



2020-2021 Annual Report

Former Kelly-Moore Manufacturing Facility
5400-5800 Airport Way South
Seattle, Washington
Facility/Site #2163
VCP #NW2305
Project # PS21204540

Prepared for:

Kelly-Moore Paint Company, Inc.

301 W Hurst Boulevard, Hurst, Texas 76053

March 25, 2022

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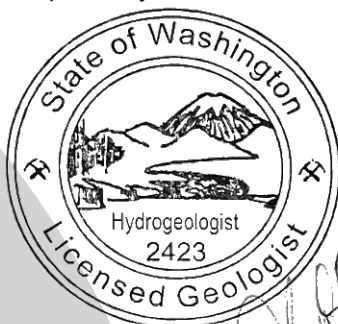
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March 25, 2022

This report was prepared by the staff of Wood Environment & Infrastructure Solutions, Inc., under the supervision of the Hydrogeologist whose seal and signature appear hereon.

The findings, recommendations, specifications, or professional opinions are presented within the limits described by the client, in accordance with generally accepted professional engineering and geologic practice. No warranty is expressed or implied.

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March 25, 2022

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List of Acronyms and Abbreviations

µg/L	micrograms per liter
Amec Foster Wheeler	Amec Foster Wheeler Environment & Infrastructure, Inc.
BNSF	BNSF Railway Company
CATOX	catalytic oxidizer
Ecology	Washington Department of Ecology
EPA	U.S. Environmental Protection Agency
FID	flame ionization detector
Kelly-Moore	Kelly-Moore Paint Company, Inc.
MRE	destruction removal efficiency
MTCA	Model Toxics Control Act
NAVD88	North American Vertical Datum of 1988
O&M	operation and maintenance
PAHs	polycyclic aromatic hydrocarbons
PSCAA	Puget Sound Clean Air Agency
Site	former Kelly-Moore manufacturing facility located at 5400-5800 Airport Way South, Seattle, Washington
SVE	soil vapor extraction
TPH	total petroleum hydrocarbons
TPH-D	total petroleum hydrocarbons in the diesel range
TPH-G	total petroleum hydrocarbons in the gasoline range
TPH-O	total petroleum hydrocarbons in the motor oil range
VCP	Washington State Voluntary Cleanup Program
VOCs	volatile organic compounds
Wood	Wood Environment & Infrastructure Solutions, Inc.

1.0 Introduction

1.1 Purpose

Wood Environment & Infrastructure Solutions, Inc. (Wood), prepared this report on behalf of Kelly-Moore Paint Company, Inc. (Kelly-Moore), for the former Kelly-Moore manufacturing facility located at 5400-5800 Airport Way South, Seattle, Washington (Site; Figure 1). Kelly-Moore's objective is to conduct remedial action at the Site in compliance with requirements established by the Washington State Department of Ecology (Ecology) under the state Model Toxics Control Act (MTCA) via the Washington State Voluntary Cleanup Program (VCP) and attain No Further Action status for the Site.

This report presents the results of groundwater and Site monitoring activities as summarized below.

- Dry season groundwater monitoring (August 2020 and September 2021);
- Wet season groundwater monitoring (March 2021);
- Soil vapor extraction (SVE) system operation and maintenance (O&M; January 2020 through December 2021); and
- Air sparge system O&M (January 2020 through December 2021).

Groundwater monitoring results (August 2019 and March 2020) and O&M activities (June 2019 through May 2020) were reported in the 2019 *Summary of Investigations and Remedial Actions* report dated September 28, 2020 (Wood, 2020).

1.2 Background

The Site is located on the east side of Airport Way South at the intersection of South Lucile Street and Airport Way South in the Georgetown neighborhood of Seattle, Washington (Figure 1), and covers approximately 2.7 acres. The Site is bordered on the north by BNSF Railway Company (BNSF) tracks and the Olympic Foundry, on the west by Airport Way South and the Airport Way South overpass, on the east by BNSF tracks and a steep hillside, and on the south by an Interstate 5 connector ramp overpass (Figure 1).

The Site has been used for a variety of industrial purposes since the early 1900s, and Kelly-Moore acquired the Site in 1994. Kelly-Moore used portions of the Site as a paint manufacturing plant for blending paints and pigments between approximately 1994 and 2008 and vacated the property by 2010. Kelly-Moore sold the southern portion of the Site to JST Georgetown, LLC, in 2011, and sold the northern portion of the Site to NCD GeorgeTown, LLC, in 2014. The new owners of the northern parcel demolished all of the former buildings and warehouses in 2015, during which time Kelly-Moore directed Wood (formerly Amec Foster Wheeler Environment & Infrastructure, Inc. [Amec Foster Wheeler]) to perform additional interim remedial actions and address known areas of contamination that were not accessible prior to the demolition. Construction of the new building on the northern parcel was completed in 2016. Elysian Brewing Company is the primary tenant of the new building constructed on this parcel, using it for brewing beer. The southern parcel is also leased by Elysian Brewing Company, which moved into the warehouse in 2011 to add bottling capacity to its operations.

2.0 Groundwater Monitoring

The groundwater monitoring program consists of collecting groundwater samples from eight wells twice a year, once during the dry season (August/September) and once during the wet season (March). Groundwater monitoring has been conducted twice a year since June 2016. Tables 1 through 3 provide

information on groundwater elevations, field parameters, and groundwater analytical results. During the March 2021 wet season and September 2021 dry season groundwater sampling events, Wood performed additional groundwater analysis as part of review and optimization of the soil vapor extraction (SVE) treatment system. Five monitoring wells were sampled for the additional analyses: KMW-03R, KMW-04, KMW-06, KMW-09, and KMW-10 as discussed in Section 2.2. Two additional monitoring wells, BFK926 and BFK927, identified during a Site walk with Ecology on May 5, 2021, were also sampled during September 2021. Location of the two additional monitoring wells are shown on Figure 3.

2.1 Water Level Measurements and Hydrogeology

The groundwater monitoring program includes measuring water levels in each of the eight monitoring wells. The reference points for determining water level elevations are the tops of the polyvinyl chloride well casings, which have been surveyed relative to mean sea level (North American Vertical Datum of 1988 [NAVD88]). To reduce variation in groundwater level measurements, static water levels for all wells are measured on the same day and before the wells are purged and sampled. Groundwater levels were measured to the nearest 0.01 foot using an electronic water level meter. Groundwater measurements from August 20, 2020, March 22, 2021, and September 1, 2021 are presented in Table 1.

Groundwater elevation contours for water level measurements collected in August 2020, March 2021, and September 2021 are presented on Figures 2, 3, and 4, respectively. Water level measurements collected during both the dry and wet season groundwater monitoring events indicate that groundwater generally flows to the south and west-southwest, in agreement with measurements from previous years (Wood, 2020). Groundwater elevations across the Site vary seasonally, with higher groundwater elevations in the wet season and lower elevations in the dry season. The wet season/dry season range of elevations observed during the 2020–2021 reporting period was between 1.96 and 2.34 feet of elevation difference.

2.2 Groundwater Sampling Methodology

Groundwater samples were collected on August 19 and 20, 2020 and September 1 and 2, 2021, for the dry season and on March 22 through 24, 2021, for the wet season. The groundwater samples were collected in accordance with the procedures outlined in the *Additional Investigation Work Plan* (Amec Foster Wheeler, 2016). Samples were collected using a peristaltic pump with pre-installed dedicated polyethylene tubing using U.S. Environmental Protection Agency (EPA) low-flow sampling techniques. Groundwater parameters were measured at each well during purging using a YSI multi-parameter water quality meter and were recorded on field data sheets (Appendix A). Parameters measured were turbidity, pH, dissolved oxygen, specific conductivity, and oxidation reduction potential (Table 2). Representative unfiltered groundwater samples were collected upon stabilization of the water quality parameters over the course of three consecutive measurements.

Groundwater sample containers were filled directly from the pump tubing and were immediately placed on ice. Samples were transported under chain-of-custody protocols to Friedman & Bruya, Inc., in Seattle, Washington, for laboratory analyses. Groundwater samples from all eight monitoring wells during the reporting period and monitoring wells BFK926 and BFK927 during September 2021 were analyzed for the following:

- Volatile organic compounds (VOCs) by EPA Method 8260D;
- Polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270E with selected ion monitoring for some compounds;
- Total metals (arsenic, chromium, copper, lead, mercury, nickel, and zinc) by EPA Method 6020B;

- Total petroleum hydrocarbons (TPH) in the gasoline range (TPH-G) by Ecology method NWTPH Gx; and
- TPH in the diesel and motor oil ranges (TPH-D and TPH-O) by Ecology Method NWTPH-Dx.

Additionally, the five monitoring wells, KMW-03R, KMW-04, KMW-06, KMW-09, and KMW-10, were analyzed for the following analyses during the wet season in March 2021 and dry season in September 2021:

- Volatile fatty acids by EPA Method 300.0;
- Biological oxygen demand by Standard Method (SM) 5210B;
- Carbon dioxide by SM 2320/SM 4500-CO₂D;
- Chemical oxygen demand by SM 5220D;
- Dissolved gases (methane, ethane, and ethene) by RSK-175;
- Dissolved metals (iron, calcium, manganese, magnesium, aluminum, and sodium) by EPA Method 200.8;
- Ion chromatography (sulfate, nitrate) by EPA Method 300.0;
- Total metals (iron, calcium, manganese, magnesium, aluminum, and sodium) by EPA Method 200.8 and EPA Method 6020B;
- Total alkalinity by SM 2320B;
- Hardness by EPA Method 200.8 and SM 2340B; and
- Total organic carbon by SM 5310C.

Laboratory data packages and data validation memoranda are included in Appendix B.

2.3 Data Validation Results

The groundwater monitoring results for the dry and wet season events were reviewed in accordance with the Quality Assurance Projection Plan (Amec Foster Wheeler, 2016, Attachment B). Documentation provided in the analytical data package was acceptable, data quality was acceptable, and results from these samples may be considered usable with the limitations described in the data validation assessment summaries provided in Appendix B. Data qualifiers added during validation are summarized below:

- August 2020:
 - Wood J/UJ-IS qualified samples KMW-04-082020, KMW-06-082020, KMW-09-082020, KMW-10-082020, and KMW-10-9-082020 for chromium because there was interference in the internal standard in the undiluted analyses. The affected samples were diluted and re-analyzed for chromium. Internal standard recoveries were acceptable, but chromium was not detected in the diluted re-analyses. Wood excluded the non-detected results from the re-analyses and J/UJ-IS from the original analyses as appropriate.
 - Wood J/UJ-IS qualified samples KMW-04-082020, KMW-09-082020, KMW-10-082020, and KMW-10-9-082020 for copper and nickel because there was interference in the internal standard in the undiluted analyses. The affected samples were diluted and re-analyzed for copper and nickel. Internal standard recoveries were acceptable, but copper and nickel were not detected in the diluted re-analyses. Wood excluded the non-detected results from the re-analyses and J/UJ-IS from the original analyses as appropriate.

- March 2021:
 - Wood J-MI qualified samples KMW-06 and Duplicate1 for TPH-G because there was matrix interference.
 - Wood J/UJ-LS qualified sample KMW-06 for detected isopropylbenzene and n-propylbenzene, and remaining non-detected VOCs because of potential low analytical bias because the surrogate compound 4-bromofluorobenzene was low in the analysis.
 - Wood J/UJ-LS qualified sample Duplicate1 for detected methylene chloride, isopropylbenzene, n-propylbenzene, and 1,1,2,2-tetrachloroethane, and remaining non-detected VOCs because of potential low analytical bias because the surrogate compound 4-bromofluorobenzene was low in the analysis.
 - Wood excluded results from undiluted analyses where F&BI qualified results when detected concentrations were greater than the instrument's calibration range.
 - Wood J-HT qualified the sample KMW-06 for biochemical oxygen demand because the analysis was started more than 2 hours after the hold time.
 - Wood UH-JT qualified sample KMW-03R for nitrate because the analysis was started more than 2 hours after the hold time.
 - Wood excluded re-analysis sample of KMW-10 for the non-detected result from the 1:2 dilution analyzed outside of hold because the analytical sensitivity in the 1:5 dilution was sufficient to meet project goals.
 - Wood J-DS qualified all dilution samples for KMW-06, Duplicate1, and KMW-10 for biochemical oxygen demand because reported results may be biased low because they resulted in full oxygen depletion.
 - Wood UJ-RT qualified sample KMW-03R for non-detected volatile fatty acid because of the elevated receipt temperature.
- September 2021:
 - Wood J-FD qualified the detected TPH-G and TPH-O results from samples KMW-10 and Duplicate 1 because of sampling and/or analytical imprecision.
 - Wood J qualified the detected and UJ qualified the non-detected arsenic, lead, chromium, copper, and zinc results from samples KMW-10 and Duplicate 1 because of sampling and/or analytical imprecision.
 - Wood J-FD qualified the detected benzo(a)anthracene, chrysene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, and indeno (1,2,3-cd)pyrene results from samples KMW-10 and Duplicate 1 because of sampling and/or analytical imprecision.
 - Wood UJ-BC qualified the 1,1-dichloroethane results from BFK926, BFK927, KMW-04, KMW-06, KMW-09, KMW-10, and Duplicate 1 because the calibration standard did not meet criteria.
 - Wood J-HL qualified the aluminum results from KMW-06, KMW-10, and Duplicate 1 because of potential high analysis bias.
 - Wood J-HT qualified the carbon dioxide results from KMW-03R, KMW-06, KMW-09, KMW-10 and Duplicate 1 because of the missed hold times.
 - Wood J-RT qualified the detected and UJ-RT qualified non-detected VFA results from KMW-03R, KMW-04, KMW-06, KMW-09, KMW-10 and Duplicate 1 because of elevated receipt temperature.

A list of qualified data is presented in the data validation assessment summary (Appendix B).

2.4 Groundwater Analytical Results

Groundwater results for commonly detected compounds are presented in Table 3, along with the results for detected compounds in sampling events conducted since 2011. Figures 5 through 8 present select groundwater constituents for August 2020, March 2021, and September 2021, respectively.

2.4.1 Total Petroleum Hydrocarbons

The highest concentrations of TPH-G have been observed in the groundwater from KMW-04, KMW-06, KMW-09, and KMW-10 (Figures 5 through 8). During the August 2020, March 2021, and September 2021 sampling events, the concentrations of TPH-G exceeded the Site screening level (also the MTCA Method A Cleanup Level) of 800 micrograms per liter ($\mu\text{g/L}$) (where benzene is present), at wells KMW-04 (August 2020, 77,000 $\mu\text{g/L}$ and March 2021, 19,000 $\mu\text{g/L}$), KMW-06 (August 2020, 5,400 $\mu\text{g/L}$, March 2021, 4,500 [estimated] $\mu\text{g/L}$, and September 2021, 7,600 $\mu\text{g/L}$), KMW-09 (August 2020, 990 $\mu\text{g/L}$), and KMW-10 (August 2020, 1,800 $\mu\text{g/L}$, March 2021, 31,000 $\mu\text{g/L}$, and September 2021, 31,000 [estimated] $\mu\text{g/L}$).

TPH-D and/or TPH-O have been detected in the groundwater from all of the monitoring wells except for KMW-02R and KMW-07 at least once since sampling began in 2011. During the most recent sampling events in August 2020, March 2021, and September 2021 (See Figures 5 through 8), the concentrations of TPH-D exceeded the Site screening level (also the MTCA Method A Cleanup Level) of 500 $\mu\text{g/L}$ for the following wells, KMW-03 (August 2020, 700 $\mu\text{g/L}$), KMW-04 (August 2020, 5,800 $\mu\text{g/L}$, March 2021, 1,300 $\mu\text{g/L}$, and September 2021, 2,600 $\mu\text{g/L}$), KMW-06 (August 2020, 17,000 $\mu\text{g/L}$, March 2021, 35,000 $\mu\text{g/L}$, and September 2021, 19,000 $\mu\text{g/L}$), KMW-09 (August 2020, 13,000 $\mu\text{g/L}$, March 2021, 7,000 $\mu\text{g/L}$, and September 2021, 7,900 $\mu\text{g/L}$), and KMW-10 (August 2020, 10,000 $\mu\text{g/L}$, March 2021, 8,600 $\mu\text{g/L}$, and September 2021, 8,900 $\mu\text{g/L}$).

2.4.2 Volatile Organic Compounds

Groundwater samples were analyzed for the full list of VOC compounds. Toluene, ethylbenzene, and xylenes compounds were the most frequently detected VOCs, and were predominantly detected in the central area of the Site, where high concentrations of TPH-G also have been detected. These detections are most prevalent in the groundwater from KMW-04, and concentrations appear to have decreased over time, like the TPH-G concentrations in the groundwater from KMW-04. We expect to see VOC concentrations decrease in groundwater at KMW-04 as SVE and air sparging continue to target the western portion of the property. Benzene has not been detected in the Site monitoring wells since routine monitoring began in September 2017.

Other VOC compounds detected in the groundwater during the reporting period are 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, acetone, ethylbenzene, xylenes, and toluene which were detected in the groundwater collected from KMW-04 and/or KMW-10 during one or both sampling events (August 2020, March 2021, and/or September 2021).

Chlorinated VOCs were not detected in groundwater samples collected from the monitoring wells during the 2020 and 2021 sampling events, which is consistent with historical results.

2.4.3 Carcinogenic Polycyclic Aromatic Hydrocarbons

Carcinogenic PAHs were detected during the August 2020, March 2021, and September 2021 groundwater sampling events at KMW-06, KMW-08 (September 2021 only) and KMW-10 (March and September 2021 only) as shown on Figures 5 through 8. Samples from KMW-06 during March 2021 and

KMW-10 during September 2021 exceeded the Site screening level of 0.20 µg/L for the total Toxicity Equivalency Quotient.

2.4.4 Metals

Groundwater samples were analyzed for total arsenic, chromium, copper, lead, mercury, nickel, and zinc. The concentrations of metals in the groundwater samples were below Site screening levels, except for arsenic and lead (See Figures 5 through 8). For the 2020 and 2021 sampling events, arsenic was detected at concentrations that exceed the Ecology background level (also the MTCA Method A Cleanup Level) of 5.0 µg/L at KMW-04 (August 2020, 17.9 µg/L and September 2021, 16.9 µg/L), KMW-06 (August 2020, 5.58 µg/L, March 2021, 8.05 µg/L, and September 2021, 5.93 µg/L), and at KMW-10 (August 2020, 5.34 µg/L, March 2021, 6.59 µg/L, and September 2021, 48.7 [estimated] µg/L). Lead was only detected at concentrations above the MTCA Method A Cleanup Level of 15.0 µg/L at KMW-06 (29.7 µg/L) during the March 2021 sampling event and KMW-10 (116 [estimated] µg/L) during the September 2021 sampling event.

2.5 Additional Groundwater Analytical Results

Additional groundwater sampling was conducted during the March and September 2021 sampling events at five wells (KMW-03R, KMW-04, KMW-06, KMW-09, and KMW-10) for optimization of the treatment system. These additional groundwater results are presented in Table 3.

3.0 Soil Vapor Extraction/Air Sparge System Operations

3.1 Design, Installation, and Operations

3.1.1 SVE System Design and Installation

SVE and air sparging technologies were selected to address past subsurface releases of hydrocarbons associated with former paint manufacturing activities at the Site. SVE uses a vacuum to extract soil vapors from the subsurface, while in-situ air sparging injects air into the saturated zone to help volatilize hydrocarbons to increase the contaminant removal rate. Both methods introduce or help move oxygen into and through the subsurface, which also promotes aerobic biodegradation of residual hydrocarbons.

A series of eight horizontal SVE wells (SVE-01 through SVE-08) were installed beneath the building during redevelopment in 2015. After building construction was completed, a second set of five horizontal SVE wells (SVE-09 through SVE-13) were installed in the parking lot on the western side of the Site. A set of five air sparge wells (IAS-1 through IAS-5) were installed between the western SVE wells. Figure 8 shows the locations of the SVE horizontal wells at the Site, and Figure 9 shows the locations of the air sparge wells. Applicable permits and construction details were included in the *2017 Summary of Investigations and Remedial Actions* (Wood, 2018).

The SVE wells installed under the building were routed to a common manifold (referred to as the eastern manifold) located in a walkway between the north warehouse and the south warehouse. The SVE wells installed on the west side of the building were routed to a common manifold (referred to as the western manifold), which is located in a fenced-off area near the treatment equipment. Figure 10 shows the current configuration of the SVE and air sparge system.

The SVE (vacuum) blower and air sparge compressor were installed adjacent to the western manifold along with a catalytic oxidizer (CATOX) unit. The CATOX unit is used to treat the extracted soil vapor as well as volatilized hydrocarbons sparged from the shallow groundwater recovered by the western SVE wells. The treatment system was permitted with the Puget Sound Clean Air Agency (PSCAA) as detailed in

the 2017 *Summary of Investigations and Remedial Actions* (Wood, 2018) and as approved by PSCAA per the Notice of Construction No. 11291, under Registration No. 29932, dated February 22, 2017.

Figure 11 is an abbreviated piping and instrumentation diagram showing the SVE system and the treatment equipment. Both eastern and western SVE manifolds route extracted soil vapor to the CATOX treatment unit. The combined SVE and air sparging system is equipped with automatic controls and an auto-dialer that notifies Wood and O&M personnel when the CATOX system or other components have shut down with an alarm condition or if specific maintenance tasks are required, such as disposal of condensate water that is produced by the SVE wells that is collected in the 30-gallon knock-out tank. The system is equipped with a 250-gallon polyethylene tote (referred to as the condensate storage tank) to store condensate water that is pumped from the knock-out tank. Both the knock-out tank and the condensate storage tank have high level alarm switches directed to the control system to shut down the SVE blower if high level alarm conditions occur to reduce the risk of overfilling. The entire air sparging system is configured to shut down immediately upon an alarm condition of the SVE system.

3.1.2 SVE and Air Sparge Operations

The SVE system has operated semi-continuously between January 2020 and December 2021. Because the SVE and CATOX systems use three-phase electrical power, they are sensitive to local power variations and occasionally shut-down due to power fluctuations and outages. The system will also shut-down periodically due to high level alarm conditions in the condensate storage tank due to increased condensate production that typically peaks in the winter/wet season. In summer, power outages/fluctuations typically occur due to increased demand for air conditioning. When these events occur, O&M personnel are alerted via the auto-dialer and address the issue(s) during an expedited site visit. Due to elevated groundwater levels during the middle of the winter/wet season where groundwater actually starts to enter the western manifold SVE wells, these wells are closed along with deactivation of the nearby in-situ air sparging wells for a few months. When groundwater levels lower during the late winter/early spring, these wells to allow sufficient air movement without water entry, the western manifold wells are brought back on-line with the in-situ air sparging system.

3.2 SVE and Air Sparge Performance Evaluation

3.2.1 CATOX Performance Monitoring and Regulatory Compliance

Since initial startup of the SVE system in November 2017, performance monitoring vapor samples have been collected monthly from the CATOX influent vapor stream sampling port and at the effluent sample port on the emissions stack. In compliance with the PSCAA NOC requirements, monthly performance monitoring samples are field measured using either a photo ionization detector (PID) or a flame ionization detector (FID) calibrated to 100 parts per million hexane. PID/FID readings are reported on field forms presented in Appendix C. Monthly performance monitoring samples are also collected and submitted to Friedman & Bruya, Inc., in Seattle, Washington, for laboratory analyses of benzene and gasoline-range organic compounds (also referred to as TPH-G) by EPA Method TO-15. Monthly FID readings and monthly analytical results for SVE performance monitoring from January 2020 through December 2021 are summarized on Table 4, and analytical reports are provided in Appendix D.

The CATOX performance is determined by its mass removal efficiency (MRE) of gasoline-range organics compounds from extracted soil vapor from the SVE wells. MRE is calculated from results of PID/FID field measurements and analytical laboratory results of samples collected at the CATOX influent and at the effluent emissions stack. These data are shown in Table 5. MREs have exceeded the minimum PSCAA NOC requirements in 2020 and 2021 and demonstrate compliant system performance except for the January, February, and March 2020 monthly site visits. For the January through March 2020 monitoring results, the

system was shut down, and extensive system troubleshooting and maintenance were performed as described in Section 3.1.2. Since March 2020, field PID/FID and laboratory analytical results have met permit requirements (see Table 5.).

3.2.2 SVE and Air Sparge Optimization and Performance Monitoring

Between November 2017 through December 2021, an estimated 7,635 pounds of gasoline range organic compounds or TPH-G (as hexane equivalent using FID results) were removed from the subsurface by the SVE system in conjunction with the air-sparge system. Table 4 summarizes the performance data. Mass removal rates are highest in the summer months when SVE concentrations are high due to lower groundwater levels, which causes the smear zone to be exposed for volatilization and recovery of volatile constituents through increased soil vapor flow by the SVE system. The flows from the individual SVE wells are optimized during the monthly site visits to maximize the concentration of hydrocarbons to the CATOX influent. The highest-concentration SVE wells have been lately from SVE-07 and SVE-08.

SVE mass removal rates generally diminish when site groundwater levels rise during the winter, thereby reducing the vadose zone thickness and available volume for subsurface vapor movement and with a decrease in SVE influent concentrations. Wet season operations are also less efficient due to intermittent alarm conditions and periodic shutdowns associated with increased condensate production at the CATOX knockout tank and occasional power outages and fluctuations due to storms. As mentioned above, when groundwater levels reach a high elevation with respect to the screened intervals of the western manifold SVE wells in the middle of winter, all of the western manifold SVE wells are closed in addition to the IAS wells. Monthly O&M visits are used to operate and adjust the SVE and air sparge systems (when operational) during the wet and dry seasons to optimize mass removal year round.

4.0 Upcoming Tasks

The following actions will be conducted before the end of 2022:

- Wood will install new groundwater monitoring wells on Site during the summer of 2022 per Ecology's request in its Opinion Letter dated November 2019 and per the Site walk conducted with Ecology on May 5, 2021. Installation of the monitoring wells has been delayed due to offsite property access negotiations.
- Groundwater samples will be collected for the wet season sampling event in March 2022 and dry season sampling event in August 2022.
- SVE and air sparging system inspections (including performance monitoring sampling) will occur at least monthly. On-site personnel will continue to optimize SVE and air sparging operating conditions in order to maximize mass removal rates and CATOX performance.
- Kelly-Moore and Ecology would like to continue working together to take the necessary steps to eventually obtain "No Further Action" for the Site.

5.0 References

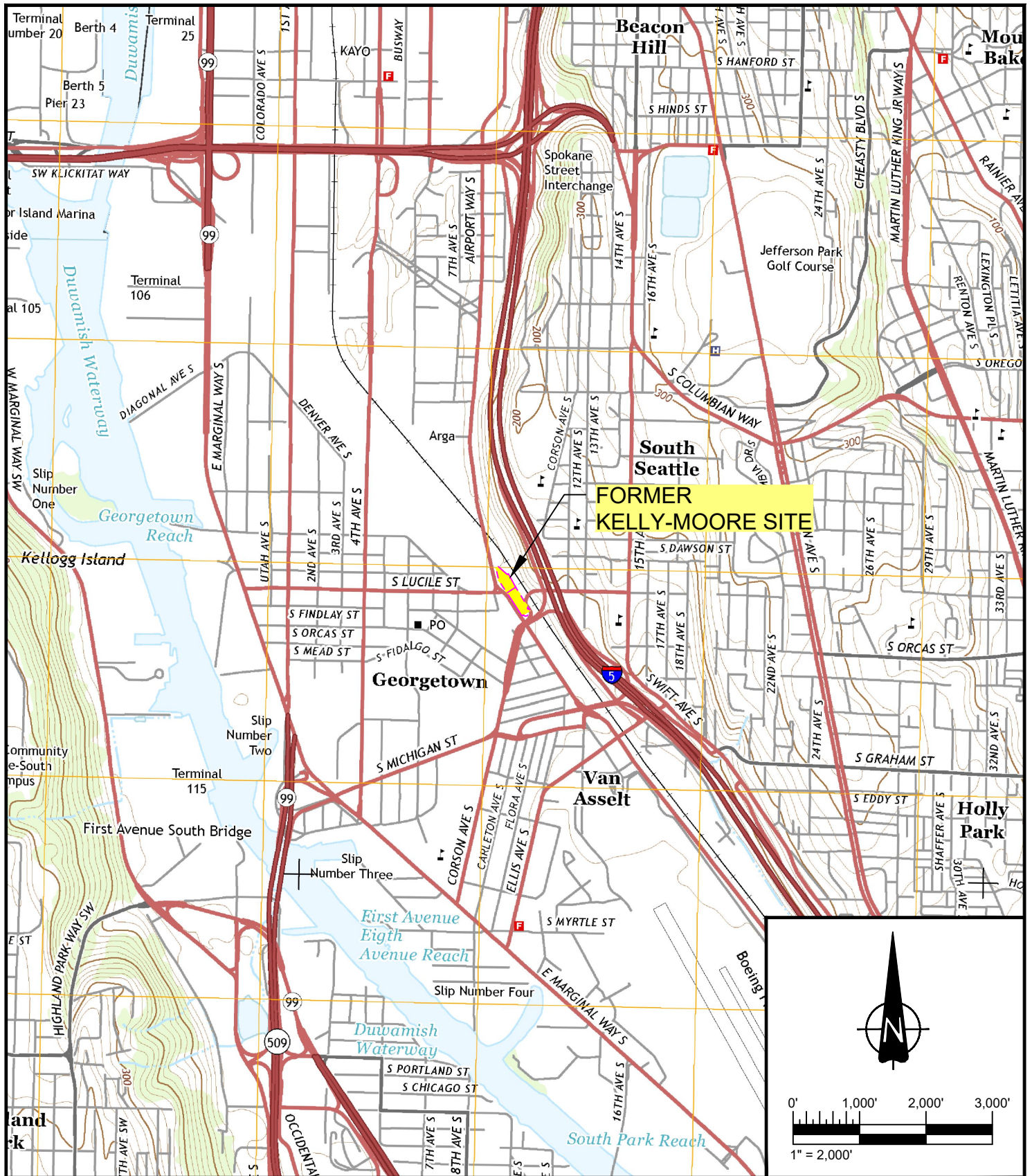
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wood.

Figures





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2020-2021 ANNUAL REPORT

SITE VICINITY MAP

DATE

MARCH 2022

SCALE

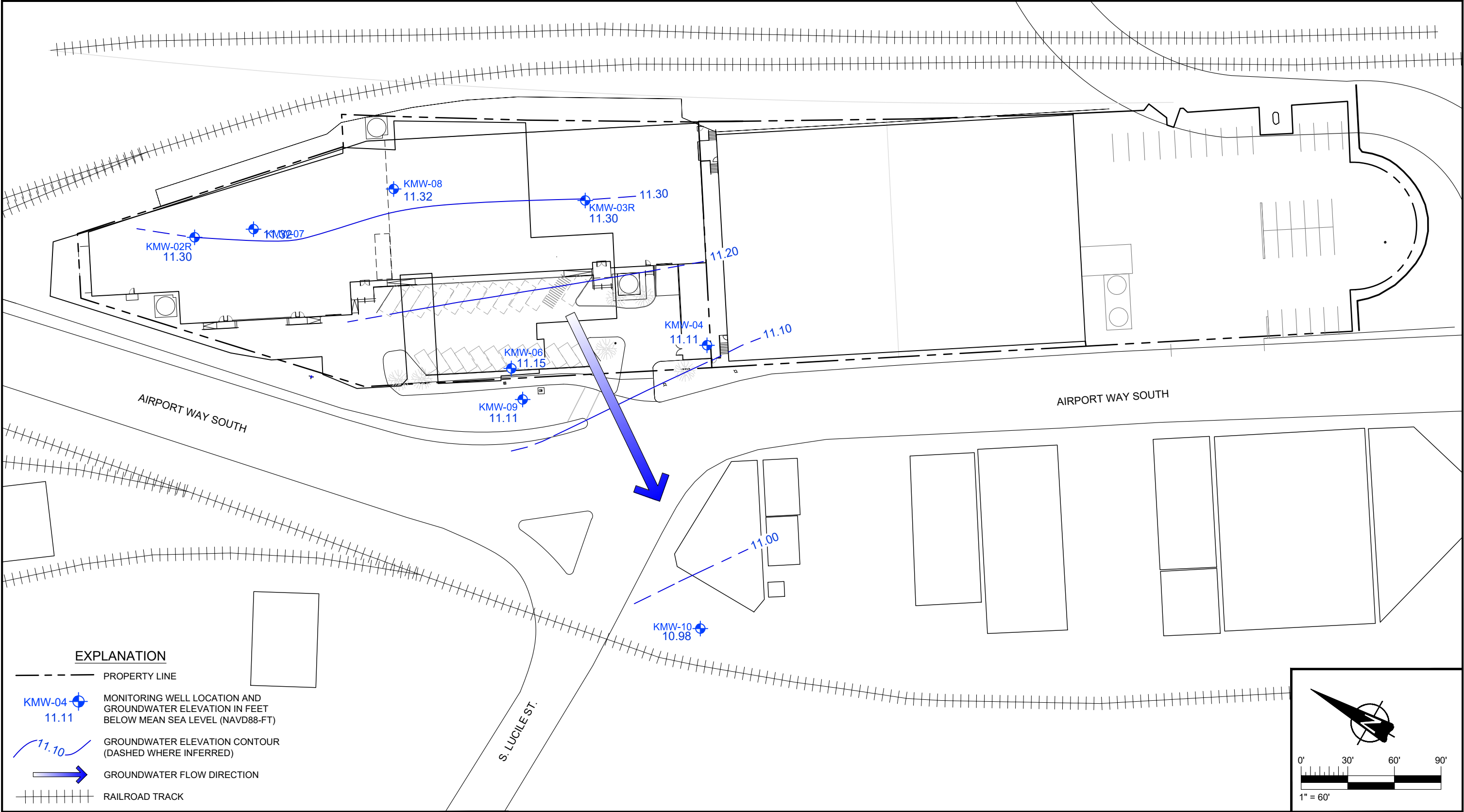
1" = 2,000'

PROJECT NO.

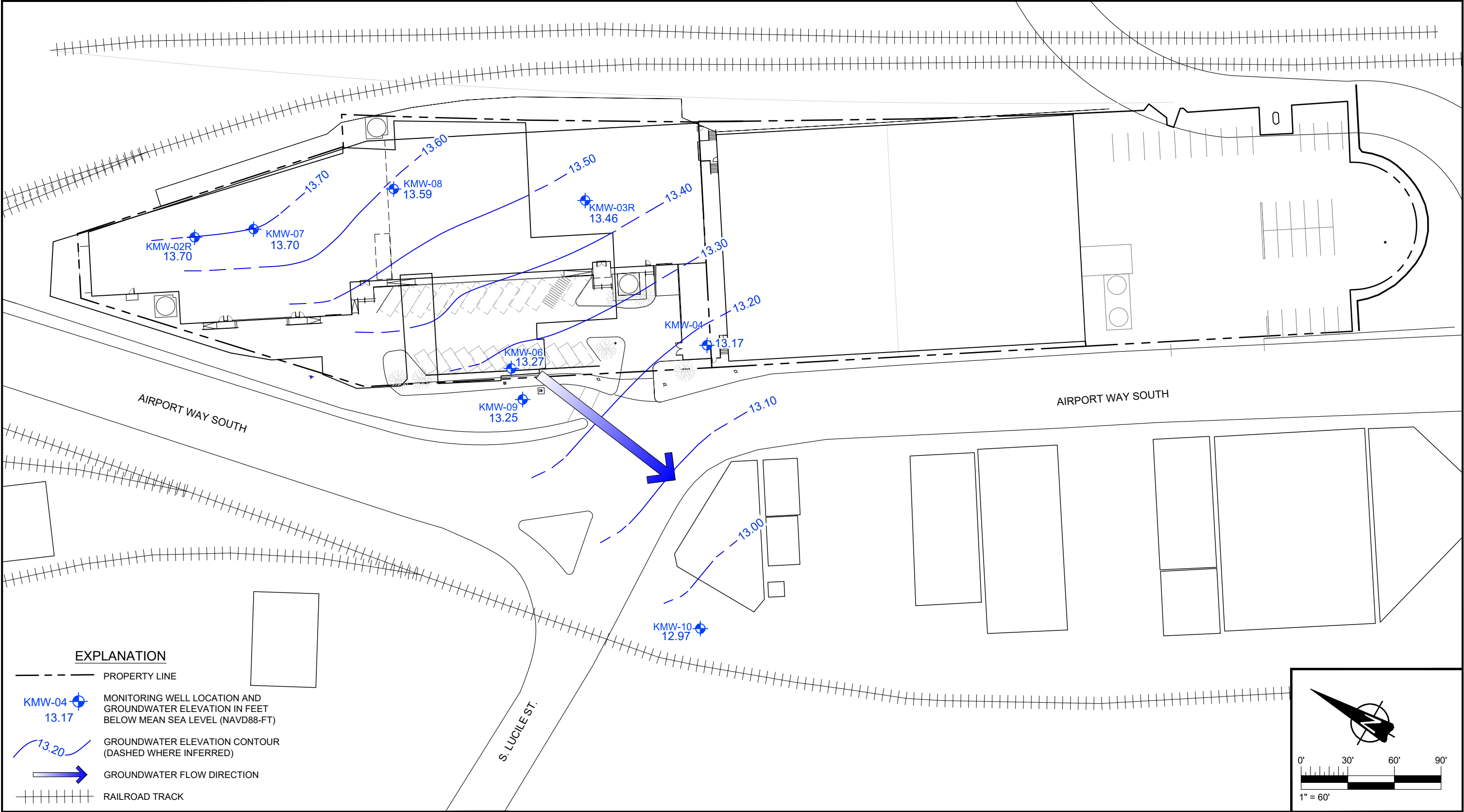
PS21204540.01

FIGURE

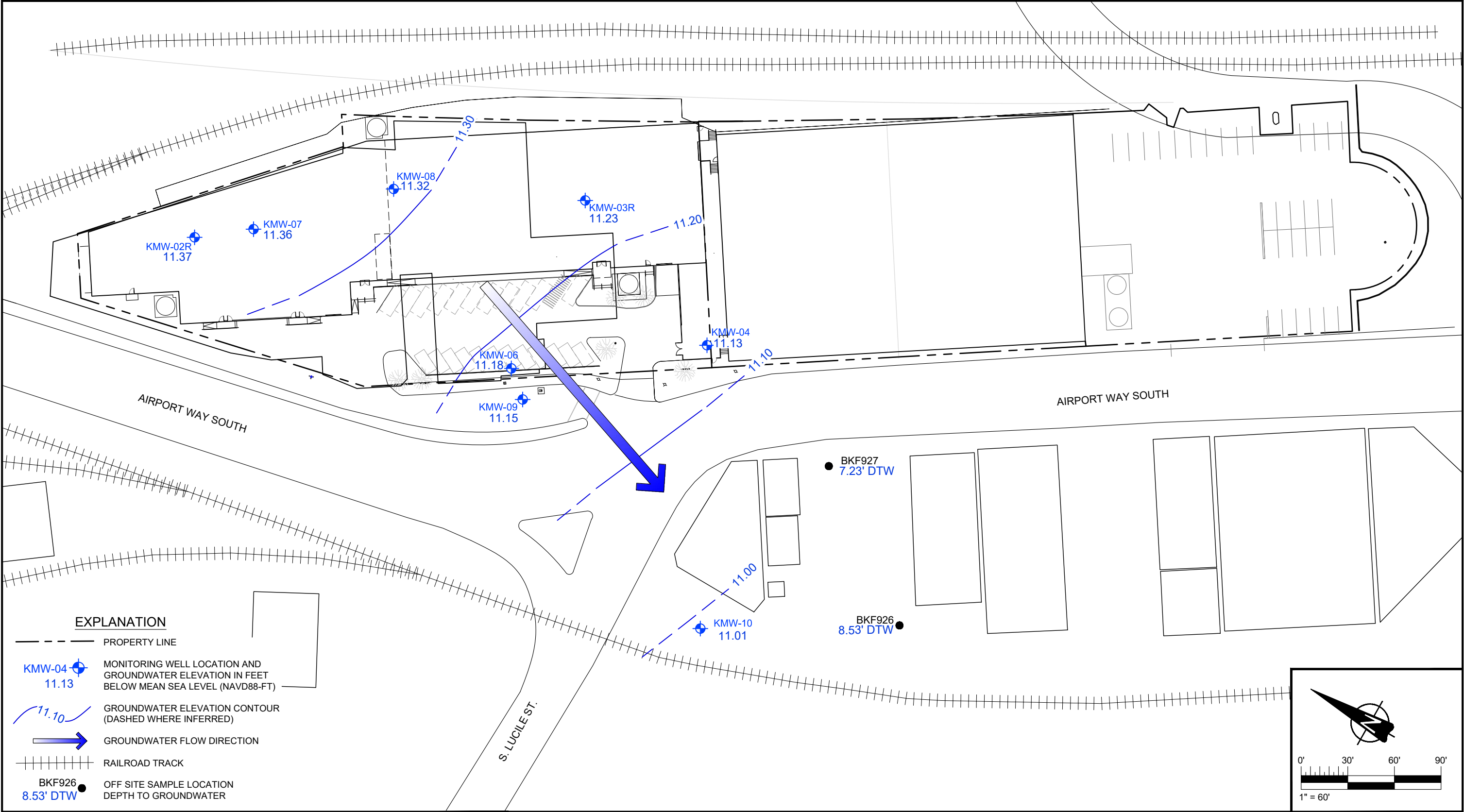
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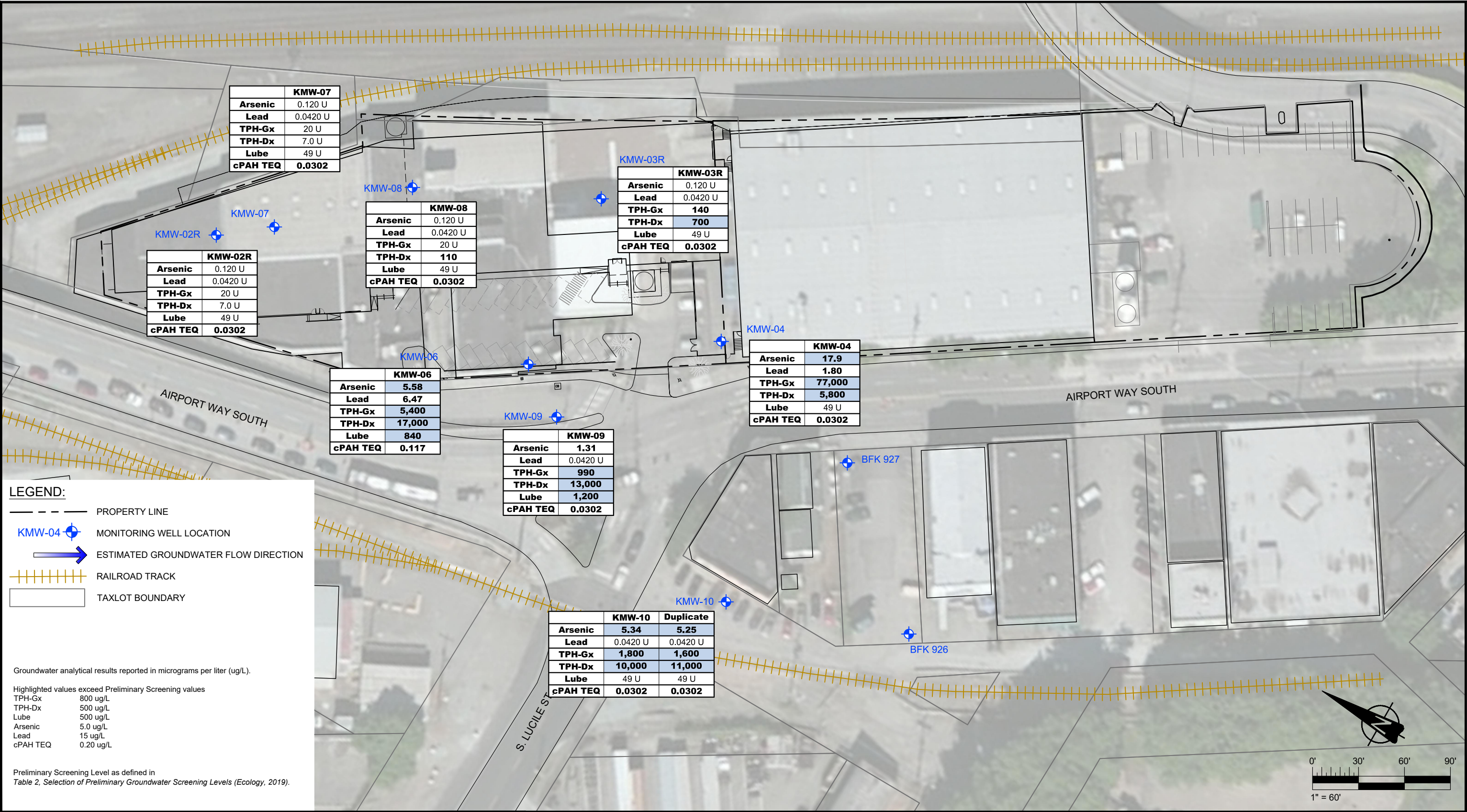
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	KELLY-MOORE PAINT COMPANY		2020-2021 ANNUAL REPORT	MAY 2021
				SCALE
				AS SHOWN
				PROJECT NO.
				PS21204540.01
	Wood Environment & Infrastructure Solutions, Inc. 4020 Lake Washington Blvd NE, Suite 200 Kirkland, Washington 98033		TITLE	FIGURE
			AUGUST 2020 DRY SEASON GROUNDWATER CONTOURS	2

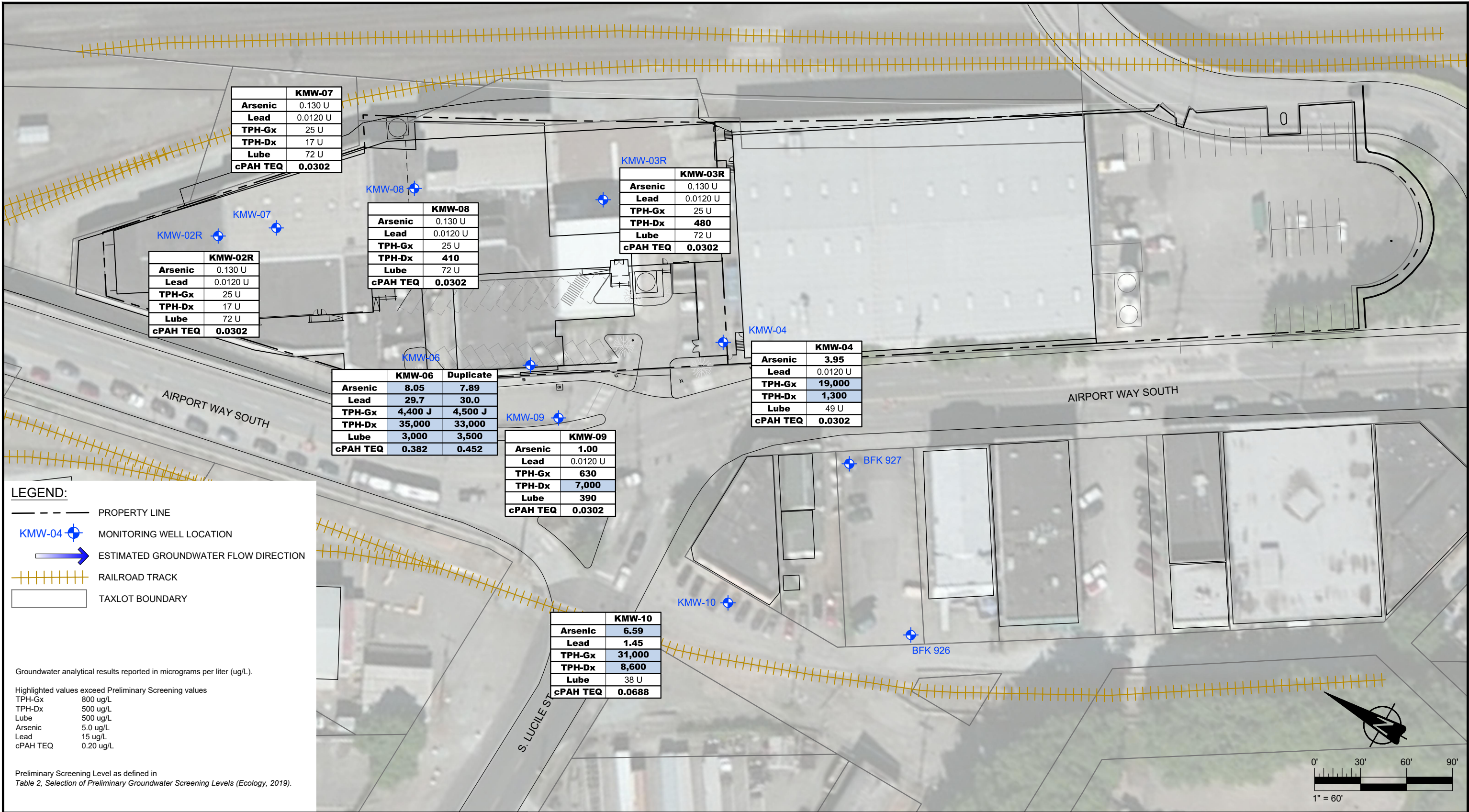


DRAWN BY: APS CHECKED BY: JB	CLIENT		PROJECT		DATE
	KELLY-MOORE PAINT COMPANY		2020-2021 ANNUAL REPORT		MARCH 2022
	Wood Environment & Infrastructure Solutions, Inc. 4020 Lake Washington Blvd NE, Suite 200 Kirkland, Washington 98033		TITLE		PROJECT NO. PS21204540.01
			MARCH 2021 WET SEASON GROUNDWATER CONTOURS		FIGURE 3

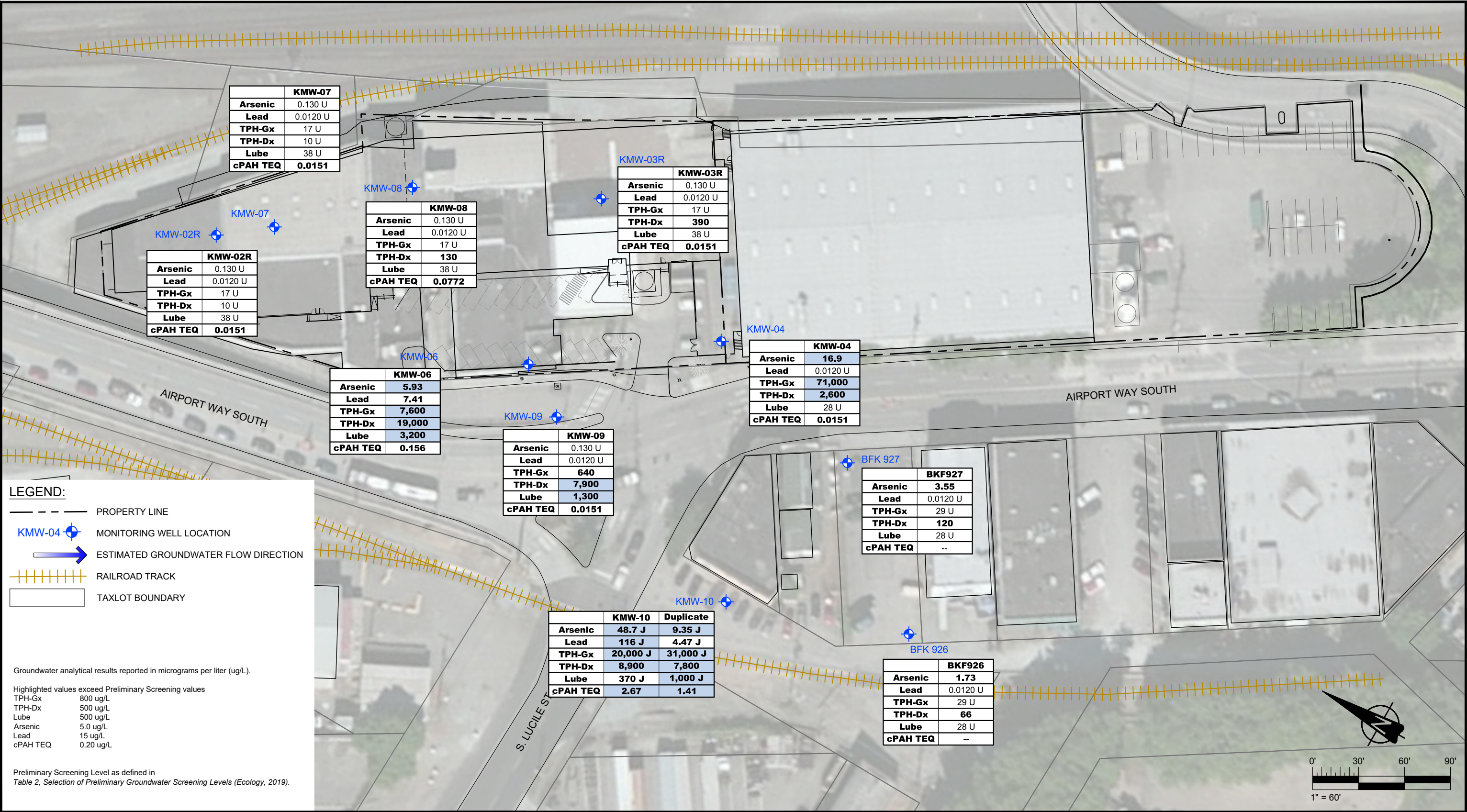


	CLIENT		PROJECT	DATE
	KELLY-MOORE PAINT COMPANY		2020-2021 ANNUAL REPORT	MARCH 2022
				SCALE
				AS SHOWN
	Wood Environment & Infrastructure Solutions, Inc. 4020 Lake Washington Blvd NE, Suite 200 Kirkland, Washington 98033		TITLE	PROJECT NO.
			SEPTEMBER 2021 DRY SEASON GROUNDWATER CONTOURS	PS21204540.01
				FIGURE
				4

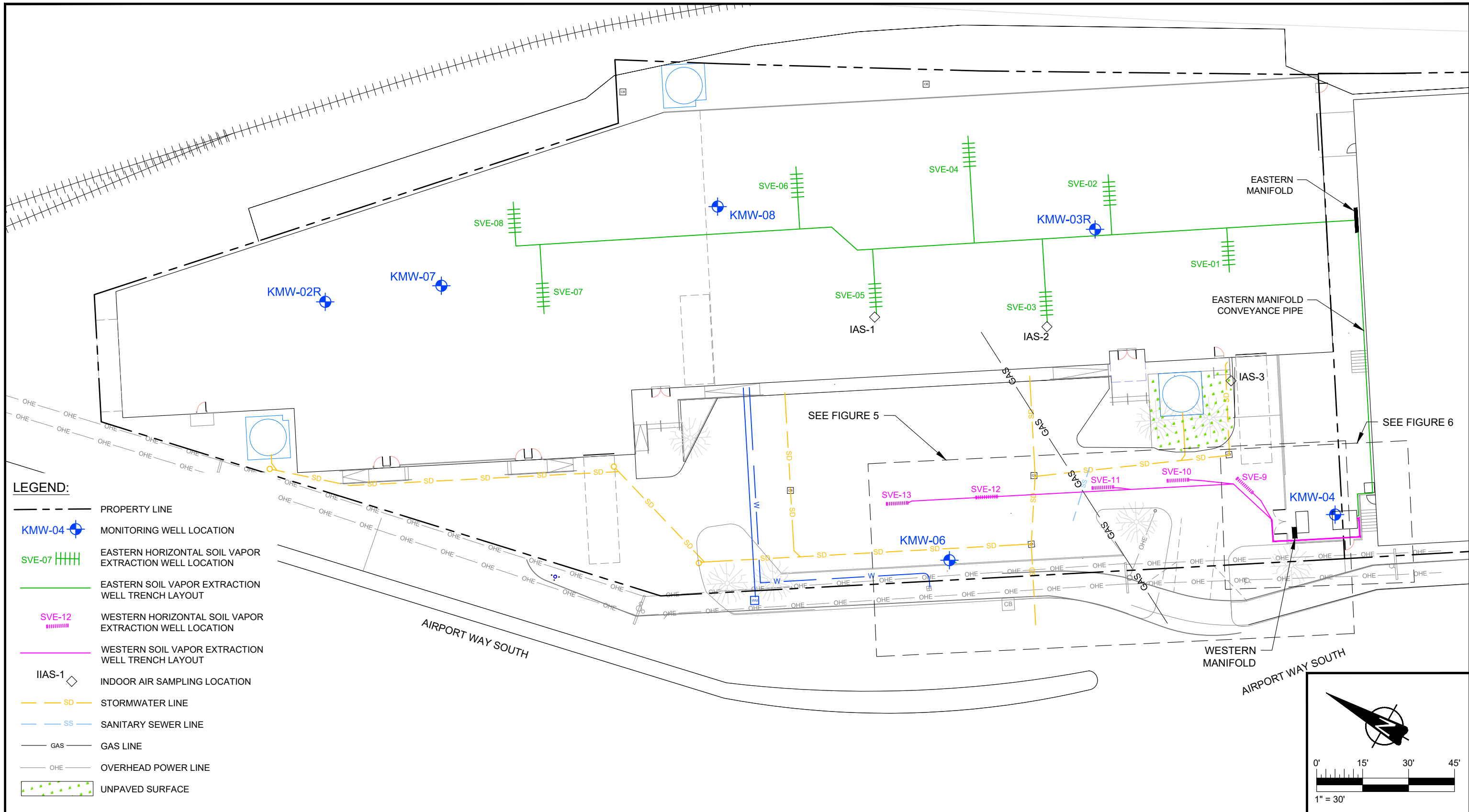




	KELLY-MOORE PAINT COMPANY		2020-2021 ANNUAL REPORT	DATE
	Wood Environment & Infrastructure Solutions, Inc. 600 University Street, Suite 600 Seattle, WA 98101			MARCH 2022
			SCALE	
				1" = 60'
			MARCH 2021 SELECT CONSTITUENTS IN GROUNDWATER	PROJECT NO. PS21204540.01
				FIGURE 6

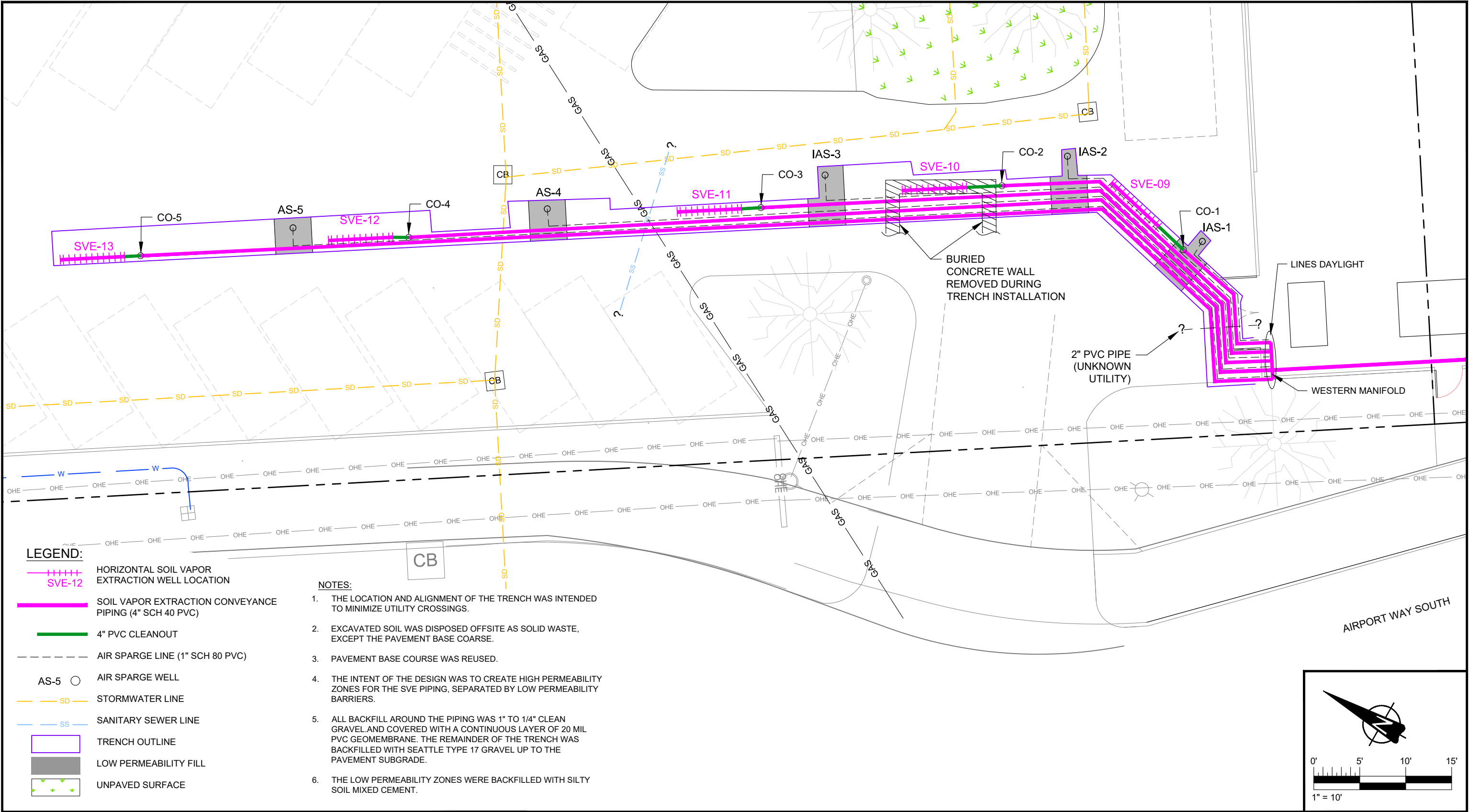


	KELLY-MOORE PAINT COMPANY		2020-2021 ANNUAL REPORT	DATE MARCH 2022
	Wood Environment & Infrastructure Solutions, Inc. 600 University Street, Suite 600 Seattle, WA 98101		SEPTEMBER 2021 SELECT CONSTITUENTS IN GROUNDWATER	SCALE 1" = 60'
				PROJECT NO. PS21204540.01
				FIGURE 7

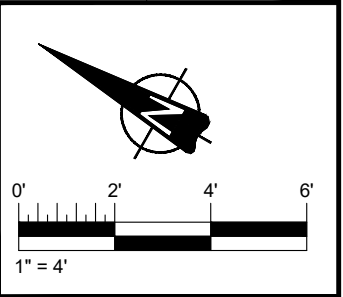
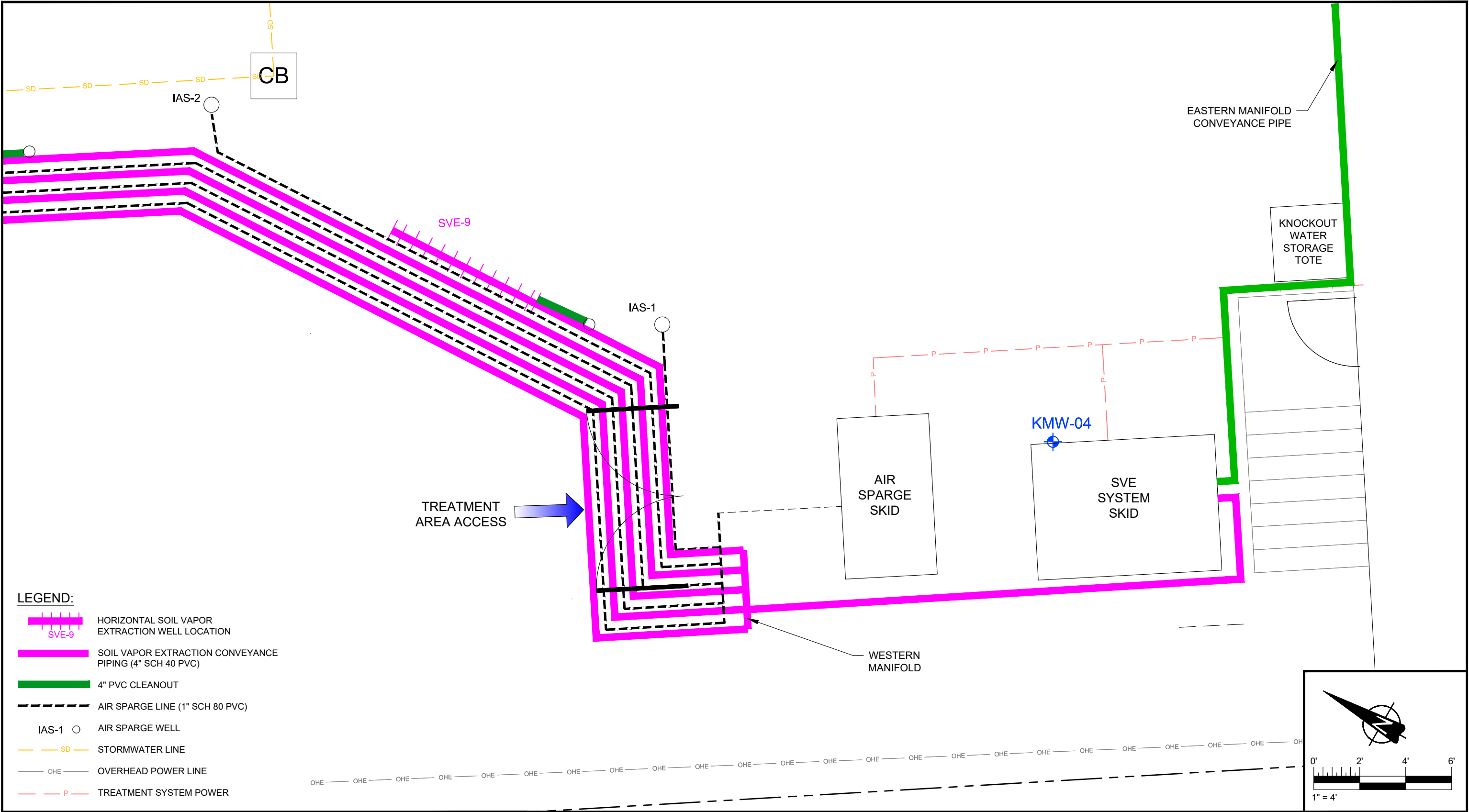


DRAWN BY: SD, CHECKED BY: CD

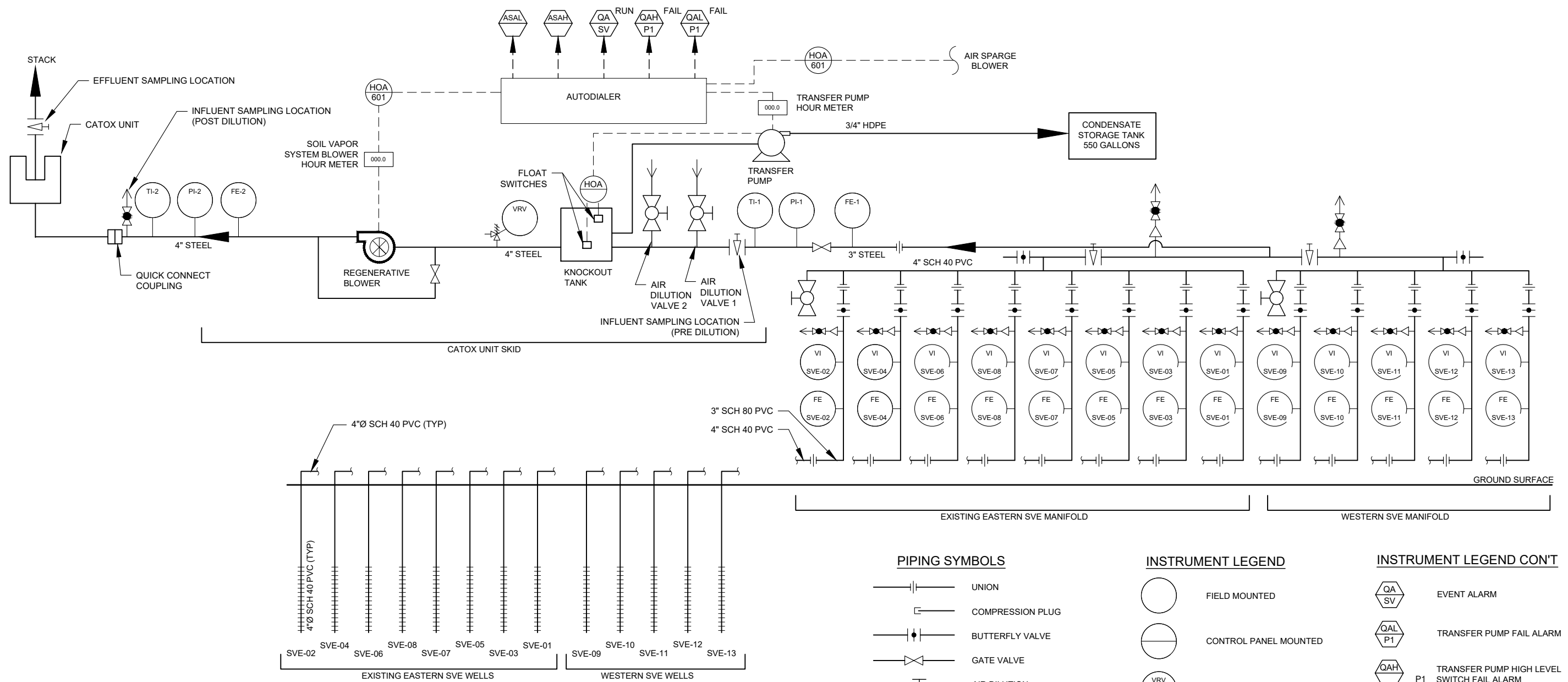
<div>KELLY-MOORE PAINT COMPANY</div> <div> <div>wood.</div> <div> Wood Environment & Infrastructure Solutions, Inc. 600 University Street, Suite 600 Seattle, WA 98101 </div> </div>	2020-2021 ANNUAL REPORT		DATE MARCH 2022
	SVE WELL LAYOUT		SCALE 1" = 30'
			PROJECT NO. PS21204540.01
			FIGURE 8



	KELLY-MOORE PAINT COMPANY		2020-2021 ANNUAL REPORT	DATE MARCH 2022
	Wood Environment & Infrastructure Solutions, Inc. 600 University Street, Suite 600 Seattle, WA 98101		WESTERN SVE & AIR SPARGE TRENCH	SCALE 1" = 10'
				PROJECT NO. PS21204540.01
				FIGURE 9



DRAWN BY: SD, CHECKED BY: CD	KELLY-MOORE PAINT COMPANY		2020-2021 ANNUAL REPORT	DATE
				MARCH 2022
	Wood Environment & Infrastructure Solutions, Inc. 600 University Street, Suite 600 Seattle, WA 98101		TREATMENT SYSTEM PLAN VIEW	SCALE
				1" = 4'
				PROJECT NO.
				PS21204540.01
				FIGURE
				10



PIPING SYMBOLS		INSTRUMENT LEGEND		INSTRUMENT LEGEND CONT'	
	UNION		FIELD MOUNTED		EVENT ALARM
	COMPRESSION PLUG		CONTROL PANEL MOUNTED		TRANSFER PUMP FAIL ALARM
	BUTTERFLY VALVE		VACUUM RELIEF VALVE		TRANSFER PUMP HIGH LEVEL SWITCH FAIL ALARM
	GATE VALVE		VACUUM INDICATOR		AIR SPARGE BLOWER HIGH PRESSURE ALARM
	AIR DILUTION BALL VALVE		TEMPERATURE INDICATOR		AIR SPARGE BLOWER LOW PRESSURE ALARM
	REDUCER		FLOW ELEMENT	ABBREVIATIONS	
	1/4" SAMPLE PORT		HAND OFF AUTO	TYP	TYPICAL
	MICROSEEPS SAMPLE PORT			PVC	POLYVINYL CHLORIDE
EQUIPMENT SYMBOLS				SCH	SCHEDULE
	REGENERATIVE BLOWER			GAC	GRANULAR ACTIVATED CARBON
	TRANSFER PUMP				

DRAWN BY: SD, CHECKED BY: CD

\\por-Is1\ClientData\AMEC US OFFICES\Seattle\14697 - Kelly Moore\dwg_2020-2021 Annual Report\Figure 8-11 - SVE System.dwg - 11 - Mar. 17, 2022 11:37am - brian.johnson

KELLY-MOORE PAINT COMPANY	wood.	2020-2021 ANNUAL REPORT	DATE
			MARCH 2022
SCALE			
N/A			
Wood Environment & Infrastructure Solutions, Inc. 600 University Street, Suite 600 Seattle, WA 98101		CATOX SYSTEM PROCESS AND INSTRUMENTATION DIAGRAM	PROJECT NO. PS21204540.01
			FIGURE 11



wood.

