualifiers that may be assigned to results include:

- U - The analyte was analyzed for but was not detected above the reported sample quantitation limit.
- J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- UJ - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.



**Summary Data Quality Review
Port of Seattle - T 30
April 2022 Groundwater Sampling
Laboratory Group: 204253**

- DNR - Do Not Report. Another result is available that is more reliable or appropriate.

Sample Receipt

Upon receipt by the laboratory, the sample jar information was compared to the chain-of-custody (COC) and the cooler temperatures were recorded. The coolers were received at temperatures within the EPA-recommended limits of greater than 0°C and less than or equal to 6°C. Sample volume intended for use as the matrix spike and matrix spike duplicate (MS/MSD) for sample RW-11A were listed individually on the COC. The laboratory logged the samples as primary samples (204253-2 and 204253-3), and an MS/MSD was not analyzed.

Organic Analyses

Samples were analyzed for BTEX and TPHs by the methods identified in the introduction of this report.

1. Holding Times – Acceptable
2. Blanks – Acceptable
3. Surrogates – Acceptable
4. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) – Acceptable
5. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

General – MS/MSDs were not performed due to the login error described above. Precision and accuracy were assessed using LCS/LCSD results and/or field duplicate results

6. Laboratory Duplicate – Acceptable (applicable to BTEX and gasoline-range TPH only)

BTEX by EPA 8021B – A laboratory duplicate was performed using a sample from an unrelated project. Results were comparable.

Gasoline-range TPH by NWTPH-Gx – A laboratory duplicate was performed using a sample from an unrelated project. Results were comparable.

7. Field Duplicate – Acceptable

General – A field duplicate was submitted for MW-89 and identified as MW-100. Results were comparable with the following exception.

Toluene and total xylenes were not detected in MW-89 but were detected in MW-100 at concentrations greater than five times the reporting limits; therefore, the results for toluene and total xylenes in MW-89 and MW-100 were qualified as estimated and flagged 'J' or 'UJ' based on these field duplicate results.



**Summary Data Quality Review
Port of Seattle - T 30
April 2022 Groundwater Sampling
Laboratory Group: 204253**

- 8. Reporting Limits - Acceptable
- 9. Other Items of Note:

Diesel-range and Motor Oil-range TPH by NWTPH-Dx – The laboratory noted that the diesel-range and motor oil-range hydrocarbon patterns in RW-11A, MW-100, and MW-89 did not resemble the fuel standards used for quantitation. No qualifiers were assigned based on these qualitative observations.

Overall Assessment of Data

The data reported in this laboratory group are considered to be usable for meeting project objectives. The completeness for F&BI laboratory group 204253 is 100%.

Table 1. Summary of Qualified Data

| Sample ID | Lab ID | Analyte | Result | Units | Final Result |
|-----------|-----------|---------------|--------|-------|--------------|
| MW-100 | 204253-04 | Toluene | 6.8 | ug/L | 6.8 J |
| MW-100 | 204253-04 | Total Xylenes | 7.7 | ug/L | 7.7 J |
| MW-89 | 204253-05 | Toluene | 1 U | ug/L | 1 UJ |
| MW-89 | 204253-05 | Total Xylenes | 3 U | ug/L | 3 UJ |

Memorandum

| | | | |
|---------|--|------|-------|
| To | Paul Kalina, Project Manager | Info | FINAL |
| Subject | Summary Data Quality Review Port of Seattle – T-30 October 2022 Groundwater Sampling | | |
| From | Lucy Panteleeff, Chemist Jennifer B. Garner, Chemist | | |
| Date | November 9, 2022 | | |