Tables



TABLE 1: GROUNDWATER ELEVATIONS

Former Kelly-Moore Manufacturing Facility, Seattle, Washington

Well ID	WCS North Zone		Ground Surface Elevation	TOC Elevation	Date	Depth to Water (feet below TOC)	Groundwater Elevation (feet) ¹
	Northing	Easting					
KMW-02R ¹	205743.868	1273010.429	22.01	21.63	8/31/2017	9.58	12.05
					1/26/2018	7.56	14.07
					8/15/2018	9.96	11.67
					2/7/2019	9.17	12.46
					8/20/2019	10.78	10.85
					3/11/2020	NM	NM
					8/19/2020	10.33	11.30
					3/22/2021	7.93	13.70
					9/1/2021	10.26	11.37
KMW-03R ¹	205538.065	1273156.594	21.99	21.54	8/31/2017	9.52	12.02
					1/26/2018	7.87	13.67
					8/15/2018	9.93	11.61
					2/7/2019	9.37	12.17
					8/20/2019	10.7	10.84
					3/11/2020	NM	NM
					8/19/2020	10.24	11.30
					3/22/2021	8.08	13.46
					9/1/2021	10.31	11.23
KMW-04 ¹	205423.586	1273115.009	18.90	18.56	8/31/2017	6.63	11.93
					1/26/2018	5.35	13.21
					8/15/2018	7.06	11.50
					2/7/2019	6.60	11.96
					8/20/2019	7.89	10.67
					3/11/2020	5.91	12.65
					8/19/2020	7.45	11.11
					3/22/2021	5.39	13.17
					9/1/2021	7.43	11.13
KMW-06 ¹	205525.215	1273039.239	20.16	19.80	8/31/2017	7.87	11.93
					1/26/2018	6.48	13.32
					8/15/2018	8.29	11.51
					2/7/2019	7.77	12.03
					8/20/2019	9.09	10.71
					3/11/2020	7.08	12.72
					8/19/2020	8.65	11.15
					3/22/2021	6.53	13.27
					9/1/2021	8.62	11.18
KMW-07 ¹	205713.659	1273033.950	22.00	21.63	8/31/2017	9.57	12.06
					1/26/2018	7.93	13.70
					8/15/2018	9.96	11.67
					2/7/2019	9.21	12.42
					8/20/2019	10.79	10.84
					3/11/2020	NM	NM
					8/19/2020	10.31	11.32
					3/22/2021	7.93	13.70
					9/1/2021	10.27	11.36

TABLE 1: GROUNDWATER ELEVATIONS
Former Kelly-Moore Manufacturing Facility, Seattle, Washington

Well ID	WCS North Zone		Ground Surface Elevation	TOC Elevation	Date	Depth to Water (feet below TOC)	Groundwater Elevation (feet) ¹
	Northing	Easting					
KMW-08 ¹	205648.461	1273101.305	22.03	21.65	8/31/2017	9.59	12.06
					1/26/2018	7.72	13.93
					8/15/2018	10.00	11.65
					2/7/2019	9.31	12.34
					8/20/2019	10.80	10.85
					3/11/2020	NM	NM
					8/19/2020	10.33	11.32
					3/22/2021	8.06	13.59
KMW-09 ²	205508.919	1273025.542	18.60	18.14	9/1/2021	10.33	11.32
					8/31/2017	6.24	11.90
					1/26/2018	4.86	13.28
					8/15/2018	6.64	11.50
					2/7/2019	6.15	11.99
					8/20/2019	7.48	10.66
					3/11/2020	5.46	12.68
					8/19/2020	7.03	11.11
KMW-10 ²	205336.155	1272955.049	20.84	20.39	3/22/2021	4.89	13.25
					9/1/2021	6.99	11.15
					8/31/2017	8.61	11.78
					1/26/2018	7.51	12.88
					8/15/2018	9.01	11.38
					2/7/2019	8.65	11.74
					8/20/2019	9.89	10.50
					3/11/2020	7.98	12.41
					8/19/2020	9.41	10.98
					3/22/2021	7.42	12.97
					9/1/2021	9.38	11.01

Notes:

1. Survey completed on June 30, 2016, by Duane Hartman & Associates.
2. Survey completed on December 13, 2016, by Duane Hartman & Associates.
3. Coordinate System and Zone: Washington State Plane, North Zone Coordinates.
Horizontal Datum: NAD 83(91), North Zone, US feet.
Vertical Datum: NAVD88, US feet.

Abbreviations:

NAD = North American Datum
NAVD88 = North American Vertical Datum of 1988
NM = not measured
TOC = top of casing
WCS = Washington Coordinate System

TABLE 2: GROUNDWATER PARAMETERS

Former Kelly-Moore Manufacturing Facility, Seattle, Washington

Well ID	Date	pH	SC	ORP	DO
			(ms/cm)	(mv)	(mg/L)
KMW-02R	8/31/2017	5.89	0.175	142.9	0.21
	1/26/2018	5.99	0.199	150.9	0.28
	8/16/2018	5.85	0.173	274	0.55
	2/8/2019	5.95	0.245	130.1	0.81
	8/20/2019	5.76	0.211	121	2.97
	3/11/2020	NM	NM	NM	NM
	8/19/2020	5.73	0.205	208.2	0.33
	3/24/2021	5.55	0.169	273.5	1.41
KMW-03R	9/1/2021	5.99	0.196	-330.9	1.01
	8/31/2017	7.07	0.477	-117.2	0.15
	1/26/2018	7.27	0.454	-102.2	0.19
	8/16/2018	7.03	0.378	112	0.47
	2/8/2019	6.97	0.582	-87	0.51
	8/20/2019	6.90	0.613	-47	2.19
	3/11/2020	NM	NM	NM	NM
	8/19/2020	6.56	0.411	-63.5	0.09
KMW-04	3/22/2021	6.87	0.392	-61.7	0.59
	9/1/2021	6.97	0.311	-406.9	0.82
	8/31/2017	6.31	0.485	-92.0	0.07
	1/25/2018	6.40	0.276	-40.0	0.58
	8/16/2018	6.09	0.326	99.0	0.63
	2/7/2019	6.22	0.341	-74.0	0.62
	8/20/2019	6.26	0.352	-52.0	2.38
	3/11/2020	6.15	0.293	-51.0	0.42
KMW-06	8/20/2020	6.10	0.241	-51.9	0.1
	3/23/2021	5.58	0.179	91.4	1.65
	9/2/2021	6.15	0.192	-352.5	1.29
	8/31/2017	6.35	0.453	-90.3	0.10
	1/24/2018	6.56	0.314	-91.4	0.24
	8/16/2018	6.33	0.421	-39	0.37
	2/7/2019	6.18	0.635	-32	0.65
	8/19/2019	6.32	0.49	-66	2.38
KMW-07	3/11/2020	5.7	0.9	27.1	2.45
	8/20/2020	6.11	0.631	-59.9	0.14
	3/23/2021	5.82	0.836	-14	0.67
	9/2/2021	6.34	0.705	-372.3	0.80
	8/31/2017	6.02	0.283	56.2	0.15
	1/26/2018	6.32	0.280	56.1	0.32
	8/16/2018	6.02	0.211	268	0.6
	2/8/2019	6.23	0.318	51.1	0.52
KMW-07	8/20/2019	5.96	0.249	106	2.93
	3/11/2020	NM	NM	NM	NM
	8/19/2020	5.81	0.224	94	0.12
	3/24/2021	5.9	0.221	130.8	0.67
	9/1/2021	6.15	0.242	-383.6	0.77

TABLE 2: GROUNDWATER PARAMETERS

Former Kelly-Moore Manufacturing Facility, Seattle, Washington

Well ID	Date	pH	SC	ORP	DO
			(ms/cm)	(mv)	(mg/L)
KMW-08	8/31/2017	6.15	0.177	1.90	0.10
	1/26/2018	5.98	0.526	32.9	0.50
	8/16/2018	5.95	0.211	248	0.58
	2/8/2019	6.05	0.25	91.4	0.74
	8/20/2019	5.58	2.508	133.7	2.26
	3/11/2020	NM	NM	NM	NM
	8/19/2020	4.99	0.176	195.7	0.14
	3/22/2021	5.49	0.203	94.1	1.27
KMW-09	9/1/2021	5.73	0.167	-339.7	1.03
	8/31/2017	6.32	0.415	-95.1	0.21
	1/24/2018	6.56	0.396	-79.5	0.40
	8/16/2018	6.35	0.387	-24	0.47
	2/7/2019	6.42	0.4	-69	0.57
	8/20/2019	6.4	0.314	-47	3.05
	3/11/2020	6.16	0.512	-55.6	0.35
	8/20/2020	6.08	0.615	-63.4	0.07
	3/23/2021	6.21	0.474	-45.8	0.59
KMW-10	9/2/2021	6.39	0.426	-413.3	0.85
	8/31/2017	6.21	0.567	-86.3	0.15
	1/25/2018	6.46	0.656	-69.4	0.28
	8/16/2018	6.25	0.416	-15	0.46
	2/7/2019	6.53	0.43	-82	0.49
	8/19/2019	6.26	0.612	-67	3.26
	3/11/2020	6.39	0.542	-63	0.37
	8/20/2020	6.12	0.551	-65.7	0.07
	3/23/2021	6.24	0.654	-63.7	0.61
	9/2/2021	6.38	0.682	-394.2	0.68

Abbreviations

DO = dissolved oxygen

mg/L = milligrams per liter

ms/cm = millisiemens per centimeter

mv = millivolts

NM = not measured

ORP = oxidation reduction potential

SC = specific conductivity

TABLE 3: GROUNDWATER ANALYTICAL RESULTS
Former Kelly-Moore Manufacturing Facility, Seattle, Washington

				Location	BKF926	BKF927	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-03R	KMW-03R	KMW-04	KMW-04	KMW-04	KMW-06	KMW-06	KMW-06	KMW-06	KMW-07	KMW-07	KMW-07	KMW-07	KMW-08	KMW-08	KMW-08	KMW-09	KMW-09	KMW-09	KMW-10	KMW-10	KMW-10			
				Sample Date	09/02/21	09/02/21	09/01/17	01/26/18	08/16/18	02/08/19	08/20/19	08/19/20	03/24/21	09/01/21	08/19/20	03/22/21	09/01/21	08/20/20	03/23/21	09/02/21	08/20/20	03/23/21	09/02/21	08/19/20	03/24/21	09/01/21	08/19/20	03/22/21	09/01/21	08/20/20	03/23/21	09/02/21	08/20/20	03/23/21	09/02/21	08/20/20	03/23/21	09/02/21		
				Sample ID																																				
				Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N			
				Preliminary Screening Level																																				
Group	Analyte	CAS	Units																																					
PAHs	Benzo(a)anthracene	56-55-3	ug/L	-	0.00450 U	0.00450 U	0.00990 U	0.0110 U	0.00880 U	0.00880 U	0.0140 U	0.00900 U	0.00900 U	0.00450 U	0.00900 U	0.00960 U	0.00450 U	0.00900 U	0.00900 U	0.00450 U	0.0630	0.0570	0.0700	0.0660	0.00900 U	0.00900 U	0.00450 U	0.00900 U	0.00960 U	0.0260	0.00900 U	0.00900 U	0.00450 U	0.00900 U	0.00900 U	0.0410	1.50 J	0.800 J		
	Benzo(a)pyrene	50-32-8	ug/L	-	0.0120 U	0.0120 U	0.00990 U	0.0110 U	0.00340 U	0.00340 U	0.00560 U	0.0110 U	0.0110 U	0.0120 U	0.0110 U	0.00560 U	0.0120 U	0.0110 U	0.0240 U	0.0120 U	0.0890	0.310	0.370	0.120	0.0110 U	0.0110 U	0.0120 U	0.0110 U	0.00560 U	0.0610	0.0110 U	0.0240 U	0.0120 U	0.0110 U	0.0110 U	0.0540	2.10 J	1.10 J		
	Benzo(b)fluoranthene	205-99-2	ug/L	-	0.00720 U	0.00720 U	0.00990 U	0.0110 U	0.00340 U	0.00340 U	0.00420 U	0.00640 U	0.00640 U	0.00720 U	0.00640 U	0.00900 U	0.00720 U	0.00640 U	0.0140 U	0.00720 U	0.100	0.340	0.400	0.140	0.00640 U	0.00640 U	0.00720 U	0.00640 U	0.00900 U	0.0590	0.00640 U	0.0140 U	0.00720 U	0.00640 U	0.00640 U	0.0450	2.00 J	1.10 J		
	Benzo(k)fluoranthene	207-08-9	ug/L	-	0.00750 U	0.00750 U	-	-	0.00460 U	0.00460 U	0.00700 U	0.00760 U	0.00760 U	0.00750 U	0.00760 U	0.00960 U	0.00750 U	0.00760 U	0.0150 U	0.00750 U	0.00760 U	0.110	0.110	0.0460	0.00760 U	0.00760 U	0.00750 U	0.00760 U	0.00960 U	0.0210	0.00760 U	0.0150 U	0.00750 U	0.00760 U	0.00760 U	0.0150 U	0.660 J	0.350 J		
	Chrysene	218-01-9	ug/L	-	0.00710 U	0.00710 U	0.00990 U	0.0110 U	0.00320 U	0.00320 U	0.00480 U	0.00620 U	0.00620 U	0.00710 U	0.00620 U	0.0120 U	0.00710 U	0.00620 U	0.0140 U	0.00710 U	0.0630	0.130	0.140	0.0660	0.00620 U	0.00620 U	0.00710 U	0.00620 U	0.0120 U	0.0260	0.00620 U	0.0140 U	0.00710 U	0.00620 U	0.00620 U	0.0140 U	1.50 J	0.790 J		
	Dibenzo(a,h)anthracene	53-70-3	ug/L	-	0.0190 U	0.0190 U	0.00990 U	0.0110 U	0.0150 U	0.0150 U	0.0100 U	0.0180 U	0.0180 U	0.0190 U	0.0180 U	0.0300 U	0.0190 U	0.0180 U	0.0380 U	0.0190 U	0.0180 U	0.0380 U	0.0380 U	0.0380 U	0.0180 U	0.0180 U	0.0190 U	0.0180 U	0.0300 U	0.0190 U	0.0180 U	0.0380 U	0.0190 U	0.0180 U	0.0180 U	0.0380 U	0.380 U	0.190 U		
	Indeno(1,2,3-cd)pyrene	193-39-5	ug/L	-	0.0150 U	0.0150 U	0.00990 U	0.0110 U	0.00940 U	0.00940 U	0.00980 U	0.0200 U	0.0200 U	0.0150 U	0.0200 U	0.0200 U	0.0150 U	0.0200 U	0.0300 U	0.0150 U	0.0690	0.180	0.210	0.0820	0.0200 U	0.0200 U	0.0150 U	0.0200 U	0.0200 U	0.0430	0.0200 U	0.0300 U	0.0150 U	0.0200 U	0.0200 U	0.0300 U	1.20 J	0.690 J		
Total cPAH TEQ	cPAH_TEQ	ug/L	0.20	-	-	0.00698	0.00721	0.0453	0.0302	0.0302	0.0302	0.0302	0.0151	0.0302	0.0302	0.0151	0.0302	0.0302	0.0151	0.117	0.382	0.452	0.156	0.0302	0.0302	0.0151	0.0302	0.0302	0.0772	0.0302	0.0302	0.0151	0.0302	0.0302	0.0688	2.67	1.41			
Dissolved Gases	Carbon dioxide	124-38-9	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	145,000	144,000 J	-	41,900	60,600 J	-	264,000	255,000	291,000 J	-	-	-	-	-	-	-	-	-	115,000	129,000 J	-	-	203,000	226,000 J	241,000 J
	Ethane	74-84-0	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	7.54 U	7.54 U	-	7.54 U	7.54 U	-	7.54 U	7.54 U	7.54 U	-	-	-	-	-	-	-	-	-	7.54 U	7.54 U	-	-	7.54 U	7.54 U	7.54 U
	Ethene	74-85-1	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	6.10 U	6.10 U	-	6.10 U	6.10 U	-	6.10 U	6.10 U	6.10 U	-	-	-	-	-	-	-	-	-	6.10 U	6.10 U	-	-	6.10 U	6.10 U	6.10 U
	Methane	74-82-8	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	373	1,300	-	260	1,190	-	1,380	1,400	1,630	-	-	-	-	-	-	-	-	-	700	1,020	-	-	5,790	6,390	6,260
Dissolved Metals	Dissolved Aluminum	7429-90-5	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	26.1 U	26.1 U	-	26.1 U	26.1 U	-	26.1 U	26.1 U	26.1 U	-	-	-	-	-	-	-	-	-	26.1 U	26.1 U	-	-	26.1 U	26.1 U	26.1 U
	Dissolved Arsenic	7440-38-2	ug/L	5.0	-	-	3.00 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Dissolved Barium	7440-39-3	ug/L	-	-	-	25.0 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Dissolved Cadmium	7440-43-9	ug/L	-	-	-	4.00 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Dissolved Calcium	7440-70-2	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Dissolved Chromium	7440-47-3	ug/L	100	-	-	10.0 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Dissolved Iron	7439-89-6	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Dissolved Lead	7439-92-1	ug/L	15	-	-	1.00 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Dissolved Magnesium	7439-95-4	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Dissolved Manganese	7439-96-5	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Dissolved Mercury	7439-97-6	ug/L	2.0	-	-	0.500 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Dissolved Selenium	7782-49-2	ug/L	-	-	-	5.00 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Dissolved Silver	7440-22-4	ug/L	-	-	-	10.0 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Dissolved Sodium	7440-23-5	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				

TABLE 3: GROUNDWATER ANALYTICAL RESULTS
Former Kelly-Moore Manufacturing Facility, Seattle, Washington

[illegible]

TABLE 3: GROUNDWATER ANALYTICAL RESULTS
Former Kelly-Moore Manufacturing Facility, Seattle, Washington

Location					BKF926	BKF927	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R	KMW-02R
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Notes
BOLD indicates analyte detections.
- = not analyzed
U = The analyte was not detected at the reporting limit indicated.
J = The value is an estimate.
UJ = The analyte was not detected at the estimated reporting limit indicated.
FD = Field Duplicate
ug/L = micrograms per liter
mg/L = milligram per liter
Preliminary Screening Level as defined on Table 2, Selection of
Preliminary Groundwater Screening Levels (Ecology, 2019).
Concentration Exceeds Preliminary Screening Level

TABLE 4: SOIL VAPOR EXTRACTION SYSTEM ANALYTICAL SUMMARY^{1, 2, 3}

Former Kelly-Moore Manufacturing Facility, Seattle, Washington

Sample	Date ⁴	Benzene	TPH
		(mg/m ³)	(mg/m ³)
Western SVE Wells			
SVE-09	11/7/17	0.069	310
	5/30/19	<0.1	630
	6/4/19	<0.1	440
SVE-10	11/7/17	0.53	820 J
	5/30/19	<0.5	3,500
	6/4/19	<0.5	2,300
SVE-11	11/7/17	0.069	220
	5/30/19	<0.1	1,300
	6/4/19	<0.1	660
SVE-12	11/7/17	0.44	1,400 J
	5/30/19	<0.1	3,300
	6/4/19	<0.2	1,400
SVE-13	11/7/17	0.23	600 J
	5/30/19	<0.1	2,100
	6/4/19	<0.1	760
Eastern SVE Wells			
SVE-02	11/7/17	<0.03	3.4
	5/30/19	<0.1	<7.1
	6/4/19	<0.1	14
SVE-04	11/7/17	<0.03	310
	5/30/19	<0.1	470
	6/4/19	<0.1	400
SVE-06	11/7/17	0.041	280
	5/30/19	<0.1	36
	6/4/19	<0.1	33
SVE-08	11/7/17	<0.03	65
	5/30/19	<0.1	30
	6/4/19	<0.1	16
SVE-07	11/7/17	<0.03	82
	5/30/19	<0.1	70
	6/4/19	<0.1	230
SVE-05	11/7/17	0.50	2,200 J
	5/30/19	<0.2	5,100
	6/4/19	<0.5	3,500
SVE-03	11/7/17	1.1	1,900 J
	5/30/19	<0.2	1,900
	6/4/19	<0.1	2,400
SVE-01	11/7/17	0.14	450
	5/30/19	<0.1	10
	6/4/19	<0.1	14

Notes:

1. Data qualifiers are as follows:
J = the result is estimated because the concentration exceeded the calibration range of the instrument.
2. **Bold** values indicate results above the detection limits.
3. Analytes that were not detected above the method detection limit are listed as less than the detection limit.
4. The SVE system began operating without air sparging on November 7, 2017. The SVE did not operate between October 16, 2018 and April 1, 2019. SVE system with air sparge began operating on May 29, 2019.
5. Benzene results, SW8021B through Feb. 2020, then TO-15 from March 2020 onward.
6. TPH results from NWPTW-Gx

Abbreviations:

SVE = soil vapor extraction

TPH = total petroleum hydrocarbons

TABLE 4: SOIL VAPOR EXTRACTION SYSTEM ANALYTICAL SUMMARY^{1, 2, 3}

Former Kelly-Moore Manufacturing Facility, Seattle, Washington

Sample	Date ⁴	Benzene	TPH
		(mg/m ³)	(mg/m ³)
Influent	3/21/18	<0.034	140
	5/30/18	<0.034	170
	6/29/18	<0.034	530
	7/31/18	<0.034	730
	8/31/18	<0.034	550
	9/19/18	<0.034	470
	10/16/18	<0.034	1,900
	4/3/19	<0.034	670
	5/3/19	<0.034	-
	5/30/19	<0.10	1,100
	6/4/19	<0.10	640
	7/2/19	<0.10	-
	8/7/19	0.22	-
	1/9/20	<0.50	8,200
	2/14/20	<0.10	180
	3/17/20	<0.0011	135
	4/20/20	0.035	90
	5/18/20	0.0059	110
	6/16/20	0.065	170
	7/20/20	0.055	260
	8/27/20	0.12	840
	9/21/20	<0.013	1,400
	10/26/20	<0.0028	980
	11/18/20	0.035	140
	12/14/20	<0.0030	280
	1/11/21	<0.0030	140
	2/9/21	0.032	370
	3/9/21	0.057	420
	4/6/21	0.020	320
	5/11/21	0.021	510
	6/16/21	<0.00033	490
	7/13/21	<0.00034	2,400
	8/5/21	<0.00035	1,800
	9/7/21	<0.00034	600
	10/5/21	<0.00036	290
	11/11/21	<0.00039	89
	12/8/21	<0.00036	41

Notes:

1. Data qualifiers are as follows:
J = the result is estimated because the concentration exceeded the calibration range of the instrument.
2. **Bold** values indicate results above the detection limits.
3. Analytes that were not detected above the method detection limit are listed as less than the detection limit.
4. The SVE system began operating without air sparging on November 7, 2017. The SVE did not operate between October 16, 2018 and April 1, 2019. SVE system with air sparge began operating on May 29, 2019.
5. Benzene results, SW8021B through Feb. 2020, then TO-15 from March 2020 onward.
6. TPH results from NWPTW-Gx

Abbreviations:

SVE = soil vapor extraction

TPH = total petroleum hydrocarbons

TABLE 4: SOIL VAPOR EXTRACTION SYSTEM ANALYTICAL SUMMARY^{1, 2, 3}

Former Kelly-Moore Manufacturing Facility, Seattle, Washington

Sample	Date ⁴	Benzene	TPH
		(mg/m ³)	(mg/m ³)
Effluent	11/7/17	<0.03	28
	3/21/18	<0.034	10
	4/24/18	<0.034	15
	5/30/18	<0.034	160
	6/29/18	<0.034	520
	7/31/18	<0.034	450
	8/31/18	<0.034	23
	9/19/18	<0.034	59
	10/16/18	<0.034	460
	4/3/19	<0.034	10
	5/3/19	<0.034	-
	5/30/19	<0.10	41
	6/4/19	<0.10	20
	7/2/19	<0.10	-
	8/7/19	<0.10	-
	1/9/20	<0.10	1,400
	2/14/20	<0.10	20
	3/17/20	<0.000086	<2.2
	4/20/20	<0.00023	<2.3
	5/18/20	<0.00023	<1.1
	6/16/20	<0.00025	<1.3
	7/20/20	<0.00023	<1.2
	8/27/20	<0.00023	<0.92
	9/21/20	<0.00023	<0.95
	10/26/20	<0.00022	<0.89
	11/18/20	<0.00023	<0.95
	12/14/20	<0.00023	<0.95
	1/11/21	<0.00024	<0.98
	2/9/21	<0.00016	<1.6
	3/9/21	<0.00040	<1.6
	4/6/21	<0.000042	<1.6
	5/11/21	<0.000067	<2.5
	6/16/21	<0.000043	<1.6
	7/13/21	<0.000044	<1.6
	8/5/21	<0.000044	<1.6
	9/7/21	<0.000044	<1.6
	10/5/21	<0.000047	<1.7
	11/11/21	<0.000052	<1.9
	12/8/21	<0.000046	<1.7

Notes:

1. Data qualifiers are as follows:
J = the result is estimated because the concentration exceeded the calibration range of the instrument.
2. **Bold** values indicate results above the detection limits.
3. Analytes that were not detected above the method detection limit are listed as less than the detection limit.
4. The SVE system began operating without air sparging on November 7, 2017. The SVE did not operate between October 16, 2018 and April 1, 2019. SVE system with air sparge began operating on May 29, 2019.
5. Benzene results, SW8021B through Feb. 2020, then TO-15 from March 2020 onward.
6. TPH results from NWPTW-Gx

Abbreviations:

SVE = soil vapor extraction

TPH = total petroleum hydrocarbons

TABLE 5: SVE/CATOX and PSCAA Permit Compliance Results
Former Kelly-Moore Manufacturing Facility, Seattle, Washington

Field Visit Date	CATOX Results (Influent / Effluent)						CATOX Operation					Estimated Mass Removal / Removal Rates ²												Estimated Pre-Control Emission ³		Estimated Post-Control Emission	
	PID / FID Field Readings		Laboratory Results ¹			Effluent (µg/m³)	Extraction Rate (scfm)	Influent Temperature (°F)	Hour Meter (hours)	Operational Hours of Interval (hours)	Using PID / FID Field Reading Results*				Using Laboratory Results - TPH Gasoline Range				Using Laboratory Results - Benzene				Rate for PSCAA Condition ³		Rate		
			TPH-Gasoline Range		Benzene						Mass Removal Efficiency (%)	Mass Removal Rate (lbs/day)	Mass Removed per Interval (lbs)	Cumulative Mass Removed (lbs)	Mass Removal Efficiency (%)	Mass Removal Rate (lbs/day)	Mass Removed per Interval (lbs)	Cumulative Mass Removed (lbs)	Mass Removal Efficiency (%)	Mass Removal Rate (lbs/day)	Mass Removed per Interval (lbs)	Cumulative Mass Removed (lbs)	TPH-Gasoline Range Emission Rate (lbs/day)	Benzene Emission Rate (lbs/day)	TPH-Gasoline Range Emission Rate (lbs/day)	Benzene Emission Rate (lbs/day)	
	Influent (ppmv)	Effluent (ppmv)	Influent (µg/m³)	Effluent (µg/m³)	Influent (µg/m³)																						
NOC Conditions ⁴	-	≤ 10	-	-	-	-	-	> 650	-	-	See Notes	-	-	-	-	-	-	-	-	-	-	≤ 2.74	≤ 0.018	-	-		
1/9/2020	6,333.0	2,075.0	8,200,000	1,400,000	500.0	100.0	78	799	3,598.7	35.0	67.2%	105.10	153.3	2,861.2	82.9%	47.7	69.6	1,545.8	80.0%	0.00281	0.00205	0.17384	57.54	0.004	9.82	0.001	
2/14/2020	55.0	1.3	180,000	20,000	100.0	99.0	198	665	3,897.0	298.3	97.6%	3.36	674.1	3,535.2	88.9%	2.9	314.3	1,860.1	1.0%	0.00002	0.01755	0.19139	3.21	0.002	0.36	0.002	
3/17/2020	100.9	7.6	135,000	2,200	1.1	0.09	225	659	4,056.0	159.0	92.5%	6.64	33.1	3,568.4	98.4%	2.7	18.3	1,878.4	92.2%	0.00002	0.00013	0.19152	2.73	0.000	0.04	0.000	
4/20/2020	98.9	4.8	90,000	2,300	35	0.23	155	696	4,854.0	798.0	95.1%	4.62	187.2	3,755.5	97.4%	1.2	65.0	1,943.4	99.3%	0.00048	0.00840	0.19992	1.26	0.000	0.03	0.000	
5/18/2020	6.2	0.3	110,000	1,100	5.9	0.23	138	687	5,525.0	671.0	95.2%	0.26	68.1	3,823.7	99.0%	1.4	36.0	1,979.4	96.1%	0.00007	0.00776	0.20768	1.37	0.000	0.01	0.000	
6/16/2020	25.0	1.3	170,000	1,300	65	0.25	150	701	6,164.0	639.0	94.8%	1.12	18.4	3,842.1	99.2%	2.3	48.3	2,027.7	99.6%	0.00087	0.01257	0.22025	2.29	0.001	0.02	0.000	
7/20/2020	42.0	5.0	260,000	1,200	55	0.23	151	716	6,980.0	816.0	88.1%	1.77	49.2	3,891.2	99.5%	3.5	98.5	2,126.2	99.6%	0.00074	0.02750	0.24775	3.53	0.001	0.02	0.000	
8/27/2020	321.0	7.5	840,000	920	120	0.23	125	705	7,885.2	905.2	97.7%	12.40	267.2	4,158.5	99.9%	9.4	244.3	2,370.5	99.8%	0.00135	0.03943	0.28719	9.45	0.001	0.01	0.000	
9/21/2020	228.0	4.2	1,400,000	950	13	0.23	130	703	8,485.0	599.7	98.2%	9.21	270.0	4,428.4	99.9%	16.4	322.3	2,692.8	98.2%	0.00015	0.01869	0.30588	16.37	0.000	0.01	0.000	
10/26/2020	195.0	3.0	980,000	890	2.8	0.22	277	690	9,181.0	696.0	98.5%	16.83	377.5	4,806.0	99.9%	24.4	591.1	3,283.9	92.1%	0.00006	0.00310	0.30898	24.42	0.000	0.02	0.000	
11/18/2020	62.5	1.4	140,000	950	35	0.23	234	688	9,734.0	553.0	97.8%	4.52	246.0	5,052.0	99.3%	2.9	314.8	3,598.7	99.3%	0.00073	0.00917	0.31815	2.95	0.001	0.02	0.000	
12/14/2020	25.9	1.8	280,000	950	3.0	0.23	279	697	10,343.0	609.0	93.1%	2.13	84.4	5,136.4	99.7%	7.0	126.0	3,724.7	92.3%	0.00007	0.01017	0.32832	7.03	0.000	0.02	0.000	
1/11/2021	97.5	1.5	140,000	980	3.0	0.24	280	705	11,013.0	670.0	98.5%	8.51	148.4	5,284.8	99.3%	3.5	146.6	3,871.4	92.0%	0.00007	0.00194	0.33026	3.53	0.000	0.02	0.000	
2/9/2021	309.0	3.0	370,000	1,600	32	0.16	63	684	11,690.0	677.0	99.0%	6.10	206.0	5,490.8	99.6%	2.1	78.8	3,950.2	99.5%	0.00018	0.00353	0.33379	2.10	0.000	0.01	0.000	
3/9/2021	103.9	2.0	420,000	1,600	57	0.40	67	712	12,324.0	634.0	98.1%	2.16	109.1	5,599.9	99.6%	2.5	60.9	4,011.1	99.3%	0.00034	0.00689	0.34068	2.53	0.000	0.01	0.000	
4/6/2021	230.0	3.7	320,000	1,600	20	0.042	67	560	12,994.8	670.8	98.4%	4.80	97.2	5,697.2	99.5%	1.9	62.1	4,073.2	99.8%	0.00012	0.00645	0.34713	1.93	0.000	0.01	0.000	
5/11/2021	344.0	2.8	510,000	2,500	21	0.067	96	728	13,822.0	827.2	99.2%	10.37	261.3	5,958.5	99.5%	4.4	108.6	4,181.8	99.7%	0.00018	0.00519	0.35232	4.40	0.000	0.02	0.000	
6/16/2021	124.4	5.5	490,000	1,600	0.33	0.043	286	707	14,689.0	867.0	95.6%	10.76	381.6	6,340.1	99.7%	12.6	306.2	4,487.9	87.0%	0.00001	0.00340	0.35572	12.61	0.000	0.04	0.000	
7/13/2021	771.6	2.2	2,400,000	1,600	0.34	0.044	291	695	14,899.7	210.7	99.7%	70.85	358.2	6,698.2	99.9%	62.8	330.7	4,818.7	87.1%	0.00001	0.00007	0.35578	62.83	0.000	0.04	0.000	
8/5/2021	505.0	5.1	1,800,000	1,600	0.35	0.044	290	706	15,452.0	552.3	99.0%	45.88	1,343.1	8,041.3	99.9%	46.9	1,262.4	6,081.0	87.4%	0.00001	0.00018	0.35596	46.96	0.000	0.04	0.000	
9/7/2021	299.0	1.7	600,000	1,600	0.34	0.044	319	698	16,226.0	774.0	99.4%	30.01	1,223.7	9,265.0	99.7%	17.2	1,033.6	7,114.6	87.1%	0.00001	0.00027	0.35623	17.22	0.000	0.05	0.000	
10/5/2021	137.1	0.3	290,000	1,700	0.36	0.047	247	690	16,899.0	673.0	99.8%	10.69	570.7	9,835.7	99.4%	6.4	330.6	7,445.2	86.9%	0.00001	0.00022	0.35645	6.44	0.000	0.04	0.000	
11/11/21	23.1	1.0	89,000	1,900	0.39	0.052	290	684	17,768.0	869.0	95.7%	2.03	230.3	10,066.0	97.9%	2.3	157.1	7,602.3	86.7%	0.00001	0.00029	0.35673	2.32	0.000	0.05	0.000	
12/8/21	6.0	0.5	41,000	1,700	0.36	0.046	79	728	18,389.0	621.0	91.7%	0.14	28.0	10,094.1	95.9%	0.3	33.0	7,635.3	87.2%	0.00000	0.00014	0.35687	0.29	0.000	0.01	0.000	

* = mass as equivalent hexane

** = Pre-control inlet emissions based on laboratory data

Conversions / Constants
Hexane Mol Weight = 86 grams/mol
Molar Volume = 24.45 liters
1 meter = 3.28 feet
1 pound = 453592 milligrams
1 day = 1440 minutes

Abbreviations
*F - degrees Fahrenheit
µg/m³ - micrograms per cubic meter
% - percent
CATOX - Catalytic Oxidizers
PID - Photo Ionization Detector
FID - Flame Ionization Detector
lbs - pounds
NOC - Notice of Construction
ppmv - parts per million by volume
PSCAA - Puget Sound Clean Air Agency
scfm - standard cubic feet per minute
TPH - total petroleum hydrocarbons
USEPA - United States Environmental Protection Agency

Notes:

1) Laboratory results that are below reporting or method detection limits are presented with the respective limit values to facilitate calculations.

2) The estimated mass of contaminant removed per interval is obtained by multiplying the mass removal rate, averaged over the current and prior field visit, by the time elapsed for the interval as measured by the hour meter.

3) Estimated pre-control emission rate is more than the maximum value (2.74 lb/day for TPH, 0.018 lb/day for benzene) for which no air treatment controls are required per PSCAA NOC conditions.

4) Conditions from PSCAA Notice of Construction No. 11291, Registration No. 29932
FID Field Reading for Removal Efficiency / Discharge Concentration
1. Greater than or equal to 97% if inlet TPH is greater than or equal to 200 ppmv (measured as hexane with FID).
2. Greater than or equal to 90% if inlet TPH is less than 200 ppmv (measured as hexane with FID).
3. Effluent at less than or equal to 10 ppmv (measured as hexane with FID).
4. CATOX flow rate must not exceed 300 scfm.
5. Use only electric CATOX.
6. CATOX temperature must be a minimum of 650F degrees.
7. System must shutdown if CATOX temperature drops below 650F degrees during normal operation.
8. CATOX must have sensor to monitor system temperature continuously.
No Air Treatment Controls are Required if:
9. Pre-control TPH emissions are less than or equal to 2.74 lbs/day
10. Pre-control benzene emissions are less than equal to 0.018 lbs/day

5) TPH-Gasoline Range and benzene concentrations were analyzed by NWTPH-Gx and USEPA Method 80218 from January-February 2020 and by USEPA Method TO-15 and NWTPH-Gx since March 2020. Benzene influent and effluent laboratory results that are 100 and 99 µg/m3 represent samples that were below the detection level of 100 µg/m3. The 99 value is used to keep the calculations from dividing by zero. Actual values could be lower than shown.

6) The January 9, 2020 field results reflect the CATOX system restart after months of being offline and is not indicative of continuous operation. Initial startup concentrations are usually higher than during extended operation and CATOX may not have been consistently reached above minimum temperature which is required for removal efficiency.

7) The April 6, 2021 CATOX influent temperature recorded is likely not indicative of CATOX operating conditions due to incorrect configuration of the meter, which was remedied on the same day. See Appendix C.



Appendix A

Field Forms, Groundwater Monitoring



GROUNDWATER SAMPLING LOG
Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER- KMW-02R

Project Name: Kelly-Moore

Date: 8/19/20

Project Number: 14697009

Weather Conditions: OK

Location: Seattle, WA

Sampler: Lucas Kerner

Wind Speed/Direction: N/A

WELL INFORMATION

Casing Diameter (in): 2"

Groundwater Elevation (ft): _____

Top of Casing Elevation (ft): 21.63'

Depth of Well Casing (ft): _____

Initial Depth to Water (ft): 10.33

Actual Purge Volume (gal): ~1.75 gallons

Wellhead Condition: OKAY

PURGING MEASUREMENTS

WL (ft btoc)	Time	pH (std. units)	SC (ms/cm)	Temp. (°C)	ORP (mv)	DO (mg/L)	Turbidity (NTUs)	mL/min-Notes
10.33	11:30	7.02	0.227	15.8	184.1	2.02	9.71	200
10.35	11:39	5.89	0.213	15.0	2052	0.67	8.01	200
10.35	11:41	5.84	0.212	14.9	2092	0.61	6.02	200
10.35	11:49	5.80	0.211	14.9	202	0.52	6.58	200
10.35	11:47	5.79	0.210	14.9	192	0.42	7.97	200
10.35	11:50	5.76	0.205	15.0	223.9	0.38	9.35	200
10.35	11:53	5.77	0.205	15.0	244.4	0.33	11.15	175
10.36	11:56	5.78	0.205	15.3	204.8	0.29	14.95	Bubbler on Turb.
10.36	11:59	5.70	0.204	15.3	210.2	0.36	7.50	
10.36	12:02	5.75	0.205	15.2	208.5	0.31	6.48	
10.36	12:05	5.73	0.205	15.2	208.2	0.33	6.51	
	17:06	COLLECT SAMPLE						

Sample ID No.: KMW-02R-081920

Water Level Ind. Model & No.: Solinst Model 101

ORP/DO Meter Model & No.: YSI-Pro Dss

Purge Equipment Used: Peristaltic Pump with dedicated tubing

Sampling Equipment Used: YSI Pro Dss

Purge Start Time: 11:30

Sample Collection Time: 12:06

Purge Completion Time: _____

Purging Method: SAA

Average Purge Rate (mL/min): 200

Sample Containers Used: Lab Provided

Analytical Lab: Friedman & Bruya Inc.

Chemical Analyses: See COC

Other Field Observations: _____

GROUNDWATER SAMPLING LOG

Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER- KMW-04

Project Name: Kelly-Moore

Date: 08/20/25

Project Number: 14697009

Weather Conditions: SUN 70's

Location: Seattle, WA

Wind Speed/Direction: N/A

Sampler: Lucas Kerner

WELL INFORMATION

Casing Diameter (in): 2"

Groundwater Elevation (ft): _____

Top of Casing Elevation (ft): 18.56'

Depth of Well Casing (ft): _____

Initial Depth to Water (ft): 7.45

Actual Purge Volume (gal): 1.5511

Wellhead Condition: OKAY / RUSTED

Actual Purge Volume (gal): 1.5 gal

PURGING MEASUREMENTS

[illegible]

Sample ID No.: KMW-04-~~0213-120~~ 0213-120

Water Level Ind. Model & No.: Solinst Model 101

ORP/DO Meter Model & No.: YSI-Pro Dss

Purge Equipment Used: Peristaltic Pump with dedicated tubing

Sampling Equipment Used: YSI Pro Dss

Purge Start Time: 12:20

Sample Collection Time: 17.50

Purge Completion Time: 15:00

Purging Method: SAA

Average Purge Rate (mL/min): 200

Sample Containers Used: Lab Provided

Analytical Lab: Friedman & Bruya Inc.

Chemical Analyses: See COC

Other Field Observations: ORANGE water in present



GROUNDWATER SAMPLING LOG
Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER- KMW-06

Project Name: Kelly-Moore

Date: 8/20/20

Project Number: 14697009

Weather Conditions: SUN 70's

Location: Seattle, WA

Sampler: Lucas Kerner

Wind Speed/Direction: North

WELL INFORMATION

Casing Diameter (in): 2"
Top of Casing Elevation (ft): 19.80'
Initial Depth to Water (ft): 8.65
Wellhead Condition: OK

Groundwater Elevation (ft): _____
Depth of Well Casing (ft): _____
Actual Purge Volume (gal): 1.5 gallons

PURGING MEASUREMENTS

WL (ft btoc)	Time	pH (std. units)	SC (ms/cm)	Temp. (°C)	ORP (mv)	DO (mg/L)	Turbidity (NTUs)	Notes
8.74	11:23	6.04	0.649	18.9	-33	0.64	37	
8.78	11:26	6.02	0.645	18.9	-41.7	0.30	49	
8.78	11:29	6.03	0.638	19.1	-46	0.18	63	
8.78	11:32	6.05	0.626	19.2	-52.3	0.11	93	Bubble
8.78	11:35	6.06	0.623	19.1	-54.6	0.09	84	Outside temp increase
8.78	11:38	6.07	0.625	19.5	-55.0	0.75	84	
8.78	11:41	6.08	0.628	19.5	-55.7	0.29	85	
8.78	11:44	6.10	0.632	19.6	-57.5	0.19	94	
8.78	11:47	6.11	0.630	19.6	-58.7	0.16	100	
8.78	11:50	6.11	0.631	19.5	-57.9	0.14	(27)	
								Taken from piston cap installed of Flexthru cell

Sample ID No.: KMW-06- 8/20/20

Water Level Ind. Model & No.: Solinst Model 101

ORP/DO Meter Model & No.: YSI-Pro Dss

Purge Equipment Used: Peristaltic Pump with dedicated tubing

Sampling Equipment Used: YSI Pro Dss

Purge Start Time: 11:20

Sample Collection Time: 11:50

Purge Completion Time: 11:50

Purging Method: SAA

Average Purge Rate (mL/min): 200 mL/min

Sample Containers Used: Lab Provided

Analytical Lab: Friedman & Bruya Inc.

Chemical Analyses: See COC

Other Field Observations: MS/MSD taken. 27 bottles. 18 vials, 6 amber, & 3 metals

GROUNDWATER SAMPLING LOG Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER- KMW-07

Project Name: Kelly-Moore

Date: 8/19/20

Project Number: 14697009

Weather Conditions: OKAY

Location: Seattle, WA

Sampler: Lucas Kerner

Wind Speed/Direction: N/A

WELL INFORMATION

Casing Diameter (in): 2"

Groundwater Elevation (ft): _____

Top of Casing Elevation (ft): 21.63'

Depth of Well Casing (ft): _____

Initial Depth to Water (ft): 10.31

Actual Purge Volume (gal): 1.5

Wellhead Condition: OKAY

PURGING MEASUREMENTS

WL (ft btoc)	Time	pH (std. units)	SC (ms/cm)	Temp. (°C)	ORP (mv)	DO (mg/L)	Turbidity (NTUs)	Notes
10.36	12:33	5.91	0.215	16.0	81.4	0.49	52	
10.35	12:36	5.80	0.211	16.4	101.6	0.30	37	
10.36	12:38	5.80	0.244	16.2	99.4	0.23	24	
10.37	12:41	5.80	0.216	16.1	92.4	0.18	20	
10.37	12:45	5.80	0.220	16.2	93.3	0.15	26	
10.38	12:48	5.81	0.223	16.1	94.8	0.13	26	
10.38	12:51	5.87	0.224	16.2	94.8	0.12	27	
10.38	12:54	5.88	0.224	16.1	94.0	0.12	27	
Parameters		Stable		LN				

Sample ID No.: KMW-07-081920

Water Level Ind. Model & No.: Solinst Model 101

ORP/DO Meter Model & No.: YSI-Pro Dss

Purge Equipment Used: Peristaltic Pump with dedicated tubing

Sampling Equipment Used: YSI Pro Dss

Purge Start Time: 12:30

Sample Collection Time: 13:00

Purge Completion Time: 12:54

Purging Method: SAA

Average Purge Rate (mL/min): 750

Sample Containers Used: Lab Provided

Analytical Lab: Friedman & Bruya Inc.

Chemical Analyses: See COC

Other Field Observations: _____

GROUNDWATER SAMPLING LOG Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER- KMW-08

Project Name: Kelly-Moore

Date: 08/19/20

Project Number: 14697009

Weather Conditions: DRY SW / NA

Location: Seattle, WA

Sampler: Lucas Kerner

Wind Speed/Direction: N/A

WELL INFORMATION

Casing Diameter (in): 2"
Top of Casing Elevation (ft): 21.65'
Initial Depth to Water (ft): 10.33
Wellhead Condition: OKAY

Groundwater Elevation (ft): _____
Depth of Well Casing (ft): _____
Actual Purge Volume (gal): ~750ll

PURGING MEASUREMENTS

WL (ft btoc)	Time	pH (std. units)	SC (ms/cm)	Temp. (°C)	ORP (mv)	DO (mg/L)	Turbidity (NTUs)	Notes
10.44	13:23	4.85	0.246	18.1	143	0.40	140	ORANGE
10.42	13:26	4.82	0.216	18.0	196.6	0.26	54	
10.42	13:29	4.81	0.195	18.1	202.3	0.22	34	
10.44	13:32	4.83	0.187	18.2	205.6	0.19	20	
10.43	13:35	4.87	0.181	18.3	208.1	0.17	16	
10.44	13:38	4.90	0.178	18.2	206.1	0.16	12	
10.44	13:41	4.96	0.176	18.3	203.6	0.16	12	
10.44	13:44	4.98 ⁴⁹⁸	0.175	18.3	200.1	0.15	11	
10.44	13:47	4.98	0.176	18.3	197	0.15	11	
10.44	13:50	4.99	0.176	18.3	195.7	0.14	12	
						2K		

Sample ID No.: KMW-08-081970

Water Level Ind. Model & No.: Solinst Model 101

ORP/DO Meter Model & No.: YSI-Pro Dss

Purge Equipment Used: Peristaltic Pump with dedicated tubing

Sampling Equipment Used: YSI Pro Dss

Purge Start Time: 13:20

Sample Collection Time: 13:50

Purge Completion Time: 13:50

Purging Method: SAA

Average Purge Rate (mL/min): 750

Sample Containers Used: Lab Provided

Analytical Lab: Friedman & Bruya Inc.

Chemical Analyses: See COC

Other Field Observations: _____



GROUNDWATER SAMPLING LOG
Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER- KMW-09

Project Name: Kelly-Moore

Date: 08/20/20

Project Number: 14697009

Weather Conditions: SUN 77°

Location: Seattle, WA

Sampler: Lucas Kerner

Wind Speed/Direction: N/A

WELL INFORMATION

Casing Diameter (in): 2"

Groundwater Elevation (ft): _____

Top of Casing Elevation (ft): 18.14'

Depth of Well Casing (ft): _____

Initial Depth to Water (ft): 7.03

Actual Purge Volume (gal): 1.75

Wellhead Condition: OKAY

PURGING MEASUREMENTS

WL (ft btoc)	Time	pH (std. units)	SC (ms/cm)	Temp. (°C)	ORP (mv)	DO (mg/L)	Turbidity (NTUs)	Notes
7.04	10:33	5.97	0.675	18.3	-40.5	0.23	173	173 bubbles
7.04	10:36	5.97	0.670	18.7	-46.1	0.15	20	
7.04	10:39	5.99	0.615	19.0	-50	0.16	27	
7.04	10:42	6.03	0.613	19.2	-55	0.12	31	
7.04	10:45	6.04	0.613	19.2	-57.1	0.10	41	
7.04	10:48	6.05	0.612	19.2	-59.1	0.09	47	
7.04	10:51	6.05	0.613	19.3	-60.6	0.08	50	
7.04	10:54	6.12	0.614	19.1	-63.3	0.07	50 42	
7.05	10:57	6.08	0.614	19.1	-62.9	0.07	48	
7.05	11:00	6.08	0.615	19.1	-63.4	0.07	51	
					STABLE			
LW								

Sample ID No.: KMW-09-082020

Water Level Ind. Model & No.: Solinst Model 101

ORP/DO Meter Model & No.: YSI-Pro Dss

Purge Equipment Used: Peristaltic Pump with dedicated tubing

Sampling Equipment Used: YSI Pro Dss

Purge Start Time: 10:50

Sample Collection Time: 11:00

Purge Completion Time: 11:00

Purging Method: SAA

Average Purge Rate (mL/min): 200

Sample Containers Used: Lab Provided

Analytical Lab: Friedman & Bruya Inc.

Chemical Analyses: See COC

Other Field Observations: _____

GROUNDWATER SAMPLING LOG

Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER- KMW-10

Project Name: Kelly-Moore

Date: 8/20/20

Project Number: 14697009

Weather Conditions: SUNNY

Location: Seattle, WA

Wind Speed/Direction: To North

Sampler: Lucas Kerner

WELL INFORMATION

Casing Diameter (in): 2"

Groundwater Elevation (ft):

Top of Casing Elevation (ft): 20.39'

Depth of Well Casing (ft):

Initial Depth to Water (ft): 9.41

Actual Purge Volume (gal): 2.5941

Wellhead Condition: OKAY

PURGING MEASUREMENTS

[illegible]

Sample ID No.: KMW-10-082020

Water Level Ind. Model & No.: Solinst Model 101

ORP/DO Meter Model & No.: YSI-Pro Dss

Purge Equipment Used: Peristaltic Pump with dedicated tubing

Sampling Equipment Used: YSI Pro Dss

Purge Start Time: 0845

Purge Completion Time: 9:12

Average Purge Rate (mL/min): 225

Analytical Lab: Friedman & Bruya Inc.

Sample Collection Time: 9:15

Purging Method:	SAA
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Sample Containers Used: Lab Provided

Chemical Analyses: See COC

Other Field Observations: Duplicate: KMW-10-9-1987020 taken @ 9:20.

GROUNDWATER SAMPLING LOG

Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER- KMW-02R

Project Name: Kelly-Moore

Date: 3/29/21

Project Number: 14697009

Weather Conditions: Indoor

Location: Seattle, WA

Wind Speed/Direction: NA

Sampler: BC

WELL INFORMATION

Casing Diameter (in): 2"

Groundwater Elevation (ft):

Top of Casing Elevation (ft): 21.63'

Depth of Well Casing (ft):

Initial Depth to Water (ft): 7.93 3/22

7.81 3/24

Actual Purge Volume (gal): 354

Wellhead Condition: New

PURGING MEASUREMENTS

[illegible]

Sample ID No.: KMW-02R-

Water Level Ind. Model & No.: Solinst Model 101

ORP/DO Meter Model & No.: YSI-Pro Dss

Purge Equipment Used: Peristaltic Pump with dedicated tubing

Sampling Equipment Used: YSI Pro Dss

Purge Start Time:

Sample Collection Time: 0955

Purge Completion Time:

Purging Method: SAA

Average Purge Rate (mL/min):

Sample Containers Used: Lab Provided

Analytical Lab: Friedman & Bruya Inc.

Chemical Analyses: See COC

Other Field Observations: 0.0 ppm PCB headspace, Sampling complete @ 1027

GROUNDWATER SAMPLING LOG Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER- KMW-03R

Project Name: Kelly-Moore

Date: 3/22/21

Project Number: 14697009

Weather Conditions: Indoor

Location: Seattle, WA

Sampler: BL

Wind Speed/Direction: NA

WELL INFORMATION

Casing Diameter (in): 2"

Groundwater Elevation (ft): _____

Top of Casing Elevation (ft): 21.54'

Depth of Well Casing (ft): _____

Initial Depth to Water (ft): ~~8.08'~~ 8.08'

Actual Purge Volume (gal): 3 gal

Wellhead Condition: Good

PURGING MEASUREMENTS

WL (ft btoc)	Time	pH (std. units)	SC (ms/cm)	Temp. (°C)	ORP (mv)	DO (mg/L)	Turbidity (NTUs)	Notes
8.26	1304	6.53	0.343	15.9	26.3	1.04	4.9	
8.26	1310	6.71	0.372	15.9	-32.8	0.76	5.2	
8.26	1315	6.79	0.381	15.9	-45.6	0.71	7.2	
8.28	1320	6.82	0.384	15.9	-51.1	0.67	8.2	
8.31	1326	6.84	0.387	15.9	-56.2	0.64	15.2	
8.28	1332	6.86	0.388	15.9	-59.2	0.62	20.9	
8.29	1337	6.86	0.391	15.9	-60.2	0.61	29.6	
8.28	1343	6.87	0.392	15.9	-61.7	0.59	38.8	Sampling

Sample ID No.: KMW-03R-

Water Level Ind. Model & No.: Solinst Model 101

ORP/DO Meter Model & No.: YSI-Pro Dss

Purge Equipment Used: Peristaltic Pump with dedicated tubing

Sampling Equipment Used: YSI Pro Dss

Purge Start Time: 12:58

Sample Collection Time: 1344

Purge Completion Time: 1344

Purging Method: SAA

Average Purge Rate (mL/min): _____

Sample Containers Used: Lab Provided

Analytical Lab: Friedman & Bruya Inc.

Chemical Analyses: See COC

Other Field Observations: Sampling complete @ 13:17, 0.0 ppb PFO headspace



GROUNDWATER SAMPLING LOG
Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER- KMW-04

Project Name: Kelly-Moore

Date: 2/23/21

Project Number: 14697009

Weather Conditions: Sunny 50°F

Location: Seattle, WA

Sampler: BL

Wind Speed/Direction: N

WELL INFORMATION

Casing Diameter (in): 2"

Groundwater Elevation (ft): _____

Top of Casing Elevation (ft): 18.56'

Depth of Well Casing (ft): _____

Initial Depth to Water (ft): 5.39 3/22 5.41 3/23

Actual Purge Volume (gal): 2.5 gal

Wellhead Condition: Old, baits don't work

PURGING MEASUREMENTS

WL (ft btoc)	Time	pH (std. units)	SC (ms/cm)	Temp. (°C)	ORP (mv)	DO (mg/L)	Turbidity (NTUs)	Notes
5.44	1436	6.37	0.212	13.3	69.0	2.10	23.4	
5.44	1443	6.12	0.205	12.6	62.3	0.75	50.2	
5.44	1448	6.01	0.199	12.5	58.6	0.69	135.7	
5.44	1454	5.83	0.183	12.4	60.7	0.92	145.4	
5.44	1501	5.72	0.180	12.3	75.0	1.30	158.2	
5.45	1506	5.64	0.182	12.3	81.7	1.33	18.2	Bubbles were on sensor
5.45	1512	5.61	0.179	12.2	85.6	1.34	16.7	
5.45	1519	5.58	0.179	12.2	91.4	1.65	22.1	

Sample ID No.: KMW-04-

Water Level Ind. Model & No.: Solinst Model 101

ORP/DO Meter Model & No.: YSI-Pro Dss

Purge Equipment Used: Peristaltic Pump with dedicated tubing

Sampling Equipment Used: YSI Pro Dss

Purge Start Time: 1434

Sample Collection Time: 1520

Purge Completion Time: 1519

Purging Method: SAA

Average Purge Rate (mL/min): _____

Sample Containers Used: Lab Provided

Analytical Lab: Friedman & Bruya Inc.

Chemical Analyses: See COC

Other Field Observations: 0.2 ppm PID headspace, Sample complete @ 1542

GROUNDWATER SAMPLING LOG Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER- KMW-06

Project Name: Kelly-Moore

Date: 3/23/21

Project Number: 14697009

Weather Conditions: Cloudy, 40's & 50's

Location: Seattle, WA

Wind Speed/Direction: No wind

Sampler: BL

WELL INFORMATION

Casing Diameter (in): 2"
Top of Casing Elevation (ft): 19.80'
Initial Depth to Water (ft): 6.53 3/22
Wellhead Condition: Fair

Groundwater Elevation (ft): _____
Depth of Well Casing (ft): _____
Actual Purge Volume (gal): 2.5 gal

PURGING MEASUREMENTS

WL (ft btoc)	Time	pH (std. units)	SC (ms/cm)	Temp. (°C)	ORP (mv)	DO (mg/L)	Turbidity (NTUs)	Notes
6.57	0822	5.66	0.737	13.8	118	2.00	29.2	
6.63	0830	5.71	0.777	14.1	24.9	0.81	30.6	
6.61	0837	5.77	0.792	14.0	0.7	0.68	31.1	
6.61	0842	5.79	0.809	14.0	-6.8	0.66	33.9	
6.62	0849	5.81	0.824	13.9	-11.6	0.63	32.6	
6.60	0855	5.81	0.837	13.5	-13.1	0.63	32.9	
6.68	0901	5.82	0.836	13.6	-14.0	0.67	32.2	Shaken on purge water

Sample ID No.: KMW-06

Water Level Ind. Model & No.: Solinst Model 101

ORP/DO Meter Model & No.: YSI-Pro Dss

Purge Equipment Used: Peristaltic Pump with dedicated tubing

Sampling Equipment Used: YSI Pro Dss

Purge Start Time: 0822

Sample Collection Time: 0905 + 0940

Purge Completion Time: 0905 0905

Purging Method: SAA

Average Purge Rate (mL/min): _____

Sample Containers Used: Lab Provided

Analytical Lab: Friedman & Bruya Inc.

Chemical Analyses: See COC

Other Field Observations: 6.75 PID ppm headspace, Sampling ended @ 0957



GROUNDWATER SAMPLING LOG
Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER- KMW-07

Project Name: Kelly-Moore

Date: 3/24/21

Project Number: 14697009

Weather Conditions: Indoor

Location: Seattle, WA

Sampler: BL

Wind Speed/Direction: NA

WELL INFORMATION

Casing Diameter (in): 2"

Groundwater Elevation (ft): _____

Top of Casing Elevation (ft): 21.63'

Depth of Well Casing (ft): _____

Initial Depth to Water (ft): 7.93 7/22

Actual Purge Volume (gal): 2.25 gal

Wellhead Condition: New 7.85' 3/24

PURGING MEASUREMENTS

WL (ft btoc)	Time	pH (std. units)	SC (ms/cm)	Temp. (°C)	ORP (mv)	DO (mg/L)	Turbidity (NTUs)	Notes
7.87	1054	6.06	0.200	14.7	307.5	1.08	35.5	
7.89	1100	6.04	0.191	14.8	206.2	0.81	29.1	
7.97	1105	6.02	0.191	14.8	226.8	0.71	21.8	
7.86	1110	6.01	0.189	14.8	203.0	0.68	23.0	
7.88	1116	5.98	0.189	14.8	172.6	0.65	24.1	
7.88	1121	5.96	0.192	14.9	158.0	0.66	29.7	
7.88	1125	5.94	0.198	14.9	148.3	0.67	33.6	
7.88	1132	5.92	0.207	14.9	135.9	0.67	41.8	
7.88	1136	5.90	0.221	14.9	130.8	0.67	44.3	

Sample ID No.: KMW-07-

Water Level Ind. Model & No.: Solinst Model 101

ORP/DO Meter Model & No.: YSI-Pro Dss

Purge Equipment Used: Peristaltic Pump with dedicated tubing

Sampling Equipment Used: YSI Pro Dss

Purge Start Time: 1051

Sample Collection Time: 1056 1136

Purge Completion Time: _____

Purging Method: SAA

Average Purge Rate (mL/min): _____

Sample Containers Used: Lab Provided

Analytical Lab: Friedman & Bruya Inc.

Chemical Analyses: See COC

Other Field Observations: 0.0 ppm PFO headspace, Sample complete @ 1149

GROUNDWATER SAMPLING LOG

Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER- KMW-08

Project Name: Kelly-Moore

Date: 3/22/2

Project Number: 14697009

Weather Conditions: Indoor

Location: Seattle, WA

Wind Speed/Direction: NA

Sampler: BL

WELL INFORMATION

Casing Diameter (in): 2"

Groundwater Elevation (ft): _____

Top of Casing Elevation (ft): 21.65'

Depth of Well Casing (ft): _____

Initial Depth to Water (ft): 8.06 8.06

Actual Purge Volume (gal): 2.5 gal

Wellhead Condition: Good

PURGING MEASUREMENTS

[illegible]

Probed + showed low	flow cell because of Turb
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Sample ID No.: KMW-08-

Water Level Ind. Model & No.: Solinst Model 101

ORP/DO Meter Model & No.: YSI-Pro Dss

Purge Equipment Used:	Peristaltic Pump with dedicated tubing
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Sampling Equipment Used: YSI Pro Dss

Purge Start Time: 1851 1451

Sample Collection Time: 1538

Purge Completion Time: 1538

Purging Method: SAA

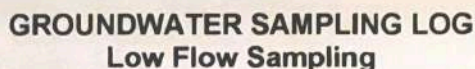
Average Purge Rate (mL/min): _____

Sample Containers Used: Lab Provided

Analytical Lab: Friedman & Bruya Inc.

Chemical Analyses: See COC

Other Field Observations: Sampling complete @ 1355, 0.0 ppm PTD headspace



Project Name: Kelly-Moore

Date: 3/23/21

Project Number: 14697009

Weather Conditions: Clady 40's &

Location: Seattle, WA

Sampler: BL

Wind Speed/Direction: No wind N

Casing Diameter (in): 2"

Groundwater Elevation (ft):

Top of Casing Elevation (ft): 18.14'

Depth of Well Casing (ft):

Initial Depth to Water (ft): 4.89 3/22

Actual Purge Volume (gal):

Wellhead Condition: Good

3/23

[illegible]

Sample ID No.: KMW-09-

Water Level Ind. Model & No.: Solinst Model 101

ORP/DO Meter Model & No.: YSI-Pro Dss

Purge Equipment Used: Peristaltic Pump with dedicated tubing

Sampling Equipment Used: YSI Pro Dss

Purge Start Time: 1055

Sample Collection Time: 1130

Purge Completion Time: 1130

Purging Method: SAA

Average Purge Rate (mL/min):

Sample Containers Used: Lab Provided

Analytical Lab: Friedman & Bruya Inc.

Chemical Analyses: See COC

Other Field Observations: 12.0 ppm PFO headspace, Sample completed 1157

GROUNDWATER SAMPLING LOG

Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER- KMW-10

Project Name: Kelly-Moore

Date: 3/23/2

Project Number: 14697009

Weather Conditions: Cloudy 40's F

Location: Seattle, WA

Wind Speed/Direction: N

Sampler: BL

WELL INFORMATION

Casing Diameter (in): 2"

Groundwater Elevation (ft): _____

Top of Casing Elevation (ft): 20.39'

Depth of Well Casing (ft): _____

Initial Depth to Water (ft): 7.42 3/22 7.45 2/1 Ac

Actual Purge Volume (gal): 2.5 gal

Wellhead Condition: Fail

PURGING MEASUREMENTS

[illegible]

Sample ID No.: KMW-10-

Water Level Ind. Model & No.: Solinst Model 101

ORP/DO Meter Model & No.: YSI-Pro Dss

Purge Equipment Used:	Peristaltic Pump with dedicated tubing
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Sampling Equipment Used: YSI Pro Dss

Purge Start Time: 1250

Sample Collection Time: 1320

Purge Completion Time: 320

Purging Method: SAA

Average Purge Rate (mL/min): _____

Sample Containers Used: Lab Provided

Analytical Lab: Friedman & Bruya Inc.

Chemical Analyses: See COC

Other Field Observations: 0.0 ppm PFO head space, Sampling complete @ 1347

- When loads were big, wk rose went up 0.04' bgs



GROUNDWATER SAMPLING LOG
Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER- KMW-02R

Project Name: Kelly-Moore

Date: 9/1/21

Project Number: 14697009

Weather Conditions: NA

Location: Seattle, WA

Sampler: BC

Wind Speed/Direction: NA

WELL INFORMATION

Casing Diameter (in): 2"

Groundwater Elevation (ft): _____

Top of Casing Elevation (ft): 21.63'

Depth of Well Casing (ft): _____

Initial Depth to Water (ft): 10.76'

Actual Purge Volume (gal): 2.5 gal

Wellhead Condition: New

PURGING MEASUREMENTS

WL (ft btoc)	Time	pH (std. units)	SC (ms/cm)	Temp. (°C)	ORP (mv)	DO (mg/L)	Turbidity (NTUs)	Notes
10.33	1127	6.44	0.252	15.1	-342.9	1.66	75.2	
10.29	1133	6.10	0.212	15.3	-328.4	1.23	20.5	
10.29	1137	6.03	0.205	15.3	-335.6	1.13	18.6	
10.29	1142	6.00	0.201	15.4	-336.8	1.06	23.9	
10.30	1147	5.99	0.198	15.5	-336.2	1.03	31.2	
10.27	1156	5.98	0.197	15.7	-336.0	1.00	41.2	
10.27	1203	6.00	0.198	16.2	-335.4	1.01	45.0	
10.29	1212	5.99	0.196	16.0	-330.9	1.01	51.6	

Sample ID No.: KMW-02R-

Water Level Ind. Model & No.: Solinst Model 101

ORP/DO Meter Model & No.: YSI-Pro Dss

Purge Equipment Used: Peristaltic Pump with dedicated tubing

Sampling Equipment Used: YSI Pro Dss

Purge Start Time: 1126

Sample Collection Time: 1220

Purge Completion Time: 1212

Purging Method: SAA

Average Purge Rate (mL/min): 205 mL/min

Sample Containers Used: Lab Provided

Analytical Lab: Friedman & Bruya Inc.

Chemical Analyses: See COC

Other Field Observations: Sampling complete @ 1230

GROUNDWATER SAMPLING LOG

Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER- KMW-03R

Project Name: Kelly-Moore

Date: 9/1/2021

Project Number: 14697009

Weather Conditions: NA

Location: Seattle, WA

Wind Speed/Direction: NA

Sampler: BL

WELL INFORMATION

Casing Diameter (in): 2"

Groundwater Elevation (ft): _____

Top of Casing Elevation (ft): 21.54'

Depth of Well Casing (ft): _____

Initial Depth to Water (ft): 10.31

Actual Purge Volume (gal): 1175 gal

Wellhead Condition: New

PURGING MEASUREMENTS

[illegible]

Sample ID No.: KMW-03R-

Water Level Ind. Model & No.: Solinst Model 101

ORP/DO Meter Model & No.: YSI-Pro Dss

Purge Equipment Used:	Peristaltic Pump with dedicated tubing
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Sampling Equipment Used: YSI Pro Dss

Purge Start Time: 1529

Sample Collection Time: 1620

Purge Completion Time: 1614

Purging Method: SAA

Average Purge Rate (mL/min): 147 mL/min

Sample Containers Used: Lab Provided

Analytical Lab: Friedman & Bruya Inc.

Chemical Analyses: See COC

Other Field Observations: Sampling complete 1645

GROUNDWATER SAMPLING LOG

Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER- KMW-04

Project Name: Kelly-Moore

Date: 9/2/2021

Project Number: 14697009

Weather Conditions: Sunny, 70's °F

Location: Seattle, WA

Wind Speed/Direction: NW, low

Sampler: Be

WELL INFORMATION

Casing Diameter (in): 2"

Groundwater Elevation (ft):

Top of Casing Elevation (ft): 18.56'

Depth of Well Casing (ft):

Initial Depth to Water (ft): 7.43' on 9/1/21

Actual Purge Volume (gal): 3.5 gal

Wellhead Condition: Good

PURGING MEASUREMENTS

[illegible]

Sample ID No.: KMW-04-

Water Level Ind. Model & No.: Solinst Model 101

ORP/DO Meter Model & No.: YSI-Pro Dss

Purge Equipment Used: Peristaltic Pump with dedicated tubing

Sampling Equipment Used: YSI Pro Dss

Purge Start Time:

Sample Collection Time: 1710

Purge Completion Time:

Purging Method: SAA

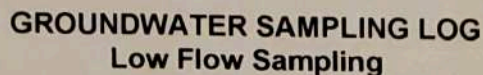
Average Purge Rate (mL/min): 294 mL/min

Sample Containers Used: Lab Provided

Analytical Lab: Friedman & Bruya Inc.

Chemical Analyses: See COC

Other Field Observations:



MONITORING WELL/PIEZOMETER NUMBER- KMW-06

Project Name: Kelly-Moore

Date: 9/2/2021

Project Number: 14697009

Weather Conditions: Sunny, 60-75°F

Location: Seattle, WA

Wind Speed/Direction: SE, 1-4

Sampler: BC

WELL INFORMATION

Casing Diameter (in): 2"

Groundwater Elevation (ft):

Top of Casing Elevation (ft): 19.80'

Depth of Well Casing (ft): _____

Initial Depth to Water (ft): 8.62' on 9/1/21

Actual Purge Volume (gal): 115 gal

Wellhead Condition: Good Feb, 1 bolt stripped Actual P

PURGING MEASUREMENTS

[illegible]

Sample ID No.: KMW-06-

Water Level Ind. Model & No.: Solinst Model 101

ORP/DO Meter Model & No.: YSI-Pro Dss

Purge Equipment Used:	Peristaltic Pump with dedicated tubing
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Sampling Equipment Used: YSI Pro Dss

Purge Start Time:

Sample Collection Time: 1015

Purge Completion Time:

Purging Method:	SAA
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Average Purge Rate (mL/min): 153 mL/min

Sample Containers Used: Lab Provided

Analytical Lab: Friedman & Bruya Inc.

Chemical Analyses: See COC

Other Field Observations:

Project Name: Kelly-Moore

Date: 9/1/2021

Project Number: 14697009

Weather Conditions: NA

Location: Seattle, WA

Sampler: BL

Wind Speed/Direction: NA

Casing Diameter (in): 2"

Top of Casing Elevation (ft): 21.63'

Initial Depth to Water (ft): 10.27'

Wellhead Condition: New

Groundwater Elevation (ft):

Depth of Well Casing (ft):

Actual Purge Volume (gal): 2.5 gal

[illegible]

Sample ID No.: KMW-07-

Water Level Ind. Model & No.: Solinst Model 101

ORP/DO Meter Model & No.: YSI-Pro Dss

Purge Equipment Used: Peristaltic Pump with dedicated tubing

Sampling Equipment Used: YSI Pro Dss

Purge Start Time: 1251

Purge Completion Time: 1237

Average Purge Rate (mL/min): 205 mL/min

Analytical Lab: Friedman & Bruya Inc.

Sample Collection Time: 1340

Purging Method: SAA

Sample Containers Used: Lab Provided

Chemical Analyses: See COC

Other Field Observations: Sampling complete @ 1356

GROUNDWATER SAMPLING LOG

Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER- KMW-08

Project Name: Kelly-Moore

Date: 9/11/21

Project Number: 14697009

Weather Conditions: NA

Location: Seattle, WA

Sampler: BL

Wind Speed/Direction: NA

WELL INFORMATION

Casing Diameter (in): 2"

Groundwater Elevation (ft):

Top of Casing Elevation (ft): 21.65'

Depth of Well Casing (ft):

Initial Depth to Water (ft): 10.33'

Actual Purge Volume (gal): 1.75 gal

Wellhead Condition: New

PURGING MEASUREMENTS

[illegible]

Sample ID No.: KMW-08-

Water Level Ind. Model & No.: Solinst Model 101

ORP/DO Meter Model & No.: YSI-Pro Dss

Purge Equipment Used: Peristaltic Pump with dedicated tubing

Sampling Equipment Used: YSI Pro Dss

Purge Start Time: 1414

Sample Collection Time: 1455

Purge Completion Time: 1450

Purging Method: SAA

Average Purge Rate (mL/min): 184 mL/min

Sample Containers Used: Lab Provided

Analytical Lab: Friedman & Bruya Inc.

Chemical Analyses: See COC

Other Field Observations: Scrubby complete 1520

GROUNDWATER SAMPLING LOG Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER- KMW-09

Project Name: Kelly-Moore

Date: 9/2/2021

Project Number: 14697009

Weather Conditions: Sunny 50's °F

Location: Seattle, WA

Sampler: RL

Wind Speed/Direction: SE, low

WELL INFORMATION

Casing Diameter (in): 2"

Groundwater Elevation (ft): _____

Top of Casing Elevation (ft): 18.14'

Depth of Well Casing (ft): _____

Initial Depth to Water (ft): 6.99' on 9/1/21

Actual Purge Volume (gal): 3 gal

Wellhead Condition: Good

PURGING MEASUREMENTS

WL (ft btoc)	Time	pH (std. units)	SC (ms/cm)	Temp. (°C)	ORP (mv)	DO (mg/L)	Turbidity (NTUs)	Notes
7.01	0745							
7.03	0750	6.38	0.422	17.0	-385.9	1.13	15.1	
7.04	0756	6.38	0.420	17.3	-397.8	0.91	18.7	
7.03	0801	6.39	0.413	17.5	-405.8	0.82	33.7	
7.04	0807	6.39	0.416	17.6	-413.3	0.77	52.6	Bubbles
7.04	0813	6.39	0.421	17.7	-419.3	0.74	75.2	↓
7.04	0819	6.39	0.424	17.8	-419.2	0.71	76.1	
7.03	0824	6.39	0.425	17.8	-414.9	0.70	38.0	
7.04	0830	6.39	0.426	17.9	-413.3	0.85	38.6	

Sample ID No.: KMW-09-

Water Level Ind. Model & No.: Solinst Model 101

ORP/DO Meter Model & No.: YSI-Pro Dss

Purge Equipment Used: Peristaltic Pump with dedicated tubing

Sampling Equipment Used: YSI Pro Dss

Purge Start Time: 0745

Sample Collection Time: 0840

Purge Completion Time: 0830

Purging Method: SAA

Average Purge Rate (mL/min): 252 mL/min

Sample Containers Used: Lab Provided

Analytical Lab: Friedman & Bruya Inc.

Chemical Analyses: See COC

Other Field Observations: _____

GROUNDWATER SAMPLING LOG Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER- KMW-10

Project Name: Kelly-Moore

Date: 9/2/21

Project Number: 14697009

Weather Conditions: Sunny, 70's °F

Location: Seattle, WA

Sampler: BL

Wind Speed/Direction: SE low

WELL INFORMATION

Casing Diameter (in): 2"

Groundwater Elevation (ft): _____

Top of Casing Elevation (ft): 20.39'

Depth of Well Casing (ft): _____

Initial Depth to Water (ft): 9.78 on 9/1/21

Actual Purge Volume (gal): 3 gal

Wellhead Condition: Full

PURGING MEASUREMENTS

WL (ft btoc)	Time	pH (std. units)	SC (ms/cm)	Temp. (°C)	ORP (mv)	DO (mg/L)	Turbidity (NTUs)	Notes
9.37	1415	—	—	—	—	—	—	—
9.40	1418	6.43	0.690	18.3	-268.9	1.17	72.0	Bubbles
9.39	1425	6.40	0.692	18.7	-363.5	0.88	33.5	
9.40	1430	6.46	0.690	18.8	-373.8	0.83	44.6	
9.40	1435	6.39	0.688	18.5	-385.0	0.81	81.9	
9.40	1442	6.39	0.687	18.5	-388.2	0.71	29.7	
9.40	1448	6.40	0.689	18.3	-393.0	0.76	27.2	
9.39	1455	6.39	0.687	18.4	-396.0	0.68	53.2	
9.40	1503	6.38	0.682	18.4	-394.2	0.68	85.2	

Sample ID No.: KMW-10-@1510 Dup1-20210902 @ 1540

Water Level Ind. Model & No.: Solinst Model 101

ORP/DO Meter Model & No.: YSI-Pro Dss

Purge Equipment Used: Peristaltic Pump with dedicated tubing

Sampling Equipment Used: YSI Pro Dss

Purge Start Time: 1415

Sample Collection Time: 1510 + 1540 (Dup)

Purge Completion Time: 1503

Purging Method: SAA

Average Purge Rate (mL/min): 237 mL/min

Sample Containers Used: Lab Provided

Analytical Lab: Friedman & Bruya Inc.

Chemical Analyses: See COC

Other Field Observations: _____

GROUNDWATER SAMPLING LOG Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER BKF926

Project Name: Kelly Moore Paint Company Date: 9/2/2021
Project Number: 14697009 Weather Conditions: Sunny 60-70's °F
Location: Seattle, WA
Sampler: BL Wind/Direction: SE, low

WELL INFORMATION

Casing Diameter (in): 2" Groundwater Elevation (ft): -
Top of Casing Elevation (ft): - Depth of Well Casing (ft): -
Initial Depth to Water (ft): 8.53' on 9/2/21 Actual Purge Volume (gal): 2.5 gal
Wellhead Condition: Fair

PURGING MEASUREMENTS

WL (ft btoc)	Time	pH (std. units)	SC (ms/cm)	Temp. (°C)	ORP (mv)	DO (mg/L)	Turbidity (NTUs)	Notes
8.53	1116							
8.53	1117	6.48	0.344	17.9	-117.9	1.76	168.2	Bubbles
8.53	1124	6.48	0.343	18.3	-116.9	0.96	81.2	" "
8.53	1129	6.47	0.340	18.0	-311.6	0.83	72.2	
8.53	1136	6.48	0.338	17.2	-391.6	0.71	56.0	
8.53	1142	6.47	0.334	17.2	-408.9	0.68	60.7	
8.53	1149	6.46	0.332	17.3	-418.2	0.66	57.7	
8.53	1155	6.45	0.330	17.4	-419.2	0.65	59.0	
8.51	1201	6.44	0.330	17.4	-420.7	0.64	61.2	

Sample ID BKF926

Water Level Ind. Model & No.: Solinst Model 101 Interface Meter 122
ORP/DO Meter Model & No.: VST-Pac DSS
Purge Equipment Used: Perist pump, non dedicated tubing
Sampling Equipment Used: Perist pump

Purge Start Time: 1116 Sample Collection Time: 1210
Purge Completion Time: 1201 Purging Method: SKH
Average Purge Rate (mL/min): 210 mL/min Sample Containers Used: Lab Provided
Analytical Lab: F&BI Chemical Analyses: See EOC

Other Field Observations: _____

GROUNDWATER SAMPLING LOG Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER BKF 927

Project Name: Kelly Moore Paint Company Date: 9/2/2022
Project Number: 14697009 Weather Conditions: Sunny, 70's °F
Location: Seattle, WA
Sampler: BL Wind/Direction: SE, low

WELL INFORMATION

Casing Diameter (in): 2" Groundwater Elevation (ft): -
Top of Casing Elevation (ft): - Depth of Well Casing (ft): -
Initial Depth to Water (ft): 7.23' on 7/1/21 Actual Purge Volume (gal): 1.5 gal
Wellhead Condition: Fair

PURGING MEASUREMENTS

WL (ft btoc)	Time	pH (std. units)	SC (ms/cm)	Temp. (°C)	ORP (mv)	DO (mg/L)	Turbidity (NTUs)	Notes
7.22	1238							First 5 seconds turbid
7.22	1240	6.57	0.453	19.5	-275.7	1.06	131.1	
7.22	1249	6.56	0.441	20.0	-389.2	0.78	122.1	
7.22	1256	6.56	0.432	20.4	-390.0	0.75	150.7	
7.22	1305	6.56	0.419	20.9	-383.2	0.79	153.0	
7.20	1309	6.57	0.419	21.9	-377.8	0.78	129.0	Pump turned off briefly
7.23	1311	6.54	0.421	19.7	-399.8	0.72	176.5	
7.23	1320	6.53	0.405	20.2	-408.0	0.67	131.6	
7.23	1323	6.53	0.404	20.3	-407.1	0.67	122.8	

Sample ID BKF 927

Water Level Ind. Model & No.: Solinst Model 101 Interface meter 122
ORP/DO Meter Model & No.: YSI Pro DSS
Purge Equipment Used: Perist Pump non dedicated tubing
Sampling Equipment Used: Perist Pump

Purge Start Time: 1238 Sample Collection Time: 1335
Purge Completion Time: 1323 Purging Method: SAM
Average Purge Rate (mL/min): 16 mL/min Sample Containers Used: Lab Prohibited
Analytical Lab: F&BI Chemical Analyses: See COC

Other Field Observations: _____



Appendix B

Analytical Data, Groundwater Monitoring

ORGANIC DATA ASSESSMENT SUMMARY

Project Information			
Project Name:	Kelly-Moore Paint	Lab Name:	Friedman & Bruya, Inc.
Project Number:	0146970060.00010	Lab Report Number:	008315
Reviewer's Name:	Marie Bevier	Number of Samples:	10
Review Date:	09/11/2020	Matrix:	Water

Field Sample Identification	Collection Date	Laboratory Sample Identification	Note
KMW-02R-081920	08/19/2020	008315 -01	
KMW-03-081920	08/19/2020	008315 -02	
KMW-04-082020	08/20/2020	008315 -03	
KMW-06-082020	08/20/2020	008315 -04	
KMW-07-081920	08/19/2020	008315 -05	
KMW-08-081920	08/19/2020	008315 -06	
KMW-09-082020	08/20/2020	008315 -07	
KMW-10-082020	08/20/2020	008315 -08	
KMW-10-9-082020	08/20/2020	008315 -09	Field duplicate of KMW-10-082020
Trip Blanks	--	008315 -10	

Field Duplicate Assessment				
Analyte	Reporting Limit	Primary Result	Duplicate Result	RPD
Samples KMW-10-082020 and KMW-10-9-082020				
GRO	100 µg/L	1,800	1,600	12%
DRO	50 µg/L	10,000	11,000	9.5%
Arsenic	1 µg/L	5.34	5.25	1.7%
Barium	1 µg/L	18.6	18.9	1.6%
Chromium	1 µg/L	1.05 J	1.12 J	6.5%
Ethylbenzene	10 µg/L	96	110	14%
m,p-Xylene	20 µg/L	400	470	16%
Acenaphthylene	0.04 µg/L	8.7	8.9	2.3%
Phenanthrene	0.04 µg/L	0.69	0.65	6.0%

Notes:

µg/L = micrograms per liter

RPD = relative percent difference

Assessment Summary					
Parameter:	Gasoline-Range Organics (GRO) by NWTPH-Gx	Diesel Range Organics (DRO) and Oil Range Organics (ORO) by NWTPH-Dx	Metals by EPA Method 6020B	Volatile Organic Compounds (VOCs) by EPA Method 8260D	Polycyclic Aromatic Hydrocarbons (PAHs) by EPA Method 8270E
1. Chain of Custody	Chain of custody is complete.				
2. Receipt Temperature	The recorded receipt temperature is acceptable at 3 degrees Celsius.				
3. Hold Time	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable
4. Blank Detections	None	None	None	None	None
5. Surrogate Recoveries	Informational ^a	Acceptable	Not applicable	Acceptable	Informational ^e
6. Laboratory Control Sample (LCS) Recoveries	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable
7. LCS/LCS Duplicate (LCSD) Precision	Not applicable	Acceptable	Not applicable	Not applicable	Not applicable
8. Matrix Spike (MS) Recoveries	Acceptable (KMW-03-081920)	Not applicable	Acceptable (KMW-02R-081920)	Acceptable (KMW-03-081920)	Acceptable (KMW-03-081920)
9. MS,MS Duplicate (MSD) Precision	Acceptable	Not applicable	Acceptable	Acceptable	Acceptable
10. Other Quality Control Issues	None	Informational ^b	Qualification ^{c, d}	None	None

Qualifier Definitions	
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

Reason Code Definitions	
EXC	This result has been excluded from the dataset.
IS	Internal standard recovery is outside of method-specified limits.

Notes	Description	Action Required
a	According to the laboratory's notes, surrogate recoveries for samples KMW-04-082020 and KMW-06-082020 are outside of limits due to sample matrix effects.	Wood agrees that high target analyte concentrations in the affected samples would impact surrogate recoveries and it is not possible to assess data usability for these samples based on surrogate recoveries.
b	According to the laboratory's notes, DRO chromatograms from samples KMW-03-081920, KMW-04-082020, KMW-08-081920, KMW-10-082020, and KMW-10-9-082020; and DRO and ORO chromatograms from samples KMW-06-082020 and KMW-09-082020 do not match the chromatographic patterns of the hydrocarbon standards used or quantification.	None.
c	According to the laboratory's notes, there is interference in the internal standard used to quantify chromium in the undiluted analysis of samples KMW-04-082020, KMW-06-082020, KMW-09-082020, KMW-10-082020, and KMW-10-9-082020.	The affected samples were diluted and re-analyzed for chromium. Internal standard recoveries were acceptable, but chromium was not detected in the diluted re-analyses. Based on professional judgement, Wood excluded the non-detected results from the re-analyses (EXC) and J or UJ qualified the chromium results from the original analyses, as appropriate, due to the internal standard recoveries outside of limits. (J/UJ-IS)
d	According to the laboratory's notes, there is interference in the internal standard used to quantify copper and nickel in the undiluted analysis of samples KMW-04-082020, KMW-09-082020, KMW-10-082020, and KMW-10-9-082020.	The affected samples were diluted and reanalyzed for copper and nickel. Internal standard recoveries were acceptable, but copper and nickel were not detected in the diluted re-analyses. Based on professional judgement, Wood excluded the non-detected results from the re-analyses (EXC) and J or UJ qualified the copper and nickel results from the original analyses, as appropriate, due to the internal standard recoveries outside of limits. (J/UJ-IS)
e	Recoveries of the surrogate compounds 2-fluorophenol and phenol-d6 are high in samples KMW-03-081920 (38%, 28%), KMW-07-081920 (40%, 28%), KMW-08-081920 (44%, 29%), KMW-10-082020 (36%, 30%), and KMW-10-9-082020 (35%, 28%); phenol-d6 recovery is high in sample KMW-04-082020 at 27%; and 2-fluorophenol recovery is high in sample KMW-09-082020 at 38%.	Acid-extractable compounds are not target analytes and data usability is not adversely affected by the high surrogate recoveries.

Data Qualified During Validation				
Sample Identification	Method	Parameter	Concentration	Qualifier and Reason Code
KMW-04-082020	EPA 6020B	Chromium	1.07 µg/L	J-IS
KMW-04-082020	EPA 6020B	Copper	15.0 µg/L	J-IS
KMW-04-082020	EPA 6020B	Nickel	< 1 µg/L	UJ-IS
KMW-04-082020	EPA 6020B	Chromium	< 10 µg/L	EXC
KMW-04-082020	EPA 6020B	Copper	< 50 µg/L	EXC
KMW-04-082020	EPA 6020B	Nickel	< 10 µg/L	EXC
KMW-06-082020	EPA 6020B	Chromium	1.48 µg/L	J-IS
KMW-06-082020	EPA 6020B	Chromium	< 10 µg/L	EXC
KMW-09-082020	EPA 6020B	Chromium	< 1 µg/L	UJ-IS
KMW-09-082020	EPA 6020B	Copper	< 5 µg/L	UJ-IS
KMW-09-082020	EPA 6020B	Nickel	1.26 µg/L	J-IS
KMW-09-082020	EPA 6020B	Chromium	< 10 µg/L	EXC
KMW-09-082020	EPA 6020B	Copper	< 50 µg/L	EXC
KMW-09-082020	EPA 6020B	Nickel	< 10 µg/L	EXC

Data Qualified During Validation				
Sample Identification	Method	Parameter	Concentration	Qualifier and Reason Code
KMW-10-082020	EPA 6020B	Chromium	1.05 µg/L	J-IS
KMW-10-082020	EPA 6020B	Copper	< 5 µg/L	UJ-IS
KMW-10-082020	EPA 6020B	Nickel	< 1 µg/L	UJ-IS
KMW-10-082020	EPA 6020B	Chromium	< 10 µg/L	EXC
KMW-10-082020	EPA 6020B	Copper	< 50 µg/L	EXC
KMW-10-082020	EPA 6020B	Nickel	< 10 µg/L	EXC
KMW-10-9-082020	EPA 6020B	Chromium	1.12 µg/L	J-IS
KMW-10-9-082020	EPA 6020B	Copper	< 5 µg/L	UJ-IS
KMW-10-9-082020	EPA 6020B	Nickel	< 1 µg/L	UJ-IS
KMW-10-9-082020	EPA 6020B	Chromium	< 10 µg/L	EXC
KMW-10-9-082020	EPA 6020B	Copper	< 50 µg/L	EXC
KMW-10-9-082020	EPA 6020B	Nickel	< 10 µg/L	EXC

DATA ASSESSMENT SUMMARY

Project Information			
Project Name:	Kelly-Moore Paint	Lab Names:	Friedman & Bruya, Inc. (F&BI), Fremont Analytical (Fremont), and Amtest Laboratories (Amtest)
Project Number:	0146970060.00010	Lab Report Numbers:	F&BI: 103413, 103441, and 103462 Fremont: 2103381 and 2103389
Reviewer's Name:	Marie Bevier	Number of Samples:	9
Review Date:	04/15/2021	Matrix:	Water

Field Sample Identification	Collection Date	Laboratory Sample Identification			Note
		F&BI	Fremont	Amtest	
KMW-03R	03/22/2021	103413 -01	2103381-001	21-A003783	MS/MSD for calcium, magnesium, and TOC. MS for volatile organic acids. Laboratory duplicate for BOD, alkalinity, carbon dioxide, TOC, and volatile organic acids.
KMW-08	03/22/2001	103413-02	--	--	
KMW-04	03/23/2021	103441 -01	2103389-001	21-A003778	MS/MSD for dissolved metals (EPA 200.8) and TOC Laboratory duplicate for alkalinity, BOD, carbon dioxide, dissolved metals (EPA 200.8), and TOC
KMW-06	03/23/2021	103441 -02	2103389-002	21-A003779	
KMW-09	03/23/2021	103441 -03	2103389-003	21-A003780	
KMW-10	03/23/2021	103441 -04	2103389-004	21-A003781	
Duplicate1	03/23/2021	103441 -05	2103389-005	21-A003782	Field duplicate of KMW-06 Laboratory duplicate for dissolved gases
KMW-02R	03/24/2021	103462-01	--	--	MS/MSD for DRO, metals, SVOCs, and VOCs
KMW-07	03/24/2021	103462-02	--	--	

Notes:

BOD = biochemical oxygen demand

DRO = diesel-range organics

MS/MSD = matrix spike/matrix spike duplicate

SVOC = semivolatile organic compounds

TOC = total organic carbon

VOC = volatile organic compound

Field Duplicate Assessment				
Analyte	Average Reporting Limit	Primary Result	Duplicate Result	RPD
Samples KMW-06 and Duplicate1				
Gasoline Range Organics	100 µg/L	4,400	4,500	2.2%
Diesel Range Organics	50 µg/L	35,000	33,000	5.9%
Motor Oil Range Organics	250 µg/L	3,000	3,500	15%
Iron, Dissolved	50 µg/L	37,900	35,900	5.4%
Manganese, Dissolved	1 µg/L	1,450	1,440	0.69%
Calcium	0.05 mg/L	51.4	51.3	0.19%
Magnesium	0.05 mg/L	13.1	13.0	0.77%
Hardness (as CaCO3)	0.05 mg/L	182	182	0.0%
Arsenic	1 µg/L	8.05	7.89	2.0%
Chromium	5.5 µg/L	< 10	5.2	NC
Copper	5 µg/L	96.5	74.6	26%
Iron	50 µg/L	42,800	45,200	5.5%
Lead	1 µg/L	29.7	30.0	1.0%
Manganese	1 µg/L	1,430	1,530	6.8%
Nickel	1 µg/L	21.5	16.8	24%
Zinc	5 µg/L	148	117	23%
Benzo(a)anthracene	0.02 µg/L	0.057	0.070	20%
Chrysene	0.02 µg/L	0.13	0.14	7.4%
Benzo(a)pyrene	0.02 µg/L	0.31	0.37	18%
Benzo(b)fluoranthene	0.02 µg/L	0.34	0.40	16%
Benzo(k)fluoranthene	0.02 µg/L	0.11	0.11	0.0%
Indeno(1,2,3-cd)pyrene	0.02 µg/L	0.18	0.21	15%
Isopropylbenzene	1 µg/L	2.8	2.7	3.6%
Methylene Chloride	5 µg/L	< 5	5.0	NC
n-Propylbenzene	1 µg/L	3.6	3.5	2.8%
1,1,2,2-Tetrachloroethane	1 µg/L	< 1	1.2	NC
Biochemical Oxygen Demand	2.00 mg/L	39.5	39.4 J	0.25%
Dissolved Methane	0.0675 mg/L	1.38	1.40	1.4%
Sulfate	12.0 mg/L	121	135	11%
Calcium, Dissolved	525 µg/L	61,300	56,400	8.3%
Magnesium, Dissolved	100 µg/L	14,600	13,800	5.6%
Sodium, Dissolved	250 µg/L	84,200	79,400	5.87%
Aluminum	100 µg/L	303	309	2.0%
Calcium	200 µg/L	54,100	54,400	0.55%
Magnesium	100 µg/L	13,800	13,500	2.2%
Sodium	200 µg/L	92,700	90,600	2.3%
Total Organic Carbon	2.50 mg/L	157	157	0.0%
Alkalinity	2.50 mg/L	162	162	0.0%
Carbon Dioxide	2.50 mg/L	264	255	3.5%
Chemical Oxygen Demand	10.0 mg/L	98.0	119	19%

Notes:

< = less than

NC = not calculable

µg/L = micrograms per liter

RPD = relative percent difference

mg/L = milligrams per liter

Assessment Summary: F&BI 103413, 103441, and 103462

Parameter:	Gasoline-Range Organics (GRO) by NWTPH-Gx	Diesel Range Organics (DRO) and Motor Oil Range Organics (ORO) by NWTPH-Dx	Dissolved Metals by EPA Method 6020B	Hardness by EPA Method 200.0 and SM 2340B	Total Metals by EPA Method 6020B
1. Chain of Custody	Chains of custody are complete.				
2. Receipt Temperature	The recorded receipt temperatures are acceptable at 3, 4, and 4 degrees Celsius.				
3. Hold Time	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable
4. Blank Detections	None	None	None	None	None
5. Surrogate Recoveries	Qualification ^a	Acceptable	NA	NA	NA
6. Laboratory Control Sample (LCS) Recoveries	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable
7. LCS/LCS Duplicate (LCSD) Precision	Acceptable	Acceptable	NA	NA	NA
8. Matrix Spike (MS) Recoveries	NA	Acceptable	NA	Informational ^b	Acceptable
9. MS/MS Duplicate (MSD) Precision	NA	Acceptable	NA	Informational ^c	Acceptable
10. Laboratory Duplicate Precision	NA	NA	NA	NA	NA
11. Other Quality Control Issues	None	Informational ^d	None	None	None

Assessment Summary: F&BI 103413, 103441, and 103462

Parameter:	Semivolatile Compounds by EPA Method 8270E	Volatile Organic Compounds (VOCs) by EPA Method 8260D			
1. Chain of Custody	Chains of custody are complete.				
2. Receipt Temperature	The recorded receipt temperatures are acceptable at 3, 4, and 4 degrees Celsius.				
3. Hold Time	Acceptable	Acceptable			
4. Blank Detections	None	None			
5. Surrogate Recoveries	Acceptable	Qualification ^{e,f,g}			
6. LCS Recoveries	Acceptable	Acceptable			
7. LCS/LCSD Precision	NA	Informational ^h			
8. MS Recoveries	Acceptable	Acceptable			
9. MS/MSD Precision	Acceptable	Acceptable			
10. Laboratory Duplicate Precision	NA	NA			
11. Other Quality Control Issues	None	Exclusion ⁱ			

Assessment Summary: Freemont 2103381 and 2103389

Parameter:	Biochemical Oxygen Demand (BOD) by SM 5210B	Dissolved Gases by RSK-175	Anions by EPA Method 300.0	Dissolved Metals by EPA Method 200.8	Total Metals by EPA Method 200.8
1. Chain of Custody	Chains of custody are complete.				
2. Receipt Temperature	The recorded receipt temperatures are acceptable at 3.4 and 1.1 degrees Celsius.				
3. Hold Time	Qualification ^j	Acceptable	Qualification ^k Exclusion ^l	Acceptable	Acceptable
4. Blank Detections	None	None	None	None	None
5. Surrogate Recoveries	NA	NA	NA	NA	NA
6. LCS) Recoveries	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable
7. LCS/LCSD Precision	NA	NA	NA	NA	NA
8. MS Recoveries	NA	NA	NA	Acceptable	NA
9. MS/MSD Precision	NA	NA	NA	Acceptable	NA
10. Laboratory Duplicate Precision	Acceptable	Acceptable	NA	Acceptable	NA
11. Other Quality Control Issues	Qualification ^m	None	None	None	None

Assessment Summary: Freemont 2103381 and 2103389

Parameter:	Total Organic Carbon by SM 5310C	Total Alkalinity by SM 2320B	Carbon Dioxide by SM 2320B/ SM 4500-CO2D	Chemical Oxygen Demand by SM 5220D	
1. Chain of Custody	Chains of custody are complete.				
2. Receipt Temperature	The recorded receipt temperatures are acceptable at 3.4 and 1.1 degrees Celsius.				
3. Hold Time	Acceptable	Acceptable	Acceptable	Acceptable	
4. Blank Detections	None	None	None	None	
5. Surrogate Recoveries	NA	NA	NA	NA	
6. LCS Recoveries	Acceptable	Acceptable	Acceptable	Acceptable	
7. LCS/LCSD Precision	NA	NA	NA	NA	
8. MS Recoveries	Acceptable	NA	NA	NA	
9. MS/MSD Precision	Acceptable	NA	NA	NA	
10. Laboratory Duplicate Precision	Acceptable	Acceptable	Acceptable	NA	
11. Other Quality Control Issues	None	None	None	None	

Assessment Summary: AmTest					
Parameter:	Volatile Fatty Acids by EPA 300.0 modified				
1. Chain of Custody	Chain of custody is complete.				
2. Receipt Temperature	Qualification ⁿ				
3. Hold Time	Acceptable				
4. Blank Detections	Acceptable				
5. Surrogate Recoveries	NA				
6. Standard Reference Material Recoveries	Acceptable				
7. LCS/LCSD Precision	NA				
8. MS Recoveries	Acceptable				
9. MS/MSD Precision	NA				
10. Laboratory Duplicate Precision	Acceptable				
11. Other Quality Control Issues	None				

Qualifier Definitions	
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

Reason Code Definitions	
DS	All BOD dilutions resulted in full oxygen depletion. Result may be biased low.
EXC	There are multiple results for the same analyte in the same sample and this result should not be used for reporting purposes.
HT	Maximum-recommended hold time was exceeded.
LS	Low surrogate recovery. Result may be biased low.
MI	Possible matrix interference.
PC	Potential laboratory contamination.
RT	Elevated sample receipt temperature.

Notes	Description	Action Required
a	According to the laboratory's notes there was matrix interference, and they did not report surrogate recoveries for the GRO analyses of samples KMW-06 and its field duplicate, Duplicate1.	Wood J qualified the GRO results from samples KMW-06 and Duplicate1 because of uncertainty with the reported GRO results due to the matrix interference. (J-MI)
b	Calcium (735%, 257%) and magnesium (172%, MS) recoveries were outside of limits in the MS and/or MSD performed on sample KMW-03R.	The calcium and magnesium concentrations detected in the unspiked native sample, at 53.4 mg/L and 5.79 mg/L, respectively, are more than four times the spike concentrations of 1 mg/L and it is not possible to assess data usability based on MS recoveries.
c	Reported RPDs between calcium and magnesium results were high at 96% and 40%, respectively, in the MS and MSD performed on sample KMW-03R.	The reported RPDs are based on recoveries, not the concentrations detected in the MS and MSD. When Wood recalculated the RPDs based on the detected concentrations both results were less than the laboratory's maximum limit of 20%, indicating acceptable analytical precision.
d	According to the laboratory's notes, the DRO chromatograms from samples Duplicate1, KMW-03R, KMW-04, KMW-06, KMW-08, KMW-09, and KMW-10 do not match the analytical standard used for quantitation.	None. Results are being reported as diesel range and all compounds present in the same retention time range as the diesel standard would correctly be identified as diesel range.
e	Recovery of the surrogate compound 4-bromofluorobenzene was low in the VOC analysis of sample KMW-06.	Wood J qualified the detected isopropylbenzene and n-propylbenzene results and UJ qualified the remaining non-detected VOC results from this sample because of potential low analytical bias. (J/UJ-LS)
f	Recovery of the surrogate compound 4-bromofluorobenzene was low in the VOC analysis of sample Duplicate1.	Wood J qualified the detected methylene chloride, isopropylbenzene, n-propylbenzene, and 1,1,2,2-tetrachloroethane results and UJ qualified the remaining non-detected VOC results from this sample because of potential low analytical bias. (J/UJ-LS)
g	According to the laboratory's notes, the methylene chloride detection in sample Duplicate1 may be due to laboratory contamination.	Wood J qualified the methylene chloride result from this sample because of the potential laboratory contamination. (J-PC)
h	The relative percent difference between bromomethane results was high in the LCS and LCSD associated with the analysis of samples Duplicate1, KMW-04, KMW-06, KMW-09, and KMW-10.	Bromomethane was not detected in the associated samples and data usability is not adversely affected by the potential analytical imprecision.
i	F&BI ve qualified results when the detected concentrations were greater than the instrument's calibration range.	Wood excluded the ve qualified results from the undiluted analyses. (EXC)
j	The BOD analysis of sample KMW-06 was started more than two hours after the EPA-recommended maximum hold time of 48 hours from sample collection.	Wood J qualified the BOD result from this sample because of the missed hold time. (J-HT)
k	Sample KMW-03R was analyzed for nitrate more than two hours outside the EPA-recommended maximum hold time of 48 hours from sampling until analysis.	Wood UJ qualified the non-detected nitrate result from sample KMW-03R because of the missed hold time. (UJ-HT)
l	Sample KMW-10 was initially analyzed for nitrate at a 1:5 dilution within the method-recommended maximum hold time and was reanalyzed outside of hold at a 1:2 dilution.	Wood excluded the non-detected result from the 1:2 dilution analyzed outside of hold because analytical sensitivity in the 1:5 dilution was sufficient to meet project goals. (EXC)
m	According to the laboratory's notes, all dilutions of samples KMW-06, Duplicate1, and KMW-10 for BOD resulted in full oxygen depletion and the true values are equal to or greater than the reported results.	Wood J qualified the BOD result from samples KMW-06, Duplicate1, and KMW-10 because the reported results may be biased low. (J-DS)
n	The receipt temperature for sample KMW-03R was high at 6.8 degrees Celsius upon receipt at AmTest.	Wood UJ qualified the non-detected volatile fatty acid result from this sample because of the elevated receipt temperature (UJ-RT)

Data Qualified During Validation				
Sample Identification	Method	Parameter	Concentration	Qualifier and Reason Code
Duplicate1	EPA 8260D	Isopropylbenzene	2.7 µg/L	J-LS
Duplicate1	EPA 8260D	Methylene chloride	5.0 µg/L	J-LS, PC
Duplicate1	EPA 8260D	n-Propylbenzene	3.5 µg/L	J-LS
Duplicate1	EPA 8260D	1,1,2,2-Tetrachloroethane	1.2 µg/L	J-LS
Duplicate1	EPA 8260D	All remaining results		UJ-LS
Duplicate1	NWTPH-Gx	GRO	4,500 µg/L	J-MI
Duplicate1	SM5210B	BOD	39.4 mg/L	J-DS
KMW-03R	EPA 300.0	Nitrate	< 0.200 mg/L	UJ-HT
KMW-03R	EPA 300.0 mod	Volatile fatty acids	< 0.1 mg/L	UJ-RT
KMW-04	EPA 8260D	m,p-Xylene	4,500 µg/L	EXC
KMW-06	EPA 8260D	Isopropylbenzene	2.8 µg/L	J-LS
KMW-06	EPA 8260D	n-Propylbenzene	3.6 µg/L	J-LS
KMW-06	EPA 8260D	All remaining results		UJ-LS
KMW-06	NWTPH-Gx	GRO	4,400 µg/L	J-MI
KMW-06	SM 5210B	BOD	39.5 mg/L	J-HT, DS
KMW-10	EPA 300.0	Nitrate	< 0.200 mg/L	EXC
KMW-10	EPA 8260D	Ethylbenzene	2,300 µg/L	EXC
KMW-10	EPA 8260D	Toluene	2,600 µg/L	EXC
KMW-10	EPA 8260D	m,p-Xylene	4,400 µg/L	EXC
KMW-10	SM 5210B	BOD	38.9 mg/L	J-DS

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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August 28, 2020

Lucas Kerner, Project Manager
Wood Environment & Infrastructure Solutions, Inc.
One Union Square
600 University Street, Suite 600
Seattle, WA 98101

Dear Mr Kerner:

Included are the results from the testing of material submitted on August 20, 2020 from the Kelly-Moore 014697, F&BI 008315 project. There are 46 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
WEI0828R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on August 20, 2020 by Friedman & Bruya, Inc. from the Wood Environment & Infrastructure Solutions Kelly-Moore 014697, F&BI 008315 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Wood Environment & Infrastructure Solutions</u>
008315 -01	KMW-02R-081920
008315 -02	KMW-03-081920
008315 -03	KMW-04-082020
008315 -04	KMW-06-082020
008315 -05	KMW-07-081920
008315 -06	KMW-08-081920
008315 -07	KMW-09-082020
008315 -08	KMW-10-082020
008315 -09	KMW-10-9-082020
008315 -10	Trip Blank

A 6020B internal standard failed the acceptance criteria for several samples. The samples were diluted and reanalyzed with acceptable results. Both data sets were reported.

Several 8270 surrogates exceeded the laboratory acceptance criteria. No analytes associated with that surrogates were detected in the samples, therefore the data were acceptable.

All other quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 08/28/20

Date Received: 08/20/20

Project: Kelly-Moore 014697, F&BI 008315

Date Extracted: 08/25/20

Date Analyzed: 08/25/20

**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>	Surrogate <u>(% Recovery)</u> (Limit 51-134)
KMW-02R-081920 008315-01	<100	88
KMW-03-081920 008315-02	140	93
KMW-04-082020 008315-03 1/10	77,000	ip
KMW-06-082020 008315-04	5,400	ip
KMW-07-081920 008315-05	<100	89
KMW-08-081920 008315-06	<100	90
KMW-09-082020 008315-07	990	122
KMW-10-082020 008315-08	1,800	116
KMW-10-9-082020 008315-09	1,600	116
Method Blank 00-1804 MB	<100	94

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 08/28/20

Date Received: 08/20/20

Project: Kelly-Moore 014697, F&BI 008315

Date Extracted: 08/21/20

Date Analyzed: 08/21/20

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES
FOR TOTAL PETROLEUM HYDROCARBONS AS
DIESEL AND MOTOR OIL
USING METHOD NWTPH-Dx**
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 51-134)
KMW-02R-081920 008315-01	<50	<250	69
KMW-03-081920 008315-02	700 x	<250	82
KMW-04-082020 008315-03	5,800 x	<250	84
KMW-06-082020 008315-04	17,000 x	840 x	60
KMW-07-081920 008315-05	<50	<250	85
KMW-08-081920 008315-06	110 x	<250	91
KMW-09-082020 008315-07	13,000 x	1,200 x	69
KMW-10-082020 008315-08	10,000 x	<250	84
KMW-10-9-082020 008315-09	11,000 x	<250	88
Method Blank 00-1905 MB	<50	<250	76

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-02R-081920	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/20/20	Project:	Kelly-Moore 014697
Date Extracted:	08/24/20	Lab ID:	008315-01
Date Analyzed:	08/24/20	Data File:	008315-01.045
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<1
Barium	9.60
Cadmium	<1
Chromium	<1
Lead	<1
Mercury	<1
Selenium	<1
Silver	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-03-081920	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/20/20	Project:	Kelly-Moore 014697
Date Extracted:	08/24/20	Lab ID:	008315-02
Date Analyzed:	08/25/20	Data File:	008315-02.043
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<1
Barium	10.4
Cadmium	<1
Chromium	<1
Lead	<1
Mercury	<1
Selenium	<1
Silver	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-04-082020	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/20/20	Project:	Kelly-Moore 014697
Date Extracted:	08/24/20	Lab ID:	008315-03
Date Analyzed:	08/25/20	Data File:	008315-03.045
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	17.9
Barium	6.06
Cadmium	<1
Chromium	1.07 J
Lead	1.80
Mercury	<1
Selenium	<1
Silver	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-04-082020	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/20/20	Project:	Kelly-Moore 014697
Date Extracted:	08/24/20	Lab ID:	008315-03 x10
Date Analyzed:	08/25/20	Data File:	008315-03 x10.044
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
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Chromium	<10
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-06-082020	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/20/20	Project:	Kelly-Moore 014697
Date Extracted:	08/24/20	Lab ID:	008315-04
Date Analyzed:	08/25/20	Data File:	008315-04.047
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	5.58
Barium	23.7
Cadmium	1.26
Chromium	1.48 J
Lead	6.47
Mercury	<1
Selenium	<1
Silver	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-06-082020	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/20/20	Project:	Kelly-Moore 014697
Date Extracted:	08/24/20	Lab ID:	008315-04 x10
Date Analyzed:	08/25/20	Data File:	008315-04 x10.046
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
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Chromium	<10
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-07-081920	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/20/20	Project:	Kelly-Moore 014697
Date Extracted:	08/24/20	Lab ID:	008315-05
Date Analyzed:	08/25/20	Data File:	008315-05.048
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<1
Barium	4.21
Cadmium	<1
Chromium	<1
Lead	<1
Mercury	<1
Selenium	<1
Silver	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-08-081920	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/20/20	Project:	Kelly-Moore 014697
Date Extracted:	08/24/20	Lab ID:	008315-06
Date Analyzed:	08/25/20	Data File:	008315-06.049
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<1
Barium	14.5
Cadmium	<1
Chromium	<1
Lead	<1
Mercury	<1
Selenium	<1
Silver	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-09-082020	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/20/20	Project:	Kelly-Moore 014697
Date Extracted:	08/24/20	Lab ID:	008315-07
Date Analyzed:	08/25/20	Data File:	008315-07.056
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	1.31
Barium	21.9
Cadmium	<1
Chromium	<1 J
Lead	<1
Mercury	<1
Selenium	<1
Silver	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-09-082020	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/20/20	Project:	Kelly-Moore 014697
Date Extracted:	08/24/20	Lab ID:	008315-07 x10
Date Analyzed:	08/25/20	Data File:	008315-07 x10.055
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
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Chromium	<10
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-10-082020	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/20/20	Project:	Kelly-Moore 014697
Date Extracted:	08/24/20	Lab ID:	008315-08
Date Analyzed:	08/25/20	Data File:	008315-08.058
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	5.34
Barium	18.6
Cadmium	<1
Chromium	1.05 J
Lead	<1
Mercury	<1
Selenium	<1
Silver	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-10-082020	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/20/20	Project:	Kelly-Moore 014697
Date Extracted:	08/24/20	Lab ID:	008315-08 x10
Date Analyzed:	08/25/20	Data File:	008315-08 x10.057
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
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Chromium	<10
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-10-9-082020	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/20/20	Project:	Kelly-Moore 014697
Date Extracted:	08/24/20	Lab ID:	008315-09
Date Analyzed:	08/25/20	Data File:	008315-09.060
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	5.25
Barium	18.9
Cadmium	<1
Chromium	1.12 J
Lead	<1
Mercury	<1
Selenium	<1
Silver	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-10-9-082020	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/20/20	Project:	Kelly-Moore 014697
Date Extracted:	08/24/20	Lab ID:	008315-09 x10
Date Analyzed:	08/25/20	Data File:	008315-09 x10.059
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
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Chromium	<10
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Method Blank	Client:	Wood Environment & Infrastructure Solutions
Date Received:	NA	Project:	Kelly-Moore 014697
Date Extracted:	08/24/20	Lab ID:	I0-491 mb
Date Analyzed:	08/24/20	Data File:	I0-491 mb.036
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<1
Barium	<1
Cadmium	<1
Chromium	<1
Lead	<1
Mercury	<1
Selenium	<1
Silver	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID:	KMW-02R-081920	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/20/20	Project:	Kelly-Moore 014697
Date Extracted:	08/24/20	Lab ID:	008315-01
Date Analyzed:	08/24/20	Data File:	082418.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	57	121
Toluene-d8	94	63	127
4-Bromofluorobenzene	93	60	133

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<1
Bromomethane	<5	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<50	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<5	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<5
1,1-Dichloroethane	<1	n-Propylbenzene	<1
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	<1	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	<1
2-Butanone (MEK)	<20	1,2,3-Trichloropropane	<1
1,2-Dichloroethane (EDC)	<1	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<1	1,2,4-Trimethylbenzene	<1
Benzene	<0.35	sec-Butylbenzene	<1
Trichloroethene	<1	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1	1,3-Dichlorobenzene	<1
Bromodichloromethane	<1	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<10
cis-1,3-Dichloropropene	<1	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	<1
trans-1,3-Dichloropropene	<1	Naphthalene	<1
1,1,2-Trichloroethane	<1	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID:	KMW-03-081920	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/20/20	Project:	Kelly-Moore 014697
Date Extracted:	08/24/20	Lab ID:	008315-02
Date Analyzed:	08/24/20	Data File:	082413.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	57	121
Toluene-d8	97	63	127
4-Bromofluorobenzene	95	60	133

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<1
Bromomethane	<5	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<50	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<5	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<5
1,1-Dichloroethane	<1	n-Propylbenzene	<1
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	<1	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	<1
2-Butanone (MEK)	<20	1,2,3-Trichloropropane	<1
1,2-Dichloroethane (EDC)	<1	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<1	1,2,4-Trimethylbenzene	<1
Benzene	<0.35	sec-Butylbenzene	<1
Trichloroethene	<1	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1	1,3-Dichlorobenzene	<1
Bromodichloromethane	<1	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<10
cis-1,3-Dichloropropene	<1	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	<1
trans-1,3-Dichloropropene	<1	Naphthalene	<1
1,1,2-Trichloroethane	<1	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID:	KMW-04-082020	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/20/20	Project:	Kelly-Moore 014697
Date Extracted:	08/24/20	Lab ID:	008315-03 1/100
Date Analyzed:	08/24/20	Data File:	082433.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	57	121
Toluene-d8	97	63	127
4-Bromofluorobenzene	94	60	133

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<100	1,3-Dichloropropane	<100
Chloromethane	<1,000	Tetrachloroethene	<100
Vinyl chloride	<20	Dibromochloromethane	<100
Bromomethane	<500	1,2-Dibromoethane (EDB)	<100
Chloroethane	<100	Chlorobenzene	<100
Trichlorofluoromethane	<100	Ethylbenzene	6,400
Acetone	<5,000	1,1,1,2-Tetrachloroethane	<100
1,1-Dichloroethene	<100	m,p-Xylene	17,000
Hexane	<500	o-Xylene	3,400
Methylene chloride	<500	Styrene	<100
Methyl t-butyl ether (MTBE)	<100	Isopropylbenzene	<100
trans-1,2-Dichloroethene	<100	Bromoform	<500
1,1-Dichloroethane	<100	n-Propylbenzene	<100
2,2-Dichloropropane	<100	Bromobenzene	<100
cis-1,2-Dichloroethene	<100	1,3,5-Trimethylbenzene	<100
Chloroform	<100	1,1,2,2-Tetrachloroethane	<100
2-Butanone (MEK)	<2,000	1,2,3-Trichloropropane	<100
1,2-Dichloroethane (EDC)	<100	2-Chlorotoluene	<100
1,1,1-Trichloroethane	<100	4-Chlorotoluene	<100
1,1-Dichloropropene	<100	tert-Butylbenzene	<100
Carbon tetrachloride	<100	1,2,4-Trimethylbenzene	190
Benzene	<5 j	sec-Butylbenzene	<100
Trichloroethene	<100	p-Isopropyltoluene	<100
1,2-Dichloropropane	<100	1,3-Dichlorobenzene	<100
Bromodichloromethane	<100	1,4-Dichlorobenzene	<100
Dibromomethane	<100	1,2-Dichlorobenzene	<100
4-Methyl-2-pentanone	<1,000	1,2-Dibromo-3-chloropropane	<1,000
cis-1,3-Dichloropropene	<100	1,2,4-Trichlorobenzene	<100
Toluene	810	Hexachlorobutadiene	<100
trans-1,3-Dichloropropene	<100	Naphthalene	<100
1,1,2-Trichloroethane	<100	1,2,3-Trichlorobenzene	<100
2-Hexanone	<1,000		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID:	KMW-06-082020	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/20/20	Project:	Kelly-Moore 014697
Date Extracted:	08/24/20	Lab ID:	008315-04
Date Analyzed:	08/24/20	Data File:	082414.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	57	121
Toluene-d8	96	63	127
4-Bromofluorobenzene	90	60	133

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<1
Bromomethane	<5	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<50	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<5	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	8.2
trans-1,2-Dichloroethene	<1	Bromoform	<5
1,1-Dichloroethane	<1	n-Propylbenzene	10
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	<1	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	<1
2-Butanone (MEK)	<20	1,2,3-Trichloropropane	<1
1,2-Dichloroethane (EDC)	<1	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<1	1,2,4-Trimethylbenzene	<1
Benzene	<0.35	sec-Butylbenzene	1.1
Trichloroethene	<1	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1	1,3-Dichlorobenzene	<1
Bromodichloromethane	<1	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<10
cis-1,3-Dichloropropene	<1	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	<1
trans-1,3-Dichloropropene	<1	Naphthalene	<1
1,1,2-Trichloroethane	<1	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID:	KMW-07-081920	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/20/20	Project:	Kelly-Moore 014697
Date Extracted:	08/24/20	Lab ID:	008315-05
Date Analyzed:	08/24/20	Data File:	082415.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	57	121
Toluene-d8	95	63	127
4-Bromofluorobenzene	94	60	133

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<1
Bromomethane	<5	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<50	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<5	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<5
1,1-Dichloroethane	<1	n-Propylbenzene	<1
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	<1	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	<1
2-Butanone (MEK)	<20	1,2,3-Trichloropropane	<1
1,2-Dichloroethane (EDC)	<1	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<1	1,2,4-Trimethylbenzene	<1
Benzene	<0.35	sec-Butylbenzene	<1
Trichloroethene	<1	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1	1,3-Dichlorobenzene	<1
Bromodichloromethane	<1	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<10
cis-1,3-Dichloropropene	<1	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	<1
trans-1,3-Dichloropropene	<1	Naphthalene	<1
1,1,2-Trichloroethane	<1	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID:	KMW-08-081920	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/20/20	Project:	Kelly-Moore 014697
Date Extracted:	08/24/20	Lab ID:	008315-06
Date Analyzed:	08/24/20	Data File:	082416.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	57	121
Toluene-d8	98	63	127
4-Bromofluorobenzene	95	60	133

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<1
Bromomethane	<5	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<50	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<5	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<5
1,1-Dichloroethane	<1	n-Propylbenzene	<1
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	<1	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	<1
2-Butanone (MEK)	<20	1,2,3-Trichloropropane	<1
1,2-Dichloroethane (EDC)	<1	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<1	1,2,4-Trimethylbenzene	<1
Benzene	<0.35	sec-Butylbenzene	<1
Trichloroethene	<1	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1	1,3-Dichlorobenzene	<1
Bromodichloromethane	<1	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<10
cis-1,3-Dichloropropene	<1	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	<1
trans-1,3-Dichloropropene	<1	Naphthalene	<1
1,1,2-Trichloroethane	<1	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID:	KMW-09-082020	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/20/20	Project:	Kelly-Moore 014697
Date Extracted:	08/24/20	Lab ID:	008315-07
Date Analyzed:	08/24/20	Data File:	082417.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	57	121
Toluene-d8	91	63	127
4-Bromofluorobenzene	93	60	133

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<1
Bromomethane	<5	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<50	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<5	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	6.6
trans-1,2-Dichloroethene	<1	Bromoform	<5
1,1-Dichloroethane	<1	n-Propylbenzene	5.9
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	<1	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	<1
2-Butanone (MEK)	<20	1,2,3-Trichloropropane	<1
1,2-Dichloroethane (EDC)	<1	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<1	1,2,4-Trimethylbenzene	<1
Benzene	<0.35	sec-Butylbenzene	<1
Trichloroethene	<1	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1	1,3-Dichlorobenzene	<1
Bromodichloromethane	<1	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<10
cis-1,3-Dichloropropene	<1	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	<1
trans-1,3-Dichloropropene	<1	Naphthalene	<1
1,1,2-Trichloroethane	<1	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID:	KMW-10-082020	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/20/20	Project:	Kelly-Moore 014697
Date Extracted:	08/24/20	Lab ID:	008315-08 1/10
Date Analyzed:	08/24/20	Data File:	082421.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	57	121
Toluene-d8	99	63	127
4-Bromofluorobenzene	95	60	133

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<10	1,3-Dichloropropane	<10
Chloromethane	<100	Tetrachloroethene	<10
Vinyl chloride	<2	Dibromochloromethane	<10
Bromomethane	<50	1,2-Dibromoethane (EDB)	<10
Chloroethane	<10	Chlorobenzene	<10
Trichlorofluoromethane	<10	Ethylbenzene	96
Acetone	<500	1,1,1,2-Tetrachloroethane	<10
1,1-Dichloroethene	<10	m,p-Xylene	400
Hexane	<50	o-Xylene	<10
Methylene chloride	<50	Styrene	<10
Methyl t-butyl ether (MTBE)	<10	Isopropylbenzene	<10
trans-1,2-Dichloroethene	<10	Bromoform	<50
1,1-Dichloroethane	<10	n-Propylbenzene	<10
2,2-Dichloropropane	<10	Bromobenzene	<10
cis-1,2-Dichloroethene	<10	1,3,5-Trimethylbenzene	<10
Chloroform	<10	1,1,2,2-Tetrachloroethane	<10
2-Butanone (MEK)	<200	1,2,3-Trichloropropane	<10
1,2-Dichloroethane (EDC)	<10	2-Chlorotoluene	<10
1,1,1-Trichloroethane	<10	4-Chlorotoluene	<10
1,1-Dichloropropene	<10	tert-Butylbenzene	<10
Carbon tetrachloride	<10	1,2,4-Trimethylbenzene	<10
Benzene	<3.5	sec-Butylbenzene	<10
Trichloroethene	<10	p-Isopropyltoluene	<10
1,2-Dichloropropane	<10	1,3-Dichlorobenzene	<10
Bromodichloromethane	<10	1,4-Dichlorobenzene	<10
Dibromomethane	<10	1,2-Dichlorobenzene	<10
4-Methyl-2-pentanone	<100	1,2-Dibromo-3-chloropropane	<100
cis-1,3-Dichloropropene	<10	1,2,4-Trichlorobenzene	<10
Toluene	<10	Hexachlorobutadiene	<10
trans-1,3-Dichloropropene	<10	Naphthalene	<10
1,1,2-Trichloroethane	<10	1,2,3-Trichlorobenzene	<10
2-Hexanone	<100		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID:	KMW-10-9-082020	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/20/20	Project:	Kelly-Moore 014697
Date Extracted:	08/24/20	Lab ID:	008315-09 1/10
Date Analyzed:	08/24/20	Data File:	082422.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	57	121
Toluene-d8	95	63	127
4-Bromofluorobenzene	95	60	133

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<10	1,3-Dichloropropane	<10
Chloromethane	<100	Tetrachloroethene	<10
Vinyl chloride	<2	Dibromochloromethane	<10
Bromomethane	<50	1,2-Dibromoethane (EDB)	<10
Chloroethane	<10	Chlorobenzene	<10
Trichlorofluoromethane	<10	Ethylbenzene	110
Acetone	<500	1,1,1,2-Tetrachloroethane	<10
1,1-Dichloroethene	<10	m,p-Xylene	470
Hexane	<50	o-Xylene	<10
Methylene chloride	<50	Styrene	<10
Methyl t-butyl ether (MTBE)	<10	Isopropylbenzene	<10
trans-1,2-Dichloroethene	<10	Bromoform	<50
1,1-Dichloroethane	<10	n-Propylbenzene	<10
2,2-Dichloropropane	<10	Bromobenzene	<10
cis-1,2-Dichloroethene	<10	1,3,5-Trimethylbenzene	<10
Chloroform	<10	1,1,2,2-Tetrachloroethane	<10
2-Butanone (MEK)	<200	1,2,3-Trichloropropane	<10
1,2-Dichloroethane (EDC)	<10	2-Chlorotoluene	<10
1,1,1-Trichloroethane	<10	4-Chlorotoluene	<10
1,1-Dichloropropene	<10	tert-Butylbenzene	<10
Carbon tetrachloride	<10	1,2,4-Trimethylbenzene	12
Benzene	<3.5	sec-Butylbenzene	<10
Trichloroethene	<10	p-Isopropyltoluene	<10
1,2-Dichloropropane	<10	1,3-Dichlorobenzene	<10
Bromodichloromethane	<10	1,4-Dichlorobenzene	<10
Dibromomethane	<10	1,2-Dichlorobenzene	<10
4-Methyl-2-pentanone	<100	1,2-Dibromo-3-chloropropane	<100
cis-1,3-Dichloropropene	<10	1,2,4-Trichlorobenzene	<10
Toluene	<10	Hexachlorobutadiene	<10
trans-1,3-Dichloropropene	<10	Naphthalene	<10
1,1,2-Trichloroethane	<10	1,2,3-Trichlorobenzene	<10
2-Hexanone	<100		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID:	Trip Blank	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/20/20	Project:	Kelly-Moore 014697
Date Extracted:	08/24/20	Lab ID:	008315-10
Date Analyzed:	08/24/20	Data File:	082412.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	57	121
Toluene-d8	98	63	127
4-Bromofluorobenzene	94	60	133

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<1
Bromomethane	<5	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<50	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<5	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<5
1,1-Dichloroethane	<1	n-Propylbenzene	<1
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	<1	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	<1
2-Butanone (MEK)	<20	1,2,3-Trichloropropane	<1
1,2-Dichloroethane (EDC)	<1	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<1	1,2,4-Trimethylbenzene	<1
Benzene	<0.35	sec-Butylbenzene	<1
Trichloroethene	<1	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1	1,3-Dichlorobenzene	<1
Bromodichloromethane	<1	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<10
cis-1,3-Dichloropropene	<1	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	<1
trans-1,3-Dichloropropene	<1	Naphthalene	<1
1,1,2-Trichloroethane	<1	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID:	Method Blank	Client:	Wood Environment & Infrastructure Solutions
Date Received:	Not Applicable	Project:	Kelly-Moore 014697
Date Extracted:	08/24/20	Lab ID:	00-1858 mb
Date Analyzed:	08/24/20	Data File:	082408.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	57	121
Toluene-d8	94	63	127
4-Bromofluorobenzene	93	60	133

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<1
Bromomethane	<5	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<50	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<5	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<5
1,1-Dichloroethane	<1	n-Propylbenzene	<1
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	<1	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	<1
2-Butanone (MEK)	<20	1,2,3-Trichloropropane	<1
1,2-Dichloroethane (EDC)	<1	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<1	1,2,4-Trimethylbenzene	<1
Benzene	<0.35	sec-Butylbenzene	<1
Trichloroethene	<1	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1	1,3-Dichlorobenzene	<1
Bromodichloromethane	<1	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<10
cis-1,3-Dichloropropene	<1	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	<1
trans-1,3-Dichloropropene	<1	Naphthalene	<1
1,1,2-Trichloroethane	<1	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	KMW-02R-081920	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/20/20	Project:	Kelly-Moore 014697
Date Extracted:	08/21/20	Lab ID:	008315-01 1/2
Date Analyzed:	08/21/20	Data File:	082120.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	38 vo	15	33
Phenol-d6	26 vo	10	20
Nitrobenzene-d5	78	17	143
2-Fluorobiphenyl	85	50	150
2,4,6-Tribromophenol	80	50	150
Terphenyl-d14	89	50	150

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.4
2-Methylnaphthalene	<0.4
1-Methylnaphthalene	<0.4
Acenaphthylene	<0.04
Acenaphthene	<0.04
Fluorene	<0.04
Phenanthrene	<0.04
Anthracene	<0.04
Fluoranthene	<0.04
Pyrene	<0.04
Benz(a)anthracene	<0.04
Chrysene	<0.04
Benzo(a)pyrene	<0.04
Benzo(b)fluoranthene	<0.04
Benzo(k)fluoranthene	<0.04
Indeno(1,2,3-cd)pyrene	<0.04
Dibenz(a,h)anthracene	<0.04
Benzo(g,h,i)perylene	<0.08

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	KMW-03-081920	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/20/20	Project:	Kelly-Moore 014697
Date Extracted:	08/21/20	Lab ID:	008315-02 1/2
Date Analyzed:	08/21/20	Data File:	082121.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	38 vo	15	33
Phenol-d6	28 vo	10	20
Nitrobenzene-d5	78	17	143
2-Fluorobiphenyl	74	50	150
2,4,6-Tribromophenol	84	50	150
Terphenyl-d14	84	50	150

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.4
2-Methylnaphthalene	<0.4
1-Methylnaphthalene	<0.4
Acenaphthylene	<0.04
Acenaphthene	0.17
Fluorene	0.066
Phenanthrene	<0.04
Anthracene	<0.04
Fluoranthene	<0.04
Pyrene	<0.04
Benz(a)anthracene	<0.04
Chrysene	<0.04
Benzo(a)pyrene	<0.04
Benzo(b)fluoranthene	<0.04
Benzo(k)fluoranthene	<0.04
Indeno(1,2,3-cd)pyrene	<0.04
Dibenz(a,h)anthracene	<0.04
Benzo(g,h,i)perylene	<0.08

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	KMW-04-082020	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/20/20	Project:	Kelly-Moore 014697
Date Extracted:	08/21/20	Lab ID:	008315-03 1/2
Date Analyzed:	08/22/20	Data File:	082122.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	15	15	33
Phenol-d6	27 vo	10	20
Nitrobenzene-d5	77	17	143
2-Fluorobiphenyl	58	50	150
2,4,6-Tribromophenol	69	50	150
Terphenyl-d14	80	50	150

Compounds:	Concentration ug/L (ppb)
Naphthalene	6.8
2-Methylnaphthalene	0.52
1-Methylnaphthalene	<0.4
Acenaphthylene	<0.04
Acenaphthene	<0.04
Fluorene	0.040
Phenanthrene	0.091
Anthracene	<0.04
Fluoranthene	0.040
Pyrene	0.044
Benz(a)anthracene	<0.04
Chrysene	<0.04
Benzo(a)pyrene	<0.04
Benzo(b)fluoranthene	<0.04
Benzo(k)fluoranthene	<0.04
Indeno(1,2,3-cd)pyrene	<0.04
Dibenz(a,h)anthracene	<0.04
Benzo(g,h,i)perylene	<0.08

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	KMW-06-082020	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/20/20	Project:	Kelly-Moore 014697
Date Extracted:	08/21/20	Lab ID:	008315-04 1/2
Date Analyzed:	08/22/20	Data File:	082123.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	32	15	33
Phenol-d6	14	10	20
Nitrobenzene-d5	88	17	143
2-Fluorobiphenyl	52	50	150
2,4,6-Tribromophenol	70	50	150
Terphenyl-d14	77	50	150

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.4
2-Methylnaphthalene	<0.4
1-Methylnaphthalene	<0.4
Acenaphthylene	4.8
Acenaphthene	1.2
Fluorene	<0.04
Phenanthrene	0.29
Anthracene	0.94
Fluoranthene	0.14
Pyrene	0.26
Benz(a)anthracene	0.063
Chrysene	0.063
Benzo(a)pyrene	0.089
Benzo(b)fluoranthene	0.10
Benzo(k)fluoranthene	<0.04
Indeno(1,2,3-cd)pyrene	0.069
Dibenz(a,h)anthracene	<0.04
Benzo(g,h,i)perylene	<0.08

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	KMW-07-081920	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/20/20	Project:	Kelly-Moore 014697
Date Extracted:	08/21/20	Lab ID:	008315-05 1/2
Date Analyzed:	08/22/20	Data File:	082124.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	40 vo	15	33
Phenol-d6	28 vo	10	20
Nitrobenzene-d5	80	17	143
2-Fluorobiphenyl	76	50	150
2,4,6-Tribromophenol	84	50	150
Terphenyl-d14	92	50	150

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.4
2-Methylnaphthalene	<0.4
1-Methylnaphthalene	<0.4
Acenaphthylene	<0.04
Acenaphthene	<0.04
Fluorene	<0.04
Phenanthrene	<0.04
Anthracene	<0.04
Fluoranthene	<0.04
Pyrene	<0.04
Benz(a)anthracene	<0.04
Chrysene	<0.04
Benzo(a)pyrene	<0.04
Benzo(b)fluoranthene	<0.04
Benzo(k)fluoranthene	<0.04
Indeno(1,2,3-cd)pyrene	<0.04
Dibenz(a,h)anthracene	<0.04
Benzo(g,h,i)perylene	<0.08

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	KMW-08-081920	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/20/20	Project:	Kelly-Moore 014697
Date Extracted:	08/21/20	Lab ID:	008315-06 1/2
Date Analyzed:	08/22/20	Data File:	082125.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	44 vo	15	33
Phenol-d6	29 vo	10	20
Nitrobenzene-d5	83	17	143
2-Fluorobiphenyl	81	50	150
2,4,6-Tribromophenol	88	50	150
Terphenyl-d14	95	50	150

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.4
2-Methylnaphthalene	<0.4
1-Methylnaphthalene	<0.4
Acenaphthylene	<0.04
Acenaphthene	0.064
Fluorene	0.12
Phenanthrene	<0.04
Anthracene	0.11
Fluoranthene	0.13
Pyrene	0.14
Benz(a)anthracene	<0.04
Chrysene	<0.04
Benzo(a)pyrene	<0.04
Benzo(b)fluoranthene	<0.04
Benzo(k)fluoranthene	<0.04
Indeno(1,2,3-cd)pyrene	<0.04
Dibenz(a,h)anthracene	<0.04
Benzo(g,h,i)perylene	<0.08

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	KMW-09-082020	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/20/20	Project:	Kelly-Moore 014697
Date Extracted:	08/21/20	Lab ID:	008315-07 1/2
Date Analyzed:	08/22/20	Data File:	082126.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	38 vo	15	33
Phenol-d6	11	10	20
Nitrobenzene-d5	71	17	143
2-Fluorobiphenyl	51	50	150
2,4,6-Tribromophenol	72	50	150
Terphenyl-d14	84	50	150

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.4
2-Methylnaphthalene	<0.4
1-Methylnaphthalene	0.48
Acenaphthylene	1.3
Acenaphthene	3.2
Fluorene	1.1
Phenanthrene	0.38
Anthracene	<0.04
Fluoranthene	<0.04
Pyrene	0.045
Benz(a)anthracene	<0.04
Chrysene	<0.04
Benzo(a)pyrene	<0.04
Benzo(b)fluoranthene	<0.04
Benzo(k)fluoranthene	<0.04
Indeno(1,2,3-cd)pyrene	<0.04
Dibenz(a,h)anthracene	<0.04
Benzo(g,h,i)perylene	<0.08

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	KMW-10-082020	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/20/20	Project:	Kelly-Moore 014697
Date Extracted:	08/21/20	Lab ID:	008315-08 1/2
Date Analyzed:	08/22/20	Data File:	082127.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	36 vo	15	33
Phenol-d6	30 vo	10	20
Nitrobenzene-d5	82	17	143
2-Fluorobiphenyl	72	50	150
2,4,6-Tribromophenol	102	50	150
Terphenyl-d14	86	50	150

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.4
2-Methylnaphthalene	<0.4
1-Methylnaphthalene	<0.4
Acenaphthylene	8.7
Acenaphthene	<0.04
Fluorene	<0.04
Phenanthrene	0.69
Anthracene	<0.04
Fluoranthene	<0.04
Pyrene	<0.04
Benz(a)anthracene	<0.04
Chrysene	<0.04
Benzo(a)pyrene	<0.04
Benzo(b)fluoranthene	<0.04
Benzo(k)fluoranthene	<0.04
Indeno(1,2,3-cd)pyrene	<0.04
Dibenz(a,h)anthracene	<0.04
Benzo(g,h,i)perylene	<0.08

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	KMW-10-9-082020	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/20/20	Project:	Kelly-Moore 014697
Date Extracted:	08/21/20	Lab ID:	008315-09 1/2
Date Analyzed:	08/22/20	Data File:	082128.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	35 vo	15	33
Phenol-d6	28 vo	10	20
Nitrobenzene-d5	73	17	143
2-Fluorobiphenyl	68	50	150
2,4,6-Tribromophenol	88	50	150
Terphenyl-d14	82	50	150

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.4
2-Methylnaphthalene	<0.4
1-Methylnaphthalene	<0.4
Acenaphthylene	8.9
Acenaphthene	<0.04
Fluorene	<0.04
Phenanthrene	0.65
Anthracene	<0.04
Fluoranthene	<0.04
Pyrene	<0.04
Benz(a)anthracene	<0.04
Chrysene	<0.04
Benzo(a)pyrene	<0.04
Benzo(b)fluoranthene	<0.04
Benzo(k)fluoranthene	<0.04
Indeno(1,2,3-cd)pyrene	<0.04
Dibenz(a,h)anthracene	<0.04
Benzo(g,h,i)perylene	<0.08

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	Method Blank	Client:	Wood Environment & Infrastructure Solutions
Date Received:	Not Applicable	Project:	Kelly-Moore 014697
Date Extracted:	08/21/20	Lab ID:	00-1904 mb
Date Analyzed:	08/21/20	Data File:	082119.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	22	15	33
Phenol-d6	13	10	20
Nitrobenzene-d5	79	17	143
2-Fluorobiphenyl	78	50	150
2,4,6-Tribromophenol	77	50	150
Terphenyl-d14	86	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: 08/28/20

Date Received: 08/20/20

Project: Kelly-Moore 014697, F&BI 008315

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER
SAMPLES FOR TPH AS GASOLINE
USING METHOD NWTPH-G_x**

Laboratory Code: 008315-02 (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	130	94	101	53-117	7