The summary data quality review of fifteen groundwater samples collected on October 13 and October 19, 2022, has been completed. The samples were analyzed at Freidman and Bruya, Incorporated (F&BI) located in Seattle, Washington for benzene, toluene, ethylbenzene, and total xylenes (BTEX) by EPA Method 8260D, total petroleum hydrocarbons (TPHs) by Washington State Department of Ecology Methods NWTPH-Gx (gasoline-range TPH) and NWTPH-Dx (diesel-range and motor oil-range TPH) with silica gel cleanup (SGC) and NWTPH-Dx (diesel-range and motor oil-range TPH) without silica gel cleanup. Select samples got polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270E modified by selected ion monitoring (SIM). The laboratory provided a summary report containing sample results and associated quality assurance (QA) and quality control (QC) data for all samples. For this report, the sample identifications (IDs) do not include the sampling date suffixes (-1022). The following samples are associated with F&BI laboratory groups 210207 and 210273:

| Sample ID | Laboratory Group | Laboratory ID | Requested Analyses |
|--|------------------|---------------|--------------------------------|
| RW-11A-1022 | 210207 | 210207-01 | BTEX, NWTPH-Gx, NWTPH-Dx |
| MW-36A-1022 | | 210207-02 | BTEX, NWTPH-Gx, NWTPH-Dx |
| MW-39A-1022 | | 210207-03 | BTEX, NWTPH-Gx, NWTPH-Dx |
| MW-42-1022 | | 210207-04 | BTEX, NWTPH-Gx, NWTPH-Dx |
| RW-9-1022 | | 210207-05 | BTEX, NWTPH-Gx, NWTPH-Dx |
| MW-93-1022 | | 210207-06 | BTEX, NWTPH-Gx, NWTPH-Dx |
| RW-5A-1022 | | 210207-07 | BTEX, NWTPH-Gx, NWTPH-Dx |
| MW-45A-1022 | | 210207-08 | BTEX, NWTPH-Gx, NWTPH-Dx, PAHs |
| MW-46B-1022 | | 210207-09 | BTEX, NWTPH-Gx, NWTPH-Dx, PAHs |
| MW-92-1022 | | 210207-10 | BTEX, NWTPH-Gx, NWTPH-Dx, PAHs |
| Dup 1-1022 (Field duplicate of RW-11A-1022) | | 210207-11 | BTEX, NWTPH-Gx, NWTPH-Dx |
| MW-89-1022 | 210273 | 210273-01 | BTEX, NWTPH-Gx, NWTPH-Dx |
| MW-58A-1022 | | 210273-02 | BTEX, NWTPH-Gx, NWTPH-Dx, PAHs |
| MW-86B-1022 | | 210273-03 | BTEX, NWTPH-Gx, NWTPH-Dx, PAHs |
| Dup 2-1022 (Field duplicate of MW-86B-1022) | | 210273-04 | BTEX, NWTPH-Gx, NWTPH-Dx, PAHs |

Data were evaluated based on laboratory QC criteria and validation criteria established in the *National Functional Guidelines for Organic Superfund Methods Data Review*, November 2020.

The following data components were reviewed during the limited data validation procedure for compliance with method specific or laboratory control charted criteria where appropriate: chain of custody forms, holding times, method/trip/instrument blanks, surrogate recoveries, matrix spike/matrix

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spike duplicate recoveries, laboratory and field duplicate results, laboratory control sample/laboratory control sample duplicate recoveries, reporting limits, and electronic data deliverables.

A summary of qualifiers that may be assigned to results in these laboratory groups are included in Table 1. Qualifiers that may be assigned to results include:

- U - The analyte was analyzed for but was not detected above the reported sample quantitation limit.
- J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- UJ - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.
- DNR - Do Not Report. Another result is available that is more reliable or appropriate.

Sample Receipt

Upon receipt by the laboratory, the sample jar information was compared to the chain-of-custody (COC) and the cooler temperatures were recorded. No discrepancies related to sample identification were noted and the coolers were received by the laboratory at temperatures within the EPA recommended limits of greater than 0°C and less than or equal to 6°C.

Organic Analyses

Samples were analyzed for BTEX, TPHs and PAHs by the methods identified in the introduction of this report.