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Gasoline	ug/L (ppb)	1,000	110	69-134

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 08/28/20

Date Received: 08/20/20

Project: Kelly-Moore 014697, F&BI 008315

**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	88	58-134	5

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 08/28/20

Date Received: 08/20/20

Project: Kelly-Moore 014697, F&BI 008315

**QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF WATER SAMPLES
FOR TOTAL METALS USING EPA METHOD 6020B**

Laboratory Code: 008315-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	ug/L (ppb)	10	<1	87	92	75-125	6
Barium	ug/L (ppb)	50	9.60	101	106	75-125	5
Cadmium	ug/L (ppb)	5	<1	98	101	75-125	3
Chromium	ug/L (ppb)	20	<1	92	93	75-125	1
Lead	ug/L (ppb)	10	<1	87	89	75-125	2
Mercury	ug/L (ppb)	5	<1	93	97	75-125	4
Selenium	ug/L (ppb)	5	<1	93	95	75-125	2
Silver	ug/L (ppb)	5	<1	94	99	75-125	5

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	ug/L (ppb)	10	90	80-120
Barium	ug/L (ppb)	50	93	80-120
Cadmium	ug/L (ppb)	5	93	80-120
Chromium	ug/L (ppb)	20	98	80-120
Lead	ug/L (ppb)	10	96	80-120
Mercury	ug/L (ppb)	5	99	80-120
Selenium	ug/L (ppb)	5	93	80-120
Silver	ug/L (ppb)	5	93	80-120

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 08/28/20

Date Received: 08/20/20

Project: Kelly-Moore 014697, F&BI 008315

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260D

Laboratory Code: 008315-02 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Dichlorodifluoromethane	ug/L (ppb)	50	<1	70	71	10-172	1
Chloromethane	ug/L (ppb)	50	<10	83	86	25-166	4
Vinyl chloride	ug/L (ppb)	50	<0.2	86	89	36-166	3
Bromomethane	ug/L (ppb)	50	<5	102	105	47-169	3
Chloroethane	ug/L (ppb)	50	<1	98	100	46-160	2
Trichlorofluoromethane	ug/L (ppb)	50	<1	97	98	44-165	1
Acetone	ug/L (ppb)	250	<50	87	94	10-182	8
1,1-Dichloroethene	ug/L (ppb)	50	<1	98	99	60-136	1
Hexane	ug/L (ppb)	50	<5	79	78	52-150	1
Methylene chloride	ug/L (ppb)	50	<5	93	95	67-132	2
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	98	100	74-127	2
trans-1,2-Dichloroethene	ug/L (ppb)	50	<1	94	94	72-129	0
1,1-Dichloroethane	ug/L (ppb)	50	<1	93	95	70-128	2
2,2-Dichloropropane	ug/L (ppb)	50	<1	80	79	36-154	1
cis-1,2-Dichloroethene	ug/L (ppb)	50	<1	96	98	71-127	2
Chloroform	ug/L (ppb)	50	<1	96	97	65-132	1
2-Butanone (MEK)	ug/L (ppb)	250	<20	86	91	10-129	6
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	94	96	48-149	2
1,1,1-Trichloroethane	ug/L (ppb)	50	<1	95	95	60-146	0
1,1-Dichloropropene	ug/L (ppb)	50	<1	95	97	69-133	2
Carbon tetrachloride	ug/L (ppb)	50	<1	92	94	56-152	2
Benzene	ug/L (ppb)	50	<0.35	93	95	76-125	2
Trichloroethene	ug/L (ppb)	50	<1	88	89	66-135	1
1,2-Dichloropropane	ug/L (ppb)	50	<1	85	89	78-125	5
Bromodichloromethane	ug/L (ppb)	50	<1	86	88	61-150	2
Dibromomethane	ug/L (ppb)	50	<1	90	93	66-141	3
4-Methyl-2-pentanone	ug/L (ppb)	250	<10	91	96	10-185	5
cis-1,3-Dichloropropene	ug/L (ppb)	50	<1	85	89	72-132	5
Toluene	ug/L (ppb)	50	<1	92	93	76-122	1
trans-1,3-Dichloropropene	ug/L (ppb)	50	<1	87	89	76-130	2
1,1,2-Trichloroethane	ug/L (ppb)	50	<1	80	83	68-131	4
2-Hexanone	ug/L (ppb)	250	<10	88	94	10-185	7
1,3-Dichloropropene	ug/L (ppb)	50	<1	92	96	71-128	4
Tetrachloroethene	ug/L (ppb)	50	<1	93	94	10-226	1
Dibromochloromethane	ug/L (ppb)	50	<1	88	90	70-139	2
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	<1	95	98	69-134	3
Chlorobenzene	ug/L (ppb)	50	<1	96	98	77-122	2
Ethylbenzene	ug/L (ppb)	50	<1	94	96	69-135	2
1,1,1,2-Tetrachloroethane	ug/L (ppb)	50	<1	94	93	73-137	1
m,p-Xylene	ug/L (ppb)	100	<2	95	96	69-135	1
o-Xylene	ug/L (ppb)	50	<1	97	98	60-140	1
Styrene	ug/L (ppb)	50	<1	91	92	71-133	1
Isopropylbenzene	ug/L (ppb)	50	<1	97	97	65-142	0
Bromoform	ug/L (ppb)	50	<5	94	97	65-142	3
n-Propylbenzene	ug/L (ppb)	50	<1	93	95	58-144	2
Bromobenzene	ug/L (ppb)	50	<1	94	98	75-124	4
1,3,5-Trimethylbenzene	ug/L (ppb)	50	<1	94	95	66-137	1
1,1,2,2-Tetrachloroethane	ug/L (ppb)	50	<1	99	103	51-154	4
1,2,3-Trichloropropane	ug/L (ppb)	50	<1	91	95	53-150	4
2-Chlorotoluene	ug/L (ppb)	50	<1	94	96	66-127	2
4-Chlorotoluene	ug/L (ppb)	50	<1	92	95	65-130	3
tert-Butylbenzene	ug/L (ppb)	50	<1	97	97	65-137	0
1,2,4-Trimethylbenzene	ug/L (ppb)	50	<1	95	97	59-146	2
sec-Butylbenzene	ug/L (ppb)	50	<1	95	96	64-140	1
p-Isopropyltoluene	ug/L (ppb)	50	<1	94	95	65-141	1
1,3-Dichlorobenzene	ug/L (ppb)	50	<1	96	98	72-123	2
1,4-Dichlorobenzene	ug/L (ppb)	50	<1	95	98	69-126	3
1,2-Dichlorobenzene	ug/L (ppb)	50	<1	97	99	69-128	2
1,2-Dibromo-3-chloropropane	ug/L (ppb)	50	<10	88	92	32-164	4
1,2,4-Trichlorobenzene	ug/L (ppb)	50	<1	98	99	66-136	1
Hexachlorobutadiene	ug/L (ppb)	50	<1	97	98	60-143	1
Naphthalene	ug/L (ppb)	50	<1	95	97	44-164	2
1,2,3-Trichlorobenzene	ug/L (ppb)	50	<1	102	103	69-148	1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 08/28/20

Date Received: 08/20/20

Project: Kelly-Moore 014697, F&BI 008315

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260D

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Dichlorodifluoromethane	ug/L (ppb)	50	70	25-158
Chloromethane	ug/L (ppb)	50	82	45-156
Vinyl chloride	ug/L (ppb)	50	85	50-154
Bromomethane	ug/L (ppb)	50	100	55-143
Chloroethane	ug/L (ppb)	50	93	58-146
Trichlorofluoromethane	ug/L (ppb)	250	92	50-150
Acetone	ug/L (ppb)	250	85	22-155
1,1-Dichloroethene	ug/L (ppb)	50	93	67-136
Hexane	ug/L (ppb)	50	86	57-137
Methylene chloride	ug/L (ppb)	50	80	39-148
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	91	64-147
trans-1,2-Dichloroethene	ug/L (ppb)	50	89	68-128
1,1-Dichloroethane	ug/L (ppb)	50	89	74-135
2,2-Dichloropropane	ug/L (ppb)	50	114	55-143
cis-1,2-Dichloroethene	ug/L (ppb)	50	93	74-136
Chloroform	ug/L (ppb)	50	91	74-134
2-Butanone (MEK)	ug/L (ppb)	250	87	37-150
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	89	66-129
1,1,1-Trichloroethane	ug/L (ppb)	50	91	74-142
1,1-Dichloropropene	ug/L (ppb)	50	92	77-129
Carbon tetrachloride	ug/L (ppb)	50	88	75-158
Benzene	ug/L (ppb)	50	89	69-134
Trichloroethene	ug/L (ppb)	50	84	67-133
1,2-Dichloropropane	ug/L (ppb)	50	83	71-134
Bromodichloromethane	ug/L (ppb)	50	82	76-132
Dibromomethane	ug/L (ppb)	50	87	68-132
4-Methyl-2-pentanone	ug/L (ppb)	250	89	65-138
cis-1,3-Dichloropropene	ug/L (ppb)	50	90	74-140
Toluene	ug/L (ppb)	50	89	72-122
trans-1,3-Dichloropropene	ug/L (ppb)	50	92	80-136
1,1,2-Trichloroethane	ug/L (ppb)	50	80	75-124
2-Hexanone	ug/L (ppb)	250	90	60-136
1,3-Dichloropropane	ug/L (ppb)	50	91	76-126
Tetrachloroethene	ug/L (ppb)	50	92	76-121
Dibromochloromethane	ug/L (ppb)	50	87	84-133
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	94	82-115
Chlorobenzene	ug/L (ppb)	50	94	83-114
Ethylbenzene	ug/L (ppb)	50	92	77-124
1,1,1,2-Tetrachloroethane	ug/L (ppb)	50	91	84-127
m,p-Xylene	ug/L (ppb)	100	93	81-112
o-Xylene	ug/L (ppb)	50	93	81-121
Styrene	ug/L (ppb)	50	89	84-119
Isopropylbenzene	ug/L (ppb)	50	94	80-117
Bromoform	ug/L (ppb)	50	95	74-136
n-Propylbenzene	ug/L (ppb)	50	92	74-126
Bromobenzene	ug/L (ppb)	50	92	80-121
1,3,5-Trimethylbenzene	ug/L (ppb)	50	92	78-123
1,1,2,2-Tetrachloroethane	ug/L (ppb)	50	96	66-126
1,2,3-Trichloropropane	ug/L (ppb)	50	89	67-124
2-Chlorotoluene	ug/L (ppb)	50	92	77-127
4-Chlorotoluene	ug/L (ppb)	50	92	78-128
tert-Butylbenzene	ug/L (ppb)	50	92	80-123
1,2,4-Trimethylbenzene	ug/L (ppb)	50	93	79-122
sec-Butylbenzene	ug/L (ppb)	50	93	80-116
p-Isopropyltoluene	ug/L (ppb)	50	92	81-123
1,3-Dichlorobenzene	ug/L (ppb)	50	94	83-113
1,4-Dichlorobenzene	ug/L (ppb)	50	93	81-112
1,2-Dichlorobenzene	ug/L (ppb)	50	94	84-112
1,2-Dibromo-3-chloropropane	ug/L (ppb)	50	87	57-141
1,2,4-Trichlorobenzene	ug/L (ppb)	50	94	72-130
Hexachlorobutadiene	ug/L (ppb)	50	95	53-141
Naphthalene	ug/L (ppb)	50	90	64-133
1,2,3-Trichlorobenzene	ug/L (ppb)	50	96	65-136

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 08/28/20

Date Received: 08/20/20

Project: Kelly-Moore 014697, F&BI 008315

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR SEMIVOLATILES BY EPA METHOD 8270E

Laboratory Code: 008315-02 1/2 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	5	<0.4	77	75	50-150	3
2-Methylnaphthalene	ug/L (ppb)	5	<0.4	83	83	50-150	0
1-Methylnaphthalene	ug/L (ppb)	5	<0.4	82	82	50-150	0
Acenaphthylene	ug/L (ppb)	5	<0.04	78	78	50-150	0
Acenaphthene	ug/L (ppb)	5	0.17	72	73	50-150	1
Fluorene	ug/L (ppb)	5	0.066	79	78	50-150	1
Phenanthrene	ug/L (ppb)	5	<0.04	88	88	50-150	0
Anthracene	ug/L (ppb)	5	<0.04	90	91	50-150	1
Fluoranthene	ug/L (ppb)	5	<0.04	97	98	50-150	1
Pyrene	ug/L (ppb)	5	<0.04	91	97	50-150	6
Benz(a)anthracene	ug/L (ppb)	5	<0.04	95	97	50-150	2
Chrysene	ug/L (ppb)	5	<0.04	94	95	50-150	1
Benzo(a)pyrene	ug/L (ppb)	5	<0.04	99	101	50-150	2
Benzo(b)fluoranthene	ug/L (ppb)	5	<0.04	99	103	50-150	4
Benzo(k)fluoranthene	ug/L (ppb)	5	<0.04	101	100	50-150	1
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	5	<0.04	94	96	50-150	2
Dibenz(a,h)anthracene	ug/L (ppb)	5	<0.04	93	94	50-150	1
Benzo(g,h,i)perylene	ug/L (ppb)	5	<0.08	90	91	50-150	1

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	80	76	70-130	5
2-Methylnaphthalene	ug/L (ppb)	5	85	80	70-130	6
1-Methylnaphthalene	ug/L (ppb)	5	84	79	70-130	6
Acenaphthylene	ug/L (ppb)	5	88	86	70-130	2
Acenaphthene	ug/L (ppb)	5	82	81	70-130	1
Fluorene	ug/L (ppb)	5	89	87	70-130	2
Phenanthrene	ug/L (ppb)	5	85	86	70-130	1
Anthracene	ug/L (ppb)	5	89	91	70-130	2
Fluoranthene	ug/L (ppb)	5	95	98	70-130	3
Pyrene	ug/L (ppb)	5	89	92	70-130	3
Benz(a)anthracene	ug/L (ppb)	5	91	93	70-130	2
Chrysene	ug/L (ppb)	5	91	93	70-130	2
Benzo(a)pyrene	ug/L (ppb)	5	97	99	70-130	2
Benzo(b)fluoranthene	ug/L (ppb)	5	101	100	70-130	1
Benzo(k)fluoranthene	ug/L (ppb)	5	95	101	70-130	6
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	5	87	85	70-130	2
Dibenz(a,h)anthracene	ug/L (ppb)	5	84	85	70-130	1
Benzo(g,h,i)perylene	ug/L (ppb)	5	82	82	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.

008315

SAMPLE CHAIN OF CUSTODY

ME 08/20/20 VW4/DPU/ATJ

Report To Lucas KernoCompany WoodAddress 600 University StCity, State, ZIP Seattle, WA 98101Phone 208-316-7223 Email lucas.kerno@woodplc.com

SAMPLERS (signature)

PROJECT NAME

PO #

REMARKS

INVOICE TO

Page # of

TURNAROUND TIME

☒ Standard turnaround☐ RUSH

Rush charges authorized by:

SAMPLE DISPOSAL

☐ Archive samples☐ Other

Default: Dispose after 30 days

Project specific RLs? - Yes / No

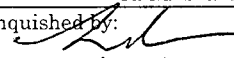
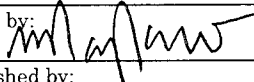
						ANALYSES REQUESTED												
Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	Total Metals - Zn, Pb, Cu, Ni, Cr, Mn, Fe, Al, Ag, As, Cd, Co, Hg, Mo, Se, Sn, Ti, V, W, Bi, Br, Ca, Cl, Cs, F, Ga, Ge, In, Ir, K, Li, Mg, Na, Nb, Os, Pd, P, Pt, Rh, Rb, S, Sb, Sc, Si, Sr, Ta, Te, Th, Tl, U, Y, Zn	Total Mercury	741704		Notes	
KMV-02R-081920	01 A-I	8/19/20	12:06	GW	9	X	X			X	X		X	X				TOTAL Metals
KMV-03-081920	02 A-A	8/19/20	14:45		26											← 45/1000		Arsenic, Barium, Cadmium,
KMV-04-082020	03 A-I	8/20/20	12:50		9													Chromium, Lead,
KMV-06-082020	04	8/20/20	11:50		9													Selenium, Silver
KMV-07-082020	05	8/19/20	13:00		9													
KMV-08-081920	06	8/19/20	13:50		9													
KMV-09-082020	07	8/20/20	11:00		9													
KMV-10-082020	08	8/20/20	9:15		9													
KMV-10-9-082020	09	8/20/20	9:20	↓	9													
TRIP BLANKS	10 A-B	--																

Friedman & Bruya, Inc.

3012 16th Avenue West

Seattle, WA 98119-2029

Ph. (206) 285-8282

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: 	Lucas Kerno	WOOD	8/24/20	13:11
Received by: 	Brian Phan	FERT	8/20/20	13:41
Relinquished by:				
Received by:		Samples received at	3°C	

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

September 8, 2020

Lucas Kerner, Project Manager
Wood Environment & Infrastructure Solutions, Inc.
One Union Square
600 University Street, Suite 600
Seattle, WA 98101

Dear Mr Kerner:

Included are the additional results from the testing of material submitted on August 20, 2020 from the Kelly-Moore 014697, F&BI 008315 project. There are 18 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
WEI0908R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on August 20, 2020 by Friedman & Bruya, Inc. from the Wood Environment & Infrastructure Solutions Kelly-Moore 014697, F&BI 008315 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Wood Environment & Infrastructure Solutions</u>
008315 -01	KMW-02R-081920
008315 -02	KMW-03-081920
008315 -03	KMW-04-082020
008315 -04	KMW-06-082020
008315 -05	KMW-07-081920
008315 -06	KMW-08-081920
008315 -07	KMW-09-082020
008315 -08	KMW-10-082020
008315 -09	KMW-10-9-082020
008315 -10	Trip Blanks

A 6020B internal standard failed the acceptance criteria for several samples. The samples were diluted and reanalyzed with acceptable results. Both data sets were reported.

All other quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-02R-081920	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/20/20	Project:	Kelly-Moore 014697, F&BI 008315
Date Extracted:	08/24/20	Lab ID:	008315-01
Date Analyzed:	08/24/20	Data File:	008315-01.045
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
----------	-----------------------------

Copper	<5
Nickel	2.06

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-02R-081920	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/20/20	Project:	Kelly-Moore 014697, F&BI 008315
Date Extracted:	08/24/20	Lab ID:	008315-01
Date Analyzed:	08/24/20	Data File:	008315-01.107
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
----------	-----------------------------

Copper	<5
Nickel	2.07

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-03-081920	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/20/20	Project:	Kelly-Moore 014697, F&BI 008315
Date Extracted:	08/24/20	Lab ID:	008315-02
Date Analyzed:	08/25/20	Data File:	008315-02.043
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
----------	-----------------------------

Copper	<5
Nickel	1.99

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-04-082020	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/20/20	Project:	Kelly-Moore 014697, F&BI 008315
Date Extracted:	08/24/20	Lab ID:	008315-03
Date Analyzed:	08/25/20	Data File:	008315-03.045
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
----------	-----------------------------

Copper	15.0 J
Nickel	<1 J

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-04-082020	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/20/20	Project:	Kelly-Moore 014697, F&BI 008315
Date Extracted:	08/24/20	Lab ID:	008315-03 x10
Date Analyzed:	08/25/20	Data File:	008315-03 x10.044
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
----------	-----------------------------

Copper	<50
Nickel	<10

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-06-082020	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/20/20	Project:	Kelly-Moore 014697, F&BI 008315
Date Extracted:	08/24/20	Lab ID:	008315-04 x10
Date Analyzed:	08/25/20	Data File:	008315-04 x10.046
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
----------	-----------------------------

Copper	64.2
Nickel	11.9

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-07-081920	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/20/20	Project:	Kelly-Moore 014697, F&BI 008315
Date Extracted:	08/24/20	Lab ID:	008315-05
Date Analyzed:	08/25/20	Data File:	008315-05.048
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
----------	-----------------------------

Copper	<5
Nickel	1.15

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-08-081920	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/20/20	Project:	Kelly-Moore 014697, F&BI 008315
Date Extracted:	08/24/20	Lab ID:	008315-06
Date Analyzed:	08/25/20	Data File:	008315-06.049
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
----------	-----------------------------

Chromium	<1
Nickel	4.26

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-09-082020	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/20/20	Project:	Kelly-Moore 014697, F&BI 008315
Date Extracted:	08/24/20	Lab ID:	008315-07
Date Analyzed:	08/25/20	Data File:	008315-07.056
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
----------	-----------------------------

Copper	<5 J
Nickel	1.26 J

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-09-082020	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/20/20	Project:	Kelly-Moore 014697, F&BI 008315
Date Extracted:	08/24/20	Lab ID:	008315-07 x10
Date Analyzed:	08/25/20	Data File:	008315-07 x10.055
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
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Copper	<50
Nickel	<10

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-10-082020	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/20/20	Project:	Kelly-Moore 014697, F&BI 008315
Date Extracted:	08/24/20	Lab ID:	008315-08
Date Analyzed:	08/25/20	Data File:	008315-08.058
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
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Copper	<5 J
Nickel	<1 J

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-10-082020	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/20/20	Project:	Kelly-Moore 014697, F&BI 008315
Date Extracted:	08/24/20	Lab ID:	008315-08 x10
Date Analyzed:	08/25/20	Data File:	008315-08 x10.057
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
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Copper	<50
Nickel	<10

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-10-9-082020	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/20/20	Project:	Kelly-Moore 014697, F&BI 008315
Date Extracted:	08/24/20	Lab ID:	008315-09
Date Analyzed:	08/25/20	Data File:	008315-09.060
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
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Copper	<5 J
Nickel	<1 J

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-10-9-082020	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/20/20	Project:	Kelly-Moore 014697, F&BI 008315
Date Extracted:	08/24/20	Lab ID:	008315-09 x10
Date Analyzed:	08/25/20	Data File:	008315-09 x10.059
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
----------	-----------------------------

Copper	<50
Nickel	<10

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Method Blank	Client:	Wood Environment & Infrastructure Solutions
Date Received:	NA	Project:	Kelly-Moore 014697, F&BI 008315
Date Extracted:	08/24/20	Lab ID:	I0-491 mb
Date Analyzed:	08/24/20	Data File:	I0-491 mb.036
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
----------	-----------------------------

Chromium	<1
Nickel	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/08/20

Date Received: 08/20/20

Project: Kelly-Moore 014697, F&BI 008315

**QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF WATER SAMPLES
FOR TOTAL METALS USING EPA METHOD 6020B**

Laboratory Code: 008315-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Copper	ug/L (ppb)	20	<5	90	90	75-125	0
Nickel	ug/L (ppb)	20	2.06	93	95	75-125	2

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Copper	ug/L (ppb)	20	94	80-120
Nickel	ug/L (ppb)	20	95	80-120

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.

008315

SAMPLE CHAIN OF CUSTODY

ME 08/20/20 VW4/DQU/ALH

Report To Lucas KernoCompany WoodAddress 600 University StCity, State, ZIP Seattle, WA 98101Phone 206-316-7223 Email lucas.kerno@woodplc.com

SAMPLERS (signature)

PROJECT NAME

PO #

REMARKS

INVOICE TO

Page # of

TURNAROUND TIME

☒ Standard turnaround☐ RUSH

Rush charges authorized by:

SAMPLE DISPOSAL

☐ Archive samples☐ Other

Default: Dispose after 30 days

Project specific RLs? - Yes / 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	Total Metals - Zn, Pb, Cu, Ni	Total Mercury	Total Lead	Cu, Ni	Notes	
KMU-02R-081920	01 A-I	8/19/20	12:06	GW	9	X	X			X	X		X	X			⊗	⊗ - per LK 09/1 Notes
KMU-03-081920	02 A-A	8/19/20	14:45		20													
KMU-04-082020	03 A-I	8/20/20	12:50		9													
KMU-06-082020	04	8/20/20	11:50		9													
KMU-07-081920	05	8/19/20	13:00		9													
KMU-08-081920	06	8/19/20	13:50		9													
KMU-09-082020	07	8/20/20	11:00		9													
KMU-10-082020	08	8/20/20	9:15		9													
KMU-10-9-082020	09	8/20/20	9:20		9													
TRIP BLANKS	10 A-B	-																

Friedman & Bruya, Inc.

3012 16th Avenue West

Seattle, WA 98119-2029

Ph. (206) 285-8282

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: <u>[Signature]</u>	Lucas Kerno	WOOD	8/20/20	13:11
Received by: <u>[Signature]</u>	John Phan	FERT	8/20/20	13:41
Relinquished by:				
Received by:				
Samples received at 30°C				

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

April 1, 2021

Brady Lubenow, Project Manager
Wood Environment & Infrastructure Solutions, Inc.
One Union Square
600 University Street, Suite 600
Seattle, WA 98101

Dear Mr Lubenow:

Included are the results from the testing of material submitted on March 22, 2021 from the Kelly Moore-Seattle, F&BI 103413 project. There are 26 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: Christy Duitman
WEI0401R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on March 22, 2021 by Friedman & Bruya, Inc. from the Wood Environment & Infrastructure Solutions Kelly Moore-Seattle, F&BI 103413 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Wood Environment & Infrastructure Solutions</u>
103413 -01	KMW-03R
103413 -02	KMW-08

Sample KMW-03R was sent to Fremont Analytical for BOD, COD, dissolved gasses, dissolved and total cations, sulfate, nitrate, TOC, and alkalinity analyses. In addition, the sample was sent to Amtest for volatile fatty acids. The report from Fremont is enclosed. The report from Amtest will be forwarded upon receipt.

The dissolved metals samples were filtered at Friedman and Bruya on March 23, 2021 at 11:30. The data were flagged accordingly.

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/01/21

Date Received: 03/22/21

Project: Kelly Moore-Seattle, F&BI 103413

Date Extracted: 03/25/21

Date Analyzed: 03/26/21

**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>	Surrogate (% Recovery) (Limit 51-134)
KMW-03R 103413-01	<100	92
KMW-08 103413-02	<100	92
Method Blank 01-585 MB2	<100	94

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/01/21

Date Received: 03/22/21

Project: Kelly Moore-Seattle, F&BI 103413

Date Extracted: 03/23/21

Date Analyzed: 03/23/21

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES
FOR TOTAL PETROLEUM HYDROCARBONS AS
DIESEL AND MOTOR OIL
USING METHOD NWTPH-Dx**

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)
KMW-03R 103413-01	480 x	<250	114
KMW-08 103413-02	410 x	<250	107
Method Blank 01-706 MB2	<50	<250	96

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	KMW-03R f	Client:	Wood Environment & Infrastructure
Date Received:	03/22/21	Project:	Kelly Moore-Seattle, F&BI 103413
Date Extracted:	03/25/21	Lab ID:	103413-01
Date Analyzed:	03/26/21	Data File:	103413-01.056
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
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Iron	265
Manganese	134

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	Method Blank f	Client:	Wood Environment & Infrastructure
Date Received:	NA	Project:	Kelly Moore-Seattle, F&BI 103413
Date Extracted:	03/25/21	Lab ID:	I1-191 mb
Date Analyzed:	03/25/21	Data File:	I1-191 mb.106
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
----------	-----------------------------

Iron	<50
Manganese	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Hardness By EPA Method 200.8 and SM 2340B

Client ID:	KMW-03R	Client:	Wood Environment & Infrastructure
Date Received:	03/22/21	Project:	Kelly Moore-Seattle, F&BI 103413
Date Extracted:	03/23/21	Lab ID:	103413-01 x10
Date Analyzed:	03/24/21	Data File:	103413-01 x10.026
Matrix:	Water	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)
----------	-----------------------------

Calcium	53.4
Magnesium	5.79
Hardness (as CaCO ₃)	157

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Hardness By EPA Method 200.8 and SM 2340B

Client ID:	Method Blank	Client:	Wood Environment & Infrastructure
Date Received:	NA	Project:	Kelly Moore-Seattle, F&BI 103413
Date Extracted:	03/23/21	Lab ID:	I1-184 mb
Date Analyzed:	03/24/21	Data File:	I1-184 mb.025
Matrix:	Water	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)
----------	-----------------------------

Calcium	<0.05
Magnesium	<0.05
Hardness (as CaCO ₃)	<0.35

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-03R	Client:	Wood Environment & Infrastructure
Date Received:	03/22/21	Project:	Kelly Moore-Seattle, F&BI 103413
Date Extracted:	03/23/21	Lab ID:	103413-01
Date Analyzed:	03/23/21	Data File:	103413-01.082
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<1
Chromium	<1
Copper	<5
Iron	883
Lead	<1
Manganese	156
Mercury	<1
Nickel	1.54
Zinc	<5

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-08	Client:	Wood Environment & Infrastructure
Date Received:	03/22/21	Project:	Kelly Moore-Seattle, F&BI 103413
Date Extracted:	03/23/21	Lab ID:	103413-02
Date Analyzed:	03/23/21	Data File:	103413-02.083
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<1
Chromium	<1
Copper	<5
Lead	<1
Manganese	184
Mercury	<1
Nickel	7.08
Zinc	306

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-08	Client:	Wood Environment & Infrastructure
Date Received:	03/22/21	Project:	Kelly Moore-Seattle, F&BI 103413
Date Extracted:	03/23/21	Lab ID:	103413-02 x100
Date Analyzed:	03/25/21	Data File:	103413-02 x100.049
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
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Iron	5,800
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Method Blank	Client:	Wood Environment & Infrastructure
Date Received:	NA	Project:	Kelly Moore-Seattle, F&BI 103413
Date Extracted:	03/23/21	Lab ID:	I1-181 mb2
Date Analyzed:	03/23/21	Data File:	I1-181 mb2.061
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<1
Chromium	<1
Copper	<5
Iron	<50
Lead	<1
Manganese	<1
Mercury	<1
Nickel	<1
Zinc	<5

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	KMW-03R	Client:	Wood Environment & Infrastructure
Date Received:	03/22/21	Project:	Kelly Moore-Seattle, F&BI 103413
Date Extracted:	03/23/21	Lab ID:	103413-01 1/2
Date Analyzed:	03/23/21	Data File:	032313.D
Matrix:	Water	Instrument:	GCMS8
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	43	15	99
Phenol-d6	30	11	65
Nitrobenzene-d5	95	10	145
2-Fluorobiphenyl	83	16	138
2,4,6-Tribromophenol	98	12	132
Terphenyl-d14	96	35	138

Compounds:	Concentration ug/L (ppb)
Benz(a)anthracene	<0.04
Chrysene	<0.04
Benzo(a)pyrene	<0.04
Benzo(b)fluoranthene	<0.04
Benzo(k)fluoranthene	<0.04
Indeno(1,2,3-cd)pyrene	<0.04
Dibenz(a,h)anthracene	<0.04

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	KMW-08	Client:	Wood Environment & Infrastructure
Date Received:	03/22/21	Project:	Kelly Moore-Seattle, F&BI 103413
Date Extracted:	03/23/21	Lab ID:	103413-02 1/2
Date Analyzed:	03/23/21	Data File:	032314.D
Matrix:	Water	Instrument:	GCMS8
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	33	15	99
Phenol-d6	25	11	65
Nitrobenzene-d5	74	10	145
2-Fluorobiphenyl	79	16	138
2,4,6-Tribromophenol	112	12	132
Terphenyl-d14	98	35	138

Compounds:	Concentration ug/L (ppb)
Benz(a)anthracene	<0.04
Chrysene	<0.04
Benzo(a)pyrene	<0.04
Benzo(b)fluoranthene	<0.04
Benzo(k)fluoranthene	<0.04
Indeno(1,2,3-cd)pyrene	<0.04
Dibenz(a,h)anthracene	<0.04

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	Method Blank	Client:	Wood Environment & Infrastructure
Date Received:	Not Applicable	Project:	Kelly Moore-Seattle, F&BI 103413
Date Extracted:	03/23/21	Lab ID:	01-709 mb2
Date Analyzed:	03/23/21	Data File:	032311.D
Matrix:	Water	Instrument:	GCMS8
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	30	15	99
Phenol-d6	18	11	65
Nitrobenzene-d5	100	10	145
2-Fluorobiphenyl	103	16	138
2,4,6-Tribromophenol	89	12	132
Terphenyl-d14	94	35	138

Compounds:	Concentration ug/L (ppb)
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

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID: KMW-03R
 Date Received: 03/22/21
 Date Extracted: 03/23/21
 Date Analyzed: 03/23/21
 Matrix: Water
 Units: ug/L (ppb)

Client: Wood Environment & Infrastructure
 Project: Kelly Moore-Seattle, F&BI 103413
 Lab ID: 103413-01
 Data File: 032340.D
 Instrument: GCMS4
 Operator: JCM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	107	86	113
Toluene-d8	102	88	114
4-Bromofluorobenzene	110	88	112

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<1
Bromomethane	<5	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<50	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<5	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	1.7
trans-1,2-Dichloroethene	<1	Bromoform	<5
1,1-Dichloroethane	<1	n-Propylbenzene	3.1
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	<1	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	<1
2-Butanone (MEK)	<20	1,2,3-Trichloropropane	<1
1,2-Dichloroethane (EDC)	<1	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<1	1,2,4-Trimethylbenzene	<1
Benzene	<0.35	sec-Butylbenzene	<1
Trichloroethene	<1	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1	1,3-Dichlorobenzene	<1
Bromodichloromethane	<1	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<10
cis-1,3-Dichloropropene	<1	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	<1
trans-1,3-Dichloropropene	<1	Naphthalene	<1
1,1,2-Trichloroethane	<1	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID:	KMW-08	Client:	Wood Environment & Infrastructure
Date Received:	03/22/21	Project:	Kelly Moore-Seattle, F&BI 103413
Date Extracted:	03/23/21	Lab ID:	103413-02
Date Analyzed:	03/23/21	Data File:	032341.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JCM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	86	113
Toluene-d8	100	88	114
4-Bromofluorobenzene	102	88	112

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<1
Bromomethane	<5	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<50	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<5	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<5
1,1-Dichloroethane	<1	n-Propylbenzene	<1
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	<1	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	<1
2-Butanone (MEK)	<20	1,2,3-Trichloropropane	<1
1,2-Dichloroethane (EDC)	<1	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<1	1,2,4-Trimethylbenzene	<1
Benzene	<0.35	sec-Butylbenzene	<1
Trichloroethene	<1	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1	1,3-Dichlorobenzene	<1
Bromodichloromethane	<1	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<10
cis-1,3-Dichloropropene	<1	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	<1
trans-1,3-Dichloropropene	<1	Naphthalene	<1
1,1,2-Trichloroethane	<1	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID:	Method Blank	Client:	Wood Environment & Infrastructure
Date Received:	Not Applicable	Project:	Kelly Moore-Seattle, F&BI 103413
Date Extracted:	03/23/21	Lab ID:	01-648 mb
Date Analyzed:	03/23/21	Data File:	032308.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JCM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	86	113
Toluene-d8	100	88	114
4-Bromofluorobenzene	96	88	112

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<1
Bromomethane	<5	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<50	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<5	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<5
1,1-Dichloroethane	<1	n-Propylbenzene	<1
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	<1	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	<1
2-Butanone (MEK)	<20	1,2,3-Trichloropropane	<1
1,2-Dichloroethane (EDC)	<1	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<1	1,2,4-Trimethylbenzene	<1
Benzene	<0.35	sec-Butylbenzene	<1
Trichloroethene	<1	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1	1,3-Dichlorobenzene	<1
Bromodichloromethane	<1	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<10
cis-1,3-Dichloropropene	<1	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	<1
trans-1,3-Dichloropropene	<1	Naphthalene	<1
1,1,2-Trichloroethane	<1	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/01/21

Date Received: 03/22/21

Project: Kelly Moore-Seattle, F&BI 103413

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER
SAMPLES FOR TPH AS GASOLINE
USING METHOD NWTPH-G_x**

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Gasoline	ug/L (ppb)	1,000	108	88	70-119	20

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/01/21

Date Received: 03/22/21

Project: Kelly Moore-Seattle, F&BI 103413

**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	116	112	63-142	4

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/01/21

Date Received: 03/22/21

Project: Kelly Moore-Seattle, F&BI 103413

**QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF WATER SAMPLES
FOR DISSOLVED METALS USING EPA METHOD 6020B**

Laboratory Code: 103389-01 x10 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Iron	ug/L (ppb)	100	26,800	0 b	722 b	75-125	200 b
Manganese	ug/L (ppb)	20	904	0 b	261 b	75-125	200 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Iron	ug/L (ppb)	100	93	80-120
Manganese	ug/L (ppb)	20	93	80-120

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/01/21

Date Received: 03/22/21

Project: Kelly Moore-Seattle, F&BI 103413

**QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF WATER SAMPLES
FOR TOTAL METALS USING EPA METHOD 200.8 AND SM 2340B**

Laboratory Code: 103413-01 x10 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Calcium	mg/L (ppm)	1.0	53.4	735 b	257 b	70-130	96 b
Magnesium	mg/L (ppm)	1.0	5.79	172 b	115 b	70-130	40 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Calcium	mg/L (ppm)	1.0	102	85-115
Magnesium	mg/L (ppm)	1.0	100	85-115

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/01/21

Date Received: 03/22/21

Project: Kelly Moore-Seattle, F&BI 103413

**QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF WATER SAMPLES
FOR TOTAL METALS USING EPA METHOD 6020B**

Laboratory Code: 103375-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	ug/L (ppb)	10	4.78	105	106	75-125	1
Chromium	ug/L (ppb)	20	<1	96	97	75-125	1
Copper	ug/L (ppb)	20	10.3	97	99	75-125	2
Iron	ug/L (ppb)	100	132	91	90	75-125	1
Lead	ug/L (ppb)	10	<1	95	97	75-125	2
Manganese	ug/L (ppb)	20	4.48	98	98	75-125	0
Mercury	ug/L (ppb)	5	<1	98	99	75-125	1
Nickel	ug/L (ppb)	20	1.04	96	96	75-125	0
Zinc	ug/L (ppb)	50	9.20	92	92	75-125	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	ug/L (ppb)	10	106	80-120
Chromium	ug/L (ppb)	20	98	80-120
Copper	ug/L (ppb)	20	100	80-120
Iron	ug/L (ppb)	100	93	80-120
Lead	ug/L (ppb)	10	101	80-120
Manganese	ug/L (ppb)	20	99	80-120
Mercury	ug/L (ppb)	5	100	80-120
Nickel	ug/L (ppb)	20	96	80-120
Zinc	ug/L (ppb)	50	95	80-120

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/01/21

Date Received: 03/22/21

Project: Kelly Moore-Seattle, F&BI 103413

**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)
Benz(a)anthracene	ug/L (ppb)	5	98	97	70-130	1
Chrysene	ug/L (ppb)	5	93	93	70-130	0
Benzo(a)pyrene	ug/L (ppb)	5	91	92	70-130	1
Benzo(b)fluoranthene	ug/L (ppb)	5	97	99	70-130	2
Benzo(k)fluoranthene	ug/L (ppb)	5	96	96	70-130	0
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	5	101	99	57-141	2
Dibenz(a,h)anthracene	ug/L (ppb)	5	98	95	57-137	3

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/01/21

Date Received: 03/22/21

Project: Kelly Moore-Seattle, F&BI 103413

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260D

Laboratory Code: 103230-09 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Dichlorodifluoromethane	ug/L (ppb)	10	<1	100	10-172
Chloromethane	ug/L (ppb)	10	<10	77	25-166
Vinyl chloride	ug/L (ppb)	10	<0.2	86	36-166
Bromomethane	ug/L (ppb)	10	<5	125	47-169
Chloroethane	ug/L (ppb)	10	<1	86	46-160
Trichlorofluoromethane	ug/L (ppb)	10	<1	85	44-165
Acetone	ug/L (ppb)	50	<50	91	10-182
1,1-Dichloroethene	ug/L (ppb)	10	<1	95	58-142
Hexane	ug/L (ppb)	10	<5	83	38-152
Methylene chloride	ug/L (ppb)	10	<5	102	50-145
Methyl t-butyl ether (MTBE)	ug/L (ppb)	10	<1	95	61-136
trans-1,2-Dichloroethene	ug/L (ppb)	10	<1	94	61-136
1,1-Dichloroethane	ug/L (ppb)	10	<1	92	63-135
2,2-Dichloropropane	ug/L (ppb)	10	<1	77	36-154
cis-1,2-Dichloroethene	ug/L (ppb)	10	<1	92	63-134
Chloroform	ug/L (ppb)	10	<1	95	61-135
2-Butanone (MEK)	ug/L (ppb)	50	<20	101	10-129
1,2-Dichloroethane (EDC)	ug/L (ppb)	10	<1	97	48-149
1,1,1-Trichloroethane	ug/L (ppb)	10	<1	94	60-146
1,1-Dichloropropene	ug/L (ppb)	10	<1	94	69-133
Carbon tetrachloride	ug/L (ppb)	10	<1	96	56-152
Benzene	ug/L (ppb)	10	<0.35	96	57-135
Trichloroethene	ug/L (ppb)	10	<1	93	66-135
1,2-Dichloropropane	ug/L (ppb)	10	<1	93	59-136
Bromodichloromethane	ug/L (ppb)	10	<1	86	61-150
Dibromomethane	ug/L (ppb)	10	<1	95	66-141
4-Methyl-2-pentanone	ug/L (ppb)	50	<10	103	10-185
cis-1,3-Dichloropropene	ug/L (ppb)	10	<1	83	52-147
Toluene	ug/L (ppb)	10	<1	95	50-137
trans-1,3-Dichloropropene	ug/L (ppb)	10	<1	79	53-142
1,1,2-Trichloroethane	ug/L (ppb)	10	<1	96	68-131
2-Hexanone	ug/L (ppb)	50	<10	104	10-185
1,3-Dichloropropane	ug/L (ppb)	10	<1	96	60-135
Tetrachloroethene	ug/L (ppb)	10	<1	96	10-226
Dibromochloromethane	ug/L (ppb)	10	<1	86	52-145
1,2-Dibromoethane (EDB)	ug/L (ppb)	10	<1	97	62-135
Chlorobenzene	ug/L (ppb)	10	<1	98	63-130
Ethylbenzene	ug/L (ppb)	10	<1	95	60-133
1,1,1,2-Tetrachloroethane	ug/L (ppb)	10	<1	90	56-143
m,p-Xylene	ug/L (ppb)	20	<2	95	69-135
o-Xylene	ug/L (ppb)	10	<1	94	60-140
Styrene	ug/L (ppb)	10	<1	89	60-133
Isopropylbenzene	ug/L (ppb)	10	<1	90	65-142
Bromoform	ug/L (ppb)	10	<5	78	54-148
n-Propylbenzene	ug/L (ppb)	10	<1	92	58-144
Bromobenzene	ug/L (ppb)	10	<1	97	61-130
1,3,5-Trimethylbenzene	ug/L (ppb)	10	<1	92	59-134
1,1,2,2-Tetrachloroethane	ug/L (ppb)	10	<1	95	51-154
1,2,3-Trichloropropane	ug/L (ppb)	10	<1	97	53-150
2-Chlorotoluene	ug/L (ppb)	10	<1	93	66-127
4-Chlorotoluene	ug/L (ppb)	10	<1	92	65-130
tert-Butylbenzene	ug/L (ppb)	10	<1	92	65-137
1,2,4-Trimethylbenzene	ug/L (ppb)	10	<1	89	59-146
sec-Butylbenzene	ug/L (ppb)	10	<1	91	64-140
p-Isopropyltoluene	ug/L (ppb)	10	<1	91	65-141
1,3-Dichlorobenzene	ug/L (ppb)	10	<1	96	60-131
1,4-Dichlorobenzene	ug/L (ppb)	10	<1	95	60-129
1,2-Dichlorobenzene	ug/L (ppb)	10	<1	95	60-130
1,2-Dibromo-3-chloropropane	ug/L (ppb)	10	<10	79	32-164
1,2,4-Trichlorobenzene	ug/L (ppb)	10	<1	88	52-138
Hexachlorobutadiene	ug/L (ppb)	10	<1	84	60-143
Naphthalene	ug/L (ppb)	10	<1	85	44-164
1,2,3-Trichlorobenzene	ug/L (ppb)	10	<1	89	69-148

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/01/21

Date Received: 03/22/21

Project: Kelly Moore-Seattle, F&BI 103413

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260D

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Dichlorodifluoromethane	ug/L (ppb)	10	111	112	25-158	1
Chloromethane	ug/L (ppb)	10	94	90	45-156	4
Vinyl chloride	ug/L (ppb)	10	95	96	50-154	1
Bromomethane	ug/L (ppb)	10	138	133	55-143	4
Chloroethane	ug/L (ppb)	10	93	95	58-146	2
Trichlorofluoromethane	ug/L (ppb)	10	102	104	50-150	2
Acetone	ug/L (ppb)	50	95	94	22-155	1
1,1-Dichloroethene	ug/L (ppb)	10	107	108	67-136	1
Hexane	ug/L (ppb)	10	95	96	57-137	1
Methylene chloride	ug/L (ppb)	10	102	100	19-178	2
Methyl t-butyl ether (MTBE)	ug/L (ppb)	10	103	104	64-147	1
trans-1,2-Dichloroethene	ug/L (ppb)	10	99	102	68-128	3
1,1-Dichloroethane	ug/L (ppb)	10	98	100	74-135	2
2,2-Dichloropropane	ug/L (ppb)	10	103	103	55-143	0
cis-1,2-Dichloroethene	ug/L (ppb)	10	101	99	74-136	2
Chloroform	ug/L (ppb)	10	102	103	74-134	1
2-Butanone (MEK)	ug/L (ppb)	50	107	108	37-150	1
1,2-Dichloroethane (EDC)	ug/L (ppb)	10	104	104	66-129	0
1,1,1-Trichloroethane	ug/L (ppb)	10	101	102	74-142	1
1,1-Dichloropropene	ug/L (ppb)	10	102	105	77-129	3
Carbon tetrachloride	ug/L (ppb)	10	106	109	75-158	3
Benzene	ug/L (ppb)	10	101	104	69-134	3
Trichloroethene	ug/L (ppb)	10	101	100	67-133	1
1,2-Dichloropropane	ug/L (ppb)	10	102	100	71-134	2
Bromodichloromethane	ug/L (ppb)	10	97	97	66-126	0
Dibromomethane	ug/L (ppb)	10	106	107	68-132	1
4-Methyl-2-pentanone	ug/L (ppb)	50	109	112	65-138	3
cis-1,3-Dichloropropene	ug/L (ppb)	10	100	102	74-140	2
Toluene	ug/L (ppb)	10	100	102	72-122	2
trans-1,3-Dichloropropene	ug/L (ppb)	10	95	94	80-136	1
1,1,2-Trichloroethane	ug/L (ppb)	10	101	101	75-124	0
2-Hexanone	ug/L (ppb)	50	109	113	60-136	4
1,3-Dichloropropene	ug/L (ppb)	10	101	103	76-126	2
Tetrachloroethene	ug/L (ppb)	10	107	106	76-121	1
Dibromochloromethane	ug/L (ppb)	10	97	97	84-133	0
1,2-Dibromoethane (EDB)	ug/L (ppb)	10	103	102	82-115	1
Chlorobenzene	ug/L (ppb)	10	103	104	83-114	1
Ethylbenzene	ug/L (ppb)	10	100	101	77-124	1
1,1,1,2-Tetrachloroethane	ug/L (ppb)	10	99	99	84-127	0
m,p-Xylene	ug/L (ppb)	20	104	103	81-112	1
o-Xylene	ug/L (ppb)	10	100	103	81-121	3
Styrene	ug/L (ppb)	10	99	99	84-119	0
Isopropylbenzene	ug/L (ppb)	10	98	99	80-117	1
Bromoform	ug/L (ppb)	10	94	96	69-121	2
n-Propylbenzene	ug/L (ppb)	10	97	99	74-126	2
Bromobenzene	ug/L (ppb)	10	103	104	80-121	1
1,3,5-Trimethylbenzene	ug/L (ppb)	10	97	99	78-123	2
1,1,2,2-Tetrachloroethane	ug/L (ppb)	10	97	101	66-126	4
1,2,3-Trichloropropane	ug/L (ppb)	10	101	104	67-124	3
2-Chlorotoluene	ug/L (ppb)	10	96	98	77-127	2
4-Chlorotoluene	ug/L (ppb)	10	98	99	78-128	1
tert-Butylbenzene	ug/L (ppb)	10	97	99	80-123	2
1,2,4-Trimethylbenzene	ug/L (ppb)	10	95	96	79-122	1
sec-Butylbenzene	ug/L (ppb)	10	96	99	80-116	3
p-Isopropyltoluene	ug/L (ppb)	10	96	99	81-123	3
1,3-Dichlorobenzene	ug/L (ppb)	10	101	104	83-113	3
1,4-Dichlorobenzene	ug/L (ppb)	10	102	104	81-112	2
1,2-Dichlorobenzene	ug/L (ppb)	10	99	100	84-112	1
1,2-Dibromo-3-chloropropane	ug/L (ppb)	10	91	93	57-141	2
1,2,4-Trichlorobenzene	ug/L (ppb)	10	92	95	72-130	3
Hexachlorobutadiene	ug/L (ppb)	10	92	94	53-141	2
Naphthalene	ug/L (ppb)	10	92	94	64-133	2
1,2,3-Trichlorobenzene	ug/L (ppb)	10	94	95	65-136	1

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.

103413

SAMPLE CHAIN OF CUSTODY

03-22-21

VW3/AT3/1E03
Page # of 1

Report To

Brady Lubenow
Christy Duitman

Company

Wood

Address

4020 Lake Washington Blvd NE #200

City, State, ZIP

Kirkland, WA 98033

Phone

507-236-8843

brady.lubenow@woodplc.com

Email Christy.Duitman@woodplc.com

SAMPLERS (signature)

Brady Lubenow

PROJECT NAME

Kelly Moore - Seattle

PO #

REMARKS

INVOICE TO

Wood

Project specific RLs? - Yes / No

TURNAROUND TIME

☒ Standard turnaround☐ RUSH

Rush charges authorized by:

SAMPLE DISPOSAL

☒ Archive samples☐ Other

Default: Dispose after 30 days

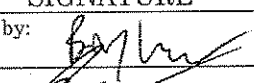
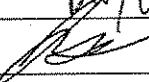
						ANALYSES REQUESTED											
Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	SPAHs EPA 8270	PCBs EPA 8082	1.	2.	3.	4.	Notes
KMW-03R	01 A-R	3/22/21	1344	GW	18	X	X			X	X		X	X	X	X	See Remarks #1-4
KMW-08	02 A-J	↓	1538	↓	10	X	X			X	X		X				See Remarks #1
* Remarks																	
1. Total Metals (As, Cr, Cu, Pb, Hg, Ni, Zn) by 6020B																	
2. Volatile Fatty Acids by SM 5560 + Biological Oxygen Demand by SM 5210B/EPA 405.1 + Chemical Oxygen Demand by EPA 410.1-2, EPA 410.3, EPA 410.4, SM 5210 + Dissolved gases (methane, ethane, ethene, CO2) by RSK-175																	
3. Dissolved AND Total Cations (Fe, Ca, Mn, Mg, Al, Na) by EPA 6020B + Anions (sulfate, nitrate) by EPA 300.0/300.1																	
4. Total Organic Carbon by 9060A/SM 5310B + Alkalinity by SM 2320/EPA 310.1 + Hardness by SM 2340B																	

Friedman & Bruya, Inc.

3012 16th Avenue West

Seattle, WA 98119-2029

Ph. (206) 285-8282

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: 	Brady Lubenow	Wood	3/22/21	1735
Received by: 	JOE MOHAMMED	F&B	3/22/21	1735
Relinquished by:		Samples received at	3 °C	
Received by:				



Fremont
Analytical

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

Friedman & Bruya
Michael Erdahl
3012 16th Ave. W.
Seattle, WA 98119

RE: 103413
Work Order Number: 2103381

March 30, 2021

Attention Michael Erdahl:

Fremont Analytical, Inc. received 1 sample(s) on 3/23/2021 for the analyses presented in the following report.

Biochemical Oxygen Demand by SM 5210B
Carbon Dioxide by SM 2320B/SM4500-CO2D
Chemical Oxygen Demand by SM 5220D
Dissolved Gases by RSK-175
Dissolved Metals by EPA Method 200.8
Ion Chromatography by EPA Method 300.0
Total Metals by EPA Method 200.8
Total Alkalinity by SM 2320B
Total Organic Carbon by SM 5310C

This report consists of the following:

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

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

Thank you for using Fremont Analytical.

Sincerely,

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

Original

www.fremontanalytical.com

Brianna Barnes
Project Manager

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

Original

www.fremontanalytical.com

CLIENT: Friedman & Bruya
Project: 103413
Work Order: 2103381

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
2103381-001	KMW-03R	03/22/2021 1:44 PM	03/23/2021 4:34 PM

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

CLIENT: Friedman & Bruya
Project: 103413

I. SAMPLE RECEIPT:

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

II. GENERAL REPORTING COMMENTS:

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

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

III. ANALYSES AND EXCEPTIONS:

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

Qualifiers:

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

Acronyms:

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



Analytical Report

Work Order: 2103381

Date Reported: 3/30/2021

Client: Friedman & Bruya

Collection Date: 3/22/2021 1:44:00 PM

Project: 103413

Lab ID: 2103381-001

Matrix: Groundwater

Client Sample ID: KMW-03R

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<u>Biochemical Oxygen Demand by SM 5210B</u>				Batch ID: R66184 Analyst: SS		
Biochemical Oxygen Demand	3.32	2.00		mg/L	1	3/24/2021 11:10:00 AM
<u>Dissolved Gases by RSK-175</u>				Batch ID: R66194 Analyst: MS		
Methane	0.373	0.0675	D	mg/L	10	3/29/2021 4:03:00 PM
Ethene	ND	0.0146		mg/L	1	3/29/2021 3:41:00 PM
Ethane	ND	0.0151		mg/L	1	3/29/2021 3:41:00 PM
<u>Ion Chromatography by EPA Method 300.0</u>				Batch ID: 31757 Analyst: SS		
Nitrate (as N)	ND	0.200	DH	mg/L	2	3/24/2021 8:24:00 PM
Sulfate	36.2	3.00	D	mg/L	5	3/26/2021 5:07:00 PM
<u>Dissolved Metals by EPA Method 200.8</u>				Batch ID: 31792 Analyst: TN		
Aluminum	ND	100		µg/L	1	3/29/2021 3:44:20 PM
Calcium	58,100	525		µg/L	1	3/29/2021 3:44:20 PM
Magnesium	6,550	100		µg/L	1	3/29/2021 3:44:20 PM
Sodium	16,900	250		µg/L	1	3/29/2021 3:44:20 PM
<u>Total Metals by EPA Method 200.8</u>				Batch ID: 31762 Analyst: EH		
Aluminum	327	100		µg/L	1	3/25/2021 5:49:45 PM
Calcium	55,300	200		µg/L	1	3/25/2021 5:49:45 PM
Magnesium	6,190	100		µg/L	1	3/25/2021 5:49:45 PM
Sodium	16,800	200		µg/L	1	3/25/2021 5:49:45 PM
<u>Total Organic Carbon by SM 5310C</u>				Batch ID: R66219 Analyst: SS		
Total Organic Carbon	2.60	0.500		mg/L	1	3/30/2021 10:08:00 AM
<u>Total Alkalinity by SM 2320B</u>				Batch ID: R66198 Analyst: WF		
Alkalinity, Total (As CaCO ₃)	153	2.50		mg/L	1	3/30/2021 10:18:28 AM
<u>Carbon Dioxide by SM 2320B/SM4500-CO₂D</u>				Batch ID: R66199 Analyst: WF		
Carbon Dioxide	145	2.50		mg/L	1	3/30/2021 10:18:51 AM

Original



Analytical Report

Work Order: 2103381
Date Reported: 3/30/2021

Client: Friedman & Bruya

Collection Date: 3/22/2021 1:44:00 PM

Project: 103413

Lab ID: 2103381-001

Matrix: Groundwater

Client Sample ID: KMW-03R

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Chemical Oxygen Demand by SM 5220D

Batch ID: R66180 Analyst: LB

Chemical Oxygen Demand	ND	10.0		mg/L	1	3/29/2021 3:28:06 PM
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Work Order: 2103381

CLIENT: Friedman & Bruya

Project: 103413

QC SUMMARY REPORT

Biochemical Oxygen Demand by SM 5210B

Sample ID: MB-66184		SampType: MBLK			Units: mg/L		Prep Date: 3/24/2021			RunNo: 66184		
Client ID: MBLKW		Batch ID: R66184			Analysis Date: 3/24/2021					SeqNo: 1331755		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Biochemical Oxygen Demand	ND	2.00									
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Sample ID: LCS-66184		SampType: LCS			Units: mg/L		Prep Date: 3/24/2021			RunNo: 66184		
Client ID: LCSW		Batch ID: R66184			Analysis Date: 3/24/2021					SeqNo: 1331756		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Biochemical Oxygen Demand	195	2.00	198.0	0	98.3	84.6	115.4				
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Sample ID: 2103381-001ADUP		SampType: DUP			Units: mg/L		Prep Date: 3/24/2021			RunNo: 66184		
Client ID: KMW-03R		Batch ID: R66184			Analysis Date: 3/24/2021					SeqNo: 1331763		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Biochemical Oxygen Demand	3.53	2.00						3.324	6.01	20	
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Work Order: 2103381
CLIENT: Friedman & Bruya
Project: 103413

QC SUMMARY REPORT

Total Alkalinity by SM 2320B

Sample ID: MB-R66198		SampType: MBLK			Units: mg/L		Prep Date: 3/30/2021			RunNo: 66198		
Client ID: MBLKW		Batch ID: R66198						Analysis Date: 3/30/2021			SeqNo: 1332116	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Alkalinity, Total (As CaCO3) ND 2.50

Sample ID: LCS-R66198		SampType: LCS			Units: mg/L		Prep Date: 3/30/2021			RunNo: 66198		
Client ID: LCSW		Batch ID: R66198			Analysis Date: 3/30/2021			SeqNo: 1332117				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Alkalinity, Total (As CaCO3) 101 2.50 100.0 0 101 99.1 105

Sample ID: 2103381-001ADUP		SampType: DUP			Units: mg/L		Prep Date: 3/30/2021			RunNo: 66198		
Client ID: KMW-03R		Batch ID: R66198						Analysis Date: 3/30/2021			SeqNo: 1332119	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Alkalinity, Total (As CaCO3) 159 2.50 152.8 4.08 20

Work Order: 2103381
CLIENT: Friedman & Bruya
Project: 103413

QC SUMMARY REPORT

Carbon Dioxide by SM 2320B/SM4500-CO2D

Sample ID: MB-R66199		SampType: MBLK			Units: mg/L		Prep Date: 3/30/2021			RunNo: 66199		
Client ID: MBLKW		Batch ID: R66199			Analysis Date: 3/30/2021			SeqNo: 1332121				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Alkalinity, Total (As CaCO3)	ND	2.50
Carbon Dioxide	ND	2.50

Sample ID: LCS-R66199		SampType: LCS			Units: mg/L		Prep Date: 3/30/2021			RunNo: 66199		
Client ID: LCSW		Batch ID: R66199			Analysis Date: 3/30/2021			SeqNo: 1332122				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Alkalinity, Total (As CaCO3)	101	2.50	100.0	0	101	94.3	116
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Sample ID: 2103381-001GDUP		SampType: DUP			Units: mg/L		Prep Date: 3/30/2021			RunNo: 66199		
Client ID: KMW-03R		Batch ID: R66199			Analysis Date: 3/30/2021			SeqNo: 1332124				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Carbon Dioxide	153	2.50						145.3	5.11	20
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Work Order: 2103381
CLIENT: Friedman & Bruya
Project: 103413

QC SUMMARY REPORT

Chemical Oxygen Demand by SM 5220D

Sample ID: MB-R66180	SampType: MBLK	Units: mg/L			Prep Date: 3/29/2021			RunNo: 66180			
Client ID: MBLKW	Batch ID: R66180				Analysis Date: 3/29/2021			SeqNo: 1331561			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Chemical Oxygen Demand	ND	10.0									
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Sample ID: LCS-R66180		SampType: LCS			Units: mg/L		Prep Date: 3/29/2021			RunNo: 66180		
Client ID: LCSW		Batch ID: R66180			Analysis Date: 3/29/2021			SeqNo: 1331562				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Chemical Oxygen Demand	76.5	10.0	75.00	0	102	87.2	113				
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Sample ID: 2103360-001BDUP		SampType: DUP			Units: mg/L		Prep Date: 3/29/2021			RunNo: 66180		
Client ID: BATCH		Batch ID: R66180			Analysis Date: 3/29/2021			SeqNo: 1331564				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Chemical Oxygen Demand	25.8	10.0						26.46	2.66	30	
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Sample ID: 2103360-001BMS		SampType: MS			Units: mg/L		Prep Date: 3/29/2021			RunNo: 66180		
Client ID: BATCH		Batch ID: R66180			Analysis Date: 3/29/2021					SeqNo: 1331565		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Chemical Oxygen Demand	97.3	10.0	75.00	26.46	94.5	60.3	143				
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Sample ID: 2103360-001BMSD		SampType: MSD			Units: mg/L		Prep Date: 3/29/2021			RunNo: 66180		
Client ID: BATCH		Batch ID: R66180			Analysis Date: 3/29/2021					SeqNo: 1331566		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Chemical Oxygen Demand	95.9	10.0	75.00	26.46	92.6	60.3	143	97.33	1.44	30	
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Work Order: 2103381
CLIENT: Friedman & Bruya
Project: 103413

QC SUMMARY REPORT

Ion Chromatography by EPA Method 300.0

Sample ID: MB-31757		SampType: MBLK			Units: mg/L		Prep Date: 3/24/2021			RunNo: 66196		
Client ID: MBLKW		Batch ID: 31757			Analysis Date: 3/24/2021			SeqNo: 1332067				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Nitrate (as N)	ND	0.100									
Sulfate	ND	0.600									

Sample ID: LCS-31757		SampType: LCS			Units: mg/L		Prep Date: 3/24/2021			RunNo: 66196		
Client ID: LCSW		Batch ID: 31757			Analysis Date: 3/24/2021			SeqNo: 1332068				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Nitrate (as N)	0.689	0.100	0.7500	0	91.9	90	110				
Sulfate	3.52	0.600	3.750	0	93.8	90	110				

Sample ID: 2103369-001BDUP		SampType: DUP			Units: mg/L		Prep Date: 3/24/2021			RunNo: 66196		
Client ID: BATCH		Batch ID: 31757			Analysis Date: 3/24/2021			SeqNo: 1332070				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Nitrate (as N)	ND	0.100						0		20	H
Sulfate	119	0.600						118.4	0.0616	20	E

NOTES:

E - Estimated value. The amount exceeds the linear working range of the instrument.

Sample ID: 2103369-001BMS		SampType: MS			Units: mg/L		Prep Date: 3/24/2021			RunNo: 66196		
Client ID: BATCH		Batch ID: 31757			Analysis Date: 3/24/2021			SeqNo: 1332071				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Nitrate (as N)	0.693	0.100	0.7500	0	92.4	80	120				H
Sulfate	122	0.600	3.750	118.4	83.3	80	120				E

NOTES:

E - Estimated value. The amount exceeds the linear working range of the instrument.

Work Order: 2103381
CLIENT: Friedman & Bruya
Project: 103413

QC SUMMARY REPORT

Ion Chromatography by EPA Method 300.0

Sample ID: 2103369-001BMSD		SampType: MSD		Units: mg/L		Prep Date: 3/24/2021		RunNo: 66196			
Client ID: BATCH		Batch ID: 31757				Analysis Date: 3/24/2021		SeqNo: 1332072			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)	0.680	0.100	0.7500	0	90.7	80	120	0.6930	1.89	20	H
Sulfate	121	0.600	3.750	118.4	73.3	80	120	121.6	0.311	20	ES

NOTES:

S,E - Outlying spike recovery(ies) observed due to sample concentration above calibrated range.

Sample ID: 2103398-001BDUP		SampType: DUP		Units: mg/L		Prep Date: 3/24/2021		RunNo: 66196			
Client ID: BATCH		Batch ID: 31757				Analysis Date: 3/25/2021		SeqNo: 1332089			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)	1.72	0.200						1.736	0.694	20	D
Sulfate	19.2	1.20						19.26	0.448	20	D

Sample ID: 2103398-001BMS		SampType: MS		Units: mg/L		Prep Date: 3/24/2021		RunNo: 66196			
Client ID: BATCH		Batch ID: 31757				Analysis Date: 3/25/2021		SeqNo: 1332090			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)	2.83	0.200	1.500	1.736	73.2	80	120				DS
Sulfate	27.6	1.20	7.500	19.26	112	80	120				D

NOTES:

S - Outlying spike recoveries were associated with this sample due to high sample concentration.

Work Order: 2103381
CLIENT: Friedman & Bruya
Project: 103413

QC SUMMARY REPORT

Total Organic Carbon by SM 5310C

Sample ID: MB-R66219	SampType: MBLK	Units: mg/L		Prep Date: 3/30/2021	RunNo: 66219
Client ID: MBLKW	Batch ID: R66219	Analysis Date: 3/30/2021		SeqNo: 1332370	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Total Organic Carbon ND 0.500

Sample ID: LCS-R66219	SampType: LCS	Units: mg/L		Prep Date: 3/30/2021	RunNo: 66219
Client ID: LCSW	Batch ID: R66219	Analysis Date: 3/30/2021		SeqNo: 1332371	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Total Organic Carbon 5.08 0.500 5.000 0 102 89.3 113

Sample ID: 2103381-001CDUP	SampType: DUP	Units: mg/L		Prep Date: 3/30/2021	RunNo: 66219
Client ID: KMW-03R	Batch ID: R66219	Analysis Date: 3/30/2021		SeqNo: 1332360	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Total Organic Carbon 2.66 0.500 2.602 2.20 20

Sample ID: 2103381-001CMS	SampType: MS	Units: mg/L		Prep Date: 3/30/2021	RunNo: 66219
Client ID: KMW-03R	Batch ID: R66219	Analysis Date: 3/30/2021		SeqNo: 1332361	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Total Organic Carbon 7.62 0.500 5.000 2.602 100 69.1 120

Sample ID: 2103381-001CMSD	SampType: MSD	Units: mg/L		Prep Date: 3/30/2021	RunNo: 66219
Client ID: KMW-03R	Batch ID: R66219	Analysis Date: 3/30/2021		SeqNo: 1332362	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Total Organic Carbon 7.42 0.500 5.000 2.602 96.3 69.1 120 7.622 2.75 30



Work Order: 2103381
CLIENT: Friedman & Bruya
Project: 103413

QC SUMMARY REPORT

Dissolved Metals by EPA Method 200.8

Sample ID: MB-31792		SampType: MBLK			Units: µg/L		Prep Date: 3/29/2021			RunNo: 66185		
Client ID: MBLKW		Batch ID: 31792			Analysis Date: 3/29/2021					SeqNo: 1331781		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Aluminum	ND	100									
Calcium	ND	525									
Magnesium	ND	100									
Sodium	ND	250									

Sample ID: LCS-31792		SampType: LCS		Units: µg/L		Prep Date: 3/29/2021			RunNo: 66185		
Client ID: LCSW		Batch ID: 31792					Analysis Date: 3/29/2021			SeqNo: 1331784	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Aluminum	929	100	1,000	0	92.9	85	115				
Calcium	1,040	525	1,000	0	104	50	150				
Magnesium	908	100	1,000	0	90.8	50	150				
Sodium	955	250	1,000	0	95.5	50	150				

Sample ID: 2103389-001FDUP		SampType: DUP		Units: µg/L		Prep Date: 3/29/2021		RunNo: 66185			
Client ID: BATCH		Batch ID: 31792				Analysis Date: 3/29/2021		SeqNo: 1331786			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Aluminum	ND	100						0		30	
Calcium	16,100	525						16,870	4.74	30	
Magnesium	2,550	100						2,779	8.57	30	
Sodium	8,160	250						8,750	6.98	30	

Sample ID: 2103389-001FMS		SampType: MS		Units: µg/L		Prep Date: 3/29/2021			RunNo: 66185		
Client ID: BATCH		Batch ID: 31792					Analysis Date: 3/29/2021			SeqNo: 1331787	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Aluminum	5,230	100	5,000	0	105	50	150				
Calcium	21,200	525	5,000	16,870	86.5	50	150				

Work Order: 2103381
CLIENT: Friedman & Bruya
Project: 103413

QC SUMMARY REPORT

Dissolved Metals by EPA Method 200.8

Sample ID: 2103389-001FMS		SampType: MS			Units: µg/L		Prep Date: 3/29/2021			RunNo: 66185		
Client ID: BATCH		Batch ID: 31792			Analysis Date: 3/29/2021			SeqNo: 1331787				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Magnesium	7,500	100	5,000	2,779	94.5	70	130				
Sodium	13,500	250	5,000	8,750	95.1	50	150				

Sample ID: 2103389-001FMSD		SampType: MSD			Units: µg/L		Prep Date: 3/29/2021			RunNo: 66185		
Client ID: BATCH		Batch ID: 31792			Analysis Date: 3/29/2021			SeqNo: 1331788				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Aluminum	5,030	100	5,000	0	101	50	150	5,232	3.91	30	
Calcium	21,600	525	5,000	16,870	94.9	50	150	21,200	1.97	30	
Magnesium	7,480	100	5,000	2,779	94.0	70	130	7,504	0.369	30	
Sodium	13,600	250	5,000	8,750	96.4	50	150	13,510	0.468	30	

Sample ID: MB-31791FB		SampType: MBLK			Units: µg/L		Prep Date: 3/29/2021			RunNo: 66185		
Client ID: MBLKW		Batch ID: 31792			Analysis Date: 3/29/2021			SeqNo: 1331804				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Aluminum	ND	100									
Calcium	ND	525									
Magnesium	ND	100									
Sodium	ND	250									

Work Order: 2103381
CLIENT: Friedman & Bruya
Project: 103413

QC SUMMARY REPORT

Total Metals by EPA Method 200.8

Sample ID: MB-31762	SampType: MBLK	Units: µg/L			Prep Date: 3/25/2021			RunNo: 66117			
Client ID: MBLKW	Batch ID: 31762				Analysis Date: 3/25/2021			SeqNo: 1330417			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	ND	100									
Calcium	ND	200									
Magnesium	ND	100									
Sodium	ND	200									

Sample ID: LCS-31762	SampType: LCS	Units: µg/L				Prep Date: 3/25/2021			RunNo: 66117		
Client ID: LCSW	Batch ID: 31762					Analysis Date: 3/25/2021			SeqNo: 1330418		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	1,020	100	1,000	0	102	85	115				
Calcium	969	200	1,000	0	96.9	50	150				
Magnesium	948	100	1,000	0	94.8	50	150				
Sodium	1,090	200	1,000	0	109	50	150				

Sample ID: 2103367-001BDUP		SampType: DUP		Units: µg/L		Prep Date: 3/25/2021			RunNo: 66117		
Client ID: BATCH		Batch ID: 31762					Analysis Date: 3/25/2021			SeqNo: 1330420	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	693	100						736.6	6.11	30	
Calcium	1,090	200						1,196	9.45	30	
Magnesium	911	100						883.7	3.08	30	
Sodium	129,000	200						120,900	6.45	30	E

NOTES:

E - Estimated value. The amount exceeds the linear working range of the instrument.

Sample ID: 2103367-001BMS		SampType: MS		Units: µg/L		Prep Date: 3/25/2021			RunNo: 66117			
Client ID: BATCH		Batch ID: 31762					Analysis Date: 3/25/2021			SeqNo: 1330421		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Aluminum	5.710	100	5.000	736.6	99.5	70	130					

Work Order: 2103381
CLIENT: Friedman & Bruya
Project: 103413

QC SUMMARY REPORT

Total Metals by EPA Method 200.8

Sample ID: 2103367-001BMS		SampType: MS		Units: µg/L		Prep Date: 3/25/2021			RunNo: 66117		
Client ID: BATCH		Batch ID: 31762					Analysis Date: 3/25/2021			SeqNo: 1330421	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	5,950	200	5,000	1,196	95.1	50	150				
Magnesium	5,680	100	5,000	883.7	96.0	70	130				
Sodium	121.000	200	5,000	120.900	-5.04	50	150				ES

NOTES:

S,E - Outlying spike recovery(ies) observed due to sample concentration above calibrated range.

Sample ID: 2103367-001BMSD		SampType: MSD		Units: µg/L		Prep Date: 3/25/2021			RunNo: 66117		
Client ID: BATCH		Batch ID: 31762				Analysis Date: 3/25/2021			SeqNo: 1330422		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	5,590	100	5,000	736.6	97.0	70	130	5,712	2.20	30	
Calcium	5,850	200	5,000	1,196	93.0	50	150	5,951	1.77	30	
Magnesium	5,600	100	5,000	883.7	94.3	70	130	5,685	1.52	30	
Sodium	127,000	200	5,000	120,900	113	50	150	120,600	4.78	30	E

NOTES:

E - Estimated value. The amount exceeds the linear working range of the instrument.

Work Order: 2103381
CLIENT: Friedman & Bruya
Project: 103413

QC SUMMARY REPORT

Dissolved Gases by RSK-175

Sample ID: LCS-R66194		SampType: LCS			Units: mg/L		Prep Date: 3/29/2021			RunNo: 66194		
Client ID: LCSW		Batch ID: R66194			Analysis Date: 3/29/2021			SeqNo: 1331999				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Methane	987	0.00675	1,000	0	98.7	66.7	141				
Ethene	987	0.0146	1,000	0	98.7	68.6	139				
Ethane	988	0.0151	1,000	0	98.8	69.3	136				

Sample ID: MB-R66194		SampType: MBLK			Units: mg/L		Prep Date: 3/29/2021			RunNo: 66194		
Client ID: MBLKW		Batch ID: R66194			Analysis Date: 3/29/2021			SeqNo: 1332000				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Methane	ND	0.00675									
Ethene	ND	0.0146									
Ethane	ND	0.0151									

Sample ID: 2103389-005AREP		SampType: REP			Units: mg/L		Prep Date: 3/29/2021			RunNo: 66194		
Client ID: BATCH		Batch ID: R66194			Analysis Date: 3/29/2021			SeqNo: 1331973				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Methane	1.43	0.00675						1.652	14.1	30	E
Ethene	ND	0.0146						0		30	
Ethane	ND	0.0151						0		30	

NOTES:

E - Estimated value. The amount exceeds the linear working range of the instrument.

Client Name: **FB**
 Logged by: **Carissa True**

Work Order Number: **2103381**
 Date Received: **3/23/2021 4:34:00 PM**

Chain of Custody

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

Log In

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

Special Handling (if applicable)

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

Person Notified:	<input type="text"/>	Date:	<input type="text"/>
By Whom:	<input type="text"/>	Via:	<input type="checkbox"/> eMail <input type="checkbox"/> Phone <input type="checkbox"/> Fax <input type="checkbox"/> In Person
Regarding:	<input type="text"/>		
Client Instructions:	<input type="text"/>		

19. Additional remarks:

3/24/21 - log in both sample delivery groups under one WO per ME -CG
 3/26/21 - remove Total & Dissolved Mn from project per ME -CG

Item Information

Item #	Temp °C
Sample 1	3.4

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

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

2103381

Send Report To Michael Erdahl

Company Friedman and Bruya, Inc.

Address 3012 16th Ave W

City, State, ZIP Seattle, WA 98119

Phone # (206) 285-8282 merdahl@friedmanandbruya.com

SUBCONTRACTOR <u>Fremont</u> <u>Amtest</u>	
PROJECT NAME/NO. <div style="font-size: 24pt; text-align: center;">103413</div>	PO # <div style="font-size: 24pt; text-align: center;">B-194 197</div>
REMARKS Please Email Results <u>EIM</u>	

Page # 1 of 1

TURNAROUND TIME

☒ Standard TAT
☐ RUSH

Rush charges authorized by: _____

SAMPLE DISPOSAL

☐ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

						ANALYSES REQUESTED										Notes
Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	Dioxins/Furans	EPH	Alkalinity APH	Volatiles - SMSS60	BOD	COD	Total + Dissolved Mg, Al, Na, Ca, Mn	Sulfate	Nitrate	TOC	
KMW-03R		3/22/21	1344	GW		6		X	X	X	X	X	X	X	X	

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:	Michael Erdahl	Friedman & Bruya	3/23/21	0810
Received by:	Carter Johnson	FAI	3/23/24	1634
Relinquished by:				
Received by:				

~~2103364~~
2103381 3/24/21cg



Phone # (206) 285-8282 merdahl@friedmanandbruya.com

SUBCONTRACTOR Fremont	
PROJECT NAME/NO. 103413	PO # B-196 197
REMARKS Please Email Results EIM	

<p align="center">TURNAROUND TIME</p> <p><input checked="" type="checkbox"/> Standard TAT _____</p> <p><input type="checkbox"/> RUSH _____</p> <p>Rush charges authorized by: _____</p>	
<p align="center">SAMPLE DISPOSAL</p> <p><input type="checkbox"/> Dispose after 30 days</p> <p><input type="checkbox"/> Return samples</p> <p><input type="checkbox"/> Will call with instructions</p>	

[illegible]

Fax (206) 283-5044

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: 	Michael Erdahl	Friedman & Bruya	3/23/21	0810
Received by: 	Ryan Littren	FAI	3/23/21	0943
Relinquished by:				
Received by:				

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

2103381

Send Report To Michael Erdahl

Company Friedman and Bruya, Inc.

Address 3012 16th Ave W

City, State, ZIP Seattle, WA 98119

Phone # (206) 285-8282 merdahl@friedmanandbruya.com

SUBCONTRACTOR

Fremont Fremont
Amtest

PROJECT NAME/NO.

103413

PO #

B-144 197

REMARKS

Please Email Results

EIM

edit per ME 3/24/21 CG

Page # 1 of +2

TURNAROUND TIME

☒ Standard TAT

☐ RUSH

Rush charges authorized by:

SAMPLE DISPOSAL

☐ Dispose after 30 days

☐ Return samples

☐ Will call with instructions

Page 24 of 25

						ANALYSES REQUESTED										Notes
Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	Dioxins/Furans	EPH	Alkalinity APH	Volatiles - SMSS60	BOD	COD	Total + Dissolved Mg, Al, Na, Ca	Sulfate	Nitrate	TOC	
KMW-03R		3/22/21	1344	GW		6		X	X	X	X	X	X	X	X	

edit per ME 3/26/21 -CG

Friedman & Bruya, Inc.
3012 16th Avenue West

Seattle, WA 98119-2029

Ph. (206) 285-8282

Fax (206) 283-5044

SIGNATURE

Relinquished by:

Received by:

Relinquished by:

Received by:

PRINT NAME

Michael Erdahl

Carter Johnson

COMPANY

Friedman & Bruya

FAI

DATE

3/23/21

3/23/24

TIME

0810

1634

~~2103364~~
2103381 3/24/21cg



Phone # (206) 285-8282 merdahl@friedmanandbruya.com

SUBCONTRACTOR Fremont	
PROJECT NAME/NO. 103413	PO # B-196 197
REMARKS Please Email Results EIM	

<p align="center">TURNAROUND TIME</p> <p><input checked="" type="checkbox"/> Standard TAT _____</p> <p><input type="checkbox"/> RUSH _____</p> <p>Rush charges authorized by: _____</p>	
<p align="center">SAMPLE DISPOSAL</p> <p><input type="checkbox"/> Dispose after 30 days</p> <p><input type="checkbox"/> Return samples</p> <p><input type="checkbox"/> Will call with instructions</p>	

[illegible]

Fax (206) 283-5044

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: 	Michael Erdahl	Friedman & Bruya	3/23/21	0810
Received by: 	Ryan Litten	FAI	3/23/21	0943
Relinquished by:				
Received by:				



Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

**Professional
Analytical
Services**

Apr 8 2021
Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Attention: MICHAEL ERDAHL

Dear MICHAEL ERDAHL:

Enclosed please find the analytical data for your 10413 project.

The following is a cross correlation of client and laboratory identifications for your convenience.

CLIENT ID	MATRIX	AMTEST ID	TEST
KMW-03R	Water	21-A003783	Actc Acd

Your sample was received on Wednesday, March 24, 2021. At the time of receipt, the sample was logged in and properly maintained prior to the subsequent analysis.

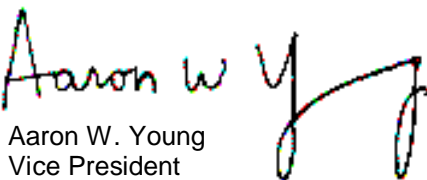
The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

If you should have any questions pertaining to the data package, please feel free to contact me.

Sincerely,


Aaron W. Young
Vice President

PO Number: B-194

BACT = Bacteriological
CONV = Conventional

MET = Metals
ORG = Organics

NUT=Nutrients
DEM=Demand

MIN=Minerals

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664
www.amtestlab.com



**Professional
Analytical
Services**

ANALYSIS REPORT

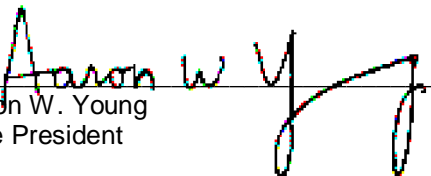
Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Attention: MICHAEL ERDAHL
Project Name: 10413
PO Number: B-194
All results reported on an as received basis.

Date Received: 03/24/21
Date Reported: 4/ 8/21

AMTEST Identification Number 21-A003783
Client Identification KMW-03R
Sampling Date 03/22/21, 13:44

Organic Acids

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Organic Acid (as Acetic)	< 0.1	mg/l		0.1	EPA 300.0 mod	KS	04/05/21


Aaron W. Young
Vice President

QC Summary for sample number: 21-A003783

DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	DUP VALUE	RPD
21-A003783	Organic Acid (as Acetic)	mg/l	< 0.1	< 0.1	

MATRIX SPIKES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPK AMT	RECOVERY
21-A003783	Organic Acid (as Acetic)	mg/l	< 0.1	1.92	2.00	96.00 %

STANDARD REFERENCE MATERIALS

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
Organic Acid (as Acetic)	mg/l	2.00	1.91	95.5 %

BLANKS

ANALYTE	UNITS	RESULT
Organic Acid (as Acetic)	mg/l	< 0.1

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

Phone # (206) 285-8282 merdahl@friedmanandbruya.com

SUBCONTRACTER		Amtest	
PROJECT NAME/NO.		PO #	
103413		B-194	
REMARKS			
Please Email Results			

Page # 1 of 1

TURNAROUND TIME

☒ Standard TAT

☐ RUSH_

Rush charges authorized by:

SAMPLE DISPOSAL

☐ Dispose after 30 days

- Return samples


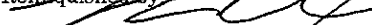
- ☐ Will call with instructions

[illegible]

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: 	Michael Erdahl	Friedman & Bruya	3/24/11	6:11
Received by: 	A. STAAB	AMTEST	3/24/21	2:55
Relinquished by:				
Received by:				

$$T = 6.8$$

COURIER

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

May 12, 2021

Brady Lubenow , Project Manager
Wood Environment & Infrastructure Solutions, Inc.
One Union Square
600 University Street, Suite 600
Seattle, WA 98101

Dear Mr Lubenow:

Included are the amended results from the testing of material submitted on March 23, 2021 from the Kelly Moore-Seattle, F&BI 103441 project. As requested, the J qualified metals results were removed and only over-range VOC compounds were reported in the sample dilutions.

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: Christy Duitman
WEI0402R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

April 2, 2021

Brady Lubenow , Project Manager
Wood Environment & Infrastructure Solutions, Inc.
One Union Square
600 University Street, Suite 600
Seattle, WA 98101

Dear Mr Lubenow:

Included are the results from the testing of material submitted on March 23, 2021 from the Kelly Moore-Seattle, F&BI 103441 project. There are 50 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: Christy Duitman
WEI0402R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on March 23, 2021 by Friedman & Bruya, Inc. from the Wood Environment & Infrastructure Solutions Kelly Moore-Seattle, F&BI 103441 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Wood Environment & Infrastructure Solutions</u>
103441 -01	KMW-04
103441 -02	KMW-06
103441 -03	KMW-09
103441 -04	KMW-10
103441 -05	Duplicate1

The samples were sent to Fremont Analytical for BOD, COD, dissolved gasses, dissolved and total cations, sulfate, nitrate, TOC, and alkalinity analyses. In addition, the samples were sent to Amtest for volatile fatty acids. The report is enclosed.

A 6020B internal standard failed the acceptance criteria for the samples. The samples were diluted and reanalyzed with acceptable results. Both data sets were reported.

Dissolved samples were filtered at Friedman & Bruya, Inc on March 24th, 2021 at 11:34 AM.

All other quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/02/21

Date Received: 03/23/21

Project: Kelly Moore-Seattle, F&BI 103441

Date Extracted: 03/25/21

Date Analyzed: 03/26/21 and 03/30/21

**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>	Surrogate (% Recovery) (Limit 51-134)
KMW-04 103441-01 1/10	19,000	111
KMW-06 103441-02	4,400	ip
KMW-09 103441-03	630	109
KMW-10 103441-04 1/10	31,000	118
Duplicate1 103441-05	4,500	ip
Method Blank 01-585 MB2	<100	94

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/02/21

Date Received: 03/23/21

Project: Kelly Moore-Seattle, F&BI 103441

Date Extracted: 03/24/21

Date Analyzed: 03/24/21

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES
FOR TOTAL PETROLEUM HYDROCARBONS AS
DIESEL AND MOTOR OIL
USING METHOD NWTPH-Dx**

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)
KMW-04 103441-01 1/1.3	1,300 x	<320	116
KMW-06 103441-02	35,000 x	3,000 x	88
KMW-09 103441-03	7,000 x	390 x	118
KMW-10 103441-04	8,600 x	<320	115
Duplicate1 103441-05	33,000 x	3,500 x	82
Method Blank 01-722 MB	<50	<250	118

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	KMW-04 f	Client:	Wood Environment & Infrastructure
Date Received:	03/23/21	Project:	Kelly Moore-Seattle, F&BI 103441
Date Extracted:	03/25/21	Lab ID:	103441-01 x20
Date Analyzed:	03/26/21	Data File:	103441-01 x20.057
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
----------	-----------------------------

Iron	5,650
Manganese	341

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	KMW-06 f	Client:	Wood Environment & Infrastructure
Date Received:	03/23/21	Project:	Kelly Moore-Seattle, F&BI 103441
Date Extracted:	03/25/21	Lab ID:	103441-02 x100
Date Analyzed:	03/26/21	Data File:	103441-02 x100.058
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
----------	-----------------------------

Iron	37,900
Manganese	1,450

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	KMW-09 f	Client:	Wood Environment & Infrastructure
Date Received:	03/23/21	Project:	Kelly Moore-Seattle, F&BI 103441
Date Extracted:	03/25/21	Lab ID:	103441-03 x100
Date Analyzed:	03/26/21	Data File:	103441-03 x100.071
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
----------	-----------------------------

Iron	21,600
Manganese	511

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	KMW-10 f	Client:	Wood Environment & Infrastructure
Date Received:	03/23/21	Project:	Kelly Moore-Seattle, F&BI 103441
Date Extracted:	03/25/21	Lab ID:	103441-04 x100
Date Analyzed:	03/26/21	Data File:	103441-04 x100.072
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
----------	-----------------------------

Iron	35,900
Manganese	989

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	Duplicate1 f	Client:	Wood Environment & Infrastructure
Date Received:	03/23/21	Project:	Kelly Moore-Seattle, F&BI 103441
Date Extracted:	03/25/21	Lab ID:	103441-05 x100
Date Analyzed:	03/26/21	Data File:	103441-05 x100.073
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
----------	-----------------------------

Iron	35,900
Manganese	1,440

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	Method Blank f	Client:	Wood Environment & Infrastructure
Date Received:	NA	Project:	Kelly Moore-Seattle, F&BI 103441
Date Extracted:	03/25/21	Lab ID:	I1-191 mb
Date Analyzed:	03/25/21	Data File:	I1-191 mb.106
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
----------	-----------------------------

Iron	<50
Manganese	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Hardness By EPA Method 200.8 and SM 2340B

Client ID:	KMW-04	Client:	Wood Environment & Infrastructure
Date Received:	03/23/21	Project:	Kelly Moore-Seattle, F&BI 103441
Date Extracted:	03/24/21	Lab ID:	103441-01 x10
Date Analyzed:	03/24/21	Data File:	103441-01 x10.078
Matrix:	Water	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)
----------	-----------------------------

Calcium	14.6
Magnesium	2.47
Hardness (as CaCO ₃)	46.6

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Hardness By EPA Method 200.8 and SM 2340B

Client ID:	KMW-06	Client:	Wood Environment & Infrastructure
Date Received:	03/23/21	Project:	Kelly Moore-Seattle, F&BI 103441
Date Extracted:	03/24/21	Lab ID:	103441-02 x10
Date Analyzed:	03/24/21	Data File:	103441-02 x10.079
Matrix:	Water	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)
----------	-----------------------------

Calcium	51.4
Magnesium	13.1
Hardness (as CaCO ₃)	182

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Hardness By EPA Method 200.8 and SM 2340B

Client ID:	KMW-09	Client:	Wood Environment & Infrastructure
Date Received:	03/23/21	Project:	Kelly Moore-Seattle, F&BI 103441
Date Extracted:	03/24/21	Lab ID:	103441-03 x10
Date Analyzed:	03/24/21	Data File:	103441-03 x10.080
Matrix:	Water	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)
----------	-----------------------------

Calcium	27.8
Magnesium	7.82
Hardness (as CaCO ₃)	102

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Hardness By EPA Method 200.8 and SM 2340B

Client ID:	KMW-10	Client:	Wood Environment & Infrastructure
Date Received:	03/23/21	Project:	Kelly Moore-Seattle, F&BI 103441
Date Extracted:	03/24/21	Lab ID:	103441-04 x10
Date Analyzed:	03/24/21	Data File:	103441-04 x10.081
Matrix:	Water	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)
----------	-----------------------------

Calcium	30.3
Magnesium	6.78
Hardness (as CaCO ₃)	104

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Hardness By EPA Method 200.8 and SM 2340B

Client ID:	Duplicate1	Client:	Wood Environment & Infrastructure
Date Received:	03/23/21	Project:	Kelly Moore-Seattle, F&BI 103441
Date Extracted:	03/24/21	Lab ID:	103441-05 x10
Date Analyzed:	03/24/21	Data File:	103441-05 x10.082
Matrix:	Water	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)
----------	-----------------------------

Calcium	51.3
Magnesium	13.0
Hardness (as CaCO ₃)	182

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Hardness By EPA Method 200.8 and SM 2340B

Client ID:	Method Blank	Client:	Wood Environment & Infrastructure
Date Received:	NA	Project:	Kelly Moore-Seattle, F&BI 103441
Date Extracted:	03/24/21	Lab ID:	I1-184 mb2
Date Analyzed:	03/24/21	Data File:	I1-184 mb2.077
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration mg/L (ppm)
----------	-----------------------------

Calcium	<0.05
Magnesium	<0.05
Hardness (as CaCO ₃)	<0.35

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-04	Client:	Wood Environment & Infrastructure
Date Received:	03/23/21	Project:	Kelly Moore-Seattle, F&BI 103441
Date Extracted:	03/24/21	Lab ID:	103441-01
Date Analyzed:	03/24/21	Data File:	103441-01.098
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	3.95
Chromium	<1
Copper	<5
Lead	<1
Manganese	303
Mercury	<1
Nickel	2.14
Zinc	<5

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-04	Client:	Wood Environment & Infrastructure
Date Received:	03/23/21	Project:	Kelly Moore-Seattle, F&BI 103441
Date Extracted:	03/24/21	Lab ID:	103441-01 x10
Date Analyzed:	03/24/21	Data File:	103441-01 x10.110
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
----------	-----------------------------

Iron	7,290
------	-------

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-06	Client:	Wood Environment & Infrastructure
Date Received:	03/23/21	Project:	Kelly Moore-Seattle, F&BI 103441
Date Extracted:	03/24/21	Lab ID:	103441-02
Date Analyzed:	03/24/21	Data File:	103441-02.099
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	8.05
Lead	29.7
Mercury	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-06	Client:	Wood Environment & Infrastructure
Date Received:	03/23/21	Project:	Kelly Moore-Seattle, F&BI 103441
Date Extracted:	03/24/21	Lab ID:	103441-02 x10
Date Analyzed:	03/24/21	Data File:	103441-02 x10.111
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Chromium	<10
Copper	96.5
Iron	42,800
Manganese	1,430
Nickel	21.5
Zinc	148

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-09	Client:	Wood Environment & Infrastructure
Date Received:	03/23/21	Project:	Kelly Moore-Seattle, F&BI 103441
Date Extracted:	03/24/21	Lab ID:	103441-03
Date Analyzed:	03/24/21	Data File:	103441-03.100
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	1.00
Lead	<1
Mercury	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-09	Client:	Wood Environment & Infrastructure
Date Received:	03/23/21	Project:	Kelly Moore-Seattle, F&BI 103441
Date Extracted:	03/24/21	Lab ID:	103441-03 x10
Date Analyzed:	03/24/21	Data File:	103441-03 x10.112
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Chromium	<10
Copper	<50
Iron	33,100
Manganese	520
Nickel	<10
Zinc	<50

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-10	Client:	Wood Environment & Infrastructure
Date Received:	03/23/21	Project:	Kelly Moore-Seattle, F&BI 103441
Date Extracted:	03/24/21	Lab ID:	103441-04
Date Analyzed:	03/24/21	Data File:	103441-04.101
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	6.59
Lead	1.45
Mercury	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-10	Client:	Wood Environment & Infrastructure
Date Received:	03/23/21	Project:	Kelly Moore-Seattle, F&BI 103441
Date Extracted:	03/24/21	Lab ID:	103441-04 x10
Date Analyzed:	03/24/21	Data File:	103441-04 x10.113
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
----------	-----------------------------

Chromium	<10
Copper	<50
Manganese	878
Nickel	<10
Zinc	<50

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-10	Client:	Wood Environment & Infrastructure
Date Received:	03/23/21	Project:	Kelly Moore-Seattle, F&BI 103441
Date Extracted:	03/24/21	Lab ID:	103441-04 x200
Date Analyzed:	03/25/21	Data File:	103441-04 x200.113
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
----------	-----------------------------

Iron	57,300
------	--------

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Duplicate1	Client:	Wood Environment & Infrastructure
Date Received:	03/23/21	Project:	Kelly Moore-Seattle, F&BI 103441
Date Extracted:	03/24/21	Lab ID:	103441-05
Date Analyzed:	03/24/21	Data File:	103441-05.102
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	7.89
Chromium	5.20
Copper	74.6
Lead	30.0
Mercury	<1
Nickel	16.8
Zinc	117

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Duplicate1	Client:	Wood Environment & Infrastructure
Date Received:	03/23/21	Project:	Kelly Moore-Seattle, F&BI 103441
Date Extracted:	03/24/21	Lab ID:	103441-05 x10
Date Analyzed:	03/24/21	Data File:	103441-05 x10.114
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
----------	-----------------------------

Iron	45,200
Manganese	1,530

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Method Blank	Client:	Wood Environment & Infrastructure
Date Received:	NA	Project:	Kelly Moore-Seattle, F&BI 103441
Date Extracted:	03/24/21	Lab ID:	I1-183 mb2
Date Analyzed:	03/24/21	Data File:	I1-183 mb2.089
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<1
Chromium	<1
Copper	<5
Iron	<50
Lead	<1
Manganese	<1
Mercury	<1
Nickel	<1
Zinc	<5

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	KMW-04	Client:	Wood Environment & Infrastructure
Date Received:	03/23/21	Project:	Kelly Moore-Seattle, F&BI 103441
Date Extracted:	03/25/21	Lab ID:	103441-01 1/2
Date Analyzed:	03/25/21	Data File:	032509.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	36	15	61
Phenol-d6	31	10	46
Nitrobenzene-d5	92	17	143
2-Fluorobiphenyl	87	50	150
2,4,6-Tribromophenol	102	50	150
Terphenyl-d14	100	50	150

Compounds:	Concentration ug/L (ppb)
Benz(a)anthracene	<0.04
Chrysene	<0.04
Benzo(a)pyrene	<0.04
Benzo(b)fluoranthene	<0.04
Benzo(k)fluoranthene	<0.04
Indeno(1,2,3-cd)pyrene	<0.04
Dibenz(a,h)anthracene	<0.04

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	KMW-06	Client:	Wood Environment & Infrastructure
Date Received:	03/23/21	Project:	Kelly Moore-Seattle, F&BI 103441
Date Extracted:	03/25/21	Lab ID:	103441-02 1/2
Date Analyzed:	03/25/21	Data File:	032510.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	33	15	61
Phenol-d6	18	10	46
Nitrobenzene-d5	95	17	143
2-Fluorobiphenyl	71	50	150
2,4,6-Tribromophenol	84	50	150
Terphenyl-d14	87	50	150

Compounds:	Concentration ug/L (ppb)
Benz(a)anthracene	0.057
Chrysene	0.13
Benzo(a)pyrene	0.31
Benzo(b)fluoranthene	0.34
Benzo(k)fluoranthene	0.11
Indeno(1,2,3-cd)pyrene	0.18
Dibenz(a,h)anthracene	<0.04

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	KMW-09	Client:	Wood Environment & Infrastructure
Date Received:	03/23/21	Project:	Kelly Moore-Seattle, F&BI 103441
Date Extracted:	03/25/21	Lab ID:	103441-03 1/2
Date Analyzed:	03/25/21	Data File:	032511.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	39	15	61
Phenol-d6	28	10	46
Nitrobenzene-d5	76	17	143
2-Fluorobiphenyl	58	50	150
2,4,6-Tribromophenol	80	50	150
Terphenyl-d14	96	50	150

Compounds:	Concentration ug/L (ppb)
Benz(a)anthracene	<0.04
Chrysene	<0.04
Benzo(a)pyrene	<0.04
Benzo(b)fluoranthene	<0.04
Benzo(k)fluoranthene	<0.04
Indeno(1,2,3-cd)pyrene	<0.04
Dibenz(a,h)anthracene	<0.04

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	KMW-10	Client:	Wood Environment & Infrastructure
Date Received:	03/23/21	Project:	Kelly Moore-Seattle, F&BI 103441
Date Extracted:	03/25/21	Lab ID:	103441-04 1/2
Date Analyzed:	03/25/21	Data File:	032513a.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	25	15	61
Phenol-d6	27	10	46
Nitrobenzene-d5	70	17	143
2-Fluorobiphenyl	60	50	150
2,4,6-Tribromophenol	85	50	150
Terphenyl-d14	99	50	150

Compounds:	Concentration ug/L (ppb)
Benz(a)anthracene	0.041
Chrysene	<0.04
Benzo(a)pyrene	0.054
Benzo(b)fluoranthene	0.045
Benzo(k)fluoranthene	<0.04
Indeno(1,2,3-cd)pyrene	<0.04
Dibenz(a,h)anthracene	<0.04

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	Duplicate1	Client:	Wood Environment & Infrastructure
Date Received:	03/23/21	Project:	Kelly Moore-Seattle, F&BI 103441
Date Extracted:	03/25/21	Lab ID:	103441-05 1/2
Date Analyzed:	03/25/21	Data File:	032514.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	35	15	61
Phenol-d6	23	10	46
Nitrobenzene-d5	84	17	143
2-Fluorobiphenyl	68	50	150
2,4,6-Tribromophenol	83	50	150
Terphenyl-d14	100	50	150

Compounds:	Concentration ug/L (ppb)
Benz(a)anthracene	0.070
Chrysene	0.14
Benzo(a)pyrene	0.37
Benzo(b)fluoranthene	0.40
Benzo(k)fluoranthene	0.11
Indeno(1,2,3-cd)pyrene	0.21
Dibenz(a,h)anthracene	<0.04

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	Method Blank	Client:	Wood Environment & Infrastructure
Date Received:	Not Applicable	Project:	Kelly Moore-Seattle, F&BI 103441
Date Extracted:	03/25/21	Lab ID:	01-726 mb
Date Analyzed:	03/25/21	Data File:	032506.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	28	15	61
Phenol-d6	16	10	46
Nitrobenzene-d5	97	17	143
2-Fluorobiphenyl	95	50	150
2,4,6-Tribromophenol	90	50	150
Terphenyl-d14	115	50	150

Compounds:	Concentration ug/L (ppb)
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

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID: KMW-04
 Date Received: 03/23/21
 Date Extracted: 03/24/21
 Date Analyzed: 03/25/21
 Matrix: Water
 Units: ug/L (ppb)

Client: Wood Environment & Infrastructure
 Project: Kelly Moore-Seattle, F&BI 103441
 Lab ID: 103441-01 1/10
 Data File: 032537.D
 Instrument: GCMS4
 Operator: JCM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	86	113
Toluene-d8	103	88	114
4-Bromofluorobenzene	99	88	112

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<10	1,3-Dichloropropane	<10
Chloromethane	<100	Tetrachloroethene	<10
Vinyl chloride	<2	Dibromochloromethane	<10
Bromomethane	<50	1,2-Dibromoethane (EDB)	<10
Chloroethane	<10	Chlorobenzene	<10
Trichlorofluoromethane	<10	Ethylbenzene	1,500
Acetone	<500	1,1,1,2-Tetrachloroethane	<10
1,1-Dichloroethene	<10	m,p-Xylene	4,500 ve
Hexane	<50	o-Xylene	800
Methylene chloride	<50	Styrene	<10
Methyl t-butyl ether (MTBE)	<10	Isopropylbenzene	11
trans-1,2-Dichloroethene	<10	Bromoform	<50
1,1-Dichloroethane	<10	n-Propylbenzene	<10
2,2-Dichloropropane	<10	Bromobenzene	<10
cis-1,2-Dichloroethene	<10	1,3,5-Trimethylbenzene	25
Chloroform	<10	1,1,2,2-Tetrachloroethane	<10
2-Butanone (MEK)	<200	1,2,3-Trichloropropane	<10
1,2-Dichloroethane (EDC)	<10	2-Chlorotoluene	<10
1,1,1-Trichloroethane	<10	4-Chlorotoluene	<10
1,1-Dichloropropene	<10	tert-Butylbenzene	<10
Carbon tetrachloride	<10	1,2,4-Trimethylbenzene	52
Benzene	<3.5	sec-Butylbenzene	<10
Trichloroethene	<10	p-Isopropyltoluene	<10
1,2-Dichloropropane	<10	1,3-Dichlorobenzene	<10
Bromodichloromethane	<10	1,4-Dichlorobenzene	<10
Dibromomethane	<10	1,2-Dichlorobenzene	<10
4-Methyl-2-pentanone	<100	1,2-Dibromo-3-chloropropane	<100
cis-1,3-Dichloropropene	<10	1,2,4-Trichlorobenzene	<10
Toluene	240	Hexachlorobutadiene	<10
trans-1,3-Dichloropropene	<10	Naphthalene	<10
1,1,2-Trichloroethane	<10	1,2,3-Trichlorobenzene	<10
2-Hexanone	<100		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID:	KMW-04	Client:	Wood Environment & Infrastructure
Date Received:	03/23/21	Project:	Kelly Moore-Seattle, F&BI 103441
Date Extracted:	03/24/21	Lab ID:	103441-01 1/200
Date Analyzed:	03/24/21	Data File:	032434.D
Matrix:	Water	Instrument:	GCMS13
Units:	ug/L (ppb)	Operator:	JCM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	85	117
Toluene-d8	99	88	112
4-Bromofluorobenzene	110	90	111

Compounds:	Concentration ug/L (ppb)
m,p-Xylene	4,100

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID:	KMW-06	Client:	Wood Environment & Infrastructure
Date Received:	03/23/21	Project:	Kelly Moore-Seattle, F&BI 103441
Date Extracted:	03/24/21	Lab ID:	103441-02
Date Analyzed:	03/25/21	Data File:	032525.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JCM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	107	86	113
Toluene-d8	99	88	114
4-Bromofluorobenzene	87 ip	88	112

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<1
Bromomethane	<5	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<50	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<5	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	2.8
trans-1,2-Dichloroethene	<1	Bromoform	<5
1,1-Dichloroethane	<1	n-Propylbenzene	3.6
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	<1	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	<1
2-Butanone (MEK)	<20	1,2,3-Trichloropropane	<1
1,2-Dichloroethane (EDC)	<1	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<1	1,2,4-Trimethylbenzene	<1
Benzene	<0.35	sec-Butylbenzene	<1
Trichloroethene	<1	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1	1,3-Dichlorobenzene	<1
Bromodichloromethane	<1	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<10
cis-1,3-Dichloropropene	<1	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	<1
trans-1,3-Dichloropropene	<1	Naphthalene	<1
1,1,2-Trichloroethane	<1	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID:	KMW-09	Client:	Wood Environment & Infrastructure
Date Received:	03/23/21	Project:	Kelly Moore-Seattle, F&BI 103441
Date Extracted:	03/24/21	Lab ID:	103441-03
Date Analyzed:	03/25/21	Data File:	032526.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JCM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	107	86	113
Toluene-d8	100	88	114
4-Bromofluorobenzene	106	88	112

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<1
Bromomethane	<5	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<50	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<5	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	3.3
trans-1,2-Dichloroethene	<1	Bromoform	<5
1,1-Dichloroethane	<1	n-Propylbenzene	3.5
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	<1	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	<1
2-Butanone (MEK)	<20	1,2,3-Trichloropropane	<1
1,2-Dichloroethane (EDC)	<1	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<1	1,2,4-Trimethylbenzene	<1
Benzene	<0.35	sec-Butylbenzene	<1
Trichloroethene	<1	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1	1,3-Dichlorobenzene	<1
Bromodichloromethane	<1	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<10
cis-1,3-Dichloropropene	<1	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	<1
trans-1,3-Dichloropropene	<1	Naphthalene	<1
1,1,2-Trichloroethane	<1	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID: KMW-10	Client: Wood Environment & Infrastructure
Date Received: 03/23/21	Project: Kelly Moore-Seattle, F&BI 103441
Date Extracted: 03/24/21	Lab ID: 103441-04 1/10
Date Analyzed: 03/25/21	Data File: 032538.D
Matrix: Water	Instrument: GCMS4
Units: ug/L (ppb)	Operator: JCM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	86	113
Toluene-d8	102	88	114
4-Bromofluorobenzene	98	88	112

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<10	1,3-Dichloropropane	<10
Chloromethane	<100	Tetrachloroethene	<10
Vinyl chloride	<2	Dibromochloromethane	<10
Bromomethane	<50	1,2-Dibromoethane (EDB)	<10
Chloroethane	<10	Chlorobenzene	<10
Trichlorofluoromethane	<10	Ethylbenzene	2,300 ve
Acetone	<500	1,1,1,2-Tetrachloroethane	<10
1,1-Dichloroethene	<10	m,p-Xylene	4,400 ve
Hexane	<50	o-Xylene	1,300
Methylene chloride	<50	Styrene	<10
Methyl t-butyl ether (MTBE)	<10	Isopropylbenzene	40
trans-1,2-Dichloroethene	<10	Bromoform	<50
1,1-Dichloroethane	<10	n-Propylbenzene	38
2,2-Dichloropropane	<10	Bromobenzene	<10
cis-1,2-Dichloroethene	<10	1,3,5-Trimethylbenzene	20
Chloroform	<10	1,1,2,2-Tetrachloroethane	<10
2-Butanone (MEK)	<200	1,2,3-Trichloropropane	<10
1,2-Dichloroethane (EDC)	<10	2-Chlorotoluene	<10
1,1,1-Trichloroethane	<10	4-Chlorotoluene	<10
1,1-Dichloropropene	<10	tert-Butylbenzene	<10
Carbon tetrachloride	<10	1,2,4-Trimethylbenzene	66
Benzene	<3.5	sec-Butylbenzene	<10
Trichloroethene	<10	p-Isopropyltoluene	<10
1,2-Dichloropropane	<10	1,3-Dichlorobenzene	<10
Bromodichloromethane	<10	1,4-Dichlorobenzene	<10
Dibromomethane	<10	1,2-Dichlorobenzene	<10
4-Methyl-2-pentanone	<100	1,2-Dibromo-3-chloropropane	<100
cis-1,3-Dichloropropene	<10	1,2,4-Trichlorobenzene	<10
Toluene	2,600 ve	Hexachlorobutadiene	<10
trans-1,3-Dichloropropene	<10	Naphthalene	<10
1,1,2-Trichloroethane	<10	1,2,3-Trichlorobenzene	<10
2-Hexanone	<100		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID:	KMW-10	Client:	Wood Environment & Infrastructure
Date Received:	03/23/21	Project:	Kelly Moore-Seattle, F&BI 103441
Date Extracted:	03/24/21	Lab ID:	103441-04 1/200
Date Analyzed:	03/24/21	Data File:	032437.D
Matrix:	Water	Instrument:	GCMS13
Units:	ug/L (ppb)	Operator:	JCM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	92	85	117
Toluene-d8	91	88	112
4-Bromofluorobenzene	118	90	111

Compounds:	Concentration ug/L (ppb)
Ethylbenzene	2,500
m,p-Xylene	4,600
Toluene	3,200

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID:	Duplicate1	Client:	Wood Environment & Infrastructure
Date Received:	03/23/21	Project:	Kelly Moore-Seattle, F&BI 103441
Date Extracted:	03/24/21	Lab ID:	103441-05
Date Analyzed:	03/25/21	Data File:	032527.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JCM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	106	86	113
Toluene-d8	98	88	114
4-Bromofluorobenzene	86 ip	88	112

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<1
Bromomethane	<5	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<50	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<5	o-Xylene	<1
Methylene chloride	5.0 lc	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	2.7
trans-1,2-Dichloroethene	<1	Bromoform	<5
1,1-Dichloroethane	<1	n-Propylbenzene	3.5
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	<1	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	1.2
2-Butanone (MEK)	<20	1,2,3-Trichloropropane	<1
1,2-Dichloroethane (EDC)	<1	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<1	1,2,4-Trimethylbenzene	<1
Benzene	<0.35	sec-Butylbenzene	<1
Trichloroethene	<1	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1	1,3-Dichlorobenzene	<1
Bromodichloromethane	<1	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<10
cis-1,3-Dichloropropene	<1	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	<1
trans-1,3-Dichloropropene	<1	Naphthalene	<1
1,1,2-Trichloroethane	<1	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID:	Method Blank	Client:	Wood Environment & Infrastructure
Date Received:	Not Applicable	Project:	Kelly Moore-Seattle, F&BI 103441
Date Extracted:	03/24/21	Lab ID:	01-662 mb
Date Analyzed:	03/25/21	Data File:	032507.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JCM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	86	113
Toluene-d8	100	88	114
4-Bromofluorobenzene	102	88	112

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<1
Bromomethane	<5	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<50	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<5	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<5
1,1-Dichloroethane	<1	n-Propylbenzene	<1
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	<1	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	<1
2-Butanone (MEK)	<20	1,2,3-Trichloropropane	<1
1,2-Dichloroethane (EDC)	<1	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<1	1,2,4-Trimethylbenzene	<1
Benzene	<0.35	sec-Butylbenzene	<1
Trichloroethene	<1	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1	1,3-Dichlorobenzene	<1
Bromodichloromethane	<1	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<10
cis-1,3-Dichloropropene	<1	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	<1
trans-1,3-Dichloropropene	<1	Naphthalene	<1
1,1,2-Trichloroethane	<1	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/02/21

Date Received: 03/23/21

Project: Kelly Moore-Seattle, F&BI 103441

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER
SAMPLES FOR TPH AS GASOLINE
USING METHOD NWTPH-G_x**

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Gasoline	ug/L (ppb)	1,000	108	88	70-119	20

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/02/21

Date Received: 03/23/21

Project: Kelly Moore-Seattle, F&BI 103441

**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	120	108	63-142	11

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/02/21

Date Received: 03/23/21

Project: Kelly Moore-Seattle, F&BI 103441

**QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF WATER SAMPLES
FOR DISSOLVED METALS USING EPA METHOD 6020B**

Laboratory Code: 103389-01 x10 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Iron	ug/L (ppb)	100	26,800	0 b	722 b	75-125	200 b
Manganese	ug/L (ppb)	20	904	0 b	261 b	75-125	200 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Iron	ug/L (ppb)	100	93	80-120
Manganese	ug/L (ppb)	20	93	80-120

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/02/21

Date Received: 03/23/21

Project: Kelly Moore-Seattle, F&BI 103441

**QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF WATER SAMPLES
FOR TOTAL METALS USING EPA METHOD 200.8 AND SM 2340B**

Laboratory Code: 103413-01 x10 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Calcium	mg/L (ppm)	1.0	53.4	735 b	257 b	70-130	96 b
Magnesium	mg/L (ppm)	1.0	5.79	172 b	115 b	70-130	40 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Calcium	mg/L (ppm)	1.0	102	85-115
Magnesium	mg/L (ppm)	1.0	100	85-115

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/02/21

Date Received: 03/23/21

Project: Kelly Moore-Seattle, F&BI 103441

**QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF WATER SAMPLES
FOR TOTAL METALS USING EPA METHOD 6020B**

Laboratory Code: 103416-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	ug/L (ppb)	10	<1	111	115	75-125	4
Chromium	ug/L (ppb)	20	<1	103	101	75-125	2
Copper	ug/L (ppb)	20	8.10	102	103	75-125	1
Iron	ug/L (ppb)	100	67.8	105	99	75-125	6
Lead	ug/L (ppb)	10	32.2	105	90	75-125	15
Manganese	ug/L (ppb)	20	5.67	104	102	75-125	2
Mercury	ug/L (ppb)	5	<1	99	100	75-125	1
Nickel	ug/L (ppb)	20	<1	101	99	75-125	2
Zinc	ug/L (ppb)	50	53.3	100	91	75-125	9

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	ug/L (ppb)	10	106	80-120
Chromium	ug/L (ppb)	20	100	80-120
Copper	ug/L (ppb)	20	112	80-120
Iron	ug/L (ppb)	100	101	80-120
Lead	ug/L (ppb)	10	100	80-120
Manganese	ug/L (ppb)	20	103	80-120
Mercury	ug/L (ppb)	5	100	80-120
Nickel	ug/L (ppb)	20	99	80-120
Zinc	ug/L (ppb)	50	101	80-120

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/02/21

Date Received: 03/23/21

Project: Kelly Moore-Seattle, F&BI 103441

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR SEMIVOLATILES BY EPA METHOD 8270E

Laboratory Code: 103462-01 1/2 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Benz(a)anthracene	ug/L (ppb)	5	<0.04	106	102	50-150	4
Chrysene	ug/L (ppb)	5	<0.04	99	96	50-150	3
Benzo(a)pyrene	ug/L (ppb)	5	<0.04	112	109	50-150	3
Benzo(b)fluoranthene	ug/L (ppb)	5	<0.04	110	106	50-150	4
Benzo(k)fluoranthene	ug/L (ppb)	5	<0.04	105	104	50-150	1
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	5	<0.04	102	101	50-150	1
Dibenz(a,h)anthracene	ug/L (ppb)	5	<0.04	98	93	50-150	5

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benz(a)anthracene	ug/L (ppb)	5	99	70-130
Chrysene	ug/L (ppb)	5	96	70-130
Benzo(a)pyrene	ug/L (ppb)	5	103	70-130
Benzo(b)fluoranthene	ug/L (ppb)	5	98	62-130
Benzo(k)fluoranthene	ug/L (ppb)	5	97	70-130
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	5	113	70-130
Dibenz(a,h)anthracene	ug/L (ppb)	5	111	70-130

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/02/21

Date Received: 03/23/21

Project: Kelly Moore-Seattle, F&BI 103441

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260D

Laboratory Code: 103429-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Dichlorodifluoromethane	ug/L (ppb)	10	<1	110	10-172
Chloromethane	ug/L (ppb)	10	<10	79	25-166
Vinyl chloride	ug/L (ppb)	10	<0.2	91	36-166
Bromomethane	ug/L (ppb)	10	<5	126	47-169
Chloroethane	ug/L (ppb)	10	<1	92	46-160
Trichlorofluoromethane	ug/L (ppb)	10	<1	99	44-165
Acetone	ug/L (ppb)	50	<50	96	10-182
1,1-Dichloroethene	ug/L (ppb)	10	<1	105	58-142
Hexane	ug/L (ppb)	10	<5	101	38-152
Methylene chloride	ug/L (ppb)	10	<5	113	50-145
Methyl t-butyl ether (MTBE)	ug/L (ppb)	10	<1	103	61-136
trans-1,2-Dichloroethene	ug/L (ppb)	10	<1	103	61-136
1,1-Dichloroethane	ug/L (ppb)	10	<1	99	63-135
2,2-Dichloropropane	ug/L (ppb)	10	<1	106	36-154
cis-1,2-Dichloroethene	ug/L (ppb)	10	<1	100	63-134
Chloroform	ug/L (ppb)	10	<1	103	61-135
2-Butanone (MEK)	ug/L (ppb)	50	<20	107	10-129
1,2-Dichloroethane (EDC)	ug/L (ppb)	10	<1	104	48-149
1,1,1-Trichloroethane	ug/L (ppb)	10	<1	102	60-146
1,1-Dichloropropene	ug/L (ppb)	10	<1	103	69-133
Carbon tetrachloride	ug/L (ppb)	10	<1	105	56-152
Benzene	ug/L (ppb)	10	<0.35	104	57-135
Trichloroethene	ug/L (ppb)	10	<1	102	66-135
1,2-Dichloropropane	ug/L (ppb)	10	<1	100	59-136
Bromodichloromethane	ug/L (ppb)	10	<1	96	61-150
Dibromomethane	ug/L (ppb)	10	<1	105	66-141
4-Methyl-2-pentanone	ug/L (ppb)	50	<10	114	10-185
cis-1,3-Dichloropropene	ug/L (ppb)	10	<1	98	52-147
Toluene	ug/L (ppb)	10	<1	100	50-137
trans-1,3-Dichloropropene	ug/L (ppb)	10	<1	89	53-142
1,1,2-Trichloroethane	ug/L (ppb)	10	<1	99	68-131
2-Hexanone	ug/L (ppb)	50	<10	109	10-185
1,3-Dichloropropane	ug/L (ppb)	10	<1	98	60-135
Tetrachloroethene	ug/L (ppb)	10	<1	111	10-226
Dibromochloromethane	ug/L (ppb)	10	<1	92	52-145
1,2-Dibromoethane (EDB)	ug/L (ppb)	10	<1	101	62-135
Chlorobenzene	ug/L (ppb)	10	<1	103	63-130
Ethylbenzene	ug/L (ppb)	10	<1	99	60-133
1,1,1,2-Tetrachloroethane	ug/L (ppb)	10	<1	97	56-143
m,p-Xylene	ug/L (ppb)	20	<2	102	69-135
o-Xylene	ug/L (ppb)	10	<1	100	60-140
Styrene	ug/L (ppb)	10	<1	98	60-133
Isopropylbenzene	ug/L (ppb)	10	<1	97	65-142
Bromoform	ug/L (ppb)	10	<5	89	54-148
n-Propylbenzene	ug/L (ppb)	10	<1	97	58-144
Bromobenzene	ug/L (ppb)	10	<1	100	61-130
1,3,5-Trimethylbenzene	ug/L (ppb)	10	<1	97	59-134
1,1,2,2-Tetrachloroethane	ug/L (ppb)	10	<1	96	51-154
1,2,3-Trichloropropane	ug/L (ppb)	10	<1	98	53-150
2-Chlorotoluene	ug/L (ppb)	10	<1	96	66-127
4-Chlorotoluene	ug/L (ppb)	10	<1	97	65-130
tert-Butylbenzene	ug/L (ppb)	10	<1	96	65-137
1,2,4-Trimethylbenzene	ug/L (ppb)	10	<1	93	59-146
sec-Butylbenzene	ug/L (ppb)	10	<1	97	64-140
p-Isopropyltoluene	ug/L (ppb)	10	<1	97	65-141
1,3-Dichlorobenzene	ug/L (ppb)	10	<1	101	60-131
1,4-Dichlorobenzene	ug/L (ppb)	10	<1	101	60-129
1,2-Dichlorobenzene	ug/L (ppb)	10	<1	98	60-130
1,2-Dibromo-3-chloropropane	ug/L (ppb)	10	<10	89	32-164
1,2,4-Trichlorobenzene	ug/L (ppb)	10	<1	94	52-138
Hexachlorobutadiene	ug/L (ppb)	10	<1	98	60-143
Naphthalene	ug/L (ppb)	10	<1	93	44-164
1,2,3-Trichlorobenzene	ug/L (ppb)	10	<1	93	69-148

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/02/21

Date Received: 03/23/21

Project: Kelly Moore-Seattle, F&BI 103441

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260D

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Dichlorodifluoromethane	ug/L (ppb)	10	98	104	25-158	6
Chloromethane	ug/L (ppb)	10	83	82	45-156	1
Vinyl chloride	ug/L (ppb)	10	88	90	50-154	2
Bromomethane	ug/L (ppb)	10	106	134	55-143	23 vo
Chloroethane	ug/L (ppb)	10	82	88	58-146	7
Trichlorofluoromethane	ug/L (ppb)	10	91	96	50-150	5
Acetone	ug/L (ppb)	50	95	95	22-155	0
1,1-Dichloroethene	ug/L (ppb)	10	105	104	67-136	1
Hexane	ug/L (ppb)	10	88	90	57-137	2
Methylene chloride	ug/L (ppb)	10	108	109	19-178	1
Methyl t-butyl ether (MTBE)	ug/L (ppb)	10	100	103	64-147	3
trans-1,2-Dichloroethene	ug/L (ppb)	10	101	100	68-128	1
1,1-Dichloroethane	ug/L (ppb)	10	96	97	74-135	1
2,2-Dichloropropane	ug/L (ppb)	10	99	98	55-143	1
cis-1,2-Dichloroethene	ug/L (ppb)	10	99	99	74-136	0
Chloroform	ug/L (ppb)	10	101	102	74-134	1
2-Butanone (MEK)	ug/L (ppb)	50	105	107	37-150	2
1,2-Dichloroethane (EDC)	ug/L (ppb)	10	102	105	66-129	3
1,1,1-Trichloroethane	ug/L (ppb)	10	100	99	74-142	1
1,1-Dichloropropene	ug/L (ppb)	10	99	100	77-129	1
Carbon tetrachloride	ug/L (ppb)	10	103	106	75-158	3
Benzene	ug/L (ppb)	10	101	102	69-134	1
Trichloroethene	ug/L (ppb)	10	99	100	67-133	1
1,2-Dichloropropane	ug/L (ppb)	10	99	101	71-134	2
Bromodichloromethane	ug/L (ppb)	10	96	94	66-126	2
Dibromomethane	ug/L (ppb)	10	103	105	68-132	2
4-Methyl-2-pentanone	ug/L (ppb)	50	108	109	65-138	1
cis-1,3-Dichloropropene	ug/L (ppb)	10	97	98	74-140	1
Toluene	ug/L (ppb)	10	99	99	72-122	0
trans-1,3-Dichloropropene	ug/L (ppb)	10	90	89	80-136	1
1,1,2-Trichloroethane	ug/L (ppb)	10	97	100	75-124	3
2-Hexanone	ug/L (ppb)	50	103	106	60-136	3
1,3-Dichloropropene	ug/L (ppb)	10	98	100	76-126	2
Tetrachloroethene	ug/L (ppb)	10	102	103	76-121	1
Dibromochloromethane	ug/L (ppb)	10	92	93	84-133	1
1,2-Dibromoethane (EDB)	ug/L (ppb)	10	101	102	82-115	1
Chlorobenzene	ug/L (ppb)	10	101	104	83-114	3
Ethylbenzene	ug/L (ppb)	10	97	99	77-124	2
1,1,1,2-Tetrachloroethane	ug/L (ppb)	10	96	96	84-127	0
m,p-Xylene	ug/L (ppb)	20	100	101	81-112	1
o-Xylene	ug/L (ppb)	10	98	99	81-121	1
Styrene	ug/L (ppb)	10	96	98	84-119	2
Isopropylbenzene	ug/L (ppb)	10	94	96	80-117	2
Bromoform	ug/L (ppb)	10	88	91	69-121	3
n-Propylbenzene	ug/L (ppb)	10	97	98	74-126	1
Bromobenzene	ug/L (ppb)	10	104	103	80-121	1
1,3,5-Trimethylbenzene	ug/L (ppb)	10	98	97	78-123	1
1,1,2,2-Tetrachloroethane	ug/L (ppb)	10	100	100	66-126	0
1,2,3-Trichloropropane	ug/L (ppb)	10	102	102	67-124	0
2-Chlorotoluene	ug/L (ppb)	10	99	97	77-127	2
4-Chlorotoluene	ug/L (ppb)	10	99	98	78-128	1
tert-Butylbenzene	ug/L (ppb)	10	97	97	80-123	0
1,2,4-Trimethylbenzene	ug/L (ppb)	10	95	95	79-122	0
sec-Butylbenzene	ug/L (ppb)	10	96	97	80-116	1
p-Isopropyltoluene	ug/L (ppb)	10	96	97	81-123	1
1,3-Dichlorobenzene	ug/L (ppb)	10	101	101	83-113	0
1,4-Dichlorobenzene	ug/L (ppb)	10	100	102	81-112	2
1,2-Dichlorobenzene	ug/L (ppb)	10	99	101	84-112	2
1,2-Dibromo-3-chloropropane	ug/L (ppb)	10	90	93	57-141	3
1,2,4-Trichlorobenzene	ug/L (ppb)	10	92	93	72-130	1
Hexachlorobutadiene	ug/L (ppb)	10	89	92	53-141	3
Naphthalene	ug/L (ppb)	10	91	91	64-133	0
1,2,3-Trichlorobenzene	ug/L (ppb)	10	94	95	65-136	1

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.

103441

SAMPLE CHAIN OF CUSTODY

ME 03/23/21

VW3/E03/AD4

Report To Brady Lubenow
Christy DuitmanCompany WoodAddress 4020 Lake Washington Blvd NE #200City, State, ZIP Kirkland, WA 98033Phone 507-236-8843 Email brady.lubenow@woodplc.com
christy.duitman@woodplc.comSAMPLERS (signature) Brady Lubenow

PROJECT NAME

Kelly Moore - Seattle

PO #

REMARKS

INVOICE TO

Wood

Project specific RLs? - Yes / No

Page # 1 of 1

TURNAROUND 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	SVOCs EPA 8270	PCBs EPA 8082	1°	2°	3°	4°	Notes
KMW-04	01 A-R	3/23/2021	1520	GW	18	X	X			X	X		X	X	X	X	See Remarks #1-4
KMW-06	02		0905		18	X	X			X	X		X	X	X	X	Bottle times say 0505 See Remarks #1-4
KMW-09	03		1130		18	X	X			X	X		X	X	X	X	* See Remarks #1-4
KMW-10	04		1320		18	X	X			X	X		X	X	X	X	* See Remarks #1-4
Duplicate 1	05	↓	0940	↓	18	X	X			X	X		X	X	X	X	Bottle times say 0540 * See Remarks #1-4
* Remarks																	
1. Total Metals (As, Cr, Cu, Pb, Hg, Ni, Zn) by 6020B																	
2. Volatile Fatty Acids by SM 5560 + Biological Oxygen Demand by SM 5210B/EPA 405.1 + Chemical Oxygen Demand by EPA 410.1-2, EPA 410-3, EPA 410.4, SM 5220 + Dissolved gases (methane, ethane, ethene, CO2) by RSK-175																	
3. Dissolved AND Total Cations (Fe, Ca, Mn, Al, NA) by EPA 6020B + Anions (sulfate, nitrate) by EPA 300.0/300.1																	
4. Total Organic Carbon by 9060A/SM 5310B + Alkalinity by SM 2320/EPA 310.1 + Hardness by SM 2340B																	

Friedman & Bruya, Inc.

3012 16th Avenue West

Seattle, WA 98119-2029

Ph. (206) 285-8282

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: <u>Brady Lubenow</u>	<u>Brady Lubenow</u>	<u>Wood</u>	<u>3/23/21</u>	<u>1700</u>
Received by: <u>Eric Porne</u>	<u>ERIC Porne</u>	<u>ECB</u>	<u>3/23/21</u>	<u>1700</u>
Relinquished by:				
Received by:		Samples received at <u>4</u> °C		



Fremont
Analytical

3600 Fremont Ave. N.

Seattle, WA 98103

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Friedman & Bruya

Michael Erdahl

3012 16th Ave. W.

Seattle, WA 98119

RE: 103441

Work Order Number: 2103389

March 31, 2021

Attention Michael Erdahl:

Fremont Analytical, Inc. received 5 sample(s) on 3/24/2021 for the analyses presented in the following report.

Biochemical Oxygen Demand by SM 5210B

Carbon Dioxide by SM 2320B/SM4500-CO2D

Chemical Oxygen Demand by SM 5220D

Dissolved Gases by RSK-175

Dissolved Metals by EPA Method 200.8

Ion Chromatography by EPA Method 300.0

Total Metals by EPA Method 200.8

Total Alkalinity by SM 2320B

Total Organic Carbon by SM 5310C

This report consists of the following:

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

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

Thank you for using Fremont Analytical.

Sincerely,

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

Original

www.fremontanalytical.com

Brianna Barnes
Project Manager

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

Original

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CLIENT: Friedman & Bruya
Project: 103441
Work Order: 2103389

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
2103389-001	KMW-04	03/23/2021 3:20 PM	03/24/2021 9:46 AM
2103389-002	KMW-06	03/23/2021 9:05 AM	03/24/2021 9:46 AM
2103389-003	KMW-09	03/23/2021 11:30 AM	03/24/2021 9:46 AM
2103389-004	KMW-10	03/23/2021 1:20 PM	03/24/2021 9:46 AM
2103389-005	Duplicate 1	03/23/2021 9:40 AM	03/24/2021 9:46 AM

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

CLIENT: Friedman & Bruya
Project: 103441

I. SAMPLE RECEIPT:

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

II. GENERAL REPORTING COMMENTS:

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

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

III. ANALYSES AND EXCEPTIONS:

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

Qualifiers:

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

Acronyms:

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



Client: Friedman & Bruya

Collection Date: 3/23/2021 3:20:00 PM

Project: 103441

Lab ID: 2103389-001

Matrix: Water

Client Sample ID: KMW-04

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<u>Biochemical Oxygen Demand by SM 5210B</u>				Batch ID: R66256		Analyst: SS
Biochemical Oxygen Demand	12.9	2.00		mg/L	1	3/25/2021 11:15:00 AM
<u>Dissolved Gases by RSK-175</u>				Batch ID: R66194		Analyst: MS
Methane	0.260	0.00675		mg/L	1	3/29/2021 3:45:00 PM
Ethene	ND	0.0146		mg/L	1	3/29/2021 3:45:00 PM
Ethane	ND	0.0151		mg/L	1	3/29/2021 3:45:00 PM
<u>Ion Chromatography by EPA Method 300.0</u>				Batch ID: 31757		Analyst: SS
Nitrate (as N)	1.38	0.200	D	mg/L	2	3/24/2021 8:47:00 PM
Sulfate	40.5	3.00	D	mg/L	5	3/26/2021 5:30:00 PM
<u>Dissolved Metals by EPA Method 200.8</u>				Batch ID: 31792		Analyst: TN
Aluminum	ND	100		µg/L	1	3/29/2021 3:22:04 PM
Calcium	16,900	525		µg/L	1	3/29/2021 3:22:04 PM
Magnesium	2,780	100		µg/L	1	3/29/2021 3:22:04 PM
Sodium	8,750	250		µg/L	1	3/29/2021 3:22:04 PM
<u>Total Metals by EPA Method 200.8</u>				Batch ID: 31762		Analyst: EH
Aluminum	ND	100		µg/L	1	3/25/2021 5:55:19 PM
Calcium	14,700	200		µg/L	1	3/25/2021 5:55:19 PM
Magnesium	2,620	100		µg/L	1	3/25/2021 5:55:19 PM
Sodium	8,370	200		µg/L	1	3/25/2021 5:55:19 PM
<u>Total Organic Carbon by SM 5310C</u>				Batch ID: R66258		Analyst: SS
Total Organic Carbon	5.08	0.500		mg/L	1	3/31/2021 10:10:00 AM
<u>Total Alkalinity by SM 2320B</u>				Batch ID: R66239		Analyst: WF
Alkalinity, Total (As CaCO ₃)	15.3	2.50		mg/L	1	3/31/2021 10:56:16 AM
<u>Carbon Dioxide by SM 2320B/SM4500-CO₂D</u>				Batch ID: R66240		Analyst: WF
Carbon Dioxide	41.9	2.50		mg/L	1	3/31/2021 10:56:42 AM



Analytical Report

Work Order: 2103389
Date Reported: 3/31/2021

Client: Friedman & Bruya

Collection Date: 3/23/2021 3:20:00 PM

Project: 103441

Lab ID: 2103389-001

Matrix: Water

Client Sample ID: KMW-04

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Chemical Oxygen Demand by SM 5220D

Batch ID: R66180 Analyst: LB

Chemical Oxygen Demand	12.6	10.0		mg/L	1	3/29/2021 3:28:06 PM
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Client: Friedman & Bruya

Collection Date: 3/23/2021 9:05:00 AM

Project: 103441

Lab ID: 2103389-002

Matrix: Water

Client Sample ID: KMW-06

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Biochemical Oxygen Demand by SM 5210B

Batch ID: R66256 Analyst: SS

Biochemical Oxygen Demand	39.5	2.00	H	mg/L	1	3/25/2021 11:15:00 AM
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NOTES:

All dilutions resulted in full oxygen depletion. Result calculated using the smallest amount of sample (largest dilution). True value equal to or greater than posted result.

Dissolved Gases by RSK-175

Batch ID: R66194 Analyst: MS

Methane	1.38	0.0675	D	mg/L	10	3/29/2021 4:06:00 PM
Ethene	ND	0.0146		mg/L	1	3/29/2021 3:47:00 PM
Ethane	ND	0.0151		mg/L	1	3/29/2021 3:47:00 PM

Ion Chromatography by EPA Method 300.0

Batch ID: 31757 Analyst: SS

Nitrate (as N)	ND	0.500	D	mg/L	5	3/24/2021 9:56:00 PM
Sulfate	121	12.0	D	mg/L	20	3/26/2021 5:53:00 PM

NOTES:

Diluted due to high levels of non-target analytes.

Dissolved Metals by EPA Method 200.8

Batch ID: 31792 Analyst: TN

Aluminum	ND	100		µg/L	1	3/29/2021 3:49:54 PM
Calcium	61,300	525		µg/L	1	3/29/2021 3:49:54 PM
Magnesium	14,600	100		µg/L	1	3/29/2021 3:49:54 PM
Sodium	84,200	250		µg/L	1	3/29/2021 3:49:54 PM

Total Metals by EPA Method 200.8

Batch ID: 31762 Analyst: EH

Aluminum	303	100		µg/L	1	3/25/2021 6:00:53 PM
Calcium	54,100	200		µg/L	1	3/25/2021 6:00:53 PM
Magnesium	13,800	100		µg/L	1	3/25/2021 6:00:53 PM
Sodium	92,700	200		µg/L	1	3/25/2021 6:00:53 PM

Total Organic Carbon by SM 5310C

Batch ID: R66258 Analyst: SS

Total Organic Carbon	157	2.50	D	mg/L	5	3/31/2021 10:33:00 AM
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Total Alkalinity by SM 2320B

Batch ID: R66239 Analyst: WF

Alkalinity, Total (As CaCO ₃)	162	2.50		mg/L	1	3/31/2021 10:56:16 AM
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Original



Analytical Report

Work Order: 2103389

Date Reported: 3/31/2021

Client: Friedman & Bruya

Collection Date: 3/23/2021 9:05:00 AM

Project: 103441

Lab ID: 2103389-002

Matrix: Water

Client Sample ID: KMW-06

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<u>Carbon Dioxide by SM 2320B/SM4500-CO2D</u>				Batch ID: R66240		Analyst: WF
Carbon Dioxide	264	2.50		mg/L	1	3/31/2021 10:56:42 AM
<u>Chemical Oxygen Demand by SM 5220D</u>				Batch ID: R66180		Analyst: LB
Chemical Oxygen Demand	98.0	10.0		mg/L	1	3/29/2021 3:28:06 PM



Client: Friedman & Bruya

Collection Date: 3/23/2021 11:30:00 AM

Project: 103441

Lab ID: 2103389-003

Matrix: Water

Client Sample ID: KMW-09

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Biochemical Oxygen Demand by SM 5210B

Batch ID: R66256 Analyst: SS

Biochemical Oxygen Demand	11.5	2.00		mg/L	1	3/25/2021 11:15:00 AM
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Dissolved Gases by RSK-175

Batch ID: R66194 Analyst: MS

Methane	0.700	0.0675	D	mg/L	10	3/29/2021 4:08:00 PM
Ethene	ND	0.0146		mg/L	1	3/29/2021 3:49:00 PM
Ethane	ND	0.0151		mg/L	1	3/29/2021 3:49:00 PM

Ion Chromatography by EPA Method 300.0

Batch ID: 31757 Analyst: SS

Nitrate (as N)	ND	0.400	D	mg/L	4	3/24/2021 10:19:00 PM
Sulfate	58.2	6.00	D	mg/L	10	3/26/2021 6:16:00 PM

NOTES:

Diluted due to high levels of non-target analytes.

Dissolved Metals by EPA Method 200.8

Batch ID: 31792 Analyst: TN

Aluminum	ND	100		µg/L	1	3/29/2021 3:55:28 PM
Calcium	31,500	525		µg/L	1	3/29/2021 3:55:28 PM
Magnesium	8,850	100		µg/L	1	3/29/2021 3:55:28 PM
Sodium	32,500	250		µg/L	1	3/29/2021 3:55:28 PM

Total Metals by EPA Method 200.8

Batch ID: 31762 Analyst: EH

Aluminum	ND	100		µg/L	1	3/25/2021 6:06:28 PM
Calcium	30,100	200		µg/L	1	3/25/2021 6:06:28 PM
Magnesium	8,750	100		µg/L	1	3/25/2021 6:06:28 PM
Sodium	30,400	200		µg/L	1	3/25/2021 6:06:28 PM

Total Organic Carbon by SM 5310C

Batch ID: R66258 Analyst: SS

Total Organic Carbon	19.0	0.500		mg/L	1	3/31/2021 10:56:00 AM
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Total Alkalinity by SM 2320B

Batch ID: R66239 Analyst: WF

Alkalinity, Total (As CaCO ₃)	110	2.50		mg/L	1	3/31/2021 10:56:16 AM
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Analytical Report

Work Order: 2103389

Date Reported: 3/31/2021

Client: Friedman & Bruya

Project: 103441

Lab ID: 2103389-003

Client Sample ID: KMW-09

Collection Date: 3/23/2021 11:30:00 AM

Matrix: Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<u>Carbon Dioxide by SM 2320B/SM4500-CO2D</u>				Batch ID: R66240		Analyst: WF
Carbon Dioxide	115	2.50		mg/L	1	3/31/2021 10:56:42 AM
<u>Chemical Oxygen Demand by SM 5220D</u>				Batch ID: R66180		Analyst: LB
Chemical Oxygen Demand	59.1	10.0		mg/L	1	3/29/2021 3:28:06 PM



Client: Friedman & Bruya

Collection Date: 3/23/2021 1:20:00 PM

Project: 103441

Lab ID: 2103389-004

Matrix: Water

Client Sample ID: KMW-10

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Biochemical Oxygen Demand by SM 5210B

Batch ID: R66256 Analyst: SS

Biochemical Oxygen Demand	38.9	2.00		mg/L	1	3/25/2021 11:15:00 AM
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NOTES:

All dilutions resulted in full oxygen depletion. Result calculated using the smallest amount of sample (largest dilution). True value equal to or greater than posted result.

Dissolved Gases by RSK-175

Batch ID: R66194 Analyst: MS

Methane	5.79	0.270	D	mg/L	40	3/29/2021 4:11:00 PM
Ethene	ND	0.0146		mg/L	1	3/29/2021 3:51:00 PM
Ethane	ND	0.0151		mg/L	1	3/29/2021 3:51:00 PM

Ion Chromatography by EPA Method 300.0

Batch ID: 31757 Analyst: SS

Nitrate (as N)	ND	0.500	D	mg/L	5	3/24/2021 10:42:00 PM
Nitrate (as N)	ND	0.200	DH	mg/L	2	3/26/2021 7:25:00 PM
Sulfate	1.77	1.20	D	mg/L	2	3/26/2021 7:25:00 PM

NOTES:

Diluted due to high levels of non-target analytes.