1. Holding Times – Acceptable
2. Blanks – Acceptable
3. Surrogates – Acceptable except as noted below:

Diesel-range and Motor Oil-range TPH by NWTPH-Dx (No SGC) – The percent recoveries for o-terphenyl in MW-58A (176%) and RW-9 (167%) exceeded the control limits of 41-152%. The results for diesel-range TPH and motor oil-range TPH in MW-58A and RW-9 were qualified as estimated and flagged 'J' based on these surrogate results.

4. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) – Acceptable
5. Matrix Spike/Matrix Spike Duplicate (MS/MSD) – Acceptable except as noted below:

Gasoline-range TPH by NWTPH-Gx – An MS/MSD was performed using MW-45A. The percent recovery for gasoline-range TPH in the MS (118%) exceeded the control limits of 53-

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117%. The percent recovery in the MSD and the relative percent difference (RPD) for the MS/MSD pair were acceptable; therefore, data were not qualified for gasoline-range TPH based on the elevated MS recovery.

Diesel-range and Motor Oil-range TPH by NWTPH-Dx (SGC) – An MS/MSD was performed using MW-45A. The RPD for diesel-range TPH (22%) exceeded the control limit of 20%. The percent recoveries for diesel-range TPH in the MS and the MSD were acceptable; therefore, data were not qualified based on the elevated RPD.

PAHs by EPA 8270E-SIM – An MS/MSD was performed using MW-45A. The percent recovery (42%) and the RPD (40%) for acenaphthene in MW-45A were outside the control limits of 50-150% and 20%, respectively. The result for acenaphthene in MW-45A was qualified as estimated and flagged 'J' based on the MS/MSD results.

6. Laboratory Duplicate – Acceptable (applicable to gasoline-range TPH only)

Gasoline-range TPH by NWTPH-Gx – A laboratory duplicate was performed using a sample from an unrelated project. Results were comparable.

7. Field Duplicate – Acceptable

General – Field duplicates were submitted for RW-11A and MW-86B and identified as Dup 1 and Dup 2, respectively. Results greater than five times the reporting limit were comparable with the following exception.

PAHs by EPA 8270E-SIM – The RPD for acenaphthene (92%) exceeded 45% in the MW-86B/Dup 2 field duplicate pair. The results for acenaphthene in MW-86B and Dup 2 were qualified as estimated and flagged 'J' based on this field duplicate result.

8. Reporting Limits - Acceptable

9. Other Items of Note:

Diesel-range and Motor Oil-range TPH by NWTPH-Dx (No SGC) – The laboratory noted that the diesel-range and/or motor oil-range hydrocarbon patterns for all of the samples reported in laboratory groups 210207 and 210273 did not resemble the fuel standards used for quantitation. No qualifiers were assigned based on these qualitative observations.

Overall Assessment of Data

The data reported in this laboratory group, as qualified, are considered to be usable for meeting project objectives. The completeness for F&BI laboratory groups 210207 and 210273 is 100%.