Dissolved Metals by EPA Method 200.8

Batch ID: 31792 Analyst: TN

Aluminum	ND	100		µg/L	1	3/29/2021 4:01:02 PM
Calcium	33,600	525		µg/L	1	3/29/2021 4:01:02 PM
Magnesium	7,420	100		µg/L	1	3/29/2021 4:01:02 PM
Sodium	62,900	250		µg/L	1	3/29/2021 4:01:02 PM

Total Metals by EPA Method 200.8

Batch ID: 31762 Analyst: EH

Aluminum	156	100		µg/L	1	3/25/2021 6:12:02 PM
Calcium	35,500	200		µg/L	1	3/25/2021 6:12:02 PM
Magnesium	8,150	100		µg/L	1	3/25/2021 6:12:02 PM
Sodium	70,300	200		µg/L	1	3/25/2021 6:12:02 PM

Total Organic Carbon by SM 5310C

Batch ID: R66258 Analyst: SS

Total Organic Carbon	32.4	0.500		mg/L	1	3/31/2021 11:19:00 AM
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Analytical Report

Work Order: 2103389

Date Reported: 3/31/2021

Client: Friedman & Bruya

Collection Date: 3/23/2021 1:20:00 PM

Project: 103441

Lab ID: 2103389-004

Matrix: Water

Client Sample ID: KMW-10

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Total Alkalinity by SM 2320B

Batch ID: R66239 Analyst: WF

Alkalinity, Total (As CaCO ₃)	215	2.50		mg/L	1	3/31/2021 10:56:16 AM
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Carbon Dioxide by SM 2320B/SM4500-CO2D

Batch ID: R66240 Analyst: WF

Carbon Dioxide	203	2.50		mg/L	1	3/31/2021 10:56:42 AM
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Chemical Oxygen Demand by SM 5220D

Batch ID: R66180 Analyst: LB

Chemical Oxygen Demand	127	10.0		mg/L	1	3/29/2021 3:28:06 PM
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Analytical Report

Work Order: 2103389

Date Reported: 3/31/2021

Client: Friedman & Bruya

Collection Date: 3/23/2021 9:40:00 AM

Project: 103441

Lab ID: 2103389-005

Matrix: Water

Client Sample ID: Duplicate 1

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Biochemical Oxygen Demand by SM 5210B

Batch ID: R66256 Analyst: SS

Biochemical Oxygen Demand	39.4	2.00	H	mg/L	1	3/25/2021 11:15:00 AM
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NOTES:

All dilutions resulted in full oxygen depletion. Result calculated using the smallest amount of sample (largest dilution). True value equal to or greater than posted result.

Dissolved Gases by RSK-175

Batch ID: R66194 Analyst: MS

Methane	1.40	0.0675	D	mg/L	10	3/29/2021 4:13:00 PM
Ethene	ND	0.0146		mg/L	1	3/29/2021 3:53:00 PM
Ethane	ND	0.0151		mg/L	1	3/29/2021 3:53:00 PM

Ion Chromatography by EPA Method 300.0

Batch ID: 31757 Analyst: SS

Nitrate (as N)	ND	0.500	D	mg/L	5	3/24/2021 11:05:00 PM
Sulfate	135	12.0	D	mg/L	20	3/26/2021 7:48:00 PM

NOTES:

Diluted due to high levels of non-target analytes.

Dissolved Metals by EPA Method 200.8

Batch ID: 31792 Analyst: TN

Aluminum	ND	100		µg/L	1	3/29/2021 4:06:36 PM
Calcium	56,400	525		µg/L	1	3/29/2021 4:06:36 PM
Magnesium	13,800	100		µg/L	1	3/29/2021 4:06:36 PM
Sodium	79,400	250		µg/L	1	3/29/2021 4:06:36 PM

Total Metals by EPA Method 200.8

Batch ID: 31762 Analyst: EH

Aluminum	309	100		µg/L	1	3/25/2021 6:28:48 PM
Calcium	54,400	200		µg/L	1	3/25/2021 6:28:48 PM
Magnesium	13,500	100		µg/L	1	3/25/2021 6:28:48 PM
Sodium	90,600	200		µg/L	1	3/25/2021 6:28:48 PM

Total Organic Carbon by SM 5310C

Batch ID: R66258 Analyst: SS

Total Organic Carbon	157	2.50	D	mg/L	5	3/31/2021 11:42:00 AM
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Total Alkalinity by SM 2320B

Batch ID: R66239 Analyst: WF

Alkalinity, Total (As CaCO ₃)	162	2.50		mg/L	1	3/31/2021 10:56:16 AM
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Original



Analytical Report

Work Order: 2103389
Date Reported: 3/31/2021

Client: Friedman & Bruya

Collection Date: 3/23/2021 9:40:00 AM

Project: 103441

Lab ID: 2103389-005

Matrix: Water

Client Sample ID: Duplicate 1

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<u>Carbon Dioxide by SM 2320B/SM4500-CO2D</u>				Batch ID: R66240		Analyst: WF
Carbon Dioxide	255	2.50		mg/L	1	3/31/2021 10:56:42 AM
<u>Chemical Oxygen Demand by SM 5220D</u>				Batch ID: R66180		Analyst: LB
Chemical Oxygen Demand	119	10.0		mg/L	1	3/29/2021 3:28:06 PM

Work Order: 2103389
CLIENT: Friedman & Bruya
Project: 103441

QC SUMMARY REPORT

Biochemical Oxygen Demand by SM 5210B

Sample ID: MB-66256		SampType: MBLK			Units: mg/L		Prep Date: 3/25/2021			RunNo: 66256		
Client ID: MBLKW		Batch ID: R66256			Analysis Date: 3/25/2021			SeqNo: 1332976				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Biochemical Oxygen Demand	ND	2.00									
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Sample ID: LCS-66256		SampType: LCS			Units: mg/L		Prep Date: 3/25/2021			RunNo: 66256		
Client ID: LCSW		Batch ID: R66256			Analysis Date: 3/25/2021			SeqNo: 1332977				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Biochemical Oxygen Demand	194	2.00	198.0	0	97.9	84.6	115.4				
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Sample ID: 2103389-001BDUP		SampType: DUP			Units: mg/L		Prep Date: 3/25/2021			RunNo: 66256		
Client ID: KMW-04		Batch ID: R66256			Analysis Date: 3/25/2021			SeqNo: 1332979				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Biochemical Oxygen Demand	12.4	2.00						12.92	3.79	20	
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Work Order: 2103389
CLIENT: Friedman & Bruya
Project: 103441

QC SUMMARY REPORT

Total Alkalinity by SM 2320B

Sample ID: MB-R66239		SampType: MBLK			Units: mg/L		Prep Date: 3/31/2021			RunNo: 66239		
Client ID: MBLKW		Batch ID: R66239			Analysis Date: 3/31/2021			SeqNo: 1332672				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Alkalinity, Total (As CaCO3) ND 2.50

Sample ID: LCS-R66239		SampType: LCS			Units: mg/L		Prep Date: 3/31/2021			RunNo: 66239		
Client ID: LCSW		Batch ID: R66239			Analysis Date: 3/31/2021			SeqNo: 1332673				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Alkalinity, Total (As CaCO3) 101 2.50 100.0 0 101 99.1 105

Sample ID: 2103389-001BDUP		SampType: DUP			Units: mg/L		Prep Date: 3/31/2021			RunNo: 66239		
Client ID: KMW-04		Batch ID: R66239			Analysis Date: 3/31/2021					SeqNo: 1332675		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Alkalinity, Total (As CaCO3) 15.8 2.50 15.28 3.08 20

Sample ID: 2103398-006BDUP		SampType: DUP			Units: mg/L		Prep Date: 3/31/2021			RunNo: 66239		
Client ID: BATCH		Batch ID: R66239			Analysis Date: 3/31/2021					SeqNo: 1332796		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Alkalinity, Total (As CaCO3) 110 2.50 105.0 4.44 20

Work Order: 2103389
CLIENT: Friedman & Bruya
Project: 103441

QC SUMMARY REPORT

Carbon Dioxide by SM 2320B/SM4500-CO2D

Sample ID: MB-R66240		SampType: MBLK			Units: mg/L		Prep Date: 3/31/2021			RunNo: 66240		
Client ID: MBLKW		Batch ID: R66240			Analysis Date: 3/31/2021					SeqNo: 1332664		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Alkalinity, Total (As CaCO3)	ND	2.50									
Carbon Dioxide	ND	2.50									

Sample ID: LCS-R66240		SampType: LCS			Units: mg/L		Prep Date: 3/31/2021			RunNo: 66240		
Client ID: LCSW		Batch ID: R66240			Analysis Date: 3/31/2021			SeqNo: 1332665				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Alkalinity, Total (As CaCO3)	101	2.50	100.0	0	101	94.3	116				
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Sample ID: 2103389-001CDUP		SampType: DUP			Units: mg/L		Prep Date: 3/31/2021			RunNo: 66240		
Client ID: KMW-04		Batch ID: R66240			Analysis Date: 3/31/2021					SeqNo: 1332667		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Carbon Dioxide	42.6	2.50						41.91	1.69	20	
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Work Order: 2103389
CLIENT: Friedman & Bruya
Project: 103441

QC SUMMARY REPORT

Chemical Oxygen Demand by SM 5220D

Sample ID: MB-R66180	SampType: MBLK	Units: mg/L		Prep Date: 3/29/2021	RunNo: 66180
Client ID: MBLKW	Batch ID: R66180	Analysis Date: 3/29/2021		SeqNo: 1331561	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Chemical Oxygen Demand ND 10.0

Sample ID: LCS-R66180	SampType: LCS	Units: mg/L		Prep Date: 3/29/2021	RunNo: 66180
Client ID: LCSW	Batch ID: R66180	Analysis Date: 3/29/2021		SeqNo: 1331562	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Chemical Oxygen Demand 76.5 10.0 75.00 0 102 87.2 113

Sample ID: 2103360-001BDUP	SampType: DUP	Units: mg/L		Prep Date: 3/29/2021	RunNo: 66180
Client ID: BATCH	Batch ID: R66180	Analysis Date: 3/29/2021		SeqNo: 1331564	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Chemical Oxygen Demand 25.8 10.0 26.46 2.66 30

Sample ID: 2103360-001BMS	SampType: MS	Units: mg/L		Prep Date: 3/29/2021	RunNo: 66180
Client ID: BATCH	Batch ID: R66180	Analysis Date: 3/29/2021		SeqNo: 1331565	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Chemical Oxygen Demand 97.3 10.0 75.00 26.46 94.5 60.3 143

Sample ID: 2103360-001BMSD	SampType: MSD	Units: mg/L		Prep Date: 3/29/2021	RunNo: 66180
Client ID: BATCH	Batch ID: R66180	Analysis Date: 3/29/2021		SeqNo: 1331566	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Chemical Oxygen Demand 95.9 10.0 75.00 26.46 92.6 60.3 143 97.33 1.44 30

Work Order: 2103389
CLIENT: Friedman & Bruya
Project: 103441

QC SUMMARY REPORT

Ion Chromatography by EPA Method 300.0

Sample ID: MB-31757		SampType: MBLK			Units: mg/L		Prep Date: 3/24/2021			RunNo: 66196		
Client ID: MBLKW		Batch ID: 31757			Analysis Date: 3/24/2021			SeqNo: 1332067				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Nitrate (as N)	ND	0.100									
Sulfate	ND	0.600									

Sample ID: LCS-31757		SampType: LCS			Units: mg/L		Prep Date: 3/24/2021			RunNo: 66196		
Client ID: LCSW		Batch ID: 31757			Analysis Date: 3/24/2021			SeqNo: 1332068				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Nitrate (as N)	0.689	0.100	0.7500	0	91.9	90	110				
Sulfate	3.52	0.600	3.750	0	93.8	90	110				

Sample ID: 2103369-001BDUP		SampType: DUP			Units: mg/L		Prep Date: 3/24/2021			RunNo: 66196		
Client ID: BATCH		Batch ID: 31757			Analysis Date: 3/24/2021			SeqNo: 1332070				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Nitrate (as N)	ND	0.100						0		20	H
Sulfate	119	0.600						118.4	0.0616	20	E

NOTES:

E - Estimated value. The amount exceeds the linear working range of the instrument.

Sample ID: 2103369-001BMS		SampType: MS			Units: mg/L		Prep Date: 3/24/2021			RunNo: 66196		
Client ID: BATCH		Batch ID: 31757			Analysis Date: 3/24/2021					SeqNo: 1332071		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Nitrate (as N)	0.693	0.100	0.7500	0	92.4	80	120				H
Sulfate	122	0.600	3.750	118.4	83.3	80	120				E

NOTES:

E - Estimated value. The amount exceeds the linear working range of the instrument.

Work Order: 2103389
CLIENT: Friedman & Bruya
Project: 103441

QC SUMMARY REPORT

Ion Chromatography by EPA Method 300.0

Sample ID: 2103369-001BMSD		SampType: MSD		Units: mg/L		Prep Date: 3/24/2021			RunNo: 66196		
Client ID: BATCH		Batch ID: 31757		Analysis Date: 3/24/2021					SeqNo: 1332072		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)	0.680	0.100	0.7500	0	90.7	80	120	0.6930	1.89	20	H
Sulfate	121	0.600	3.750	118.4	73.3	80	120	121.6	0.311	20	ES

NOTES:

S - Analyte concentration was too high for accurate spike recovery(ies). (Sulfate)
 E - Estimated value. The amount exceeds the linear working range of the instrument.

Sample ID: 2103398-001BDUP		SampType: DUP			Units: mg/L		Prep Date: 3/24/2021			RunNo: 66196		
Client ID: BATCH		Batch ID: 31757			Analysis Date: 3/25/2021			SeqNo: 1332089				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Nitrate (as N)	1.72	0.200						1.736	0.694	20	D	
Sulfate	19.2	1.20						19.26	0.448	20	D	

Sample ID: 2103398-001BMS		SampType: MS		Units: mg/L		Prep Date: 3/24/2021			RunNo: 66196		
Client ID: BATCH		Batch ID: 31757		Analysis Date: 3/25/2021					SeqNo: 1332090		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)	2.83	0.200	1.500	1.736	73.2	80	120				DS
Sulfate	27.6	1.20	7.500	19.26	112	80	120				D

NOTES:

S - Outlying spike recovery(ies) observed.

Work Order: 2103389
CLIENT: Friedman & Bruya
Project: 103441

QC SUMMARY REPORT

Total Organic Carbon by SM 5310C

Sample ID: MB-R66258	SampType: MBLK	Units: mg/L		Prep Date: 3/30/2021	RunNo: 66258
Client ID: MBLKW	Batch ID: R66258	Analysis Date: 3/30/2021		SeqNo: 1333039	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Total Organic Carbon ND 0.500

Sample ID: 2103389-001DDUP	SampType: DUP	Units: mg/L		Prep Date: 3/30/2021	RunNo: 66258
Client ID: KMW-04	Batch ID: R66258	Analysis Date: 3/30/2021		SeqNo: 1333042	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Total Organic Carbon 5.09 0.500 5.160 1.42 20 Q

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria

Sample ID: 2103389-001DMS	SampType: MS	Units: mg/L		Prep Date: 3/30/2021	RunNo: 66258
Client ID: KMW-04	Batch ID: R66258	Analysis Date: 3/30/2021		SeqNo: 1333043	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Total Organic Carbon 10.0 0.500 5.000 5.160 96.8 69.1 120

Sample ID: 2103389-001DMSD	SampType: MSD	Units: mg/L		Prep Date: 3/30/2021	RunNo: 66258
Client ID: KMW-04	Batch ID: R66258	Analysis Date: 3/30/2021		SeqNo: 1333044	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Total Organic Carbon 9.90 0.500 5.000 5.160 94.7 69.1 120 9.998 1.02 30

Sample ID: 2103494-005ADUP	SampType: DUP	Units: mg/L		Prep Date: 3/31/2021	RunNo: 66258
Client ID: BATCH	Batch ID: R66258	Analysis Date: 3/31/2021		SeqNo: 1333056	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Total Organic Carbon 53.2 0.500 53.31 0.186 20 E

NOTES:

E - Estimated value. The amount exceeds the linear working range of the instrument.



Work Order: 2103389
CLIENT: Friedman & Bruya
Project: 103441

QC SUMMARY REPORT

Total Organic Carbon by SM 5310C

Sample ID: 2103494-005AMS	SampType: MS	Units: mg/L			Prep Date: 3/31/2021			RunNo: 66258			
Client ID: BATCH	Batch ID: R66258				Analysis Date: 3/31/2021			SeqNo: 1333057			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	57.7	0.500	5.000	53.31	87.3	69.1	120				E

NOTES:

E - Estimated value. The amount exceeds the linear working range of the instrument.

Sample ID: LCSRR-R66258	SampType: LCS	Units: mg/L				Prep Date: 3/31/2021			RunNo: 66258		
Client ID: LCSW	Batch ID: R66258					Analysis Date: 3/31/2021			SeqNo: 1333073		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	4.92	0.500	5.000	0	98.4	89.3	113				

Work Order: 2103389
CLIENT: Friedman & Bruya
Project: 103441

QC SUMMARY REPORT

Dissolved Metals by EPA Method 200.8

Sample ID: MB-31792		SampType: MBLK		Units: µg/L		Prep Date: 3/29/2021			RunNo: 66185			
Client ID: MBLKW		Batch ID: 31792					Analysis Date: 3/29/2021			SeqNo: 1331781		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Aluminum	ND	100
Calcium	ND	525
Magnesium	ND	100
Sodium	ND	250

Sample ID: LCS-31792		SampType: LCS			Units: µg/L		Prep Date: 3/29/2021			RunNo: 66185		
Client ID: LCSW		Batch ID: 31792			Analysis Date: 3/29/2021			SeqNo: 1331784				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Aluminum	929	100	1,000	0	92.9	85	115
Calcium	1,040	525	1,000	0	104	50	150
Magnesium	908	100	1,000	0	90.8	50	150
Sodium	955	250	1,000	0	95.5	50	150

Sample ID: 2103389-001FDUP		SampType: DUP			Units: µg/L		Prep Date: 3/29/2021			RunNo: 66185		
Client ID: KMW-04		Batch ID: 31792			Analysis Date: 3/29/2021			SeqNo: 1331786				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Aluminum	ND	100						0		30
Calcium	16,100	525						16,870	4.74	30
Magnesium	2,550	100						2,779	8.57	30
Sodium	8,160	250						8,750	6.98	30

Sample ID: 2103389-001FMS		SampType: MS			Units: µg/L		Prep Date: 3/29/2021			RunNo: 66185		
Client ID: KMW-04		Batch ID: 31792			Analysis Date: 3/29/2021			SeqNo: 1331787				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Aluminum	5,230	100	5,000	0	105	50	150
Calcium	21,200	525	5,000	16,870	86.5	50	150

Work Order: 2103389
CLIENT: Friedman & Bruya
Project: 103441

QC SUMMARY REPORT

Dissolved Metals by EPA Method 200.8

Sample ID: 2103389-001FMS		SampType: MS			Units: µg/L		Prep Date: 3/29/2021			RunNo: 66185		
Client ID: KMW-04		Batch ID: 31792			Analysis Date: 3/29/2021					SeqNo: 1331787		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Magnesium	7,500	100	5,000	2,779	94.5	70	130				
Sodium	13,500	250	5,000	8,750	95.1	50	150				

Sample ID: 2103389-001FMSD		SampType: MSD			Units: µg/L		Prep Date: 3/29/2021			RunNo: 66185		
Client ID: KMW-04		Batch ID: 31792			Analysis Date: 3/29/2021			SeqNo: 1331788				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Aluminum	5,030	100	5,000	0	101	50	150	5,232	3.91	30	
Calcium	21,600	525	5,000	16,870	94.9	50	150	21,200	1.97	30	
Magnesium	7,480	100	5,000	2,779	94.0	70	130	7,504	0.369	30	
Sodium	13,600	250	5,000	8,750	96.4	50	150	13,510	0.468	30	

Sample ID: MB-31791FB		SampType: MBLK			Units: µg/L		Prep Date: 3/29/2021			RunNo: 66185		
Client ID: MBLKW		Batch ID: 31792			Analysis Date: 3/29/2021			SeqNo: 1331804				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Aluminum	ND	100									
Calcium	ND	525									
Magnesium	ND	100									
Sodium	ND	250									

Work Order: 2103389
CLIENT: Friedman & Bruya
Project: 103441

QC SUMMARY REPORT

Total Metals by EPA Method 200.8

Sample ID: MB-31762	SampType: MBLK	Units: µg/L			Prep Date: 3/25/2021				RunNo: 66117			
Client ID: MBLKW	Batch ID: 31762					Analysis Date: 3/25/2021				SeqNo: 1330417		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Aluminum	ND	100										
Calcium	ND	200										
Magnesium	ND	100										
Sodium	ND	200										

Sample ID: LCS-31762	SampType: LCS	Units: µg/L				Prep Date: 3/25/2021			RunNo: 66117		
Client ID: LCSW	Batch ID: 31762					Analysis Date: 3/25/2021			SeqNo: 1330418		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	1,020	100	1,000	0	102	85	115				
Calcium	969	200	1,000	0	96.9	50	150				
Magnesium	948	100	1,000	0	94.8	50	150				
Sodium	1,090	200	1,000	0	109	50	150				

Sample ID: 2103367-001BDUP	SampType: DUP	Units: µg/L			Prep Date: 3/25/2021			RunNo: 66117			
Client ID: BATCH	Batch ID: 31762				Analysis Date: 3/25/2021			SeqNo: 1330420			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	693	100						736.6	6.11	30	
Calcium	1,090	200						1,196	9.45	30	
Magnesium	911	100						883.7	3.08	30	
Sodium	129,000	200						120,900	6.45	30	E

NOTES:

E - Estimated value. The amount exceeds the linear working range of the instrument.

Sample ID: 2103367-001BMS		SampType: MS		Units: µg/L		Prep Date: 3/25/2021			RunNo: 66117			
Client ID: BATCH		Batch ID: 31762					Analysis Date: 3/25/2021			SeqNo: 1330421		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Aluminum	5,710	100	5,000	736.6	99.5	70	130					

Work Order: 2103389
CLIENT: Friedman & Bruya
Project: 103441

QC SUMMARY REPORT

Total Metals by EPA Method 200.8

Sample ID: 2103367-001BMS		SampType: MS		Units: µg/L		Prep Date: 3/25/2021			RunNo: 66117			
Client ID: BATCH		Batch ID: 31762					Analysis Date: 3/25/2021			SeqNo: 1330421		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Calcium	5,950	200	5,000	1,196	95.1	50	150				
Magnesium	5,680	100	5,000	883.7	96.0	70	130				
Sodium	121,000	200	5,000	120,900	-5.04	50	150				ES

NOTES:

S - Analyte concentration was too high for accurate spike recovery(ies).
 E - Estimated value. The amount exceeds the linear working range of the instrument.

Sample ID: 2103367-001BMSD		SampType: MSD			Units: µg/L		Prep Date: 3/25/2021			RunNo: 66117		
Client ID: BATCH		Batch ID: 31762			Analysis Date: 3/25/2021			SeqNo: 1330422				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Aluminum	5,590	100	5,000	736.6	97.0	70	130	5,712	2.20	30	
Calcium	5,850	200	5,000	1,196	93.0	50	150	5,951	1.77	30	
Magnesium	5,600	100	5,000	883.7	94.3	70	130	5,685	1.52	30	
Sodium	127,000	200	5,000	120,900	113	50	150	120,600	4.78	30	E

NOTES:

E - Estimated value. The amount exceeds the linear working range of the instrument.

Work Order: 2103389
CLIENT: Friedman & Bruya
Project: 103441

QC SUMMARY REPORT

Dissolved Gases by RSK-175

Sample ID: LCS-R66194		SampType: LCS			Units: mg/L		Prep Date: 3/29/2021			RunNo: 66194		
Client ID: LCSW		Batch ID: R66194			Analysis Date: 3/29/2021					SeqNo: 1331999		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Methane	987	0.00675	1,000	0	98.7	66.7	141				
Ethene	987	0.0146	1,000	0	98.7	68.6	139				
Ethane	988	0.0151	1,000	0	98.8	69.3	136				

Sample ID: MB-R66194		SampType: MBLK		Units: mg/L		Prep Date: 3/29/2021			RunNo: 66194			
Client ID: MBLKW		Batch ID: R66194					Analysis Date: 3/29/2021			SeqNo: 1332000		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Methane	ND	0.00675									
Ethene	ND	0.0146									
Ethane	ND	0.0151									

Sample ID: 2103389-005AREP		SampType: REP			Units: mg/L		Prep Date: 3/29/2021			RunNo: 66194		
Client ID: Duplicate 1		Batch ID: R66194			Analysis Date: 3/29/2021			SeqNo: 1331973				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	

Methane	1.43	0.00675						1.652	14.1	30	E
Ethene	ND	0.0146						0		30	
Ethane	ND	0.0151						0		30	

NOTES:

E - Estimated value. The amount exceeds the linear working range of the instrument.

Client Name: **FB**
 Logged by: **Carissa True**

Work Order Number: **2103389**
 Date Received: **3/24/2021 9:46:00 AM**

Chain of Custody

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

Log In

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

Special Handling (if applicable)

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

Person Notified:	<input type="text"/>	Date:	<input type="text"/>
By Whom:	<input type="text"/>	Via:	<input type="checkbox"/> eMail <input type="checkbox"/> Phone <input type="checkbox"/> Fax <input type="checkbox"/> In Person
Regarding:	<input type="text"/>		
Client Instructions:	<input type="text"/>		

19. Additional remarks:

Item Information

Item #	Temp °C
Sample 1	1.1

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

2103389

Phone # (206) 285-8282 merdahl@friedmanandbruya.com

Femur

PO #

103441

B-201

Please Email Results

TURNAROUND TIME

Rush charges authorized by:

- Will call with instructions

Page 30 of 30

Fax (206) 283-5044

Received by:

Ryan Littner

FAI

3/24/21

0755



Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

**Professional
Analytical
Services**

Apr 8 2021
Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Attention: MICHAEL ERDAHL

Dear MICHAEL ERDAHL:

Enclosed please find the analytical data for your 103441 project.

The following is a cross correlation of client and laboratory identifications for your convenience.

CLIENT ID	MATRIX	AMTEST ID	TEST
KMW-04	Water	21-A003778	Actc Acd
KMW-06	Water	21-A003779	Actc Acd
KMW-09	Water	21-A003780	Actc Acd
KMW-10	Water	21-A003781	Actc Acd
DUPLICATE 1	Water	21-A003782	Actc Acd

Your samples were received on Wednesday, March 24, 2021. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

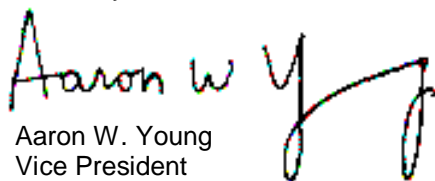
The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

If you should have any questions pertaining to the data package, please feel free to contact me.

Sincerely,


Aaron W. Young
Vice President

PO Number: B-194

BACT = Bacteriological
CONV = Conventional

MET = Metals
ORG = Organics

NUT=Nutrients
DEM=Demand

MIN=Minerals

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664
www.amtestlab.com



**Professional
Analytical
Services**

ANALYSIS REPORT

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Attention: MICHAEL ERDAHL
Project Name: 103441
PO Number: B-194
All results reported on an as received basis.

Date Received: 03/24/21
Date Reported: 4/ 8/21

AMTEST Identification Number 21-A003778
Client Identification KMW-04
Sampling Date 03/23/21, 15:20

Organic Acids

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Organic Acid (as Acetic)	< 0.1	mg/l		0.1	EPA 300.0 mod	KS	04/05/21

AMTEST Identification Number 21-A003779
Client Identification KMW-06
Sampling Date 03/23/21, 09:05

Organic Acids

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Organic Acid (as Acetic)	< 0.1	mg/l		0.1	EPA 300.0 mod	KS	04/05/21

AMTEST Identification Number 21-A003780
Client Identification KMW-09
Sampling Date 03/23/21, 11:30

Organic Acids

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Organic Acid (as Acetic)	< 0.1	mg/l		0.1	EPA 300.0 mod	KS	04/05/21

AMTEST Identification Number 21-A003781
Client Identification KMW-10
Sampling Date 03/23/21, 13:20

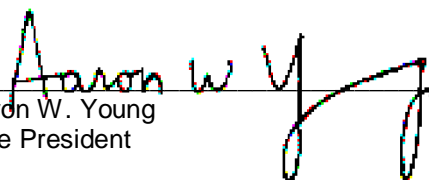
Organic Acids

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Organic Acid (as Acetic)	< 0.1	mg/l		0.1	EPA 300.0 mod	KS	04/05/21

AMTEST Identification Number 21-A003782
Client Identification DUPLICATE 1
Sampling Date 03/23/21, 09:40

Organic Acids

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Organic Acid (as Acetic)	< 0.1	mg/l		0.1	EPA 300.0 mod	KS	04/05/21


Aaron W. Young
Vice President

QC Summary for sample numbers: 21-A003778 to 21-A003782

DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	DUP VALUE	RPD
21-A003783	Organic Acid (as Acetic)	mg/l	< 0.1	< 0.1	

MATRIX SPIKES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPK AMT	RECOVERY
21-A003783	Organic Acid (as Acetic)	mg/l	< 0.1	1.92	2.00	96.00 %

STANDARD REFERENCE MATERIALS

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
Organic Acid (as Acetic)	mg/l	2.00	1.91	95.5 %

BLANKS

ANALYTE	UNITS	RESULT
Organic Acid (as Acetic)	mg/l	< 0.1

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

Phone # (206) 285-8282 merdahl@friedmanandbruya.com

Please Email Results

- Will call with instructions

[illegible]

Received by:

COURIER

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

April 2, 2021

Brady Lubenow , Project Manager
Wood Environment & Infrastructure Solutions, Inc.
One Union Square
600 University Street, Suite 600
Seattle, WA 98101

Dear Mr Lubenow:

Included are the results from the testing of material submitted on March 24, 2021 from the Kelly Moore-Seattle, F&BI 103462 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: Christy Duitman
WEI0402R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on March 24, 2021 by Friedman & Bruya, Inc. from the Wood Environment & Infrastructure Solutions Kelly Moore-Seattle, F&BI 103462 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Wood Environment & Infrastructure Solutions</u>
103462 -01	KMW-02R
103462 -02	KMW-07

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/02/21

Date Received: 03/24/21

Project: Kelly Moore-Seattle, F&BI 103462

Date Extracted: 03/31/21

Date Analyzed: 03/31/21

**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>	Surrogate (% Recovery) (Limit 51-134)
KMW-02R 103462-01	<100	96
KMW-07 103462-02	<100	96
Method Blank 01-594 MB	<100	97

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/02/21

Date Received: 03/24/21

Project: Kelly Moore-Seattle, F&BI 103462

Date Extracted: 03/26/21

Date Analyzed: 03/26/21

**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> <u>(% Recovery)</u> (Limit 41-152)
KMW-02R 103462-01	<50	<250	114
KMW-07 103462-02	<50	<250	123
Method Blank 01-728 MB	<50	<250	121

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-02R	Client:	Wood Environment & Infrastructure
Date Received:	03/24/21	Project:	Kelly Moore-Seattle, F&BI 103462
Date Extracted:	03/25/21	Lab ID:	103462-01
Date Analyzed:	03/25/21	Data File:	103462-01.150
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<1
Chromium	<1
Copper	<5
Lead	<1
Mercury	<1
Nickel	1.43
Zinc	<5

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-07	Client:	Wood Environment & Infrastructure
Date Received:	03/24/21	Project:	Kelly Moore-Seattle, F&BI 103462
Date Extracted:	03/25/21	Lab ID:	103462-02
Date Analyzed:	03/25/21	Data File:	103462-02.151
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<1
Chromium	<1
Copper	<5
Lead	<1
Mercury	<1
Nickel	1.77
Zinc	<5

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Method Blank	Client:	Wood Environment & Infrastructure
Date Received:	NA	Project:	Kelly Moore-Seattle, F&BI 103462
Date Extracted:	03/25/21	Lab ID:	I1-192 mb
Date Analyzed:	03/25/21	Data File:	I1-192 mb.107
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<1
Chromium	<1
Copper	<5
Lead	<1
Mercury	<1
Nickel	<1
Zinc	<5

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	KMW-02R	Client:	Wood Environment & Infrastructure
Date Received:	03/24/21	Project:	Kelly Moore-Seattle, F&BI 103462
Date Extracted:	03/25/21	Lab ID:	103462-01 1/2
Date Analyzed:	03/25/21	Data File:	032507.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	45	15	61
Phenol-d6	29	10	46
Nitrobenzene-d5	94	17	143
2-Fluorobiphenyl	90	50	150
2,4,6-Tribromophenol	91	50	150
Terphenyl-d14	105	50	150

Compounds:	Concentration ug/L (ppb)
Benz(a)anthracene	<0.04
Chrysene	<0.04
Benzo(a)pyrene	<0.04
Benzo(b)fluoranthene	<0.04
Benzo(k)fluoranthene	<0.04
Indeno(1,2,3-cd)pyrene	<0.04
Dibenz(a,h)anthracene	<0.04

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	KMW-07	Client:	Wood Environment & Infrastructure
Date Received:	03/24/21	Project:	Kelly Moore-Seattle, F&BI 103462
Date Extracted:	03/25/21	Lab ID:	103462-02 1/2
Date Analyzed:	03/25/21	Data File:	032508.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	36	15	61
Phenol-d6	26	10	46
Nitrobenzene-d5	100	17	143
2-Fluorobiphenyl	89	50	150
2,4,6-Tribromophenol	75	50	150
Terphenyl-d14	103	50	150

Compounds:	Concentration ug/L (ppb)
Benz(a)anthracene	<0.04
Chrysene	<0.04
Benzo(a)pyrene	<0.04
Benzo(b)fluoranthene	<0.04
Benzo(k)fluoranthene	<0.04
Indeno(1,2,3-cd)pyrene	<0.04
Dibenz(a,h)anthracene	<0.04

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	Method Blank	Client:	Wood Environment & Infrastructure
Date Received:	Not Applicable	Project:	Kelly Moore-Seattle, F&BI 103462
Date Extracted:	03/25/21	Lab ID:	01-726 mb
Date Analyzed:	03/25/21	Data File:	032506.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	28	15	61
Phenol-d6	16	10	46
Nitrobenzene-d5	97	17	143
2-Fluorobiphenyl	95	50	150
2,4,6-Tribromophenol	90	50	150
Terphenyl-d14	115	50	150

Compounds:	Concentration ug/L (ppb)
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

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID:	KMW-02R	Client:	Wood Environment & Infrastructure
Date Received:	03/24/21	Project:	Kelly Moore-Seattle, F&BI 103462
Date Extracted:	03/30/21	Lab ID:	103462-01
Date Analyzed:	03/30/21	Data File:	033026.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JCM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	86	113
Toluene-d8	97	88	114
4-Bromofluorobenzene	100	88	112

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<1
Bromomethane	<5	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<50	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<5	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<5
1,1-Dichloroethane	<1	n-Propylbenzene	<1
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	<1	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	<1
2-Butanone (MEK)	<20	1,2,3-Trichloropropane	<1
1,2-Dichloroethane (EDC)	<1	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<1	1,2,4-Trimethylbenzene	<1
Benzene	<0.35	sec-Butylbenzene	<1
Trichloroethene	<1	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1	1,3-Dichlorobenzene	<1
Bromodichloromethane	<1	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<10
cis-1,3-Dichloropropene	<1	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	<1
trans-1,3-Dichloropropene	<1	Naphthalene	<1
1,1,2-Trichloroethane	<1	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID:	KMW-07	Client:	Wood Environment & Infrastructure
Date Received:	03/24/21	Project:	Kelly Moore-Seattle, F&BI 103462
Date Extracted:	03/30/21	Lab ID:	103462-02
Date Analyzed:	03/30/21	Data File:	033027.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JCM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	86	113
Toluene-d8	98	88	114
4-Bromofluorobenzene	100	88	112

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<1
Bromomethane	<5	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<50	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<5	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<5
1,1-Dichloroethane	<1	n-Propylbenzene	<1
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	<1	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	<1
2-Butanone (MEK)	<20	1,2,3-Trichloropropane	<1
1,2-Dichloroethane (EDC)	<1	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<1	1,2,4-Trimethylbenzene	<1
Benzene	<0.35	sec-Butylbenzene	<1
Trichloroethene	<1	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1	1,3-Dichlorobenzene	<1
Bromodichloromethane	<1	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<10
cis-1,3-Dichloropropene	<1	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	<1
trans-1,3-Dichloropropene	<1	Naphthalene	<1
1,1,2-Trichloroethane	<1	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID:	Method Blank	Client:	Wood Environment & Infrastructure
Date Received:	Not Applicable	Project:	Kelly Moore-Seattle, F&BI 103462
Date Extracted:	03/30/21	Lab ID:	01-673 mb
Date Analyzed:	03/30/21	Data File:	033008.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JCM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	86	113
Toluene-d8	96	88	114
4-Bromofluorobenzene	102	88	112

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<1
Bromomethane	<5	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<50	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<5	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<5
1,1-Dichloroethane	<1	n-Propylbenzene	<1
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	<1	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	<1
2-Butanone (MEK)	<20	1,2,3-Trichloropropane	<1
1,2-Dichloroethane (EDC)	<1	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<1	1,2,4-Trimethylbenzene	<1
Benzene	<0.35	sec-Butylbenzene	<1
Trichloroethene	<1	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1	1,3-Dichlorobenzene	<1
Bromodichloromethane	<1	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<10
cis-1,3-Dichloropropene	<1	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	<1
trans-1,3-Dichloropropene	<1	Naphthalene	<1
1,1,2-Trichloroethane	<1	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/02/21

Date Received: 03/24/21

Project: Kelly Moore-Seattle, F&BI 103462

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER
SAMPLES FOR TPH AS GASOLINE
USING METHOD NWTPH-Gx**

Laboratory Code: (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	<100	90	95	53-117	5

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Gasoline	ug/L (ppb)	1,000	100	69-134

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/02/21

Date Received: 03/24/21

Project: Kelly Moore-Seattle, F&BI 103462

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER
SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS
DIESEL EXTENDED USING METHOD NWTPH-D_x**

Laboratory Code: 103462-01 (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	<50	108	119	50-150	10

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Diesel Extended	ug/L (ppb)	2,500	110	63-142

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/02/21

Date Received: 03/24/21

Project: Kelly Moore-Seattle, F&BI 103462

**QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF WATER SAMPLES
FOR TOTAL METALS USING EPA METHOD 6020B**

Laboratory Code: 103462-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	ug/L (ppb)	10	<1	87	85	75-125	2
Chromium	ug/L (ppb)	20	<1	97	95	75-125	2
Copper	ug/L (ppb)	20	<5	94	95	75-125	1
Lead	ug/L (ppb)	10	<1	90	89	75-125	1
Mercury	ug/L (ppb)	5	<1	93	94	75-125	1
Nickel	ug/L (ppb)	20	1.48	93	92	75-125	1
Zinc	ug/L (ppb)	50	<5	89	89	75-125	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	ug/L (ppb)	10	88	80-120
Chromium	ug/L (ppb)	20	95	80-120
Copper	ug/L (ppb)	20	104	80-120
Lead	ug/L (ppb)	10	95	80-120
Mercury	ug/L (ppb)	5	98	80-120
Nickel	ug/L (ppb)	20	100	80-120
Zinc	ug/L (ppb)	50	97	80-120

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/02/21

Date Received: 03/24/21

Project: Kelly Moore-Seattle, F&BI 103462

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR SEMIVOLATILES BY EPA METHOD 8270E

Laboratory Code: 103462-01 1/2 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Benz(a)anthracene	ug/L (ppb)	5	<0.04	106	102	50-150	4
Chrysene	ug/L (ppb)	5	<0.04	99	96	50-150	3
Benzo(a)pyrene	ug/L (ppb)	5	<0.04	112	109	50-150	3
Benzo(b)fluoranthene	ug/L (ppb)	5	<0.04	110	106	50-150	4
Benzo(k)fluoranthene	ug/L (ppb)	5	<0.04	105	104	50-150	1
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	5	<0.04	102	101	50-150	1
Dibenz(a,h)anthracene	ug/L (ppb)	5	<0.04	98	93	50-150	5

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benz(a)anthracene	ug/L (ppb)	5	99	70-130
Chrysene	ug/L (ppb)	5	96	70-130
Benzo(a)pyrene	ug/L (ppb)	5	103	70-130
Benzo(b)fluoranthene	ug/L (ppb)	5	98	62-130
Benzo(k)fluoranthene	ug/L (ppb)	5	97	70-130
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	5	113	70-130
Dibenz(a,h)anthracene	ug/L (ppb)	5	111	70-130

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/02/21

Date Received: 03/24/21

Project: Kelly Moore-Seattle, F&BI 103462

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260D

Laboratory Code: 103462-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Dichlorodifluoromethane	ug/L (ppb)	10	<1	80	84	10-172	5
Chloromethane	ug/L (ppb)	10	<10	58	61	25-166	5
Vinyl chloride	ug/L (ppb)	10	<0.2	65	67	36-166	3
Bromomethane	ug/L (ppb)	10	<5	95	95	47-169	0
Chloroethane	ug/L (ppb)	10	<1	65	69	46-160	6
Trichlorofluoromethane	ug/L (ppb)	10	<1	73	76	44-165	4
Acetone	ug/L (ppb)	50	<50	80	80	10-182	0
1,1-Dichloroethene	ug/L (ppb)	10	<1	79	81	58-142	2
Hexane	ug/L (ppb)	10	<5	72	73	38-152	1
Methylene chloride	ug/L (ppb)	10	<5	94	104	50-145	10
Methyl t-butyl ether (MTBE)	ug/L (ppb)	10	<1	85	88	61-136	3
trans-1,2-Dichloroethene	ug/L (ppb)	10	<1	77	79	61-136	3
1,1-Dichloroethane	ug/L (ppb)	10	<1	80	80	63-135	0
2,2-Dichloropropane	ug/L (ppb)	10	<1	81	81	36-154	0
cis-1,2-Dichloroethene	ug/L (ppb)	10	<1	83	86	63-134	4
Chloroform	ug/L (ppb)	10	<1	88	89	61-135	1
2-Butanone (MEK)	ug/L (ppb)	50	<20	95	95	10-129	0
1,2-Dichloroethane (EDC)	ug/L (ppb)	10	<1	91	92	48-149	1
1,1,1-Trichloroethane	ug/L (ppb)	10	<1	85	87	60-146	2
1,1-Dichloropropene	ug/L (ppb)	10	<1	83	85	69-133	2
Carbon tetrachloride	ug/L (ppb)	10	<1	87	90	56-152	3
Benzene	ug/L (ppb)	10	<0.35	86	86	57-135	0
Trichloroethene	ug/L (ppb)	10	<1	88	91	66-135	3
1,2-Dichloropropane	ug/L (ppb)	10	<1	88	90	59-136	2
Bromodichloromethane	ug/L (ppb)	10	<1	86	89	61-150	3
Dibromomethane	ug/L (ppb)	10	<1	95	97	66-141	2
4-Methyl-2-pentanone	ug/L (ppb)	50	<10	107	110	10-185	3
cis-1,3-Dichloropropene	ug/L (ppb)	10	<1	91	94	52-147	3
Toluene	ug/L (ppb)	10	<1	99	100	50-137	1
trans-1,3-Dichloropropene	ug/L (ppb)	10	<1	96	97	53-142	1
1,1,2-Trichloroethane	ug/L (ppb)	10	<1	109	107	68-131	2
2-Hexanone	ug/L (ppb)	50	<10	115	113	10-185	2
1,3-Dichloropropene	ug/L (ppb)	10	<1	106	107	60-135	1
Tetrachloroethene	ug/L (ppb)	10	<1	105	105	10-226	0
Dibromochloromethane	ug/L (ppb)	10	<1	99	99	52-145	0
1,2-Dibromoethane (EDB)	ug/L (ppb)	10	<1	107	109	62-135	2
Chlorobenzene	ug/L (ppb)	10	<1	107	109	63-130	2
Ethylbenzene	ug/L (ppb)	10	<1	104	103	60-133	1
1,1,1,2-Tetrachloroethane	ug/L (ppb)	10	<1	103	105	56-143	2
m,p-Xylene	ug/L (ppb)	20	<2	108	105	69-135	3
o-Xylene	ug/L (ppb)	10	<1	106	107	60-140	1
Styrene	ug/L (ppb)	10	<1	106	105	60-133	1
Isopropylbenzene	ug/L (ppb)	10	<1	104	103	65-142	1
Bromoform	ug/L (ppb)	10	<5	100	100	54-148	0
n-Propylbenzene	ug/L (ppb)	10	<1	108	110	58-144	2
Bromobenzene	ug/L (ppb)	10	<1	116	118	61-130	2
1,3,5-Trimethylbenzene	ug/L (ppb)	10	<1	107	110	59-134	3
1,1,2,2-Tetrachloroethane	ug/L (ppb)	10	<1	113	113	51-154	0
1,2,3-Trichloropropane	ug/L (ppb)	10	<1	115	116	53-150	1
2-Chlorotoluene	ug/L (ppb)	10	<1	107	110	66-127	3
4-Chlorotoluene	ug/L (ppb)	10	<1	108	111	65-130	3
tert-Butylbenzene	ug/L (ppb)	10	<1	109	110	65-137	1
1,2,4-Trimethylbenzene	ug/L (ppb)	10	<1	105	107	59-146	2
sec-Butylbenzene	ug/L (ppb)	10	<1	109	110	64-140	1
p-Isopropyltoluene	ug/L (ppb)	10	<1	108	108	65-141	0
1,3-Dichlorobenzene	ug/L (ppb)	10	<1	114	115	60-131	1
1,4-Dichlorobenzene	ug/L (ppb)	10	<1	113	116	60-129	3
1,2-Dichlorobenzene	ug/L (ppb)	10	<1	113	114	60-130	1
1,2-Dibromo-3-chloropropane	ug/L (ppb)	10	<10	99	100	32-164	1
1,2,4-Trichlorobenzene	ug/L (ppb)	10	<1	105	101	52-138	4
Hexachlorobutadiene	ug/L (ppb)	10	<1	106	102	60-143	4
Naphthalene	ug/L (ppb)	10	<1	102	99	44-164	3
1,2,3-Trichlorobenzene	ug/L (ppb)	10	<1	108	100	69-148	8

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/02/21

Date Received: 03/24/21

Project: Kelly Moore-Seattle, F&BI 103462

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260D

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Dichlorodifluoromethane	ug/L (ppb)	10	111	108	25-158	3
Chloromethane	ug/L (ppb)	10	83	83	45-156	0
Vinyl chloride	ug/L (ppb)	10	88	87	50-154	1
Bromomethane	ug/L (ppb)	10	128	125	55-143	2
Chloroethane	ug/L (ppb)	10	88	85	58-146	3
Trichlorofluoromethane	ug/L (ppb)	10	95	95	50-150	0
Acetone	ug/L (ppb)	50	88	90	22-155	2
1,1-Dichloroethene	ug/L (ppb)	10	99	96	67-136	3
Hexane	ug/L (ppb)	10	88	87	57-137	1
Methylene chloride	ug/L (ppb)	10	97	96	19-178	1
Methyl t-butyl ether (MTBE)	ug/L (ppb)	10	95	95	64-147	0
trans-1,2-Dichloroethene	ug/L (ppb)	10	94	92	68-128	2
1,1-Dichloroethane	ug/L (ppb)	10	90	89	74-135	1
2,2-Dichloropropane	ug/L (ppb)	10	97	95	55-143	2
cis-1,2-Dichloroethene	ug/L (ppb)	10	93	92	74-136	1
Chloroform	ug/L (ppb)	10	94	93	74-134	1
2-Butanone (MEK)	ug/L (ppb)	50	97	97	37-150	0
1,2-Dichloroethane (EDC)	ug/L (ppb)	10	94	94	66-129	0
1,1,1-Trichloroethane	ug/L (ppb)	10	95	94	74-142	1
1,1-Dichloropropene	ug/L (ppb)	10	95	93	77-129	2
Carbon tetrachloride	ug/L (ppb)	10	97	95	75-158	2
Benzene	ug/L (ppb)	10	93	94	69-134	1
Trichloroethene	ug/L (ppb)	10	92	93	67-133	1
1,2-Dichloropropane	ug/L (ppb)	10	92	91	71-134	1
Bromodichloromethane	ug/L (ppb)	10	88	86	66-126	2
Dibromomethane	ug/L (ppb)	10	96	97	68-132	1
4-Methyl-2-pentanone	ug/L (ppb)	50	103	103	65-138	0
cis-1,3-Dichloropropene	ug/L (ppb)	10	92	92	74-140	0
Toluene	ug/L (ppb)	10	102	98	72-122	4
trans-1,3-Dichloropropene	ug/L (ppb)	10	95	91	80-136	4
1,1,2-Trichloroethane	ug/L (ppb)	10	102	97	75-124	5
2-Hexanone	ug/L (ppb)	50	109	109	60-136	0
1,3-Dichloropropene	ug/L (ppb)	10	102	98	76-126	4
Tetrachloroethene	ug/L (ppb)	10	108	104	76-121	4
Dibromochloromethane	ug/L (ppb)	10	97	91	84-133	6
1,2-Dibromoethane (EDB)	ug/L (ppb)	10	104	100	82-115	4
Chlorobenzene	ug/L (ppb)	10	106	102	83-114	4
Ethylbenzene	ug/L (ppb)	10	102	97	77-124	5
1,1,1,2-Tetrachloroethane	ug/L (ppb)	10	99	94	84-127	5
m,p-Xylene	ug/L (ppb)	20	104	100	81-112	4
o-Xylene	ug/L (ppb)	10	102	98	81-121	4
Styrene	ug/L (ppb)	10	101	97	84-119	4
Isopropylbenzene	ug/L (ppb)	10	100	95	80-117	5
Bromoform	ug/L (ppb)	10	93	90	69-121	3
n-Propylbenzene	ug/L (ppb)	10	102	98	74-126	4
Bromobenzene	ug/L (ppb)	10	108	104	80-121	4
1,3,5-Trimethylbenzene	ug/L (ppb)	10	100	98	78-123	2
1,1,2,2-Tetrachloroethane	ug/L (ppb)	10	103	99	66-126	4
1,2,3-Trichloropropane	ug/L (ppb)	10	105	102	67-124	3
2-Chlorotoluene	ug/L (ppb)	10	102	98	77-127	4
4-Chlorotoluene	ug/L (ppb)	10	102	98	78-128	4
tert-Butylbenzene	ug/L (ppb)	10	101	98	80-123	3
1,2,4-Trimethylbenzene	ug/L (ppb)	10	97	95	79-122	2
sec-Butylbenzene	ug/L (ppb)	10	99	97	80-116	2
p-Isopropyltoluene	ug/L (ppb)	10	100	95	81-123	5
1,3-Dichlorobenzene	ug/L (ppb)	10	104	101	83-113	3
1,4-Dichlorobenzene	ug/L (ppb)	10	106	102	81-112	4
1,2-Dichlorobenzene	ug/L (ppb)	10	101	100	84-112	1
1,2-Dibromo-3-chloropropane	ug/L (ppb)	10	88	88	57-141	0
1,2,4-Trichlorobenzene	ug/L (ppb)	10	89	92	72-130	3
Hexachlorobutadiene	ug/L (ppb)	10	89	91	53-141	2
Naphthalene	ug/L (ppb)	10	89	92	64-133	3
1,2,3-Trichlorobenzene	ug/L (ppb)	10	88	93	65-136	6

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.

103462

Report To Brady Liberau
Christy Duitman

Company Wood

Address 4020 Lake Washington Blvd NE #200

City, State, ZIP Kirkland, WA 98033

Phone 507-236-8843 Email Brady.Liberau@woodplc.com
Christy.Duitman@woodplc.com

SAMPLE CHAIN OF CUSTODY

ME 03/24/21 E03/AI3/1 V44

SAMPLERS (signature) Brady Liberau

Page # of 1

PROJECT NAME

PO #

Kelly Moore - Seattle

REMARKS

INVOICE TO

Wood

Project specific RLs? - Yes / No

TURNAROUND TIME V43

☒ 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	CMHs EPA 8270	PCBs EPA 8082	1.	2.	3.	4.	Notes	
KMW-02R	A-J 01 AA-DD	3/24/21	0955	GW	30	X	X			X	X		X					* See Remarks MS/MSD
KMW-07	02A-J	↓	1136	↓	10	X	X			X	X		X					* See Remarks
* Remarks																		
1. <u>Total Metals</u> (As, Cr, Cu, Pb, Hg, Ni, Zn) by 6020B																		
2. <u>Volatile Fatty Acids</u> by SM 5560 + <u>Biological Oxygen Demand</u> by SM 5210B/EPA 405.1 + <u>Chemical Oxygen Demand</u> by EPA 410.1-2, EPA 410.3, EPA 410.4, SM 5220 + <u>Dissolved gases</u> (methane, ethane, ethene, CO2 CO2) by RSK-175																		
3. <u>Dissolved AND Total Cations</u> (Fe, Ca, Mn, Al, NA) by EPA 6020B + <u>Anions</u> (sulfate, nitrate) by EPA 300.0/300.1																		
4. <u>Total Organic Carbon</u> by 9060A/SM 5310B + <u>Alkalinity</u> by SM 2320/EPA 310.1 + <u>Hardness</u> by SM 2340B																		

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

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Brady Liberau	Brady Liberau	Wood	3/24/21	
Received by: mham/phan	mham/phan	FeBI	3/24/21	1458
Relinquished by:				
Received by:		Samples received at 4 °C		



Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

**Professional
Analytical
Services**

Oct 1 2021
Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Attention: MICHAEL ERDAHL

Dear MICHAEL ERDAHL:

Enclosed please find the analytical data for your 109059 project.

The following is a cross correlation of client and laboratory identifications for your convenience.

CLIENT ID	MATRIX	AMTEST ID	TEST
KMW-09	Water	21-A013135	Actc Acd
KMW-06	Water	21-A013136	Actc Acd
KMW-10	Water	21-A013137	Actc Acd
KMW-04	Water	21-A013138	Actc Acd
DUP1-20210902	Water	21-A013139	Actc Acd

Your samples were received on Friday, September 3, 2021. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

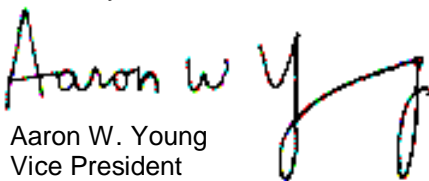
The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

If you should have any questions pertaining to the data package, please feel free to contact me.

Sincerely,


Aaron W. Young
Vice President

PO Number: B-401

BACT = Bacteriological
CONV = Conventional

MET = Metals
ORG = Organics

NUT=Nutrients
DEM=Demand

MIN=Minerals

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664
www.amtestlab.com



**Professional
Analytical
Services**

ANALYSIS REPORT

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Attention: MICHAEL ERDAHL
Project Name: 109059
PO Number: B-401
All results reported on an as received basis.

Date Received: 09/03/21
Date Reported: 10/ 1/21

AMTEST Identification Number 21-A013135
Client Identification KMW-09
Sampling Date 09/02/21, 08:40

Organic Acids

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Organic Acid (as Acetic)	< 0.1	mg/l		0.1	EPA 300.0 mod	KS	09/20/21

AMTEST Identification Number 21-A013136
Client Identification KMW-06
Sampling Date 09/02/21, 10:15

Organic Acids

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Organic Acid (as Acetic)	< 1	mg/l		1	EPA 300.0 mod	KS	09/20/21

Friedman & Bruya, Inc.
Project Name: 109059
AmTest ID: 21-A013137

AMTEST Identification Number 21-A013137
Client Identification KMW-10
Sampling Date 09/02/21, 15:10

Organic Acids

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Organic Acid (as Acetic)	0.10	mg/l		0.1	EPA 300.0 mod	KS	09/20/21

AMTEST Identification Number 21-A013138
Client Identification KMW-04
Sampling Date 09/02/21, 17:10

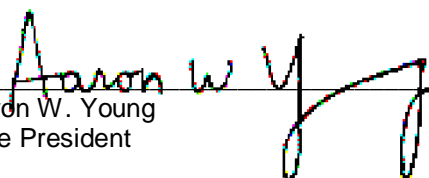
Organic Acids

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Organic Acid (as Acetic)	3.24	mg/l		0.1	EPA 300.0 mod	KS	09/20/21

AMTEST Identification Number 21-A013139
Client Identification DUP1-20210902
Sampling Date 09/02/21, 15:40

Organic Acids

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Organic Acid (as Acetic)	0.19	mg/l		0.1	EPA 300.0 mod	KS	09/20/21


Aaron W. Young
Vice President

Am Test Inc.
13600 NE 126th PL
Suite C
Kirkland, WA, 98034
(425) 885-1664
www.amtestlab.com



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QC Summary for sample numbers: 21-A013135 to 21-A013139

DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	DUP VALUE	RPD
21-A013140	Organic Acid (as Acetic)	mg/l	< 0.1	< 0.1	

MATRIX SPIKES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPK AMT	RECOVERY
21-A013140	Organic Acid (as Acetic)	mg/l	< 0.1	2.26	2.00	113.00 %

STANDARD REFERENCE MATERIALS

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
Organic Acid (as Acetic)	mg/l	2.00	2.04	102. %

BLANKS

ANALYTE	UNITS	RESULT
Organic Acid (as Acetic)	mg/l	< 0.1

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

Send Report To Michael Erdahl

Company Friedman and Bruya, Inc.

Address 3012 16th Ave W

City, State, ZIP Seattle, WA 98119

Phone # (206) 285-8282 merdahl@friedmanandbruya.com

SUBCONTRACTER *Amtest*

PROJECT NAME/NO.

PO #

109059

B-401

REMARKS

Page # 1 of 1

TURNAROUND TIME

~~E~~ Standard TAT

☐ RUSH

Rush charges authorized by:

SAMPLE DISPOSAL

☐ Dispose after 30 days

- Return samples

☐ Will call with instructions[illegible]

Friedman & Bruya, Inc.
3012 16th Avenue West

Seattle, WA 98119-2029

Ph. (206) 285-8282

Fax (206) 283-5044

SIGNATURE

~~Relinquished by:~~

Received by _____

Relinquished by:

Received by:

PRINT NAME

Michael Erdahl

Sett Fork

COMPANY

Friedman & Bruva

Am Test

DATE _____

9/3/21

TIME

0830

10.8°C Counter



Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

**Professional
Analytical
Services**

Oct 1 2021
Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Attention: MICHAEL ERDAHL

Dear MICHAEL ERDAHL:

Enclosed please find the analytical data for your 109029 project.

The following is a cross correlation of client and laboratory identifications for your convenience.

CLIENT ID	MATRIX	AMTEST ID	TEST
KMW-03R	Water	21-A013140	Actc Acd

Your sample was received on Friday, September 3, 2021. At the time of receipt, the sample was logged in and properly maintained prior to the subsequent analysis.

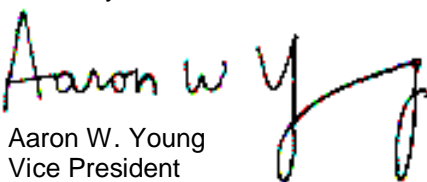
The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

If you should have any questions pertaining to the data package, please feel free to contact me.

Sincerely,


Aaron W. Young
Vice President

PO Number: B-401

BACT = Bacteriological
CONV = Conventional

MET = Metals
ORG = Organics

NUT=Nutrients
DEM=Demand

MIN=Minerals

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664
www.amtestlab.com



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Services**

ANALYSIS REPORT

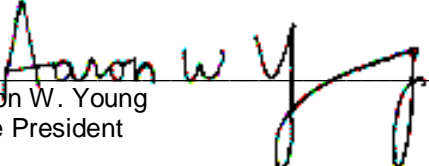
Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Attention: MICHAEL ERDAHL
Project Name: 109029
PO Number: B-401
All results reported on an as received basis.

Date Received: 09/03/21
Date Reported: 10/ 1/21

AMTEST Identification Number 21-A013140
Client Identification KMW-03R
Sampling Date 09/01/21, 16:20

Organic Acids

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Organic Acid (as Acetic)	< 0.1	mg/l		0.1	EPA 300.0 mod	KS	09/20/21


Aaron W. Young
Vice President

Am Test Inc.
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Services**

QC Summary for sample number: 21-A013140

DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	DUP VALUE	RPD
21-A013140	Organic Acid (as Acetic)	mg/l	< 0.1	< 0.1	

MATRIX SPIKES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPK AMT	RECOVERY
21-A013140	Organic Acid (as Acetic)	mg/l	< 0.1	2.26	2.00	113.00 %

STANDARD REFERENCE MATERIALS

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
Organic Acid (as Acetic)	mg/l	2.00	2.04	102. %

BLANKS

ANALYTE	UNITS	RESULT
Organic Acid (as Acetic)	mg/l	< 0.1

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

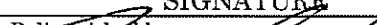

Phone # (206) 285-8282 merdahl@friedmanandbruya.com

SUBCONTRACTOR <i>Amtest</i>	
PROJECT NAME/NO. <i>109029</i>	PO # <i>B-401</i>
REMARKS	

☐ Will call with instructions

[illegible]

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: 	Michael Erdahl	Friedman & Bruya	9/2/21	1310
Received by: 	Am Kyle Watkins	Am test	9/3/21	1645
Relinquished by:				
Received by:				

Exder $T \approx 20.2$

DATA ASSESSMENT SUMMARY

Project Information			
Project Name:	Kelly-Moore Paint	Lab Names:	Friedman & Bruya, Inc. (F&BI), and Fremont Analytical (Fremont) Am Test Laboratories (Am Test)
Project Number:	PS21204540.01	Lab Report Numbers:	F&BI: 109029, 109058, 109059 Fremont: 2109050, 2109056 Am Test C21-A013135, C21-A013140
Reviewer's Name:	Marie Bevier Rebecca Enzor	Number of Samples:	12
Review Date:	09/27/2021	Matrix:	Water

Field Sample Identification	Collection Date	Laboratory Sample Identification			Note
		F&BI	Fremont	Am Test	
KMW-02R	09/01/2021	109029-01	--	--	MS for VOCs
KMW-07	09/01/2021	109029-02	--	--	
KMW-08	09/01/2021	109029-03	--	--	
KMW-03R	09/01/2021	109029-04	2109050-001	21-A013140	Lab duplicate and MS/MSD for anions, dissolved 200.8 metals, TOC, and VFA
BKF926	09/02/2021	109058-01	--	--	
BKF927	09/02/2021	109058-02	--	--	
Trip Blank	09/02/2021	109058-03	--	--	
KMW-09	09/02/2021	109059-01	2109056-001	21-A013135	Lab duplicate for BOD, carbon dioxide, and TOC MS/MSD for TOC
KMW-06	09/02/2021	109059-02	2109056-002	21-A013136	Lab duplicate for alkalinity
KMW-10	09/02/2021	109059-03	2109056-003	21-A013137	MS/MSD for hardness and 200.8 metals
KMW-04	09/02/2021	109059-04	2109056-004	21-A013138	Lab duplicate for dissolved gases
DUP1-20210902	09/02/2021	109059-05	2109056-005	21-A013139	Field duplicate of KMW-10

Notes:

BOD = biochemical oxygen demand

MS = matrix spike

MSD = matrix spike duplicate

TOC = total organic carbon

VFA = volatile fatty acids

VOC = volatile organic compound

Qualifier Definitions

J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

Reason Code Definitions

EXC	There are multiple results for the same analyte in the same sample and this result should not be used for reporting purposes.
FD	Imprecision between primary and field duplicate results.
BC	The calibration standard did not meet method-specified criteria.
HL	High laboratory control sample (LCS) recovery. Result may be biased high.
HT	Maximum-recommended hold time was exceeded.
RT	Elevated sample receipt temperature.

Field Duplicate Assessment

Analyte	Average Reporting Limit	Primary Result	Duplicate Result	RPD	Notes
Samples KMW-10 and Dup1-20210902					
Gasoline Range Organics	1,000 µg/L	20,000	31,000	43%	J-FD
Diesel Range Organics	50 µg/L	8,900	7,800	13%	
Motor Oil Range Organics	250 µg/L	370	1,000	92%	J-FD
Arsenic (6020)	1 µg/L	48.7	9.35	136%	J-FD
Lead (6020)	1 µg/L	116	4.47	185%	J-FD
Chromium (6020)	15 µg/L	38.1	< 10	NC	J/UJ-FD
Copper (6020)	75 µg/L	129	< 50	NC	J/UJ-FD
Nickel (6020)	15 µg/L	24	< 10	NC	± RL
Zinc (6020)	75 µg/L	380	< 50	NC	J/UJ-FD
Benzo(a)anthracene	0.3 µg/L	1.5	0.80	61%	J-FD
Chrysene	0.3 µg/L	1.5	0.79	62%	J-FD
Benzo(a)pyrene	0.3 µg/L	2.1	1.1	63%	J-FD
Benzo(b)fluoranthene	0.3 µg/L	2.0	1.1	58%	J-FD
Benzo(k)fluoranthene	0.3 µg/L	0.66	0.35	61%	J-FD
Indeno(1,2,3-cd)pyrene	0.3 µg/L	1.2	0.69	54%	J-FD
Toluene	25 µg/L	1,900	1,900	0.0%	
Ethylbenzene	25 µg/L	1,800	1,800	0.0%	
m,p-Xylene	50 µg/L	5,800	5,900	1.7%	
o-Xylene	25 µg/L	2,100	2,100	0.0%	
Isopropylbenzene	25 µg/L	31	31	0.0%	
n-Propylbenzene	25 µg/L	27	25	7.7%	
1,3,5-Trimethylbenzene	25 µg/L	38	37	2.7%	
1,2,4-Trimethylbenzene	25 µg/L	80	81	1.2%	
Biochemical Oxygen Demand	2 mg/L	56.1	48.8	14%	

Field Duplicate Assessment					
Analyte	Average Reporting Limit	Primary Result	Duplicate Result	RPD	Notes
Samples KMW-10 and Dup1-20210902					
Dissolved Methane	0.338 mg/L	6.39	6.26	2.1%	
Sulfate	6 mg/L	12.6	11.9	5.7%	
Hardness	5 mg/L	134	130	3.0%	
Calcium, Dissolved (200.8)	5,250 µg/L	34,100	35,400	3.7%	
Iron, Dissolved (200.8)	100 µg/L	15,900	19,100	18%	
Manganese, Dissolved (200.8)	1.8 µg/L	1,180	1,210	2.5%	
Sodium, Dissolved (200.8)	2,500 µg/L	61,000	59,400	2.7%	
Aluminum (200.8)	300 µg/L	624	348	57%	± RL
Calcium (200.8)	1,500 µg/L	36,700	36,000	1.9%	
Iron (200.8)	750 µg/L	89,300	78,600	13%	
Manganese (200.8)	15 µg/L	1,190	1,220	2.5%	
Sodium (200.8)	1,500 µg/L	53,800	61,900	14%	
Total Organic Carbon	0.50 mg/L	34.9	34.5	1.2%	
Alkalinity	2.50 mg/L	169	166	1.8%	
Carbon Dioxide	2.50 mg/L	226	241	6.4%	
Chemical Oxygen Demand	100 mg/L	104	111	6.5%	
Organic Acid (as Acetic)	0.1 mg/L	0.10	0.19	62%	± RL

Notes:

< = less than

µg/L = micrograms per liter

mg/L = milligrams per liter

NC = not calculable

RPD = relative percent difference

± RL = the difference between concentrations is less than the reporting limit

Assessment Summary: F&BI 109029, 109058, 109059

Parameter:	Gasoline-Range Organics (GRO) by NWTPH-Gx	Diesel Range Organics (DRO) and Motor Oil Range Organics (ORO) by NWTPH-Dx	Total Metals by EPA Method 6020B	Polycyclic Aromatic Hydrocarbons by EPA Method 8270E	Volatile Organic Compounds by EPA Method 8260D
1. Chain of Custody	CoC not present in the data package for 109059, otherwise acceptable				
2. Receipt Temperature	Sample receipt condition not recorded for 109059, otherwise acceptable				
3. Hold Time	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable
4. Blank Detections	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable
5. Surrogate Recoveries	Informational ^a	Acceptable	Not Applicable	Informational ^{f,g}	Acceptable
6. Laboratory Control Sample (LCS) Recoveries	Acceptable	Acceptable	Acceptable	Acceptable	Informational ⁱ
7. LCS/LCS Duplicate (LCSD) Precision	Not applicable	Acceptable	Not applicable	Acceptable	Informational ⁱ
8. Matrix Spike (MS) Recoveries	Not applicable	Not applicable	Not applicable	Not applicable	Acceptable
9. MS/MS Duplicate (MSD) Precision	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
10. Laboratory Duplicate Precision	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
11. Other Quality Control Issues	Qualification ^b	Qualification ^c Informational ^d	Qualification ^e	Qualification ^h	Qualification ^k Reporting ^l

Assessment Summary: Freemont 2109050, 2109056					
Parameter:	Biochemical Oxygen Demand (BOD) by SM 5210B	Dissolved Gases by RSK-175	Anions by EPA Method 300.0	Hardness by EPA Method 200.8/SM 2340B	Dissolved Metals by EPA Method 200.8
1. Chain of Custody	Acceptable				
2. Receipt Temperature	Acceptable				
3. Hold Time	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable
4. Blank Detections	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable
5. Surrogate Recoveries	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
6. LCS Recoveries	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable
7. LCS/LCSD Precision	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
8. MS Recoveries	Not applicable	Not applicable	Acceptable	Acceptable	Informational ^m
9. MS/MSD Precision	Not applicable	Not applicable	Acceptable	Acceptable	Informational ⁿ
10. Laboratory Duplicate Precision	Acceptable	Acceptable	Acceptable	Not applicable	Acceptable
11. Other Quality Control Issues	None	None	None	None	None

Assessment Summary: Freemont 2109050, 2109056					
Parameter:	Total Metals by EPA Method 200.8	Total Organic Carbon by SM 5310C	Total Alkalinity by SM 2320B	Carbon Dioxide by SM 2320B/ SM4500-CO2D	Chemical Oxygen Demand by SM 5220D
1. Chain of Custody	Acceptable				
2. Receipt Temperature	Acceptable				
3. Hold Time	Acceptable	Acceptable	Acceptable	Qualification ^q	Acceptable
4. Blank Detections	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable
5. Surrogate Recoveries	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
6. LCS Recoveries	Qualification ^o	Acceptable	Acceptable	Acceptable	Acceptable
7. LCS/LCSD Precision	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
8. MS Recoveries	Informational ^p	Acceptable	Not applicable	Not applicable	Not applicable
9. MS/MSD Precision	Acceptable	Acceptable	Not applicable	Not applicable	Not applicable
10. Laboratory Duplicate Precision	Not applicable	Acceptable	Acceptable	Acceptable	Not applicable
11. Other Quality Control Issues	None	None	None	None	None

Assessment Summary: AmTest 21-A0103135 and 21-A013140

Parameter:	Volatile Fatty Acids by EPA 300.0 modified				
1. Chain of Custody	Chain of custody is complete.				
2. Receipt Temperature	Qualification ^{r, s}				
3. Hold Time	Acceptable				
4. Blank Detections	None				
5. Surrogate Recoveries	NA				
6. Standard Reference Material Recoveries	Acceptable				
7. LCS/LCSD Precision	NA				
8. MS Recoveries	Acceptable				
9. MS/MSD Precision	NA				
10. Laboratory Duplicate Precision	Acceptable				
11. Other Quality Control Issues	None				

Notes	Description	Action Required
a	According to the laboratory's notes, F&BI did not report surrogate recovery from the GRO analysis of sample KMW-04 due to matrix interference.	The sample was analyzed at a 1:10 dilution due to a high target analyte concentrations and Wood did not assess data usability for this sample based on the surrogate recovery.
b	The RPD between GRO results from sample KMW-10 and it field duplicate Dup1-20210902 was high at 43%.	Wood J qualified the detected GRO results from samples KMW-10 and Dup1-20210902 because of sampling and/or analytical imprecision. (J-FD)
c	The RPD between ORO results from sample KMW-10 and it field duplicate Dup1-20210902 was high at 92%.	Wood J qualified the detected ORO results from samples KMW-10 and Dup1-20210902 because of sampling and/or analytical imprecision. (J-FD)
d	According to the laboratory's notes, the DRO chromatograms for samples BKF926, BKF927, KMW-03R, and KMW-08; and the ORO chromatograms for samples KMW-06, KMW-09, KMW-10, and Dup1-20210902 do not match the analytical standards used for quantification.	None. Results are being reported as diesel or motor oil range and all compounds present in the same retention time ranges as the diesel or motor oil standards would correctly be identified as diesel or motor oil range.
e	RPDs between arsenic and lead results from sample KMW-10 and its field duplicate Dup1-20210902 were high at 136% and 185%, respectively. Additionally, differences between chromium, copper, and zinc results were greater than the reporting limit.	Wood J qualified the detected and UJ qualified the non-detected arsenic, lead, chromium, copper, and zinc results from samples KMW-10 and Dup1-20210902 because of sampling and/or analytical imprecision. (J/UJ-FD)
f	F&BI did not recover the surrogate compound 2-fluorophenol from sample KMW-04.	2-Fluorophenol is not associated with PAH analytes and data usability is not adversely affected by the lack of surrogate recovery.
g	Recovery of the surrogate compound terphenyl-d14 was high at 152% in sample KMW-02R.	Target analytes were not detected in the sample and data usability is not adversely affected by the potential high analytical bias.

Notes	Description	Action Required
h	RPDs between benzo(a)anthracene (61%), chrysene (62%), benzo(a)pyrene (61%), benzo(b)fluoranthene (58%), benzo(k)fluoranthene (61%), and indeno(1,2,3-cd)pyrene (54%) results from sample KMW-10 and its field duplicate Dup1-20210902 were high.	Wood J qualified the detected benzo(a)anthracene, chrysene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, and indeno(1,2,3-cd)pyrene results from samples KMW-10 and Dup1-20210902 because of sampling and/or analytical imprecision. (J-FD)
i	Trichlorofluoromethane recovery was high at 135% in the LCS associated with the analysis of samples BKF926, BKF927, KMW-04, KMW-06, KMW-09, KMW-10, and Dup1-20210902.	Trichlorofluoromethane was not detected in the associated samples and data usability is not adversely affected by the potential high analytical bias.
j	The RPD between bromodichloromethane results was high at 25% in the LCS and LCSD associated with the analysis of samples KMW-02R, KMW-03R, KMW-07, and KMW-08.	Bromodichloromethane was not detected in the associated samples and data usability is not adversely affected by the potential analytical imprecision.
k	According to the laboratory's notes, 1,1-dichloroethane did not meet specified criteria in the calibration standard associated with the analysis of samples BFK926, BFK927, KMW-04, KMW-06, KMW-09, KMW-10, and Dup1-20210902.	Wood UJ qualified the 1,1-dichloroethane results from the associated samples because the calibration standard did not meet criteria. (UJ-BC)
l	According to the laboratory's notes, the ethylbenzene, m,p-xylene, and o-xylene results from the 1:25 dilution performed on sample KMW-04 were greater than the instrument's calibration range.	Ethylbenzene, m,p-xylene, and o-xylene results from sample KMW-04 should be reported from the 1:200 dilution, not from the 1:25 dilution; and all other results should be reported from the 1:25 dilution, not from the 1:200 dilution. (EXC)
m	Calcium (-45.5%, 194%) and sodium (38.1%, MS) recoveries were outside of limits in the MS and/or MSD performed on sample KMW-03R.	The calcium and sodium concentrations detected in the unspiked native sample were greater than four times the spike concentrations and it is not possible to assess data usability for these analytes in this sample based on MS recoveries.
n	It appears that Fremont miscalculated RPDs between MS and MSD results in the dissolved metal analysis of sample KMW-03R.	Fremont reported RPDs of 200% for aluminum and 175% for iron. Wood recalculated RPDs based on reported MS and MSD results. All recalculated RPDs were less than the laboratory-specified maxima of 30%.
o	Aluminum recovery was high at 123% in the LCS associated with the analysis of samples KMW-03R, KMW-04, KMW-06, KMW-09, KMW-10, and Dup1-20210902.	Wood J qualified the aluminum results from samples KMW-06, KMW-10, and Dup1-20210902 because of potential high analytical bias. (J-HL) Aluminum was not detected in the remaining samples and data usability is not adversely affected by the potential high analytical bias.
p	Iron (168%, MS) and sodium (279%, 343%) recoveries were high in the MS and/or MSD performed on sample KMW-10.	The iron and sodium concentrations detected in the unspiked native sample were greater than four times the spike concentrations and it is not possible to assess data usability for these analytes in this sample based on MS recoveries.
q	Sample KMW-03R was analyzed for carbon dioxide 9 days outside the recommended maximum hold time and samples KMW-04, KMW-06, KMW-09, KMW-10, and Dup1-20210902 were analyzed 13 days outside the recommended maximum hold time of 24 hours.	Wood J qualified the detected carbon dioxide results from the associated samples because of the missed hold times. (J-HT)
r	The temperature of samples KMW-03R was high at 20.2 degrees Celsius upon receipt at AmTest.	Wood UJ qualified the non-detected VFA result from this sample because of the elevated receipt temperature (UJ-RT)
s	The temperature of samples KMW-04, KMW-06, KMW-09, KMW-10, and Duplicate 1 was high at 10.8 degrees Celsius upon receipt at AmTest.	Wood J qualified the detected and UJ qualified the non-detected VFA results from these samples because of the elevated receipt temperature (J/UJ-RT)

Data Qualified During Validation				
Sample Identification	Method	Parameter	Concentration	Qualifier and Reason Code
BKF926	8260D	1,1-Dichloroethane	<1 µg/L	UJ-BC
BKF927	8260D	1,1-Dichloroethane	<1 µg/L	UJ-BC
Dup1-20210902	200.8	Aluminum	348 µg/L	J-HL
DUP1-20210902	300.0 mod	Organic Acid (as Acetic)	0.19 mg/L	J-RT
Dup1-20210902	6020	Arsenic	9.35 µg/L	J-FD
Dup1-20210902	6020	Chromium	< 10 µg/L	UJ-FD
Dup1-20210902	6020	Copper	< 50 µg/L	UJ-FD
Dup1-20210902	6020	Lead	4.47 µg/L	J-FD
Dup1-20210902	6020	Zinc	< 50 µg/L	UJ-FD
Dup1-20210902	8260D	1,1-Dichloroethane	< 25 µg/L	UJ-BC
Dup1-20210902	8270E	Benzo(a)anthracene	0.80 µg/L	J-FD
Dup1-20210902	8270E	Chrysene	0.79 µg/L	J-FD
Dup1-20210902	8270E	Benzo(a)pyrene	1.1 µg/L	J-FD
Dup1-20210902	8270E	Benzo(b)fluoranthene	1.1 µg/L	J-FD
Dup1-20210902	8270E	Benzo(k)fluoranthene	0.35 µg/L	J-FD
Dup1-20210902	8270E	Indeno(1,2,3-cd)pyrene	0.69 µg/L	J-FD
Dup1-20210902	NWTPH-Dx	Motor Oil Range Organics	1,000 µg/L	J-FD
Dup1-20210902	NWTPH-Gx	Gasoline Range Organics	31,000 µg/L	J-FD
Dup1-20210902	SM4500-CO2D	Carbon dioxide	241 mg/L	J-HT
KMW-03R	300.0 mod	Organic Acid (as Acetic)	< 0.1 mg/L	UJ-RT
KMW-03R	SM4500-CO2D	Carbon dioxide	144 mg/L	J-HT
KMW-04	300.0 mod	Organic Acid (as Acetic)	3.24 mg/L	J-RT
KMW-04	8260D	1,1-Dichloroethane	< 25 µg/L	UJ-BC
KMW-04	8260D (1:25 dilution)	Ethylbenzene	5,200 µg/L	EXC
KMW-04	8260D (1:25 dilution)	m,p-Xylene	17,000 µg/L	EXC
KMW-04	8260D (1:25 dilution)	o-Xylene	4,100 µg/L	EXC
KMW-04	8260D (1:200 dilution)	All analytes except for ethylbenzene, m,p-xylene, and o-Xylene	200 – 10,000 µg/L	EXC
KMW-04	SM4500-CO2D	Carbon dioxide	60.6 mg/L	J-HT
KMW-06	200.8	Aluminum	111 µg/L	J-HL
KMW-06	300.0 mod	Organic Acid (as Acetic)	< 1 mg/L	UJ-RT
KMW-06	8260D	1,1-Dichloroethane	< 10 µg/L	UJ-BC
KMW-06	SM4500-CO2D	Carbon dioxide	291 mg/L	J-HT
KMW-09	300.0 mod	Organic Acid (as Acetic)	< 0.1 mg/L	UJ-RT
KMW-09	8260D	1,1-Dichloroethane	< 1 µg/L	UJ-BC
KMW-09	SM4500-CO2D	Carbon dioxide	129 mg/L	J-HT
KMW-10	200.8	Aluminum	624 µg/L	J-HL
KMW-10	300.0 mod	Organic Acid (as Acetic)	0.10 mg/L	J-RT
KMW-10	6020	Arsenic	48.7 µg/L	J-FD
KMW-10	6020	Chromium	38.1 µg/L	J-FD
KMW-10	6020	Copper	129 µg/L	J-FD
KMW-10	6020	Lead	116 µg/L	J-FD
KMW-10	6020	Nickel	24 µg/L	J-FD
KMW-10	6020	Zinc	380 µg/L	J-FD
KMW-10	8260D	1,1-Dichloroethane	< 25 µg/L	UJ-BC
KMW-10	8270E	Benzo(a)anthracene	1.5 µg/L	J-FD
KMW-10	8270E	Chrysene	1.5 µg/L	J-FD
KMW-10	8270E	Benzo(a)pyrene	2.1 µg/L	J-FD
KMW-10	8270E	Benzo(b)fluoranthene	2.0 µg/L	J-FD
KMW-10	8270E	Benzo(k)fluoranthene	0.66 µg/L	J-FD
KMW-10	8270E	Indeno(1,2,3-cd)pyrene	1.2 µg/L	J-FD
KMW-10	NWTPH-Dx	Motor Oil Range Organics	370 µg/l	J-FD
KMW-10	NWTPH-Gx	Gasoline Range Organics	20,000 µg/L	J-FD
KMW-10	SM4500-CO2D	Carbon dioxide	226 mg/L	J-HT



Appendix C

Field Forms,
SVE-AS Operations & Monitoring

SVE System Monthly Inspection Log. Kelly Moore. Date: 01-09-2020

Visual/Audio Inspection. Located at: 5400 Airport Way South Seattle, WA

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	YES	VAC GAUGES (2013) @ MANIFOLD ARE DAMAGED NOT WORKING - PIPE + VALVES OK
Control Pump (Regenerative Blower)	YES	(On / Off) ON.
Entrainment Pump (Transfer Pump)	YES	(Auto / Hand / Off) AUTO
Pressure Gauges/Flow Meters	YES	VAC GAUGES @ MANIFOLDS HAVE ISSUES
Knockout Tank (record level)	YES	% full 0%.
Knockout Water Tote (record level)	YES	% full 35%.
Dilution Valve Status	YES	CLOSED 100%.
Recirculation Valve Status	YES	OPEN 100%.

CATOX Screen Readings

Item	Units	Reading	Operating Range
Hour Meter	H-M	3598.7	H.M.
Catox In (T ₁)	°F	799	>650
Catox Out (T ₂)	°F	927	600 - 650
Heat Ex (T ₃)	°F	561	300 - 400
Flow	SCFM	~78	<300
LEL	%	14	5-15

System Gauge Readings

Item	Units	Reading
FE - 1	"WC	- 0.40" WC
PI - 1	"WC (vacuum)	2.25" WC
TI - 1	°F	36°F
FE-2	"WC	0.40" WC

* FID FLAME OUT.

FID Measurements

FID FLAME OUT @ INF SCREENING, ALSO FLAME OUT @ VOC SCREENING OF SVE WELLS 12 + 13. FID WOULD NOT RESTART AFTER LAST FLAME OUT @ SVE-12 VOC SCREENING.

Location	Time	FID Reading (ppm)	Valve Position (record notch)	Vacuum ("WC)	Differential Pressure ("WC)
Western Manifold	NO READING				
SVE - 13	1315 HRS	* > 6333 PPM	4	0.00"	0.100"
SVE - 12	1320 HRS	* 920 PPM	4	0.50"	0.010"
SVE - 11	1308	NO FID	4	1.20"	0.005"
SVE - 10	1305		4	1.00"	0.007"
SVE - 09	1300		5	0.00"	0.010"
Eastern manifold	NO READING	NO FID			
SVE - 01	1339		6	0.00"	0.007"
SVE - 03	1344		1	0.50"	0.015"
SVE - 05	1343		1	0.00"	0.007"
SVE - 07	1341		6	0.00"	0.009"
SVE - 08	1341		6	1.75"	0.001"
SVE - 06	1340		6	0.50"	0.006"
SVE - 04	1340		6	0.50"	0.005"
SVE - 02			6	12.0" - BROKEN	0.007"
SVE Influent	1250	* > 6333 PPM			
SVE Effluent	1235	2075 PPM			

Influent Sample ID: INF-010920

Influent Sample Time: 1250 HRS

Effluent Sample ID: EFF-010920

Effluent Sample Time: 1235 HRS

Field Representative (Print and Sign): G. Klockeman
George Hagan

Date of Visit: 01-09-2020

AS System Monthly Inspection Log, Kelly Moore. Date: 01-09-2020

Visual/Audio Inspection

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	N/A	
Regenerative Blower		(Auto / Hand / Off)
Heat Exchanger		(Auto / Hand / Off)
Pressure Gauges/Flow Meters		
Vent Valve Status		

System Gauge Readings

Before Heat Exchanger

Item	Units	Reading	Operating Range
Hour Meter Spurge Blower	Hour's / Minutes	N/A	
PI - 3	psi		0 - 30
TI - 3	°F		150 - 200

After Heat Exchanger

Item	Units	Reading	Operating Range
Hour Meter Heat Exchanger	Hour's / Minutes	N/A	
PI - 4	psi		0 - 30
TI - 4	°F		150 - 200

Air Flow Monitoring

Location	Time	Valve Position (record appx angle)	Pressure (psi)	Air Flow (SCFM)
AS - 1	N/A			
AS - 2				
AS - 3				
AS - 4				
AS - 5				

Additional Notes. System (CATOX) RESTART AFTER NEW CATALYST CELL + SEAL ON 1-7-20
RESTART CATOX 1-8-20 AFTER SEAL SET OVERNIGHT. ADJUST & MONITORED FOR VOL'S + D.E.
1-9-20, SVE-CATOX OPERATION ARRIVAL. MONITOR VOL'S FOR D.E. FID KEPT SHUTTING
DOWN. DESTRUCTION EFFICIENCY + VOC VALUES UNKNOWN, COLLECTED JAN-2020
Sys VAPOR SAMPLES & DELIVERED TO LAB. SYSTEM (CATOX) DATA READ + RECORDED
AIR SPARGE SYSTEM OFF UNTIL WE KNOW (CATOX) D.E.
CATOX OPERATIONAL @ OUR DEPARTURE.

Field Representative (Print and Sign): George Hoogen Date of Visit: 1-9-20

SVE System Monthly Inspection Log. Kelly Moore. Date: 2-14-2020

Visual/Audio Inspection. Located at: 5400 Airport Way South Seattle, WA

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	Yes	
Control Pump (Regenerative Blower)	Yes	(On / Off)
Entrainment Pump (Transfer Pump)	Yes	(Auto / Hand / Off)
Pressure Gauges/Flow Meters	Yes	
Knockout Tank (record level)	Yes 10	% full
Knockout Water Tote (record level)	Yes 30	% full
Dilution Valve Status	Yes 100% closed	
Recirculation Valve Status	Yes	open

CATOX Screen Readings

Item	Units	Reading	Operating Range
Hour Meter	H-M	3897	
Catox In (T ₁)	°F	665	>650
Catox Out (T ₂)	°F	602	600 - 650
Heat Ex (T ₃)	°F	367	300 - 400
Flow	SCFM	198	<300
LEL	%	0.3	5-15

System Gauge Readings

Item	Units	Reading
FE - 1	"WC	200 SCFM or 0.11" WC
PI - 1	"WC (vacuum)	10" WC 20.5" WC
TI - 1	°F	40°F
FE-2	"WC	170 SCFM 0.011"

FID Measurements

PID CALIBRATED TO 100 PPM HEXANE G.H.

Location	Time	PID FID Reading (ppm)	Valve Position (record notch)	Vacuum ("WC)	Differential Pressure ("WC)
Western Manifold	11:05	33.4			
SVE - 13	11:04	1.2	2	0.75"	.009"
SVE - 12	11:02	58.7	7	1.5"	.010"
SVE - 11	11:00	5.5	2	1"	.010"
SVE - 10	10:58	35.2	7	16"	.010"
SVE - 09	10:55	1.9	2	0	.010"
Eastern manifold	11:07	13.5 ppm			
SVE - 01	11:17	3.2	2	0	.007"
SVE - 03	11:26-4:43	19.8	7	14"	.007"
SVE - 05	11:24	50	7	14.5"	.007"
SVE - 07	11:20	510	2 to 7	0	.007"
SVE - 08	11:28-4:43	5.2	2	13"	.008"
SVE - 06	11:29-4:43	2.6	2	1"	.008"
SVE - 04	11:32-4:43	1.3	2	5"	.007"
SVE - 02	11:33-4:43	1.1	2	10.5"	.007"
SVE Influent	10:14	55 ppm			
SVE Effluent	10:11	1.3 ppm			

Influent Sample ID: INF-02142020

Influent Sample Time: 10:28

Effluent Sample ID: EFF-02142020

Effluent Sample Time: 10:26

Field Representative (Print and Sign): Gavin Klockman

Date of Visit: 2-14-2020

AS System Monthly Inspection Log, Kelly Moore. Date: 2-14-20

Visual/Audio Inspection

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	y	
Regenerative Blower	y	(Auto) Hand / Off
Heat Exchanger	y	(Auto) Hand / Off
Pressure Gauges/Flow Meters	y	
Vent Valve Status	y	open 90%.

System Gauge Readings

Before Heat Exchanger

Item	Units	Reading	Operating Range
Hour Meter Spurge Blower	Hour's / Minutes	2377	
PI - 3	psi	11.5	0 - 30
TI - 3	°F	185	150 - 200

After Heat Exchanger

Item	Units	Reading	Operating Range
Hour Meter Heat Exchanger	Hour's / Minutes	2378	
PI - 4	psi	10	0 - 30
TI - 4	°F	68	150 - 200

Air Flow Monitoring

Location	Time	Valve Position (record appx angle)	Pressure (psi)	Air Flow (SCFM)
AS - 1	1135-163	20% open	3.5	6.5
AS - 2	↓	↓	3.0	5.5
AS - 3	↓	↓	3.5	6.0
AS - 4	↓	↓	3.5	6.0
AS - 5	↓	↓	3.5	6.0

Additional Notes.

Changed the air flow to 200 SCFM post inspection. Re-Took the February 2020 System's Vapor samples. Recorded System data.

G. Hagans

Field Representative (Print and Sign): Gavin Klockeman Date of Visit: 2-14-2020

SVE System Monthly Inspection Log. Kelly Moore. Date: 3-17-2020

Visual/Audio Inspection. Located at: 5400 Airport Way South Seattle, WA

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	yes	
Control Pump (Regenerative Blower)	yes	(On / Off)
Entrainment Pump (Transfer Pump)	yes	(Auto / Hand / Off)
Pressure Gauges/Flow Meters	yes	
Knockout Tank (record level)	yes	% full 0%
Knockout Water Tote (record level)	yes	% full 35%
Dilution Valve Status	yes	100% Closed
Recirculation Valve Status	yes	85% Closed

CATOX Screen Readings

Item	Units	Reading	Operating Range
Hour Meter	H-M	4056	
Catox In (T ₁)	°F	659	>650
Catox Out (T ₂)	°F	603	600 - 650
Heat Ex (T ₃)	°F	370	300 - 400
Flow	SCFM	225	<300
LEL	%	—	5-15

40 read 110; not correct

System Gauge Readings

Item	Units	Reading
FE - 1	"WC	0.015"
PI - 1	"WC (vacuum)	12.5" H ₂ O
TI - 1	°F	44° F
FE-2	"WC	1.2" WC

FID Measurements

Location	Time	FID Reading (ppm)	Valve Position (record notch)	Vacuum ("WC)	Differential Pressure ("WC)
Western Manifold	1127	13.2			
SVE - 13	1114	2.0	6	1"	.014"
SVE - 12	1117	2.5	1	10.5"	.015"
SVE - 11	1119	0.8	6	1"	.014"
SVE - 10	1122	59.6	1	10.5"	.015"
SVE - 09	1124	2.1	6	Q	.014"
Eastern manifold	1153	111.0			
SVE - 01	1142	0.5	6	Q	.021"
SVE - 03	1147	90.5	1	9"	.015"
SVE - 05	1149	325.0	1	12"	.014"
SVE - 07	1151	12.1	1	1.2"	.015"
SVE - 08	1139	0.9	6	10.5"	.014"
SVE - 06	1138	0.6	6	2.4"	.013"
SVE - 04	1135	2.3	6	2.5"	.013"
SVE - 02	1133	1.3	6	2.6"	.013"
SVE Influent	1246	100.9			
SVE Effluent	1243	7.6			

* Influent Sample ID: INF-03172020
Influent Sample Time: 13:09

* Effluent Sample ID: EFF-03172020
Effluent Sample Time: 12:54

Field Representative (Print and Sign): Gavin Klockman Date of Visit: 3-17-2020

George Hagan 1 of 2

* INFLUENT + EFFLUENT SAMPLES WERE COLLECTED VIA 1-LITER SUMMA VESSELS. ANALYSIS REQUEST IS BTEX BY TO-15 + TPH-G AS HEXANE.

AS System Monthly Inspection Log, Kelly Moore. Date: 3-17-2020

Visual/Audio Inspection

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	Yes	
Regenerative Blower	out for repair	(Auto / Hand / Off)
Heat Exchanger	Yes	(Auto / Hand / Off)
Pressure Gauges/Flow Meters	Yes	
Vent Valve Status	?	Blower out for repair

System Gauge Readings

Before Heat Exchanger

Item	Units	Reading	Operating Range
Hour Meter Spurge Blower	Hour's / Minutes	2497	
PI - 3	psi	—	0 - 30
TI - 3	°F	—	150 - 200

After Heat Exchanger

Item	Units	Reading	Operating Range
Hour Meter Heat Exchanger	Hour's / Minutes	2497	
PI - 4	psi	—	0 - 30
TI - 4	°F	—	150 - 200

Air Flow Monitoring

Location	Time	Valve Position (record appx angle)	Pressure (psi)	Air Flow (SCFM)
AS - 1	Unit offline, blower out for repair			
AS - 2				
AS - 3				
AS - 4				
AS - 5				

Additional Notes.

CATOX RESTART, MARCH 2020 SYSTEM VAPOR SAMPLES COLLECTED.
RECORDED ALL SYSTEM'S DATA. SVE - CATOX OPERATIONAL @ OUR DEPARTURE.

C. Huggins

Field Representative (Print and Sign): Gaston Blocken Date of Visit: 3-17-2020

[Signature]

SVE System Monthly Inspection Log. Kelly Moore. Date: 4-20-2020

Visual/Audio Inspection. Located at: 5400 Airport Way South Seattle, WA

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	yes	
Control Pump (Regenerative Blower)	yes	(On / Off)
Entrainment Pump (Transfer Pump)	yes	(Auto / Hand / Off)
Pressure Gauges/Flow Meters	yes	
Knockout Tank (record level)	yes	% full 30%
Knockout Water Tote (record level)	yes	% full 40%
Dilution Valve Status	yes	Closed 100%
Recirculation Valve Status	yes	

CATOX Screen Readings

Item	Units	Reading	Operating Range
Hour Meter	H-M	4854	
Catox In (T ₁)	°F	696	>650
Catox Out (T ₂)	°F	658	600 - 650
Heat Ex (T ₃)	°F	413	300 - 400
Flow	SCFM	65	<300
LEL	%	-	5-15

broken

System Gauge Readings

Item	Units	Reading
FE - 1	"WC	0.011"
PI - 1	"WC (vacuum)	4.5"
TI - 1	°F	50°F
FE-2	"WC	1.8"

FID Measurements

Location	Time	FID Reading (ppm)	Valve Position (record notch)	Vacuum ("WC)	Differential Pressure ("WC)
Western Manifold	10:04	23.8			
SVE - 13	10:05	23.8	4	1.5"	.012"
SVE - 12	10:03	26.2	1	2"	.011"
SVE - 11	10:02	8.0	5	1"	.011"
SVE - 10	9:59	73.0	1	3.5"	.010"
SVE - 09	9:58	2.7	5	0	.011"
Eastern manifold	10:34	37.2			
SVE - 01	10:32	5.0	6	0	.012"
SVE - 03	10:30	10.9	1	1.25"	.012"
SVE - 05	10:28	94.6	1	3.0"	.012"
SVE - 07	10:25	5.3	1	3.5"	.013"
SVE - 08	10:23	2.2	6	3.5"	.012"
SVE - 06	10:22	2.7	6	0	.012"
SVE - 04	10:20	5.9	6	1.5"	.011"
SVE - 02	10:16	7.2	6	2.5"	.012"
SVE Influent	9:15	98.9			
SVE Effluent	9:15	4.8			

Influent Sample ID: INF-4-20-2020

Influent Sample Time: 9:34

Effluent Sample ID: EFF-4-20-2020

Effluent Sample Time: 9:24

Field Representative (Print and Sign) Gavin Hockerman Date of Visit: 4-20-2020

Gavin Hockerman
George Hagan JHA

AS System Monthly Inspection Log, Kelly Moore. Date: 4-20-2020

Visual/Audio Inspection

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	yes	
Regenerative Blower	yes	(Auto / Hand / Off)
Heat Exchanger	yes	(Auto / Hand / Off)
Pressure Gauges/Flow Meters	yes	*Pressure gauges have been checked in
Vent Valve Status	yes	

System Gauge Readings

Before Heat Exchanger

Item	Units	Reading	Operating Range
Hour Meter Spurge Blower	Hour's / Minutes	2649	
PI - 3	psi	9	0 - 30
TI - 3	°F	205°F	150 - 200

After Heat Exchanger

Item	Units	Reading	Operating Range
Hour Meter Heat Exchanger	Hour's / Minutes	2649	
PI - 4	psi	8.5	0 - 30
TI - 4	°F	73°F	150 - 200

Air Flow Monitoring

Location	Time	Valve Position (record appx angle)	Pressure (psi)	Air Flow (SCFM)
AS - 1	9:53	20°	3.5	10
AS - 2	9:54	I	3.0	9.5
AS - 3	9:54	I	3.5	9.5
AS - 4	9:54	I	3.5	9.5
AS - 5	9:55	I	3.0	9.5

Additional Notes.

AS-5 is getting very ~~dark~~ dirty. DE = 95.170.
 No issues regarding inspection. Collect full round of data for April inspection. Conducted housekeeping tasks. Samples collected using TO15 canisters.

Field Representative (Print and Sign): Gravin Klockman Date of Visit: 4-20-2020

George Hagan JHA

SVE System Monthly Inspection Log. Kelly Moore. Date: 5-18-2020

Visual/Audio Inspection. Located at: 5400 Airport Way South Seattle, WA

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	yes	
Control Pump (Regenerative Blower)	yes	(On / Off)
Entrainment Pump (Transfer Pump)	yes	(Auto / Hand / Off)
Pressure Gauges/Flow Meters	yes	
Knockout Tank (record level)	yes	% full 40%
Knockout Water Tote (record level)	yes	% full 40%
Dilution Valve Status	yes	Fully closed
Recirculation Valve Status	yes	Adjusted to set flow @ 40% open GK

CATOX Screen Readings

Item	Units	Reading	Operating Range
Hour Meter	H-M	3325	
Catox In (T ₁)	°F	687	>650
Catox Out (T ₂)	°F	653	600 - 650
Heat Ex (T ₃)	°F	419	300 - 400
Flow	SCFM	138	<300
LEL	%	NOT ID	5-15

USE ga

System Gauge Readings

Item	Units	Reading
FE - 1	"WC	.017"
PI - 1	"WC (vacuum)	6.5" H ₂ O
TI - 1	°F	55
FE-2	"WC	138 SCFM

@ 21.5 Amps on motor

FID Measurements

Location	Time	FID Reading (ppm)	Valve Position (record notch)	Vacuum ("WC)	Differential Pressure ("WC)
Western Manifold	929	4.2			
SVE - 13	927	3.9	4	2	.017
SVE - 12	926	3.4	7	2	.017
SVE - 11	924	3.2	3	1	.017
SVE - 10	923	24.3	7	3	.017
SVE - 09	921	1.4	3	0	.016
Eastern manifold	949	45.9			
SVE - 01	947	2.7	2	0	.017
SVE - 03	945	49.8	7	4	.017
SVE - 05	942	85.5	7	3	.017
SVE - 07	940	4.6	7	5.5	.017
SVE - 08	938	1.3	2	4.5	.018
SVE - 06	937	2.2	2	2	.019
SVE - 04	935	26.8	2 to 5	1.5	.02
SVE - 02	933	0.6	2	2.5	.016
SVE Influent	915	6.2	D.E. CALCULATED @ 95%		
SVE Effluent	915	0.3			

Influent Sample ID: INF-5-18-2020

Influent Sample Time: 1014

Effluent Sample ID: EFF-5-18-2020

Effluent Sample Time: 1020

Field Representative (Print and Sign): Gravin Klockerman Date of Visit: 5/18/2020

George Hagan - JHA.

AS System Monthly Inspection Log, Kelly Moore. Date: 5-18-2020

Visual/Audio Inspection

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	Yes	
Regenerative Blower	Yes	(Auto / Hand / Off)
Heat Exchanger	Yes	(Auto / Hand / Off)
Pressure Gauges/Flow Meters	Yes	
Vent Valve Status	Yes	OPEN 60%.

System Gauge Readings

Before Heat Exchanger

Item	Units	Reading	Operating Range
Hour Meter Spurge Blower	Hour's / Minutes	3320	
PI - 3	psi	9	0 - 30
TI - 3	°F	220	150 - 200

After Heat Exchanger

Item	Units	Reading	Operating Range
Hour Meter Heat Exchanger	Hour's / Minutes	3320	
PI - 4	psi	9	0 - 30
TI - 4	°F	76	150 - 200

Air Flow Monitoring

Location	Time	Valve Position (record appx angle)	Pressure (psi)	Air Flow (SCFM)
AS - 1	905	20°	2.5	9.7
AS - 2	906	I	1.75	9.5
AS - 3	906	I	2	9.5
AS - 4	906	I	2.5	9.25
AS - 5	906	I	2	9.5

Additional Notes. AIR FLOW GAUGE.

AS-5 has a lot of black build up compare to AS-1-AS-4.
Field Screen DE=95%. SVE4 opened to position 5
 Excessive water in vacuum gauges on SVE pipes. SVE5 gauge needs replacement. Noise coming from heat ex, sounds like something may be coming loose. Was inspected and couldn't see any issues. Also, we replaced belt guard and chart paper for CATOX.

Field Representative (Print and Sign):

Date of Visit: 5-18-2020

Gravin Klockman
 George Hagan - JHA.

SVE System Monthly Inspection Log. Kelly Moore. Date: 6-16-2020

Visual/Audio Inspection. Located at: 5400 Airport Way South Seattle, WA

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	yes	Crack on coupler on blower outlet
Control Pump (Regenerative Blower)	yes	(On / Off)
Entrainment Pump (Transfer Pump)	yes	(Auto / Hand / Off)
Pressure Gauges/Flow Meters	yes	
Knockout Tank (record level)	yes	% full 30% full
Knockout Water Tote (record level)	yes	% full 45% full
Dilution Valve Status	yes	Closed fully
Recirculation Valve Status	yes	

CATOX Screen Readings

Item	Units	Reading	Operating Range
Hour Meter	H-M	6164	
Catox In (T ₁)	°F	701	>650
Catox Out (T ₂)	°F	660	600 - 650
Heat Ex (T ₃)	°F	410	300 - 400
Flow	SCFM	130-140	<300
LEL	%	-	5-15

System Gauge Readings

Item	Units	Reading
FE - 1	"WC	0.021
PI - 1	"WC (vacuum)	7.25
TI - 1	°F	52.5
FE-2	"WC	0.021

FID Measurements

Location	Time	FID Reading (ppm)	Valve Position (record notch)	Vacuum ("WC)	Differential Pressure ("WC)
Western Manifold	1016	4.6			
SVE - 13	1015	1.9	2	5	0.020
SVE - 12	1013	4.4	7	5.5	0.019
SVE - 11	1012	3.1	2	5	0.020
SVE - 10	1010	22.5	7	6.5	0.020
SVE - 09	1008	3.7	2	5	0.019
Eastern manifold	1036	69.5			
SVE - 01	1020	2.0	2	5	0.001
SVE - 03	1022	202.0	7	5.25	0.000
SVE - 05	1025	71	7	5.5	0.000
SVE - 07	1026	13.2	7	5.5	0.001
SVE - 08	1028	4.8	2	5.5	0.001
SVE - 06	1030	3.0	2	2	0.001
SVE - 04	1032	10.8	5	5.5	0.001
SVE - 02	1034	3.2	2	5	0.001
SVE Influent	913	25.0			
SVE Effluent	906	2.5 1.3			

Influent Sample ID: INF-6-16-20
Influent Sample Time: 9:34

Effluent Sample ID: EFF-6-16-20
Effluent Sample Time: 9:31

Field Representative (Print and Sign)

Gavin Rodenman
G. Hagan

Date of Visit: 6-16-2020

AS System Monthly Inspection Log, Kelly Moore. Date: 6-16-2020

Visual/Audio Inspection

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	yes	
Regenerative Blower	yes	(Auto / Hand / Off)
Heat Exchanger	yes	(Auto / Hand / Off) still slight rattle
Pressure Gauges/Flow Meters	yes	
Vent Valve Status	yes	

System Gauge Readings

Before Heat Exchanger

Item	Units	Reading	Operating Range
Hour Meter Sparge Blower	Hour's / Minutes	3958.9	
PI - 3	psi	8.5	0 - 30
TI - 3	°F	220	150 - 200

After Heat Exchanger

Item	Units	Reading	Operating Range
Hour Meter Heat Exchanger	Hour's / Minutes	3959.3	
PI - 4	psi	9.5	0 - 30
TI - 4	°F	76	150 - 200

Air Flow Monitoring

Location	Time	Valve Position (record appx angle)	Pressure (psi)	Air Flow (SCFM)
AS - 1	9:51	20°	to 3.5	10
AS - 2			to 2.5	10
AS - 3			9.5 3.0	9.5
AS - 4			9.5 3.5	9.5
AS - 5			12.5 3.5	12.5

Additional Notes.

AS-5 has a lot of black build up. Heat Exchanger still making slight rattle. New ^{1/4" drip legs} pressure gauge on SVE-10 & SVE-12. ~~with water catcher mechanism.~~ DE = 94.8 ²ol. Replaced rubber coupler on blower outlet. Replaced air sparge compressor outlet temp. gauge. Changed blower oil. Data was ~~also~~ collected prior to repairs. June 2020 System's Vapor Samples were collected today.

Field Representative (Print and Sign):

Gavin Blokeman
G. Hagan

Date of Visit: 6-16-2020

SVE System Monthly Inspection Log. Kelly Moore. Date: 7-20-2020

Visual/Audio Inspection. Located at: 5400 Airport Way South Seattle, WA

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	Yes	
Control Pump (Regenerative Blower)	Yes	(On / Off)
Entrainment Pump (Transfer Pump)	Yes	(Auto / Hand / Off)
Pressure Gauges/Flow Meters	Yes	
Knockout Tank (record level)	Yes	% full 30% 20
Knockout Water Tote (record level)	Yes	% full 45% 30
Dilution Valve Status	Yes	Closed fully
Recirculation Valve Status	Yes	

CATOX Screen Readings

Item	Units	Reading	Operating Range
Hour Meter	H-M	6980	
Catox In (T ₁)	°F	716	>650
Catox Out (T ₂)	°F	665	600 - 650
Heat Ex (T ₃)	°F	448	300 - 400
Flow	SCFM	151	<300
LEL	%	-	5-15

System Gauge Readings

Item	Units	Reading
FE - 1	"WC	0
PI - 1	"WC (vacuum)	6.5
TI - 1	°F	62
FE-2	"WC	1.2" H ₂ O

FID Measurements

Location	Time	PID # FID Reading (ppm)	Valve Position (record notch)	Vacuum ("WC)	Differential Pressure ("WC)
Western Manifold	1018	10.0			
SVE - 13	1014	4.1	2	0	.002
SVE - 12	1012	14.6	7	4.5	.001
SVE - 11	1010	6.3	2	0	.005
SVE - 10	1009	35.0	7	4.5	.002
SVE - 09	1006	17.0	2	0	.001
Eastern manifold	1040	114.2			
SVE - 01	1038	24.2	2	0	.001
SVE - 03	1035	34.0	7	5	.002
SVE - 05	1033	73.9	7	4.5	.003
SVE - 07	1030	19	7	4	.001
SVE - 08	1029	5.0	2	5	.003 .002
SVE - 06	1026	4.6	2	0	.003
SVE - 04	1024	32.0	5	3.5	.001
SVE - 02	1022	2.3	2	0	0
SVE Influent	917	64.5.0 42.0			
SVE Effluent	920	64.42.0 5.0			

Influent Sample ID: INF-7-20-2020
Influent Sample Time: 9:42

Effluent Sample ID: EFF-7-20-2020
Effluent Sample Time: 9:45

Field Representative (Print and Sign): Gravin Hockeman
George Hagem

Date of Visit: 7-20-2020

AS System Monthly Inspection Log, Kelly Moore. Date: 7-20-2020

Visual/Audio Inspection

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	yes	
Regenerative Blower	yes	(Auto / Hand / Off)
Heat Exchanger	yes	(Auto / Hand / Off)
Pressure Gauges/Flow Meters	yes	
Vent Valve Status	yes	

System Gauge Readings

Before Heat Exchanger

Item	Units	Reading	Operating Range
Hour Meter Spurge Blower	Hour's / Minutes	4774	
PI - 3	psi	8.5	0 - 30
TI - 3	°F	235	150 - 200

After Heat Exchanger

Item	Units	Reading	Operating Range
Hour Meter Heat Exchanger	Hour's / Minutes	4775	
PI - 4	psi	9.5	0 - 30
TI - 4	°F	90	150 - 200

Air Flow Monitoring

Location	Time	Valve Position (record appx angle)	Pressure (psi)	Air Flow (SCFM)
AS - 1	958	20°	3	10.5
AS - 2	959	↓	2.5	10
AS - 3	959	↓	3	10
AS - 4	959	↓	3.25	10
AS - 5	959	↓	2.75	9.75

Additional Notes.

DE=88%, then we calibrated PID and got new DE=91%. George installed drip legs on all SVE piping to help water not get into pressure gauges. Also, new coupler was adjusted, as vibrations caused it to move down. Replaced vacuum gauges on SVE-07 & SVE-10. Changed paper chart as well. Adjust ampereage ^{Before} after departure to 2amps. CoH.

Field Representative (Print and Sign): Gravin Blackman

Date of Visit: 7-20-2020

George Hagan

SVE System Monthly Inspection Log. Kelly Moore. Date: 08-27-20

Visual/Audio Inspection. Located at: 5400 Airport Way South Seattle, WA

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	Y	O.K.
Control Pump (Regenerative Blower)	Y	(On / Off)
Entrainment Pump (Transfer Pump)	Y	(Auto / Hand / Off)
Pressure Gauges/Flow Meters	Y	O.K.
Knockout Tank (record level)	Y	% full 45% Full
Knockout Water Tote (record level)	Y	% full 25% Full
Dilution Valve Status	Y	100% closed
Recirculation Valve Status	Y	open 45% Amps @ Drive Motor 23.

CATOX Screen Readings

Item	Units	Reading	Operating Range
Hour Meter	H-M	7885.24	
Catox In (T ₁)	°F	705	>650
Catox Out (T ₂)	°F	648	600 - 650
Heat Ex (T ₃)	°F	432	300 - 400
Flow	SCFM	125	<300
LEL	%	N/A	5-15

System Gauge Readings

Item	Units	Reading
FE - 1	"WC	0.001 H ₂ O, 116 CFM
PI - 1	"WC (vacuum)	4.5" H ₂ O
TI - 1	°F	62°F
FE-2	"WC	0.12" H ₂ O

FID Measurements

Location	Time	FID Reading (ppm)	Valve Position (record notch)	Vacuum ("WC)	Differential Pressure ("WC)
Western Manifold	10:28	106		1.25	
SVE - 13	10:25	19.8	2	6.0" H ₂ O	.003
SVE - 12	10:23	111	7	3.25" H ₂ O	.003
SVE - 11	10:20	25.8	2	0.0" H ₂ O	.003
SVE - 10	10:18	152.6	7	3.75" H ₂ O	.003
SVE - 09	10:16	26	2	0.0" H ₂ O	.002
Eastern manifold	10:54	195			
SVE - 01	10:51	103	2		.004
SVE - 03	10:47	563	7	3.75" H ₂ O	.003
SVE - 05	10:45	251	7	4.0" H ₂ O	.003
SVE - 07	10:42	59.5	7	2.8" H ₂ O	.004
SVE - 08	10:40	8.1	2	4.0" H ₂ O	.004
SVE - 06	10:39	9.1	2	1.0" H ₂ O	.003
SVE - 04	10:36	101	7	2.25" H ₂ O	.006
SVE - 02	10:33	13.0	2	0" H ₂ O	.004
SVE Influent	1002 H ₂ O	321 PPM	DE @ 97.6		
SVE Effluent	0959 H ₂ O	7.5 PPM			

Influent Sample ID: INF-8-27-20
Influent Sample Time: 1004 HRS

Effluent Sample ID: EFF-8-27-20
Effluent Sample Time: 0943-HRS

Field Representative (Print and Sign): George Hagen

Date of Visit: 8-27-20

George Hagen

AS System Monthly Inspection Log, Kelly Moore. Date: 08-27-20

Visual/Audio Inspection

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	<u>Y</u>	<u>O.K.</u>
Regenerative Blower	<u>Y</u>	<u>(Auto / Hand / Off)</u>
Heat Exchanger	<u>Y</u>	<u>(Auto / Hand / Off)</u>
Pressure Gauges/Flow Meters	<u>Y</u>	<u>BLACK SCOT IN AIR FLOW GAUGES</u>
Vent Valve Status	<u>Y</u>	<u>OPEN 50%</u>

System Gauge Readings

Before Heat Exchanger

Item	Units	Reading	Operating Range
Hour Meter Spurge Blower	Hour's / Minutes	<u>5679.9</u>	
PI - 3	psi	<u>8.5 PSI</u>	0 - 30
TI - 3	°F	<u>228°F</u>	150 - 200

After Heat Exchanger

Item	Units	Reading	Operating Range
Hour Meter Heat Exchanger	Hour's / Minutes	<u>5680.4</u>	
PI - 4	psi	<u>10.0 PSI</u>	0 - 30
TI - 4	°F	<u>85°F</u>	150 - 200

Air Flow Monitoring

Location	Time	Valve Position (record appx angle)	Pressure (psi)	Air Flow (SCFM)
AS - 1	<u>0932</u>	<u>OPEN 20%</u>	<u>3.0 PSI</u>	<u>11.0 SCFM</u>
AS - 2	<u>1</u>	<u>1</u>	<u>2.25 PSI</u>	<u>11.0 SCFM</u>
AS - 3	<u>1</u>	<u>1</u>	<u>3.0 PSI</u>	<u>10.5 SCFM</u>
AS - 4	<u>1</u>	<u>1</u>	<u>3.0 PSI</u>	<u>10.5 SCFM</u>
AS - 5	<u>1</u>	<u>1</u>	<u>2.5 PSI</u>	<u>10.0 SCFM</u>

Additional Notes.

System operational @ our arrival. Found 4" x 3" Coupler Post Blower has Moved. Replaced 4" x 3" Ferris Coupler with a 4" x 3" Marine exhaust Bellows Coupler. Screened influent + effluent vapor streams, DEC 97.6%. Collected the influent + effluent system's vapor samples for August-2020. Recorded the system's data. All operational @ our departure.

Field Representative (Print and Sign): George Hoogen Date of Visit: 8-27-20

George Hoogen

SVE System Monthly Inspection Log. Kelly Moore. Date: 9-21-20

Visual/Audio Inspection. Located at: 5400 Airport Way South Seattle, WA

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	yes	OK
Control Pump (Regenerative Blower)	yes	(On / Off)
Entrainment Pump (Transfer Pump)	yes	(Auto / Hand / Off)
Pressure Gauges/Flow Meters	yes	OK
Knockout Tank (record level)	yes	% full 30%
Knockout Water Tote (record level)	yes	% full 50% @ 120 gal
Dilution Valve Status	yes	100% closed
Recirculation Valve Status	yes	50% open

CATOX Screen Readings

Item	Units	Reading	Operating Range
Hour Meter	H-M	8484.97	
Catox In (T ₁)	°F	703	>650
Catox Out (T ₂)	°F	686	600 - 650
Heat Ex (T ₃)	°F	465	300 - 400
Flow	SCFM	130	<300
LEL	%	N/A	5-15

System Gauge Readings

Item	Units	Reading
FE - 1	"WC	0.002" WC
PI - 1	"WC (vacuum)	6" H ₂ O
TI - 1	°F	57°F
FE-2	"WC	1.2" H ₂ O

FID Measurements

Location	Time	FID Reading (ppm)	Valve Position (record notch)	Vacuum ("WC)	Differential Pressure ("WC)
Western Manifold	10:20	219.4			
SVE - 13	10:18	38.3	2	0	.001
SVE - 12	10:16	382.0	7	2.25"	0
SVE - 11	10:14	13.2	2	0	0
SVE - 10	10:11	168.9	7	2.0"	0
SVE - 09	10:09	16.9	2	0	.001
Eastern manifold	10:45	404.3			
SVE - 01	10:41	193.8	2	0	.002
SVE - 03	10:38	838.1	7	3"	.001
SVE - 05	10:36	497.6	7	1.75"	.001
SVE - 07	10:33	139.3	7	2.6"	.001
SVE - 08	10:31	18	2	2.5"	.001
SVE - 06	10:29	22.2	2	0	.001
SVE - 04	10:27	252.1	7	0.75"	.001
SVE - 02	10:25	18	2	0	.001
SVE Influent	09:44	228. ppm	DE, 98.15		
SVE Effluent	09:40	4.20 ppm			

Influent Sample ID: Inf-9-21-2020
Influent Sample Time: 9:47

Effluent Sample ID: Eff-9-21-2020
Effluent Sample Time: 9:37

Field Representative (Print and Sign):

Date of Visit: 9-21-2020

Gavin Klockern
George Hagan
George Hagan

AS System Monthly Inspection Log, Kelly Moore. Date: 9-21-20

Visual/Audio Inspection

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	yes	
Regenerative Blower	y	(Auto) Hand / Off
Heat Exchanger	y	(Auto) / Hand / Off ok
Pressure Gauges/Flow Meters	y	
Vent Valve Status	yes	open 50%.

System Gauge Readings

Before Heat Exchanger

Item	Units	Reading	Operating Range
Hour Meter Sparge Blower	Hour's / Minutes	9279.3	
PI - 3	psi	8.5	0 - 30
TI - 3	°F	223	150 - 200

After Heat Exchanger

Item	Units	Reading	Operating Range
Hour Meter Heat Exchanger	Hour's / Minutes	9279.7	
PI - 4	psi	10.0	0 - 30
TI - 4	°F	78	150 - 200

Air Flow Monitoring

Location	Time	Valve Position (record appx angle)	Pressure (psi)	Air Flow (SCFM)
AS - 1	10:52	20°	2	10.5
AS - 2	I	I	1.25	10.25
AS - 3	I	I	2	10
AS - 4	I	I	2	10
AS - 5	I	I	1.5	10

Additional Notes.

Changed chart paper. System is operational at our arrival, upon inspection no issues were found. We collected the September 2020 System's Vapor samples and recorded the system's data for the Month. Upon completion of our activities we secured and departed the site.

GEORGE HAGAN - JHA Encl.
George Hagan

Field Representative (Print and Sign): Gavin Klockman Date of Visit: 9-21-2020

SVE System Monthly Inspection Log. Kelly Moore. Date: 10-26-20

Visual/Audio Inspection. Located at: 5400 Airport Way South Seattle, WA

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	yes	O.K
Control Pump (Regenerative Blower)	yes	(On / Off)
Entrainment Pump (Transfer Pump)	yes	(Auto / Hand / Off)
Pressure Gauges/Flow Meters	yes	O.K
Knockout Tank (record level)	yes	% full 50% Full
Knockout Water Tote (record level)	yes	% full 90% Full
Dilution Valve Status	yes	100% closed
Recirculation Valve Status	yes	90% closed

CATOX Screen Readings

Item	Units	Reading	Operating Range
Hour Meter	H-M	9181	
Catox In (T ₁)	°F	690	>650
Catox Out (T ₂)	°F	653	600 - 650
Heat Ex (T ₃)	°F	358	300 - 400
Flow	SCFM	277-CFM	<300
LEL	%	N/A	5-15

System Gauge Readings

Item	Units	Reading
FE - 1	"WC	0.001" WC
PI - 1	"WC (vacuum)	14" H ₂ O - VAC
TI - 1	°F	50°F
FE-2	"WC	2"

Best Blower Temp 74°F. Amps on motor @ 11.75

FID Measurements

Location	Time	FID Reading (ppm)	Valve Position (record notch)	Vacuum ("WC)	Differential Pressure ("WC)
Western Manifold	10:26	94.6			
SVE - 13	10:24	14.0	2	2	0.001
SVE - 12	10:22	116.7	7	10.5	0.001
SVE - 11	10:21	14.8	2	0	0.001
SVE - 10	10:19	133.7	7	10.5	0
SVE - 09	10:18	9.5	2	0	0
Eastern manifold	10:47	400			
SVE - 01	10:45	120	2	0	0.001
SVE - 03	10:43	786	7	10	0
SVE - 05	10:41	361	7	10	0
SVE - 07	10:39	96.4	7	9.5	0.001
SVE - 08	10:37	11.5	2	10	0.001
SVE - 06	10:35	16.7	2	2	0.002
SVE - 04	10:33	152	7	8.25	0
SVE - 02	10:31	12.8	2	1.5	0.001
SVE Influent	9:43	195 PPM			
SVE Effluent	9:40	3.0 PPM			

Influent Sample ID: Inf-10-26-2020

Influent Sample Time: 10:01

Effluent Sample ID: Eff-10-26-2020

Effluent Sample Time: 9:48

Field Representative (Print and Sign):

Grain Klockman

George Hagan

Date of Visit: 10-26-2020

AS System Monthly Inspection Log, Kelly Moore. Date: 10-26-2020

Visual/Audio Inspection

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	yes	
Regenerative Blower	yes	(Auto / Hand / Off)
Heat Exchanger	yes	(Auto / Hand / Off)
Pressure Gauges/Flow Meters	yes	
Vent Valve Status	yes	

System Gauge Readings

Before Heat Exchanger

Item	Units	Reading	Operating Range
Hour Meter Spurge Blower	Hour's / Minutes	6968.2	
PI - 3	psi	8.5	0 - 30
TI - 3	°F	210	150 - 200

After Heat Exchanger

Item	Units	Reading	Operating Range
Hour Meter Heat Exchanger	Hour's / Minutes	6968.7	
PI - 4	psi	10	0 - 30
TI - 4	°F	66	150 - 200

Air Flow Monitoring

Location	Time	Valve Position (record appx angle)	Pressure (psi)	Air Flow (SCFM)
AS - 1	10:54	20°	3.0	11
AS - 2			2.25	10.5
AS - 3			3.0	10.25
AS - 4			3.0	10.5
AS - 5			2.5	10.25

Additional Notes.

Samples collected. George replaced air filters on influent air dilution. ^{the} System Valves different after flame arrester was power washed. In 12 days we added 30 gallons. ^{to tote} Total gallons in ~~the~~ tote = 205 gallons. We are about 25 gallons from possible shutdown.

Field Representative (Print and Sign):

Gravin Hokenman
George Hagan

Date of Visit: 10-26-2020

SVE System Monthly Inspection Log. Kelly Moore. Date: 11-18-20 (20940-MY)

Visual/Audio Inspection. Located at: 5400 Airport Way South Seattle, WA

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	Y	
Control Pump (Regenerative Blower)	Y	(On) / Off
Entrainment Pump (Transfer Pump)	Y	(Auto) / Hand / Off
Pressure Gauges/Flow Meters	Y	O.K
Knockout Tank (record level)	Y	% full 25% Full
Knockout Water Tote (record level)	Y	% full 50% Full 110 gal in 20 days *
Dilution Valve Status	Y	100% CLOSED
Recirculation Valve Status	Y	95% CLOSED

CATOX Screen Readings

Item	Units	Reading	Operating Range
Hour Meter	H-M	9734	
Catox In (T ₁)	°F	688°F	>650
Catox Out (T ₂)	°F	645°F	600 - 650
Heat Ex (T ₃)	°F	344°F	300 - 400
Flow	SCFM	234 CFM	<300
LEL	%	N/A	5-15

System Gauge Readings

Item	Units	Reading
FE - 1	"WC	0.000" H ₂ O
PI - 1	"WC (vacuum)	11.5" H ₂ O VAC
TI - 1	°F	47°F
FE-2	"WC	2.0" @ 200 CFM

FID Measurements

Location	Time	FID Reading (ppm)	Valve Position (record notch)	Vacuum ("WC)	Differential Pressure ("WC)
Western Manifold	11:50	83.7			
SVE - 13	11:23	9.0	2	0	0.001
SVE - 12	11:21	110.5	7	8.2	0.002
SVE - 11	11:19	10.3	2	0	0.001
SVE - 10	11:17	78.5	7	8	0.001
SVE - 09	11:15	6.6	2	0	0.002
Eastern manifold	11:48	108.9			
SVE - 01	11:47	71.3	7	4	0.001
SVE - 03	11:44	621.3	7	6	0.001
SVE - 05	11:37	207.2	7	5	0.000
SVE - 07	11:34	125.4	7	5	0.000
SVE - 08	11:32	5.6	2	5.75	0.002
SVE - 06	11:30	7.1	2	0.5	0.001
SVE - 04	11:28	47.4	7	4	0.001
SVE - 02	11:26	5.9	2	0.25	0.001
SVE Influent	10:18	62.5			
SVE Effluent	10:15	1.4			

Influent Sample ID: Inf-11-18-2020

Influent Sample Time: 10:16

Effluent Sample ID: Eff-11-18-2020

Effluent Sample Time: 10:36

Field Representative (Print and Sign): Gavin Klockerman

Date of Visit: 11-18-2020

George Hogan: George Hogan 11-18-20

AS System Monthly Inspection Log, Kelly Moore. Date: 11-18-20

Visual/Audio Inspection

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	Y	O.K.
Regenerative Blower	Y	(Auto) / Hand / Off
Heat Exchanger	Y	(Auto) / Hand / Off
Pressure Gauges/Flow Meters	Y	O.K.
Vent Valve Status	Y	open 40%

System Gauge Readings

Before Heat Exchanger

Item	Units	Reading	Operating Range
Hour Meter Sparge Blower	Hour's / Minutes	7520	
PI - 3	psi	8.0 PSI	0 - 30
TI - 3	°F	210°F	150 - 200

After Heat Exchanger


Item	Units	Reading	Operating Range
Hour Meter Heat Exchanger	Hour's / Minutes	7520	
PI - 4	psi	9.5 PSI	0 - 30
TI - 4	°F	65°F	150 - 200

Air Flow Monitoring

Location	Time	Valve Position (record appx angle)	Pressure (psi)	Air Flow (SCFM)
AS - 1	1053	open 20%	3.0	10.5
AS - 2	↓	↓	2.5	10.5
AS - 3	↓	↓	3.0	10.5
AS - 4	↓	↓	3.25	10.5
AS - 5	↓	↓	3.0	11.5

Additional Notes.

System operational @ our arrival, NOTE 110 gal H₂O generated from System to tote in 20-days. Delivered 5, 55gal Metal drums. Pumped H₂O from 5-poly drums into 5, 55gal Metal drums. Delivered 12 new Chart Papers & 4 new ink cartridges. Collected the Nov, 2020 System Vapor samples. Adjusted SVE-01 Well from #2 to #7 position. Recorded System data. DE=97.8%

Gavin Klockmann
Field Representative (Print and Sign):  Date of Visit: 11-18-2020
GEORGE HAGAN; George Hagen. 11-18-20 IHA Env.

SVE System Monthly Inspection Log. Kelly Moore. Date: 12-14-2020

Visual/Audio Inspection. Located at: 5400 Airport Way South Seattle, WA

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	Yes	
Control Pump (Regenerative Blower)	Yes	(On / Off)
Entrainment Pump (Transfer Pump)	Yes	(Auto / Hand / Off)
Pressure Gauges/Flow Meters	Yes	
Knockout Tank (record level)	40	% full
Knockout Water Tote (record level)	75	% full * pumped down to empty
Dilution Valve Status	Yes	100% closed
Recirculation Valve Status	Yes	20% open

CATOX Screen Readings

Item	Units	Reading	Operating Range
Hour Meter	H-M	10343	
Catox In (T ₁)	°F	697	>650
Catox Out (T ₂)	°F	635	600 - 650
Heat Ex (T ₃)	°F	341	300 - 400
Flow	SCFM	279	<300
LEL	%	—	5-15

70-73°F post blower Temp.

System Gauge Readings

Item	Units	Reading
FE - 1	"WC	0.001"
PI - 1	"WC (vacuum)	13"
TI - 1	°F	48°F
FE-2	"WC	1.8"

FID Measurements

Location	Time	FID Reading (ppm)	Valve Position (record notch)	Vacuum ("WC)	Differential Pressure ("WC)
Western Manifold	10:42	9.5			
SVE - 13	10:40	2.2	2	0	.002
SVE - 12	10:38	11.1	7	9"	.002
SVE - 11	10:36	1.6	2	0	.002
SVE - 10	10:34	18.4	7	9"	.003
SVE - 09	10:33	7.5	2	0	.003
Eastern manifold	11:10	64.0			
SVE - 01	11:07	34.7	7	6	.002
SVE - 03	11:02	44.6	7	6.5	.002
SVE - 05	11:00	69.8	7	6.5	.002
SVE - 07	10:58	30.8	7	5.4	.002
SVE - 08	10:56	1.7	2	6.5	.003
SVE - 06	10:53	2.5	2	1.5	.003
SVE - 04	10:51	19.2	7	4.5	.003
SVE - 02	10:48	1.9	2	0	.003
SVE Influent	9:45	25.9	DE=93%		
SVE Effluent	9:43	1.8			

Influent Sample ID: INF-12-14-2020
Influent Sample Time: 10:10

Effluent Sample ID: EFF-12-14-2020
Effluent Sample Time: 9:57

Field Representative (Print and Sign): Gravin Klockman Date of Visit: 12-14-2020

AS System Monthly Inspection Log, Kelly Moore. Date: 12-14-2020

Visual/Audio Inspection

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	yes	
Regenerative Blower	yes	(Auto / Hand / Off)
Heat Exchanger	yes	(Auto / Hand / Off)
Pressure Gauges/Flow Meters	yes	
Vent Valve Status	yes	

System Gauge Readings

Before Heat Exchanger

Item	Units	Reading	Operating Range
Hour Meter Sparge Blower	Hour's / Minutes	8129	
PI - 3	psi	8.5	0 - 30
TI - 3	°F	240°F	150 - 200

After Heat Exchanger

Item	Units	Reading	Operating Range
Hour Meter Heat Exchanger	Hour's / Minutes	8129.4	
PI - 4	psi	9.5	0 - 30
TI - 4	°F	650°F	150 - 200

Air Flow Monitoring

Location	Time	Valve Position (record appx angle)	Pressure (psi)	Air Flow (SCFM)
AS - 1	10:30	20°	3	10.5
AS - 2			2.5	10
AS - 3			3	10
AS - 4			3	10
AS - 5			3	11.5

Additional Notes.

DE = 93%. Samples collected without issue. Pumped 200 gallons from water tote to black metal drums. Non-Haz. labels applied to drums. Paper in chart changed. All 5 air sparge wells accessed, No drop tubes in wells, Photos Taken from each well, Measured Depth to water & Total Depth for each of the 5 air sparge wells. Moisture bleed valve installed on the air sparge manifold.

Field Representative (Print and Sign):

Grain Klockman
George Hagan

Date of Visit: 12-14-2020

SVE System Monthly Inspection Log. Kelly Moore. Date: 1-11-2021

Visual/Audio Inspection. Located at: 5400 Airport Way South Seattle, WA

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	Yes	
Control Pump (Regenerative Blower)	Yes	(On / Off)
Entrainment Pump (Transfer Pump)	Yes	(Auto / Hand / Off)
Pressure Gauges/Flow Meters	Yes	
Knockout Tank (record level)	Yes	% full 5%
Knockout Water Tote (record level)	Yes	% full 60% 145 gal
Dilution Valve Status	Yes	100% Closed
Recirculation Valve Status	Yes	65% Closed

CATOX Screen Readings

Item	Units	Reading	Operating Range
Hour Meter	H-M	11,013	
Catox In (T ₁)	°F	705	>650
Catox Out (T ₂)	°F	636	600 - 650
Heat Ex (T ₃)	°F	342	300 - 400
Flow	SCFM	280	<300
LEL	%	N/A	5-15

System Gauge Readings

Item	Units	Reading
FE - 1	"WC	0.002
PI - 1	"WC (vacuum)	20" H ₂ O
TI - 1	°F	42°F
FE-2	"WC	1.5"

Post Blower Temp 68°F
Post Blower Pressure 0.0 PSI

FID Measurements

Location	Time	FID Reading (ppm)	Valve Position (record notch)	Vacuum ("WC)	Differential Pressure ("WC)
Western Manifold	11:10	31.9			
SVE - 13	11:08	3.5	2	0	0.003
SVE - 12	11:07	39.7	7	18.5	0.002
SVE - 11	11:04	0.4	2	1.0	0.003
SVE - 10	11:00	6.3	7	17.0	0.002
SVE - 09	10:58	1.0	2	0.8	0.003
Eastern manifold	11:42	159.6			
SVE - 01	11:39	102	2	0.8	0.004
SVE - 03	11:37	120	7	18	0.004
SVE - 05	11:30	314	7	18.5	0.004
SVE - 07	11:27	1900	2→7	13.5	0.004
SVE - 08	11:21	230	2→3	18	0.003
SVE - 06	11:19	0.7	2	3.5	0.004
SVE - 04	11:17	0.9	2	5.5	0.003
SVE - 02	11:16	1.4	2	1.0	0.003
SVE Influent	10:20	97.5	DE=98.4%		
SVE Effluent	10:15	1.5			

Influent Sample ID: Inf-1-11-2021
Influent Sample Time: 10:35

Effluent Sample ID: Eff-1-11-2021
Effluent Sample Time: 10:24

Field Representative (Print and Sign): *[Signature]* Date of Visit: 1-11-2021

G. Hagan

AS System Monthly Inspection Log, Kelly Moore. Date: 1-11-2021

Visual/Audio Inspection

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	yes	
Regenerative Blower	yes	(Auto / Hand / Off)
Heat Exchanger	yes	(Auto / Hand / Off)
Pressure Gauges/Flow Meters	yes	
Vent Valve Status	yes	

System Gauge Readings

Before Heat Exchanger

Item	Units	Reading	Operating Range
Hour Meter Spurge Blower	Hour's / Minutes	8774.6	
PI - 3	psi	8.5	0 - 30
TI - 3	°F	315 Gk	150 - 200

Gauge broken

After Heat Exchanger

Item	Units	Reading	Operating Range
Hour Meter Heat Exchanger	Hour's / Minutes	8775	
PI - 4	psi	11.5	0 - 30
TI - 4	°F	60	150 - 200

Air Flow Monitoring

Location	Time	Valve Position (record appx angle)	Pressure (psi)	Air Flow (SCFM)
AS - 1	10:51	20°	4	10
AS - 2	10:51	I	3	10.25
AS - 3	10:51	I	3.5	10
AS - 4	10:51	I	3.75	10.5
AS - 5	10:51	I	3.5	10.5

Additional Notes. on site @ 0900 hrs

changed chart paper and ink. Drained Bled water from air spurge manifold. Adjusted E. Manifold ^{valve position etc} SUE01 → 2, SUE07 → 2, SUE04 → 2. Final Adjustment SUE08 → 3, SUE07 → 7.

off site @ 1230 - hrs

Field Representative (Print and Sign):

[Signature]
G. Hagen

Date of Visit: 1-11-2021

SVE System Monthly Inspection Log. Kelly Moore. Date: 2-9-21

Visual/Audio Inspection. Located at: 5400 Airport Way South Seattle, WA

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	yes	
Control Pump (Regenerative Blower)	yes	(On) Off
Entrainment Pump (Transfer Pump)	yes	(Auto) Hand / Off
Pressure Gauges/Flow Meters	yes	
Knockout Tank (record level)	yes	% full 40%
Knockout Water Tote (record level)	yes	% full 60% @ 160 gal
Dilution Valve Status	yes	100% Closed
Recirculation Valve Status	yes	75% OPEN

CATOX Screen Readings

Item	Units	Reading	Operating Range
Hour Meter	H-M	11,690	HRS
Catox In (T ₁)	°F	684°F	>650
Catox Out (T ₂)	°F	645°F	600 - 650
Heat Ex (T ₃)	°F	367°F	300 - 400
Flow	SCFM	63 CFM	<300
LEL	%	N/A	5-15

System Gauge Readings

Item	Units	Reading
FE - 1	"WC	0.003" H ₂ O
PI - 1	"WC (vacuum)	30" H ₂ O
TI - 1	°F	33°F
FE-2	"WC	0.50" H ₂ O

* LOW INFLUENT VOC'S (5-PPM INF, EFF @ 1.2PPM) LOW DE, CALCULATED @ 50%, SCREENS/ALL V.I.E, WELLS INDEPENDANTLY @ 21" H₂O VAC TO MAKE ADJUSTMENTS TO INCREASE INCREASE INF VOC'S + D.E. SEE BELOW + NOTES ON Pgs: 2 OF 2.

FID Measurements

Location	Time	FID Reading (ppm)	Valve Position (record notch)	Vacuum ("WC)	Differential Pressure ("WC)
Western Manifold	1130	2.2 PPM			
SVE - 13	1135	3.0 PPM	100% CLOSED		
SVE - 12	1140	3.0 PPM			
SVE - 11	1145	2.0 PPM			
SVE - 10	1150	1.5 PPM			
SVE - 09	1155	1.4 PPM			
Eastern manifold	1455	545 PPM			
SVE - 01	1050	4.0 PPM	100% CLOSED	LOW VOC'S	
SVE - 03	1055	3.0 PPM	100% CLOSED	LOW VOC'S	
SVE - 05	1345	25.0 PPM	2		
SVE - 07	1347	790.0 PPM	7		
SVE - 08	1342	325.0 PPM	2		
SVE - 06	1340	25.0 PPM	2		
SVE - 04	1105	4.8 PPM	100% CLOSED	LOW VOC'S	
SVE - 02	1109	2.8 PPM	100% CLOSED	LOW VOC'S	
SVE Influent	1255	309.0 PPM			
SVE Effluent	1250	3.0 PPM	D.E. 99%		

Influent Sample ID: INF-2-9-2021

Influent Sample Time: 1320-HRS

Effluent Sample ID: EFF-2-9-2021

Effluent Sample Time: 1308-HRS

Field Representative (Print and Sign): George Hagan

Date of Visit: 2/9/2021

Garvin Klockman

AS System Monthly Inspection Log, Kelly Moore. Date: 2-9-2021

Visual/Audio Inspection

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	yes	
Regenerative Blower	yes	(Auto / Hand / Off)
Heat Exchanger	yes	(Auto / Hand / Off)
Pressure Gauges/Flow Meters	yes	
Vent Valve Status	yes	

System Gauge Readings

Before Heat Exchanger

Item	Units	Reading	Operating Range
Hour Meter Spurge Blower	Hour's / Minutes	9471.5	hrs/min
PI - 3	psi	off	0 - 30
TI - 3	°F	off	150 - 200

After Heat Exchanger

Item	Units	Reading	Operating Range
Hour Meter Heat Exchanger	Hour's / Minutes	9472.0	hrs/min
PI - 4	psi	off	0 - 30
TI - 4	°F	off	150 - 200

Air Flow Monitoring

Location	Time	Valve Position (record appx angle)	Pressure (psi)	Air Flow (SCFM)
AS - 1	AIR SPURGE SYSTEM SHUT OFF, WEST MANIFOLD			
AS - 2	SHUT OFF NO VOC'S FROM WELLS, SUSPECT HIGH			
AS - 3	GROUND WATER HAS HORIZONTAL VAPOR EXTRACTION WELLS			
AS - 4	SUMMERGED			
AS - 5				

Additional Notes. SYSTEM OPERATIONAL @ OUR ARRIVAL. LOW INLET VOC'S & D.E. SCREENED ALL VE WELLS & MADE ADJUSTMENTS TO VE WELLS TO INCREASE INLET VOC'S & D.E. (PRIOR TO ADJUSTMENTS INF VOC'S @ 5.0PPM, EFF VOC'S @ 1.2PPM, D.E. @ 50%). AFTER VE ADJUSTMENTS INF VOC'S @ 309.0PPM, EFF VOC'S @ 3.0PPM, D.E. 99%. ADJUSTMENTS ARE SUCCESSFUL, SUE-CATOX OPERATING ON VE WELLS 05, 06, 07, 08, ALL OTHER WELLS SHUT OFF, AIR SPURGE UNIT SHUT OFF. FEB-2021 SYSTEM'S SAMPLES & SYSTEM DATA COLLECTED TODAY. RECALIBRATED PID WALKIE ON SITE, CHANGED CHART PAPER

Field Representative (Print and Sign): George Hagem Date of Visit: 2-9-2021
GAVIN KROCKMAN

SVE System Monthly Inspection Log. Kelly Moore. Date: 3-9-2021

Visual/Audio Inspection. Located at; 5400 Airport Way South Seattle, WA

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	yes	
Control Pump (Regenerative Blower)	yes	(On / Off)
Entrainment Pump (Transfer Pump)	yes	(Auto) / Hand / Off
Pressure Gauges/Flow Meters	yes	
Knockout Tank (record level)	yes	% full 0% full
Knockout Water Tote (record level)	yes	% full 0% full
Dilution Valve Status	yes	100% closed
Recirculation Valve Status	yes	15% closed

CATOX Screen Readings

Item	Units	Reading	Operating Range
Hour Meter	H-M	12324	
Catox In (T ₁)	°F	712	>650
Catox Out (T ₂)	°F	662	600 - 650
Heat Ex (T ₃)	°F	412	300 - 400
Flow	SCFM	67	<300
LEL	%	N/A	5-15

System Gauge Readings

Item	Units	Reading
FE - 1	"WC	0.002 "H ₂ O
PI - 1	"WC (vacuum)	30" H ₂ O
TI - 1	°F	38°F
FE-2	"WC	2.15" H ₂ O

50% gh
PZTCT TUBE CLOUSED, PULSED & CLEARED
GIVING THE CORRECT READING.