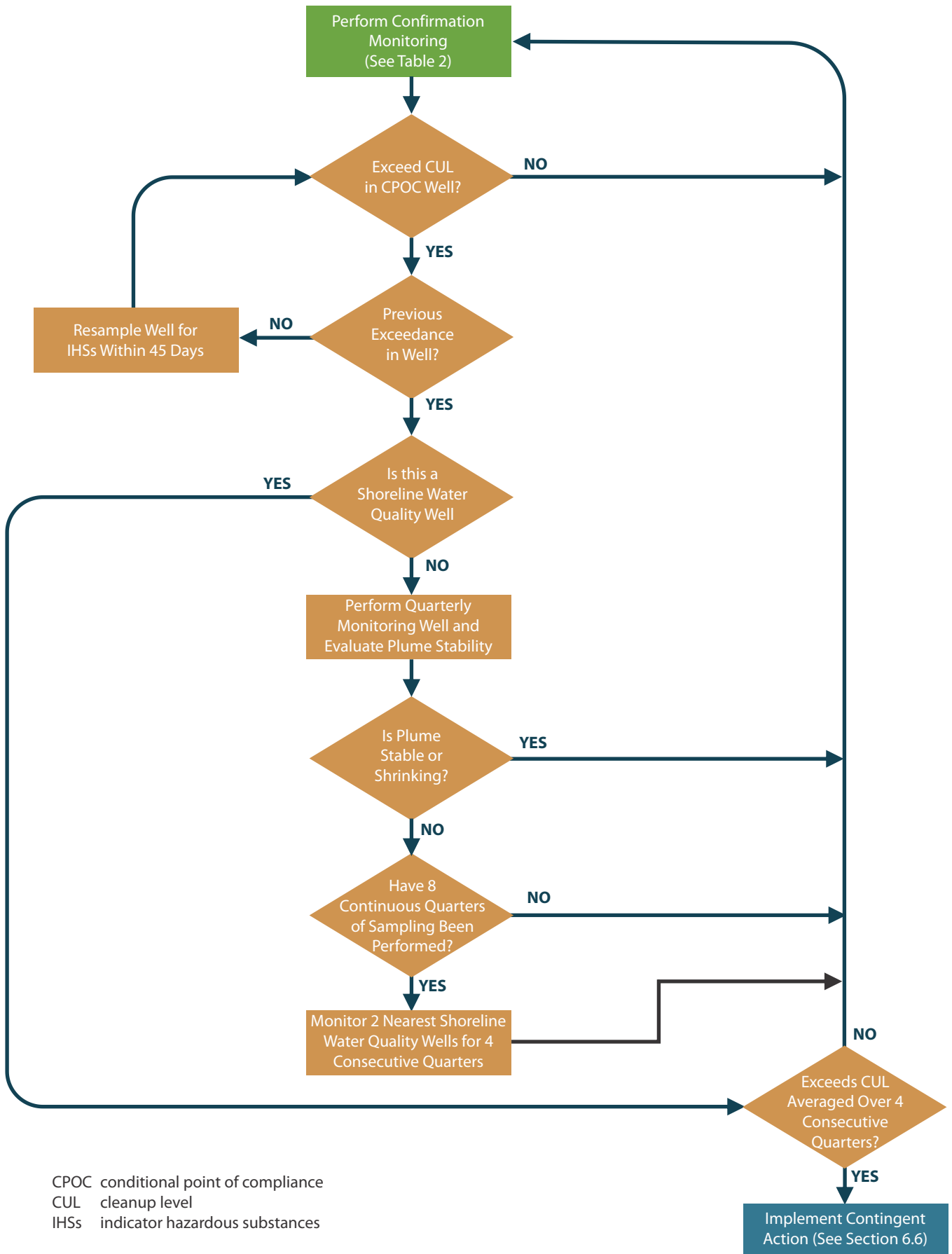


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Table 1. Summary of Qualified Data

| Sample ID | Lab ID | Analyte | Result | Units | Final Result |
|------------------|---------------|---------------------|---------------|--------------|---------------------|
| RW-9 | 210207-05 | Diesel-range TPH | 9,500 | ug/L | 9,500 J |
| RW-9 | 210207-05 | Motor Oil-range TPH | 2,000 | ug/L | 2,000 J |
| MW-45A | 210207-08 | Acenaphthene | 3.7 | ug/L | 3.7 J |
| MW-58A | 210273-02 | Diesel-range TPH | 6,300 | ug/L | 6,300 J |
| MW-58A | 210273-02 | Motor Oil-range TPH | 900 | ug/L | 900 J |
| MW-86B | 210273-03 | Acenaphthene | 0.96 | ug/L | 0.96 J |
| Dup 2 | 210273-03 | Acenaphthene | 2.6 | ug/L | 2.6 J |

Appendix I
Select Figures from the
Groundwater Compliance
Monitoring Plan



CPOC conditional point of compliance
 CUL cleanup level
 IHSs indicator hazardous substances