FID Measurements

Location	Time	FID Reading (ppm)	Valve Position (record notch)	Vacuum ("WC)	Differential Pressure ("WC)
Western Manifold	11:00	---		---	
SVE - 13	---	---	1	N/M	N/M
SVE - 12	---	---	1 = closed	---	---
SVE - 11	---	---	1	---	---
SVE - 10	---	---	1	---	---
SVE - 09	---	---	1	---	---
Eastern manifold	11:12	388			
SVE - 01	100% closed	---	1	---	N/M
SVE - 03	100% closed	---	1	25	N/M
SVE - 05	11:08	109	3	29	0.0
SVE - 07	11:06	1069	7	29	---
SVE - 08	11:03	444	3	29.5	---
SVE - 06	11:01	42.2	2	4	---
SVE - 04	100% closed	---	1	---	N/M
SVE - 02	100% closed	---	1	---	N/M
SVE Influent	9:35	103.9	AE @ 98%		
SVE Effluent	9:25	2.0			

*W. manifold all off and closed

* Well SVE-03 is being influenced by other VE wells

Influent Sample ID: INF-3-9-2021
Influent Sample Time: 10:34

Effluent Sample ID: EFF-3-9-2021
Effluent Sample Time: 10:20

Field Representative (Print and Sign):

Date of Visit: 3-9-2021

Gavin Klockeman
George Hagan

AS System Monthly Inspection Log, Kelly Moore. Date: 3-9-2021

Visual/Audio Inspection

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	Yes	
Regenerative Blower	Yes	(Auto / Hand / Off) <u>Off</u>
Heat Exchanger	Yes	(Auto / Hand / Off) <u>Off</u>
Pressure Gauges/Flow Meters	Yes	
Vent Valve Status	Yes	100% open

System Gauge Readings

Before Heat Exchanger

Item	Units	Reading	Operating Range
Hour Meter Spurge Blower	Hour's / Minutes	9471.9	
PI - 3	psi	—	0 - 30
TI - 3	°F	—	150 - 200

After Heat Exchanger

Item	Units	Reading	Operating Range
Hour Meter Heat Exchanger	Hour's / Minutes	9472.3	
PI - 4	psi	—	0 - 30
TI - 4	°F	—	150 - 200

Air Flow Monitoring

Location	Time	Valve Position (record appx angle)	Pressure (psi)	Air Flow (SCFM)
AS - 1				
AS - 2				
AS - 3				
AS - 4				
AS - 5				

Additional Notes.

Ran air spurge for a little while so it doesn't sit for too long. Chart paper was jammed so we fixed it. Changed battery in the DPR-100. Recorded the March 2021 system data and collected the March 2021 system vapor samples. After battery change in chart recorder all parameters will need to be reprogrammed. Low airflow & higher vacuum causing water in VE pipe to settle at its lowest point.

Field Representative (Print and Sign): Gravin Klockman Date of Visit: 3-9-2021

George Hoey

SVE System Monthly Inspection Log. Kelly Moore. Date: 4-6-2021

Visual/Audio Inspection. Located at; 5400 Airport Way South Seattle, WA

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	Yes	
Control Pump (Regenerative Blower)	Yes	(On) / Off
Entrainment Pump (Transfer Pump)	Yes	(Auto) / Hand / Off
Pressure Gauges/Flow Meters	Yes	
Knockout Tank (record level)	15	% full 30 gal
Knockout Water Tote (record level)	5	% full 8.0 gal
Dilution Valve Status	0	% open
Recirculation Valve Status	50 %	open

CATOX Screen Readings

Item	Units	Reading	Operating Range
Hour Meter	H-M	12944.8	
Catox In (T ₁)	°F	560	>650
Catox Out (T ₂)	°F	660	600 – 650
Heat Ex (T ₃)	°F	407	300 – 400
Flow	SCFM	67	<300
LEL	%	—	5-15

System Gauge Readings

Item	Units	Reading
FE – 1	"WC	0.001
PI – 1	"WC (vacuum)	30
TI – 1	°F	39
FE-2	"WC	0.10

FID Measurements

N/A = CURRENT VALVE CLOSED.

Location	Time	FID Reading (ppm)	Valve Position (record notch)	Vacuum ("WC)	Differential Pressure ("WC)
Western Manifold	N/A	N/A			
SVE – 13	1	1	1	N/A	N/A
SVE – 12	1	1	1	1	1
SVE – 11	1	1	1	1	1
SVE – 10	1	1	1	1	1
SVE – 09	1	1	1	1	1
Eastern manifold	10:52	180			
SVE - 01	N/A	N/A	1	N/A	N/A
SVE – 03	1	1	1	1	1
SVE – 05	10:42	118.3	3	27.5	0.004
SVE – 07	10:38	191.6	7	27	0.004
SVE – 08	10:36	446.6	3	29.5	0.004
SVE – 06	10:34	6.0	2	4.5	0.004
SVE – 04	N/A	N/A	1	N/A	N/A
SVE – 02	1	1	1	1	1
SVE Influent	920	230			
SVE Effluent	920	3.7	DE=98.4%		

Influent Sample ID: Inf-4-6-2021
Influent Sample Time: 920 10:02

Effluent Sample ID: Eff-4-6-2021
Effluent Sample Time: 9:39

Field Representative (Print and Sign): Gravin Klockman Date of Visit: 4-6-2021

George Hagan

AS System Monthly Inspection Log, Kelly Moore. Date: 4-6-2021
Visual/Audio Inspection

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	Yes	
Regenerative Blower	Yes	(Auto / Hand <u>Off</u>)
Heat Exchanger	Yes	(Auto / Hand <u>Off</u>)
Pressure Gauges/Flow Meters	Yes	
Vent Valve Status	Yes	

System Gauge Readings : Air sparge currently off
 Before Heat Exchanger After Heat Exchanger

Item	Units	Reading	Operating Range	Item	Units	Reading	Operating Range
Hour Meter Sparge Blower	Hour's / Minutes	9472.9		Hour Meter Heat Exchanger	Hour's / Minutes	9473.6	
PI - 3	psi	off	0 - 30	PI - 4	psi	off	0 - 30
TI - 3	°F	↓	150 - 200	TI - 4	°F	↓	150 - 200

Air Flow Monitoring : Air sparge currently off

Location	Time	Valve Position (record appx angle)	Pressure (psi)	Air Flow (SCFM)
AS - 1	OFF	OFF	OFF	OFF
AS - 2	↓	↓	↓	↓
AS - 3				
AS - 4				
AS - 5				

Additional Notes. NEED TO RESEARCH THE HIGH PRESSURE SENSOR BEFORE DISASSEMBLY. G.H.

Ran air sparge for about 1 hour. Changed chart paper. High pressure alarm on air sparge, unable to remedy the alarm. Troubleshoot the flow gauge without success. ALL PARAMETERS ARE CURRENTLY BEING RECORDED ON THE CHART PAPER. SUE-CATOX OPERATIONAL @ OUR DEPARTURE.

Field Representative (Print and Sign):

Gavin Klodeman
George Hagun

Date of Visit: 4-6-2021

Kelly Moore Site Log Book

4-6-20 0850 G. Hagen & G. Klockman on site.

SUE-CATOX operational @ our arrival, activated the AS unit & Ran for 1-hr, then through the unit AS unit shut down due to High Pressure. After troubleshooting the problem & think the H.P. switch is Bad. We collected the April 2021 system vapor samples & system data was recorded. Our D.E. for VOC destruction was calculated to be 98.4%. @ 1130 hrs we departed the Site leaving the SUE-CATOX operational. G. Hagen

4-16-2021 G. Hagen & G. Klockman onsite @ 10am.

We cleaned up the area using a shopvac. Cleaned and grinded RUST on the CATOX Skid. We remedied the high pressure alarm on the air sparge unit by disassembling, cleaning and reassembling the switch. We painted problem areas on the skid and the top plate of the CATOX. The paper on the paper chart was bunched up so we fixed it. The T1 temp was configured incorrectly from a previous attempt to calibrate the flow meter. That was also fixed. We installed a larger vacuum gauge before the blower. CATOX: 13238 hours Spurge: 9473 hours. Heat Ex: 9474 hrs

5-2-21 0930 G. Hagen on Site. on 05-01-21 @ 2030-Hrs Received

Notification of system Shut down. System off @ my arrival. Inspected System finding no issues. Monitored Chart paper @ 2030-hrs last evening, it shows the Temp's Fall out @ that time, Nothing else. Restart system @ 0933 hrs. Monitored temps rise & system became operational once again. Monitored operations, The SUE-CATOX is operating normally. I noticed the Blower, under no load, is a bit noisy, under load it becomes quiet. checked blower oil - O.K. Ran Air sparge unit for 5-Minutes - O.K.

SUE-CATOX HRS - 13,606. T-1 @ 711°F. T-2 @ 634°F. T-3 @ 362°F. 30" H₂O VAC @ The System, Spurge blower Hrs @ 9,473. HEAT EXCHANGER Hrs 9,474. @ 1015 hrs G. Hagen off site.

SVE System Monthly Inspection Log. Kelly Moore. Date: 5-9-2021 *bk*

Visual/Audio Inspection. Located at: 5400 Airport Way South Seattle, WA 3-11-2021

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	<i>yes</i>	
Control Pump (Regenerative Blower)	<i>yes</i>	<i>(On)</i> Off)
Entrainment Pump (Transfer Pump)	<i>yes</i>	<i>(Auto / Hand / Off)</i>
Pressure Gauges/Flow Meters	<i>yes</i>	
Knockout Tank (record level)	<i>yes</i>	% full <i>15</i>
Knockout Water Tote (record level)	<i>yes</i>	% full <i>35</i>
Dilution Valve Status	<i>yes</i>	<i>Closed fully</i>
Recirculation Valve Status	<i>yes</i>	<i>55% closed</i>

CATOX Screen Readings

Item	Units	Reading	Operating Range
Hour Meter	H-M	<i>13822</i>	
Catox In (T ₁)	°F	<i>728</i>	>650
Catox Out (T ₂)	°F	<i>658</i>	600 - 650
Heat Ex (T ₃)	°F	<i>397</i>	300 - 400
Flow	SCFM	<i>96</i>	<300
LEL	%	<i>n/A</i>	5-15

System Gauge Readings

Item	Units	Reading
FE - 1	"WC	<i>0.012" WC</i>
PI - 1	"WC (vacuum)	<i>32" WC</i>
TI - 1	°F	<i>49°F</i>
FE-2	"WC	<i>0.2" WC</i>

FID Measurements

Location	Time	FID Reading (ppm)	Valve Position (record notch)	Vacuum ("WC)	Differential Pressure ("WC)
Western Manifold	<i>N/A</i>	<i>N/A</i>			
SVE - 13	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>
SVE - 12	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>
SVE - 11	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>
SVE - 10	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>
SVE - 09	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>
Eastern manifold	<i>10:30</i>	<i>335 → 462</i>			
SVE - 01	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>
SVE - 03	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>
SVE - 05	<i>10:30</i>	<i>420 → 4.6</i>	<i>3 → 5 G.H.</i>	<i>27"</i>	<i>.007</i>
SVE - 07	<i>N/A</i>	<i>3920 → 3,600</i>	<i>7</i>	<i>29.5"</i>	<i>.009</i>
SVE - 08	<i>N/A</i>	<i>890 → 820</i>	<i>3 → 5</i>	<i>30"</i>	<i>.007</i>
SVE - 06	<i>N/A</i>	<i>8.8 → 8.0</i>	<i>2</i>	<i>4.9"</i>	<i>.007</i>
SVE - 04	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>
SVE - 02	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>
SVE Influent	<i>9:15</i>	<i>344 ppm</i>	<i>DE=99.2%</i>		
SVE Effluent	<i>9:11</i>	<i>2.8 ppm</i>			

*Took new readings 30 min. After SVE-08 pos. went from 3 → 5

Influent Sample ID: *Inl-5-11-2021*
Influent Sample Time: *9:48*

Effluent Sample ID: *Eff-5-11-2021*
Effluent Sample Time: *9:27*

Field Representative (Print and Sign):

Garth Klobbeman
George Hagan

Date of Visit: *5-9-2021* *bk*

5-11-2021 1 of 2

5-11-2021

AS System Monthly Inspection Log, Kelly Moore. Date: 5-9-2021 66
5-11-2021
Visual/Audio Inspection

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	yes	
Regenerative Blower	yes	(Auto / Hand / <u>Off</u>)
Heat Exchanger	yes	(Auto / Hand / <u>Off</u>)
Pressure Gauges/Flow Meters	NO.	
Vent Valve Status	NO.	

Air Sparge System remains off due To Shallow Groundwater.

System Gauge Readings

Before Heat Exchanger				After Heat Exchanger			
Item	Units	Reading	Operating Range	Item	Units	Reading	Operating Range
Hour Meter Sparge Blower	Hour's / Minutes	9473.2		Hour Meter Heat Exchanger	Hour's / Minutes	9474.1	
PI - 3	psi	N/A	0 - 30	PI - 4	psi	N/A	0 - 30
TI - 3	°F	↓	150 - 200	TI - 4	°F	↓	150 - 200

Air Flow Monitoring

Location	Time	Valve Position (record appx angle)	Pressure (psi)	Air Flow (SCFM)
AS - 1	N/A	N/A	N/A	N/A
AS - 2	↓	↓	↓	↓
AS - 3				
AS - 4				
AS - 5				

Additional Notes.

Changed paper and ink on DPR. Ran air sparge to exercise the equipment. Took DTW measurements on wells: KMW-04 = 6.02', KMW-06 = 7.16', KMW-09 = 5.53'. Adjusted SVE-08 to position 5 and took new readings New Inf = 430 ppm Eff = 11.5 ppm DE = 97.3%. Adjusted time on DPR. Increased influent rate from 31" to 35"

Field Representative (Print and Sign): Gavin Klockman Date of Visit: 5-9-2021 66
George Hogan 5-11-2021
5-11-2021

Post Adjustments Data

SVE System Monthly Inspection Log. Kelly Moore. Date: 6-16-2021

Visual/Audio Inspection. Located at; 5400 Airport Way South Seattle, WA

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	Yes	
Control Pump (Regenerative Blower)	Yes	(On / Off)
Entrainment Pump (Transfer Pump)	Yes	(Auto / Hand / Off)
Pressure Gauges/Flow Meters	Yes	
Knockout Tank (record level)	Yes	% full 30
Knockout Water Tote (record level)	Yes	% full 40
Dilution Valve Status	Yes	fully closed
Recirculation Valve Status	Yes	fully closed, Motor @ 15 Amps.

CATOX Screen Readings

Item	Units	Reading	Operating Range
Hour Meter	H-M	11689	
Catox In (T ₁)	°F	707	>650
Catox Out (T ₂)	°F	646	600 - 650
Heat Ex (T ₃)	°F	364	300 - 400
Flow	SCFM	286	<300
LEL	%	N/A	5-15

System Gauge Readings

Item	Units	Reading
FE - 1	"WC	.001"WC
PI - 1	"WC (vacuum)	57"WC
TI - 1	°F	61°F
FE-2	"WC	0.8"WC

FID Measurements

Valve Position 1 = Fully Closed Valve.

Location	Time	FID Reading (ppm)	Valve Position (record notch)	Vacuum ("WC)	Differential Pressure ("WC)
Western Manifold	13:38	43.0			D.P. / CFM
SVE - 13	13:35	46.3	2	4	0 40.5
SVE - 12	13:32	35.0	2	20	.001 92
SVE - 11	13:30	53.8	1	0	—
SVE - 10	13:27	177.5	2	4	.001 25
SVE - 09	13:25	6.6	1	0	—
Eastern manifold	13:47	330.6			
SVE - 01	closed	—	1	—	1
SVE - 03	closed	—	1	—	1
SVE - 05	closed	—	1	—	1
SVE - 07	13:43	137.5	7	52	0 26
SVE - 08	13:41	447.8	3	50	0 19
SVE - 06	closed	—	1	—	1
SVE - 04	closed	—	1	—	1
SVE - 02	closed	—	1	—	1
SVE Influent	13:20	124.4	DE = 95.6%		
SVE Effluent	13:16	5.5			

Influent Sample ID: N/A
Influent Sample Time: N/A

Effluent Sample ID: N/A
Effluent Sample Time: N/A

Field Representative (Print and Sign): Gavin Klockman Date of Visit: 6-16-2021

Post Adjustments Data

AS System Monthly Inspection Log, Kelly Moore. Date: 6-16-2021

Visual/Audio Inspection

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	Yes	
Regenerative Blower	Yes	(Auto) Hand / Off
Heat Exchanger	Yes	(Auto) Hand / Off
Pressure Gauges/Flow Meters	Yes	
Vent Valve Status	Yes	40% open

System Gauge Readings

Before Heat Exchanger

Item	Units	Reading	Operating Range
Hour Meter Sparge Blower	Hour's / Minutes	9479.8	
PI - 3	psi	260 4.5	0 - 30
TI - 3	°F	260	150 - 200

After Heat Exchanger

Item	Units	Reading	Operating Range
Hour Meter Heat Exchanger	Hour's / Minutes	9480.8	
PI - 4	psi	0	0 - 30
TI - 4	°F	86	150 - 200

Air Flow Monitoring

Location	Time	Valve Position (record appx angle)	Pressure (psi)	Air Flow (SCFM)
AS - 1	13:56	0	1.5	0
AS - 2	I	45	3	13.5
AS - 3		0	0	0
AS - 4		90	3.5	14.75
AS - 5		90	3	15

Additional Notes.

Post adjustment data. Restarted air sparge. SVE-09 and SVE-11 are closed but sample port is open to relieve pressure. Removed silencer from air sparge vent valve. DE = 95.6% with influent concentration less than 200ppm.

Field Representative (Print and Sign):

Date of Visit: 6-16-2021

Gavin Blockeman
George Hargus

SVE System Monthly Inspection Log. Kelly Moore. Date: 7-13-21

Visual/Audio Inspection. Located at; 5400 Airport Way South Seattle, WA

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	Y	
Control Pump (Regenerative Blower)	Y	(On/ Off)
Entrainment Pump (Transfer Pump)	Y	(Auto) Hand / Off)
Pressure Gauges/Flow Meters	Y	
Knockout Tank (record level)	Y	% full 40% Full @ 15 gallons
Knockout Water Tote (record level)	Y	% full 30% Full @ 75 gallons
Dilution Valve Status	Y	100% Closed
Recirculation Valve Status	Y	100% Closed

TOTE CAPACITY IS 250 gallons

CATOX Screen Readings

Item	Units	Reading	Operating Range
Hour Meter	H-M	14,899.65	hrs - min
Catox In (T ₁)	°F	695°F	>650
Catox Out (T ₂)	°F	382°F	600 - 650
Heat Ex (T ₃)	°F	691°F	300 - 400
Flow	SCFM	291 SCFM	<300
LEL	%	N/A	5-15

System Gauge Readings

Item	Units	Reading
FE - 1	"WC	0.001 "H ₂ O
PI - 1	"WC (vacuum)	45" H ₂ O
TI - 1	°F	62°F
FE-2	"WC	1.0"

Post Blower Temp 96°F

Post Blower Pressure 0.0 PSI

FID Measurements

Location	Time	FID Reading (ppm)	Valve Position (record notch)	Vacuum ("WC)	Differential Pressure ("WC)	
Western Manifold	10:18	4.6			DP	CFM
SVE - 13	10:14	0.8	2	Ø	0.001	20
SVE - 12	10:12	1.6	2	14	0.001	60
SVE - 11	10:09	3.2	1	Ø	0.001	0.07
SVE - 10	10:08	4.1	2	Ø	0.001	13
SVE - 09	10:05	9.8	1	Ø	Ø	0.3
Eastern manifold	10:44	1273			0.001	150
SVE - 01	10:31	0.7	1	Ø	Ø	0.4
SVE - 03	10:30	0.4	1	14	0.001	30
SVE - 05	10:28	2.2	1	9.5	0.001	29
SVE - 07	10:36	4090	7	38	Ø	75
SVE - 08	10:33	781	3	40	Ø	9
SVE - 06	10:26	4.6	1	Ø	Ø	0.17
SVE - 04	10:25	5.4	1	Ø	Ø	0.41
SVE - 02	10:22	2.4	1	Ø	Ø	0.07
SVE Influent	9:21	771.6				
SVE Effluent	9:15	2.2				

West Mani:
→ DP = 0.002" H₂O
CFM = 122 CFM

Influent Sample ID: Inf-7-13-2021
Influent Sample Time: 9:53

Effluent Sample ID: Eff-7-13-2021
Effluent Sample Time: 9:37

Field Representative (Print and Sign): Gavin Hockeman Date of Visit: 7-13-2021

George Hagan 7-13-21

AS System Monthly Inspection Log, Kelly Moore. Date: 7-13-21

Visual/Audio Inspection

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	Y	
Regenerative Blower	Y	(Auto / Hand / Off)
Heat Exchanger	Y	(Auto / Hand / Off)
Pressure Gauges/Flow Meters	Y	
Vent Valve Status	Y	40% open

System Gauge Readings

Before Heat Exchanger

Item	Units	Reading	Operating Range
Hour Meter Spurge Blower	Hour's / Minutes	9,689.2	HR - MIN
PI - 3	psi	4.5 PSI	0 - 30
TI - 3	°F	170°F	150 - 200

After Heat Exchanger

Item	Units	Reading	Operating Range
Hour Meter Heat Exchanger	Hour's / Minutes	9,690.2	HR - MIN
PI - 4	psi	4.0 PSI	0 - 30
TI - 4	°F	76.5°F	150 - 200

Air Flow Monitoring

Location	Time	Valve Position (record appx angle)	Pressure (psi)	Air Flow (SCFM)
AS - 1	0950	closed	0	0
AS - 2	}	open 100%	3.25 PSI	20.5 SCFM
AS - 3		closed	0	0
AS - 4		open 100%	3.50 PSI	18.25 SCFM
AS - 5		open 100%	3.25 PSI	18.0 SCFM

Additional Notes.

Changed chart paper. Cleaned up the skid with Simple Green. Collected samples and data

Field Representative (Print and Sign): Gavin Klockman Date of Visit: 7-13-2021

George Hagan 7-13-21

SVE System Monthly Inspection Log. Kelly Moore. Date: 8-5-2021

Visual/Audio Inspection. Located at; 5400 Airport Way South Seattle, WA

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	Y	
Control Pump (Regenerative Blower)	Y	(On) / Off
Entrainment Pump (Transfer Pump)	Y	(Auto) / Hand / Off
Pressure Gauges/Flow Meters	Y	
Knockout Tank (record level)	Y	% full 3% - REMAID 30gal manually
Knockout Water Tote (record level)	Y	% full 1/3 Full @ 105 gallons
Dilution Valve Status	Y	Closed 100%
Recirculation Valve Status	Y	Closed 100%

CATOX Screen Readings

Item	Units	Reading	Operating Range
Hour Meter	H-M	15,451.47	H-M
Catox In (T ₁)	°F	706°F	>650
Catox Out (T ₂)	°F	681°F	600 - 650
Heat Ex (T ₃)	°F	373°F	300 - 400
Flow	SCFM	290-SCFM	<300
LEL	%	N/A	5-15

System Gauge Readings

Item	Units	Reading
FE - 1	"WC	0" WC / H ₂ O - 303 CFM
PI - 1	"WC (vacuum)	46" H ₂ O
TI - 1	°F	63°F
FE-2	"WC	1.5" H ₂ O

Post Blower Temp 99°F
Post Blower Pressure 0.0 PSI

FID Measurements

Location	Time	FID Reading (ppm)	Valve Position (record notch)	Vacuum ("WC)	Differential Pressure ("WC) Flow (CFM)
Western Manifold	10:33	3.2			0.002 180
SVE - 13	10:31	3.9	2	0	0.0 21
SVE - 12	10:30	3.1	3	14	0.0 72
SVE - 11	10:28	4.7	1	0	—
SVE - 10	10:26	3.5	2	0	0.0 13
SVE - 09	10:24	15.0	1	0	—
Eastern manifold	10:51	844.0			0.001 170
SVE - 01	10:48	2.3	1	0	—
SVE - 03	10:46	6.8	1	12	—
SVE - 05	10:44	1.8	1	8	—
SVE - 07	10:57	166.9	7	38	0.0 90
SVE - 08	10:55	197.6	3	40	0.0 34
SVE - 06	10:42	1.5	1	0	—
SVE - 04	10:41	1.2	1	0	—
SVE - 02	10:39	1.7	1	0	—
SVE Influent	0940-Hrs	50.5 PPM			
SVE Effluent	0952-Hrs	5.1 PPM			D.E. Calculated to be 99%

Influent Sample ID: INF-08-05-21
Influent Sample Time: 10:10-Hrs

Effluent Sample ID: EFF-08-05-21
Effluent Sample Time: 0955-Hrs

Field Representative (Print and Sign): George Hagan Date of Visit: 8-5-2021

Gavin Klockman

AS System Monthly Inspection Log, Kelly Moore. Date: 8-5-2021

Visual/Audio Inspection

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	Y	
Regenerative Blower	Y	(Auto) / Hand / Off)
Heat Exchanger	Y	(Auto) / Hand / Off)
Pressure Gauges/Flow Meters	Y	
Vent Valve Status	Y	open 40%

System Gauge Readings

Before Heat Exchanger

Item	Units	Reading	Operating Range
Hour Meter Spurge Blower	Hour's / Minutes	10,241.7	H - M.
PI - 3	psi	4.5	0 - 30
TI - 3	°F	180°F	150 - 200

After Heat Exchanger

Item	Units	Reading	Operating Range
Hour Meter Heat Exchanger	Hour's / Minutes	10,242.4	H - M
PI - 4	psi	3.25	0 - 30
TI - 4	°F	85°F	150 - 200

Air Flow Monitoring

Location	Time	Valve Position (record appx angle)	Pressure (psi)	Air Flow (SCFM)
AS - 1	1017-Hy	closed		
AS - 2		open 100%	3.25	20.5 CFM
AS - 3		closed		
AS - 4		open 100%	3.50	18.5 CFM
AS - 5		open 100%	3.25	18.5 CFM

Additional Notes.

Collected system data and samples. Wiped down equipment. Greased zerks on both motors. System operational and running well.

Field Representative (Print and Sign):

Gravin Klockeman
George Hagan

Date of Visit:

8-5-2021

SVE System Monthly Inspection Log. Kelly Moore. Date: 9-7-21

Visual/Audio Inspection. Located at; 5400 Airport Way South Seattle, WA

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	Y	
Control Pump (Regenerative Blower)	Y	On Off
Entrainment Pump (Transfer Pump)	Y	(Auto / Hand / Off)
Pressure Gauges/Flow Meters	Y	OK
Knockout Tank (record level)	Y	% full 30% @ 20 gal
Knockout Water Tote (record level)	Y	% full 65% @ 180 gal
Dilution Valve Status	Y	100% Closed
Recirculation Valve Status	Y	100% Closed

CATOX Screen Readings

Item	Units	Reading	Operating Range
Hour Meter	H-M	16,226	
Catox In (T ₁)	°F	698°F	>650
Catox Out (T ₂)	°F	666°F	600 - 650
Heat Ex (T ₃)	°F	351°F	300 - 400
Flow	SCFM	319	<300
LEL	%	N/A	5-15

System Gauge Readings

Item	Units	Reading
FE - 1	"WC	0.001" WC
PI - 1	"WC (vacuum)	31"
TI - 1	°F	64°F
FE-2	"WC	0.60" WC

FID Measurements

Location	Time	P2D G.I.L. FID Reading (ppm)	Valve Position (record notch)	Vacuum ("WC)	Differential Pressure (WC) (SCFM)
Western Manifold	10:19	10.1			0.001 245
SVE - 13	10:17	2.4	2	0.0" WC	0.002 15
SVE - 12	10:15	18.1	3	9.5" WC	0.002 48
SVE - 11	10:13	4.6	3	1" WC	0.002 62
SVE - 10	10:11	5.4	2	1.5" WC	0.001 8.75
SVE - 09	10:08	40.9	3	6" WC	0.001 57
Eastern manifold	10:27	517			0.001 89
SVE - 01	N/A		1 = Closed	0" WC	N/A
SVE - 03	N/A		1 = Closed	7" WC	N/A
SVE - 05	N/A		1 = Closed	6.58" WC	N/A
SVE - 07	10:30	1230	7	23" WC	0.001 23
SVE - 08	10:24	130.3	4	24" WC	0.000 7.0
SVE - 06	N/A		1 = Closed	0	N/A
SVE - 04	N/A		1 = Closed	0	N/A
SVE - 02	N/A		1 = Closed	0	N/A
SVE Influent	9:27	299			
SVE Effluent	9:22	1.7	DE = 99.4%		

Influent Sample ID: Inf-9-7-2021
Influent Sample Time: 9:27

Effluent Sample ID: Eff-9-7-2021
Effluent Sample Time: 9:22

Field Representative (Print and Sign): George Hagan
Gavin Klockman Date of Visit: 9-7-21

AS System Monthly Inspection Log, Kelly Moore. Date: 9/7/21
Visual/Audio Inspection

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	Y	
Regenerative Blower	Y	(Auto) Hand / Off
Heat Exchanger	Y	(Auto) Hand / Off
Pressure Gauges/Flow Meters	Y	
Vent Valve Status	Y	60% open

System Gauge Readings

Before Heat Exchanger				After Heat Exchanger			
Item	Units	Reading	Operating Range	Item	Units	Reading	Operating Range
Hour Meter Spurge Blower	Hour's / Minutes	11,013.6		Hour Meter Heat Exchanger	Hour's / Minutes	11,014.5	
PI - 3	psi	4.75	0 - 30	PI - 4	psi	4.0	0 - 30
TI - 3	°F	177°F	150 - 200	TI - 4	°F	81°F	150 - 200

Air Flow Monitoring

Location	Time	Valve Position (record appx angle)	Pressure (psi)	Air Flow (SCFM)
AS - 1	0950-143	40% open	3.0	5.0 SCFM
AS - 2			2.25	
AS - 3			2.75	
AS - 4			2.75	
AS - 5			2.50	

Additional Notes.

Operational @ our arrival, Collected the September 2021 System's Vapor samples & systems data. We tried to Zero & Span the old air flow gauge, no success. All operations are normal @ our departure.

Field Representative (Print and Sign): George Hagan Date of Visit: 9-7-21
Grain Klockman

SVE System Monthly Inspection Log. Kelly Moore. Date: 10-5-2021

Visual/Audio Inspection. Located at; 5400 Airport Way South Seattle, WA

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	Y	
Control Pump (Regenerative Blower)	Y	(On) / Off
Entrainment Pump (Transfer Pump)	Y	(Auto / Hand / Off)
Pressure Gauges/Flow Meters	Y	
Knockout Tank (record level)	Y	% full 45
Knockout Water Tote (record level)	Y	% full 20 25
Dilution Valve Status	Y	100% Closed
Recirculation Valve Status	Y	100% Closed

CATOX Screen Readings

Item	Units	Reading	Operating Range
Hour Meter	H-M	16899	hrs
Catox In (T ₁)	°F	640	>650
Catox Out (T ₂)	°F	647	600 - 650
Heat Ex (T ₃)	°F	349	300 - 400
Flow	SCFM	247	<300
LEL	%	N/A	5-15

System Gauge Readings

Item	Units	Reading
FE - 1	"WC	0" H ₂ O
PI - 1	"WC (vacuum)	32"
TI - 1	°F	55°F
FE-2	"WC	0.6" H ₂ O

FID Measurements

Location	Time	FID Reading (ppm)	Valve Position (record notch)	Vacuum ("WC)	Differential Pressure ("WC)
Western Manifold	10:46	19.1	1 = closed		0.0 CFM
SVE - 13	10:43	2.6	2	1	0.0 21
SVE - 12	10:46	47.0	3	12	0.0 72
SVE - 11	10:37	3.7	4 3 3	5	0.0 13
SVE - 10	10:37	57.4	2	5	0.0
SVE - 09	10:35	72.3	3	7	0.0
Eastern manifold	11:09	212			0.0
SVE - 01	11:01	9.5	1	0	N/A
SVE - 03	10:59	137.5	1	8	1
SVE - 05	10:56	6.5	1	6.5	1
SVE - 07	11:06	926.2	7	30	.001
SVE - 08	11:03	1175	4	32	0.0
SVE - 06	10:55	0.7	1	0	N/A
SVE - 04	10:52	1.0	1	0	1
SVE - 02	10:50	1.8	1	0	1
SVE Influent	9:55	137.1	DE = 99.8%		
SVE Effluent	9:50	0.3			

Influent Sample ID: Inf-10-5-2021
Influent Sample Time: 10:18

Effluent Sample ID: Eff-10-5-2021
Effluent Sample Time: 10:01

Field Representative (Print and Sign):

George Hagan
George Hagan

Date of Visit: 10-5-2021

AS System Monthly Inspection Log, Kelly Moore. Date: 10-5-2021
Visual/Audio Inspection

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	y	
Regenerative Blower	y	(Auto) / Hand / Off)
Heat Exchanger	y	(Auto) / Hand / Off)
Pressure Gauges/Flow Meters	y	
Vent Valve Status	y	

System Gauge Readings

Before Heat Exchanger				After Heat Exchanger			
Item	Units	Reading	Operating Range	Item	Units	Reading	Operating Range
Hour Meter Spurge Blower	Hour's / Minutes	11686.9	hrs + min.	Hour Meter Heat Exchanger	Hour's / Minutes	11687.8	hrs + min.
PI - 3	psi	4.5	0 - 30	PI - 4	psi	4.25	0 - 30
TI - 3	°F	166	150 - 200	TI - 4	°F	72	150 - 200

Air Flow Monitoring

Location	Time	Valve Position (record appx angle)	Pressure (psi)	Air Flow (SCFM)
AS - 1	1000-hrs	30% open	3	5.5
AS - 2		20% open	2	5.25
AS - 3		20%	2.5	5
AS - 4		20%	2.75	5.25
AS - 5		25%	2.25	5.25

Additional Notes.

Changed chart paper and ink. Pumped 150 gallons from water tote into 2-poly and 1-metal 55-gallon drums. DE = 99.8%. Collected system samples TOTE PRE Pump, 225 gal (250 CAPACITY). TOTE POST Pump 75 GAL. 150 GAL TO 3-DRUMS ON SITE, DRUMS LABELED & SECURED, STAGED FOR FUTURE DISPOSAL. SVE-CATOX K.O. TRANSFER Pump CHECKED. G.H.

Field Representative (Print and Sign): George Heeger Date of Visit: 10-5-2021

Crwin Klockman

George Heeger

SVE System Monthly Inspection Log. Kelly Moore. Date: 11-11-21

Visual/Audio Inspection. Located at: 5400 Airport Way South Seattle, WA

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	Y	OK
Control Pump (Regenerative Blower)	Y	(On / Off)
Entrainment Pump (Transfer Pump)	Y	(Auto / Hand / Off) Primed & Working
Pressure Gauges/Flow Meters	Y	
Knockout Tank (record level)	Y	% full 40%
Knockout Water Tote (record level)	Y	% full 60% @ 150 gal
Dilution Valve Status	Y	100% closed.
Recirculation Valve Status	Y	100% open

CATOX Screen Readings

Item	Units	Reading	Operating Range
Hour Meter	H-M	17,768	
Catox In (T ₁)	°F	63.7	>650
Catox Out (T ₂)	°F	63.8	600 - 650
Heat Ex (T ₃)	°F	34.2	300 - 400
Flow	SCFM	290	<300
LEL	%	N/A	5-15

System Gauge Readings

Item	Units	Reading
FE - 1	"WC	0.001" H ₂ O
PI - 1	"WC (vacuum)	42" H ₂ O
TI - 1	°F	48°F
FE-2	"WC	2.4" H ₂ O

FID Measurements

Location	Time	PID FID Reading (ppm)	Valve Position (record notch)	Vacuum ("WC)	Differential Pressure ("WC)
Western Manifold	0945	1.0 ppm			
SVE - 13	0947	0.1 ppm	2	1" H ₂ O	0.000
SVE - 12	0949	0.7 ppm	3	15" H ₂ O	0.000
SVE - 11	0951	Closed	1 = 100% closed	0	0.000
SVE - 10	0953	0.6 ppm	3	23" H ₂ O	0.000
SVE - 09	0955	6.3 ppm	3	8" H ₂ O	0.001
Eastern manifold	0959	64.0 ppm			
SVE - 01	1003	Closed	Closed	27" H ₂ O	0.000
SVE - 03	1005	10.7 ppm	4	0.000 H ₂ O	0.001 H ₂ O
SVE - 05	1008	Closed	Closed	5"	0.000
SVE - 07	1011	484.7 ppm	7	31" H ₂ O	0.000 H ₂ O
SVE - 08	1014	214.4 ppm	4	32.5" H ₂ O	0.000 H ₂ O
SVE - 06	1015	Closed	Closed		0.000
SVE - 04	1017	Closed	Closed		0.000
SVE - 02	1020	Closed	Closed		0.000
SVE Influent	0915	23.1 ppm	DE @ 95%		
SVE Effluent	0912	1.0 ppm			

Influent Sample ID: INF-11-11-2021
Influent Sample Time: 0929-1023

Effluent Sample ID: EFF-11-11-2021
Effluent Sample Time: 0943

Field Representative (Print and Sign): George Hagan Date of Visit: 11-11-21

AS System Monthly Inspection Log, Kelly Moore. Date: 11-11-21

Visual/Audio Inspection

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	Y	O.K.
Regenerative Blower	Y	(Auto) / Hand / Off)
Heat Exchanger	Y	(Auto) Hand / Off)
Pressure Gauges/Flow Meters	Y	O.K.
Vent Valve Status	Y	open 60%.

System Gauge Readings

Before Heat Exchanger				After Heat Exchanger			
Item	Units	Reading	Operating Range	Item	Units	Reading	Operating Range
Hour Meter Spurge Blower	Hour's / Minutes	12,553.6		Hour Meter Heat Exchanger	Hour's / Minutes	12,554.5	
PI - 3	psi	5.0 PSI	0 - 30	PI - 4	psi	4.0 PSI	0 - 30
TI - 3	°F	161°F	150 - 200	TI - 4	°F	64°F	150 - 200

Air Flow Monitoring

Location	Time	Valve Position (record appx angle)	Pressure (psi)	Air Flow (SCFM)
AS - 1	0930	20% open	3.0 PSI	5
AS - 2	0930		2.5 PSI	5
AS - 3	0931		3.0 PSI	4.5
AS - 4	0931		2.75 PSI	5
AS - 5	0931		2.50 PSI	5

Additional Notes. 11-11-21 @ 0900 G. Hagen & G. M. Lockman on site

Air Systems operational @ our arrival, all operations are normal. Per Mr. Adamex @ WOOD SVE Manifold adjustments made today SVE 03 from Position 1 to Position 4, SVE 10 Pos 2 to 3, SVE 11 Pos 3 to Pos 1, 100% closed. Changed Chart recorder paper. Collected The November 2021 System Vapor samples, Recorded System Data, VOC Values @ System are low. ZNF 23.1 ppm, EFF 1.0 ppm DE @ 95%. @ 1045 Departed Site

Field Representative (Print and Sign): George Hagen Date of Visit: 11-11-21

SVE System Monthly Inspection Log. Kelly Moore. Date: 12-08-2021

Visual/Audio Inspection. Located at: 5400 Airport Way South Seattle, WA

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	Y	
Control Pump (Regenerative Blower)	Y	(On / Off)
Entrainment Pump (Transfer Pump)	Y	(Auto / Hand / Off) - WORKING FINE
Pressure Gauges/Flow Meters	Y	
Knockout Tank (record level)	Y	% full 50% @ 10 Gal
Knockout Water Tote (record level)	Y	% full 10% @ 50 Gal
Dilution Valve Status	Y	CLOSED 100%
Recirculation Valve Status	Y	open 40%

CATOX Screen Readings

Item	Units	Reading	Operating Range
Hour Meter	H-M	18,389	
Catox In (T ₁)	°F	728	>650
Catox Out (T ₂)	°F	653	600 - 650
Heat Ex (T ₃)	°F	391	300 - 400
Flow	SCFM	79	<300
LEL	%	N/A	5-15

System Gauge Readings

Item	Units	Reading
FE - 1	"WC	0.001 "H ₂ O
PI - 1	"WC (vacuum)	45 "H ₂ O
TI - 1	°F	41 °F
FE-2	"WC	0.02 "H ₂ O

FID Measurements

Location	Time	PID FID Reading (ppm)	Valve Position (record notch)	Vacuum ("WC)	Differential Pressure ("WC)
Western Manifold	1010-Hy	N/A			
SVE - 13		ALL WESTMANIFOLD WELLS		CLOSED	N/A
SVE - 12		N/A			
SVE - 11		N/A			
SVE - 10		N/A			
SVE - 09		N/A			
Eastern manifold	1140	10.0 PPM			
SVE - 01	closed				
SVE - 03	closed				
SVE - 05	closed				
SVE - 07	1131	8.0 PPM	7	43 "H ₂ O	0.001 "H ₂ O
SVE - 08	1132	31.1 PPM	4	43 "H ₂ O	0.000 "H ₂ O
SVE - 06	closed				
SVE - 04	closed				
SVE - 02	closed				
SVE Influent	1112	6.0 PPM	DE @ 91.6 %		
SVE Effluent	1110	0.5 PPM			

Influent Sample ID: Inf-12-8-2021
Influent Sample Time: 11:15

Effluent Sample ID: Eff-12-8-2021
Effluent Sample Time: 11:04

Field Representative (Print and Sign): George Hagan Date of Visit: 12-8-21

AS System Monthly Inspection Log, Kelly Moore. Date: 12-8-21

Visual/Audio Inspection

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	Y	
Regenerative Blower	Y	(Auto / Hand / Off)
Heat Exchanger	Y	(Auto / Hand / Off)
Pressure Gauges/Flow Meters	Y	
Vent Valve Status	closed	

System Gauge Readings

Before Heat Exchanger

Item	Units	Reading	Operating Range
Hour Meter Spurge Blower	Hour's / Minutes	12,700	
PI - 3	psi	off	0 - 30
TI - 3	°F	off	150 - 200

After Heat Exchanger

Item	Units	Reading	Operating Range
Hour Meter Heat Exchanger	Hour's / Minutes	12,702	
PI - 4	psi	off	0 - 30
TI - 4	°F	off	150 - 200

Air Flow Monitoring

Location	Time	Valve Position (record appx angle)	Pressure (psi)	Air Flow (SCFM)
AS - 1	off	off	off	off
AS - 2	off	off	off	off
AS - 3	off	off	off	off
AS - 4	off	off	off	off
AS - 5	off	off	off	off

Additional Notes. Changed Chart Paper

SVE CATOX operational, Air Spurge off @ our arrival.
Ran Spurge Blower 1-Hr To Exercise the unit. Low
VOC's across the system closed VE Well 03 100% NO VOC's
Active VE Wells are now 7 + 8. Increased Vac to 60" H₂O
Pulled H₂O into the Wells, Reduced Vacuum To 46" H₂O No
water in VE 7 or 8. Collected the December 2021 System's
Vapor samples + Date Today.

Field Representative (Print and Sign): C. Hagen Date of Visit: 12-8-21



Appendix D

Analytical Data, SVE Monitoring

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

January 14, 2020

John Long, Project Manager
Wood Environment & Infrastructure Solutions, Inc.
One Union Square
600 University Street, Suite 600
Seattle, WA 98101

Dear Mr Long:

Included are the results from the testing of material submitted on January 9, 2020 from the Kelly Moore, F&BI 001117 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
WEI0114R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on January 9, 2020 by Friedman & Bruya, Inc. from the Wood Environment & Infrastructure Solutions Kelly Moore, F&BI 001117 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Wood Environment & Infrastructure Solutions</u>
001117 -01	EFF-010920
001117 -02	INF-010920

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 01/14/20
Date Received: 01/09/20
Project: Kelly Moore, F&BI 001117
Date Extracted: 01/10/20
Date Analyzed: 01/10/20

**RESULTS FROM THE ANALYSIS OF AIR SAMPLES
FOR BENZENE, TOLUENE, ETHYLBENZENE,
XYLENES AND TPH AS GASOLINE
USING MODIFIED METHODS 8021B AND NWTPH-Gx**
Results Reported as mg/m³

<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 50-150)
EFF-010920 001117-01	<0.1	3.5	5.8	12	1,400	99
INF-010920 001117-02 1/5	<0.5	<1	38	77	8,200	102
Method Blank 00-9 MB2	<0.1	<0.2	<0.2	<0.6	<10	81

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 01/14/20

Date Received: 01/09/20

Project: Kelly Moore, F&BI 001117

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES
FOR BENZENE, TOLUENE, ETHYLBENZENE,
XYLENES, AND TPH AS GASOLINE
USING MODIFIED EPA METHOD 8021B AND NWTPH-Gx**

Laboratory Code: 001069-04 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	mg/m ³	<0.1	<0.1	nm
Toluene	mg/m ³	<0.2	<0.2	nm
Ethylbenzene	mg/m ³	<0.2	<0.2	nm
Xylenes	mg/m ³	<0.6	<0.6	nm
Gasoline	mg/m ³	<10	<10	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery	Acceptance
			LCS	Criteria
Benzene	mg/m ³	5.0	91	70-130
Toluene	mg/m ³	5.0	88	70-130
Ethylbenzene	mg/m ³	5.0	89	70-130
Xylenes	mg/m ³	15	89	70-130
Gasoline	mg/m ³	100	115	86-144

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.

001117
 Report To John Long
 Company WOOD Environmental
 Address 600 University St. Suite 600
 City, State, ZIP Seattle WA 98101
 Phone 206-839-8469 Email John Long

SAMPLE CHA OF CUSTODY ME 01-09-20

Page # 1 of 1

SAMPLERS (signature)

PROJECT NAME

PO #

REMARKS

INVOICE TO

TURNAROUND TIME

☒ Standard Turnaround

☐ RUSH

Rush charges authorized by:

SAMPLE DISPOSAL

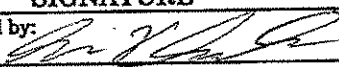

☒ Dispose after 30 days

☐ Archive Samples

☐ Other

						ANALYSES REQUESTED										
Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM	BTEX	TPH-Gas		Notes
EFF-010920	01	01-09-2020	1235	Tedlar Bag	1								X	X		
INF-010920	02	01-09-2020	1250	Tedlar Bag	1								X	X		

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

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: 	Gavin Klockeman	JHA Env.	1-9-2020	14:5
Received by: 	D J V	F&BT	1-9-20	14:50
Relinquished by:				
Received by:				

Samples received at 20 °C

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

February 19, 2020

John Long, Project Manager
Wood Environment & Infrastructure Solutions, Inc.
One Union Square
600 University Street, Suite 600
Seattle, WA 98101

Dear Mr Long:

Included are the results from the testing of material submitted on February 14, 2020 from the Kelly Moore, F&BI 002209 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
WEI0219R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on February 14, 2020 by Friedman & Bruya, Inc. from the Wood Environment & Infrastructure Solutions Kelly Moore, F&BI 002209 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Wood Environment & Infrastructure Solutions</u>
002209 -01	EFF_02142020
002209 -02	INF_02142020

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 02/19/20

Date Received: 02/14/20

Project: Kelly Moore, F&BI 002209

Date Extracted: 02/17/20

Date Analyzed: 02/17/20

**RESULTS FROM THE ANALYSIS OF AIR SAMPLES
FOR BENZENE, TOLUENE, ETHYLBENZENE,
XYLENES AND TPH AS GASOLINE
USING MODIFIED METHODS 8021B AND NWTPH-Gx**

Results Reported as mg/m³

<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 50-150)
EFF_02142020 002209-01	<0.1	<0.2	<0.2	<0.6	20	86
INF_02142020 002209-02	<0.1	0.31	<0.2	2.5	180	88
Method Blank 00-373 MB	<0.1	<0.2	<0.2	<0.6	<10	83

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 02/19/20

Date Received: 02/14/20

Project: Kelly Moore, F&BI 002209

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES
FOR BENZENE, TOLUENE, ETHYLBENZENE,
XYLENES, AND TPH AS GASOLINE
USING MODIFIED EPA METHOD 8021B AND NWTPH-Gx**

Laboratory Code: 002209-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	mg/m ³	<0.1	<0.1	nm
Toluene	mg/m ³	<0.2	<0.2	nm
Ethylbenzene	mg/m ³	<0.2	<0.2	nm
Xylenes	mg/m ³	<0.6	<0.6	nm
Gasoline	mg/m ³	20	20	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery	Acceptance Criteria
			LCS	
Benzene	mg/m ³	5.0	91	70-130
Toluene	mg/m ³	5.0	91	70-130
Ethylbenzene	mg/m ³	5.0	98	70-130
Xylenes	mg/m ³	15	94	70-130
Gasoline	mg/m ³	100	122	86-144

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.

002209

SAMPLE CHA OF CUSTODY

ME 02/14/20

Report To John LongCompany WOOD EnvironmentalAddress 600 University St. Suite 600City, State, ZIP Seattle, WA 98101Phone 206-838-8469 Email John Long

SAMPLERS (signature)

PROJECT NAME

PO #

REMARKS

INVOICE TO

Page # of

TURNAROUND TIME

☒ Standard Turnaround☐ RUSH

Rush charges authorized by:

SAMPLE DISPOSAL

☒ Dispose after 30 days☐ Archive Samples☐ Other


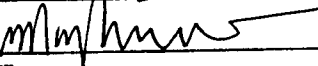
Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED										Notes
						TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM	BTEX	TPH-Gas		
EFE-02142020	01	2-14-2020	10:26	Tedder Bag	1								+	X		
INF-02142020	02	2-14-2020	10:28	I	1								+	X		

Friedman & Bruya, Inc.

3012 16th Avenue West

Seattle, WA 98119-2029

Ph. (206) 285-8282

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: 	Gavin Heckaman	JHA	2-14-2020	1300
Received by: 	John Phan	FEBT	2-14-20	1300
Relinquished by:				
Received by:			20	

Samples received at _____°C

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

March 27, 2020

John Long, Project Manager
Wood Environment & Infrastructure Solutions, Inc.
One Union Square
600 University Street, Suite 600
Seattle, WA 98101

Dear Mr Long:

Included are the results from the testing of material submitted on March 17, 2020 from the Kelly Moore, F&BI 003279 project. There are 6 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
WEI0327R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on March 17, 2020 by Friedman & Bruya, Inc. from the Wood Environment & Infrastructure Solutions Kelly Moore, F&BI 003279 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Wood Environment & Infrastructure Solutions</u>
003279 -01	EFF_03172020
003279 -02	INF_03172020

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	EFF_03172020	Client:	Wood Environment & Infrastructure Solutions
Date Received:	03/17/20	Project:	Kelly Moore, F&BI 003279
Date Collected:	03/17/20	Lab ID:	003279-01 1/2.7
Date Analyzed:	03/24/20	Data File:	032329.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	ppbv
2-Propanol	<23	<9.4
Benzene	<0.86	<0.27
Toluene	<51	<13
Ethylbenzene	<1.2	<0.27
m,p-Xylene	<2.3	<0.54
o-Xylene	<1.2	<0.27
Naphthalene	21	4.0
Gasoline Range Organics	<2,200	<540

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	INF_03172020	Client:	Wood Environment & Infrastructure Solutions
Date Received:	03/17/20	Project:	Kelly Moore, F&BI 003279
Date Collected:	03/17/20	Lab ID:	003279-02 1/33
Date Analyzed:	03/24/20	Data File:	032330.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	ppbv
2-Propanol	<280	<120
Benzene	<11	<3.3
Toluene	<620	<160
Ethylbenzene	22	5.2
m,p-Xylene	75	17
o-Xylene	19	4.4
Naphthalene	16	3.0
Gasoline Range Organics	135,000	33,000

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Method Blank	Client:	Wood Environment & Infrastructure Solutions
Date Received:	Not Applicable	Project:	Kelly Moore, F&BI 003279
Date Collected:	Not Applicable	Lab ID:	00-0716 mb
Date Analyzed:	03/23/20	Data File:	032311.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat

	%	Lower	Upper
Surrogates:	Recovery:	Limit:	Limit:
4-Bromofluorobenzene	105	70	130

Compounds:	Concentration	
	ug/m3	ppbv
2-Propanol	<8.6	<3.5
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	<0.26	<0.05
Gasoline Range Organics	<820	<200

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 03/27/20

Date Received: 03/17/20

Project: Kelly Moore, F&BI 003279

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES
FOR VOLATILES BY METHOD TO-15**

Laboratory Code: 003260-04 1/2.7 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 30)
2-Propanol	ug/m3	<23	<23	nm
Benzene	ug/m3	14	14	0
Toluene	ug/m3	<51	<51	nm
Ethylbenzene	ug/m3	<1.2	<1.2	nm
m,p-Xylene	ug/m3	<2.3	<2.3	nm
o-Xylene	ug/m3	<1.2	<1.2	nm
Naphthalene	ug/m3	<0.71	<0.71	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
2-Propanol	ug/m3	33	94	70-130
Benzene	ug/m3	43	95	70-130
Toluene	ug/m3	51	92	70-130
Ethylbenzene	ug/m3	59	94	70-130
m,p-Xylene	ug/m3	120	98	70-130
o-Xylene	ug/m3	59	97	70-130
Naphthalene	ug/m3	71	113	70-130

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.

003279

SAMPLE CHAIN OF CUSTODY

ME 3/17/20

Page # 1 of 1

Report To John Long
 Company Wood Environmental
 Address 600 University St. Suite 600
 City, State, ZIP Seattle, WA 98101
 Phone 2068388469 Email John Long

SAMPLERS (signature)

Gavin Klockeman

PROJECT NAME & ADDRESS

Kelly Moore

PO #

NOTES:

INVOICE TO

TURNAROUND TIME

☒ Standard☐ RUSH

Rush charges authorized by:

SAMPLE DISPOSAL

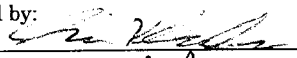
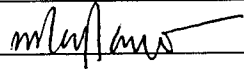
☐ Default: Clean after 3 days☐ Archive (Fee may apply)

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	Notes
EFF-03172020	-01	4180	231	IA <input checked="" type="checkbox"/> SG	3-17-2020										X Sampled at 9m.m SU: 4180
INF-03172020	-02	3387	203	IA <input checked="" type="checkbox"/> SG	3-17-2020										X Sample duration = 5.5 min SU: 3387 *Both are SG
		added per 3/17/20		IA / SG											
				IA / SG											
				IA / SG											
				IA / SG											
				IA / SG											Samples received at 16 °C
				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: 	Gavin Klockeman	IHA	3-17-2020	14:31
Received by: 	Nhan Phan	FBI	3-17-20	14:31
Relinquished by:				
Received by:				

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

May 1, 2020

Paul Stull, Project Manager
Wood Environment & Infrastructure Solutions, Inc.
One Union Square
600 University Street, Suite 600
Seattle, WA 98101

Dear Mr Stull:

Included are the results from the testing of material submitted on April 20, 2020 from the Kelly Moore, F&BI 004205 project. There are 6 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: paul.stull@woodplc.com
WEI0501R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on April 20, 2020 by Friedman & Bruya, Inc. from the Wood Environment & Infrastructure Solutions Kelly Moore, F&BI 004205 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Wood Environment & Infrastructure Solutions</u>
004205 -01	INF_4_20_2020
004205 -02	EFF_4_20_2020

The TO-15 gasoline range concentrations were quantified using a single point calibration at 200 ppbv.

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	INF_4_20_2020	Client:	Wood Environment & Infrastructure
Date Received:	04/20/20	Project:	Kelly Moore, F&BI 004205
Date Collected:	04/20/20	Lab ID:	004205-01 1/7.0
Date Analyzed:	04/28/20	Data File:	042732.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat/MS

	%	Lower	Upper
Surrogates:	Recovery:	Limit:	Limit:
4-Bromofluorobenzene	105	70	130

Compounds:	Concentration	
	ug/m3	ppbv
Benzene	35	11
Toluene	<130	<35
Ethylbenzene	120	27
m,p-Xylene	1,500	340
o-Xylene	420	96
Gasoline Range Organics	90,000	22,000

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	EFF_4_20_2020	Client:	Wood Environment & Infrastructure
Date Received:	04/20/20	Project:	Kelly Moore, F&BI 004205
Date Collected:	04/20/20	Lab ID:	004205-02 1/7.1
Date Analyzed:	04/28/20	Data File:	042731.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat/MS

	%	Lower	Upper
Surrogates:	Recovery:	Limit:	Limit:
4-Bromofluorobenzene	113	70	130

Compounds:	Concentration	
	ug/m3	ppbv
Benzene	<2.3	<0.71
Toluene	<130	<35
Ethylbenzene	<3.1	<0.71
m,p-Xylene	<6.2	<1.4
o-Xylene	<3.1	<0.71
Gasoline Range Organics	<2,300	<570

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Method Blank	Client:	Wood Environment & Infrastructure
Date Received:	Not Applicable	Project:	Kelly Moore, F&BI 004205
Date Collected:	Not Applicable	Lab ID:	00-0938 mb
Date Analyzed:	04/27/20	Data File:	042711.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat/MS

	%	Lower	Upper
Surrogates:	Recovery:	Limit:	Limit:
4-Bromofluorobenzene	100	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
Gasoline Range Organics	<330	<80

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 05/01/20

Date Received: 04/20/20

Project: Kelly Moore, F&BI 004205

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES
FOR VOLATILES BY METHOD TO-15**

Laboratory Code: 004280-14 1/3.3 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 30)
Benzene	ug/m3	<1.1	<1.1	nm
Toluene	ug/m3	<62	<62	nm
Ethylbenzene	ug/m3	<1.4	<1.4	nm
m,p-Xylene	ug/m3	<2.9	<2.9	nm
o-Xylene	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	88	70-130
Toluene	ug/m3	51	91	70-130
Ethylbenzene	ug/m3	59	92	70-130
m,p-Xylene	ug/m3	120	94	70-130
o-Xylene	ug/m3	59	91	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

004205
Report To Paul Stull
Company WOOD Environmental
Address 680 University St. Suite 600
City, State, ZIP Seattle, WA 98101
Phone 206 414 0444 Email paul.stull@woodplc.com

SAMPLERS (signature)

Gravin Klockeman

PROJECT NAME & ADDRESS

Kelly Moore

PO #

NOTES:

INVOICE TO

ME 04-20-20

Page # 1 of 1

TURNAROUND TIME

☒ Standard

☐ RUSH

Rush charges authorized by:

SAMPLE DISPOSAL

☒ Default: Clean after 3 days

☐ Archive (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	Notes
INF 4-20-2020	01	3256	106	IA / (SG)	4-20-20	15	9:34	0	9:39						X SN: 3256 Data: 6 min
EFF 4-20-2020	02	3675	02	IA / (SG)	4-20-20	20	7:24	0	9:39						X SN: 3675 Data: 15 min
		B34120		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>Gravin Klockeman</u>	<u>Gravin Klockeman</u>	<u>JHA</u>	<u>4-20-2020</u>	<u>1140</u>
Received by: <u>S. O'Brien</u>	<u>S. O'Brien</u>	<u>FJB, Inc</u>	<u>4-20-2020</u>	<u>11:40A</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.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

May 28, 2020

Paul Stull, Project Manager
Wood Environment & Infrastructure Solutions, Inc.
One Union Square
600 University Street, Suite 600
Seattle, WA 98101

Dear Mr Stull:

Included are the results from the testing of material submitted on May 18, 2020 from the Kelly Moore, F&BI 005221 project. There are 6 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
WEI0528R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on May 18, 2020 by Friedman & Bruya, Inc. from the Wood Environment & Infrastructure Solutions Kelly Moore, F&BI 005221 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Wood Environment & Infrastructure Solutions</u>
005221 -01	INF_5-18-2020
005221 -02	EFF_5-18-2020

The TO-15 gasoline range concentrations were quantified using a single point calibration at 100 ppbv.

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	INF_5-18-2020	Client:	Wood Environment & Infrastructure
Date Received:	05/18/20	Project:	Kelly Moore, F&BI 005221
Date Collected:	05/18/20	Lab ID:	005221-01 1/14
Date Analyzed:	05/21/20	Data File:	052027.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat/MS

	%	Lower	Upper
Surrogates:	Recovery:	Limit:	Limit:
4-Bromofluorobenzene	109	70	130

Compounds:	Concentration	
	ug/m3	ppbv
Hexane	<49	<14
Benzene	5.9	1.8
Toluene	<260	<70
Ethylbenzene	<6.1	<1.4
m,p-Xylene	<12	<2.8
o-Xylene	<6.1	<1.4
Gasoline Range Organics	110,000	27,000

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	EFF_5-18-2020	Client:	Wood Environment & Infrastructure
Date Received:	05/18/20	Project:	Kelly Moore, F&BI 005221
Date Collected:	05/18/20	Lab ID:	005221-02 1/2.8
Date Analyzed:	05/21/20	Data File:	052026.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat/MS

	%	Lower	Upper
Surrogates:	Recovery:	Limit:	Limit:
4-Bromofluorobenzene	105	70	130

Compounds:	Concentration	
	ug/m3	ppbv
Hexane	<9.9	<2.8
Benzene	<0.89	<0.28
Toluene	<53	<14
Ethylbenzene	<1.2	<0.28
m,p-Xylene	<2.4	<0.56
o-Xylene	<1.2	<0.28
Gasoline Range Organics	<1,100	<280

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Method Blank	Client:	Wood Environment & Infrastructure
Date Received:	Not Applicable	Project:	Kelly Moore, F&BI 005221
Date Collected:	Not Applicable	Lab ID:	00-1068 mb
Date Analyzed:	05/20/20	Data File:	052011.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat/MS

	%	Lower	Upper
Surrogates:	Recovery:	Limit:	Limit:
4-Bromofluorobenzene	111	70	130

Compounds:	Concentration	
	ug/m3	ppbv
Hexane	<3.5	<1
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
Gasoline Range Organics	<410	<100

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 05/28/20

Date Received: 05/18/20

Project: Kelly Moore, F&BI 005221

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES
FOR VOLATILES BY METHOD TO-15**

Laboratory Code: 005229-01 1/7.8 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 30)
Hexane	ug/m3	<27	<27	nm
Benzene	ug/m3	3.5	3.3	6
Toluene	ug/m3	<150	<150	nm
Ethylbenzene	ug/m3	5.9	6.1	3
m,p-Xylene	ug/m3	24	25	4
o-Xylene	ug/m3	7.8	8.0	3

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Hexane	ug/m3	48	93	70-130
Benzene	ug/m3	43	91	70-130
Toluene	ug/m3	51	94	70-130
Ethylbenzene	ug/m3	59	95	70-130
m,p-Xylene	ug/m3	120	100	70-130
o-Xylene	ug/m3	59	96	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.

005221

SAMPLE CHAIN OF CUSTODY

ME 05/18/20

Report To Paul StullCompany WOOD EnvironmentalAddress 600 University St. Suite 600City, State, ZIP Seattle, WA 98101Phone 206 414 0414 Email paul.stull@woodpic.com

SAMPLERS (signature)

PROJECT NAME & ADDRESS

PO #

NOTES:

INVOICE TO

Page # 1 of 1

TURNAROUND TIME

☒ Standard☐ RUSH

Rush charges authorized by: _____

SAMPLE DISPOSAL

☒ Default: Clean after 3 days☐ Archive (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	Notes
INF-5-18-2020	01	3673	109	IA / SG	5-18-20	30	1014	1018							X SN: 3673
EFF-5-18-2020	02	3259	102	IA / SG		30	1020	1026							X SN: 3259
				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:

Received by:

Relinquished by:

Received by:

Gavin Klockmann
Nhan PhanJMA
FEBT5/18/20
V1150
1150

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

June 24, 2020

Paul Stull, Project Manager
Wood Environment & Infrastructure Solutions, Inc.
One Union Square
600 University Street, Suite 600
Seattle, WA 98101

Dear Mr Stull:

Included are the results from the testing of material submitted on June 16, 2020 from the Kelly Moore, F&BI 006245 project. There are 6 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: paul.stull@woodplc.com
WEI0624R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on June 16, 2020 by Friedman & Bruya, Inc. from the Wood Environment & Infrastructure Solutions Kelly Moore, F&BI 006245 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Wood Environment & Infrastructure Solutions</u>
006245 -01	EFF_6-16-20
006245 -02	INF_6-16-20

The TO-15 gasoline range concentrations were quantified using a single point calibration at 100 ppbv.

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	EFF_6-16-20	Client:	Wood Environment & Infrastructure
Date Received:	06/16/20	Project:	Kelly Moore, F&BI 006245
Date Collected:	06/16/20	Lab ID:	006245-01 1/3.1
Date Analyzed:	06/19/20	Data File:	061825.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat/MS

	%	Lower	Upper
Surrogates:	Recovery:	Limit:	Limit:
4-Bromofluorobenzene	96	70	130

Compounds:	Concentration	
	ug/m3	ppbv
Hexane	<11	<3.1
Benzene	<0.99	<0.31
Toluene	<58	<15
Ethylbenzene	<1.3	<0.31
m,p-Xylene	<2.7	<0.62
o-Xylene	<1.3	<0.31
Gasoline Range Organics	<1,300	<310

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	INF_6-16-20	Client:	Wood Environment & Infrastructure
Date Received:	06/16/20	Project:	Kelly Moore, F&BI 006245
Date Collected:	06/16/20	Lab ID:	006245-02 1/13
Date Analyzed:	06/19/20	Data File:	061826.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat/MS

	%	Lower	Upper
Surrogates:	Recovery:	Limit:	Limit:
4-Bromofluorobenzene	101	70	130

Compounds:	Concentration	
	ug/m3	ppbv
Hexane	<46	<13
Benzene	65	20
Toluene	<240	<65
Ethylbenzene	<5.6	<1.3
m,p-Xylene	<11	<2.6
o-Xylene	6.2	1.4
Gasoline Range Organics	170,000	42,000

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Method Blank	Client:	Wood Environment & Infrastructure
Date Received:	Not Applicable	Project:	Kelly Moore, F&BI 006245
Date Collected:	Not Applicable	Lab ID:	00-1286 mb
Date Analyzed:	06/18/20	Data File:	061811.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat/MS

	%	Lower	Upper
Surrogates:	Recovery:	Limit:	Limit:
4-Bromofluorobenzene	93	70	130

Compounds:	Concentration	
	ug/m3	ppbv
Hexane	<3.5	<1
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
Gasoline Range Organics	<410	<100

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 06/24/20

Date Received: 06/16/20

Project: Kelly Moore, F&BI 006245

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES
FOR VOLATILES BY METHOD TO-15**

Laboratory Code: 006252-01 1/7.9 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 30)
Hexane	ug/m3	<28	<28	nm
Benzene	ug/m3	<2.5	<2.5	nm
Toluene	ug/m3	<150	<150	nm
Ethylbenzene	ug/m3	<3.4	<3.4	nm
m,p-Xylene	ug/m3	<6.9	<6.9	nm
o-Xylene	ug/m3	<3.4	<3.4	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Hexane	ug/m3	48	86	70-130
Benzene	ug/m3	43	83	70-130
Toluene	ug/m3	51	95	70-130
Ethylbenzene	ug/m3	59	90	70-130
m,p-Xylene	ug/m3	120	96	70-130
o-Xylene	ug/m3	59	93	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.

006245

SAMPLE CHAIN OF CUSTODY ME 06/16/20

Report To Paul StullCompany Wood EnvironmentalAddress 600 University St. Suite 600City, State, ZIP Seattle, WA 98101Phone 206 741 4044 Email paul.stull@woodple.com

SAMPLERS (signature)

PROJECT NAME & ADDRESS

PO #

NOTES:

INVOICE TO

TURNAROUND TIME

☒ Standard☐ RUSH

Rush charges authorized by:

SAMPLE DISPOSAL

☒ Default: Clean after 3 days☐ Archive (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	Notes
EFF-6-16-20	01	4175	02	IA / SG	6-16-20	30	9:31	5	9:57						X Data: 4175 Data: 26 min
INF-6-16-20	02	2436	19	IA / SG	6-16-20	30	9:34	0	9:42						X Data: 2436 Data: 8 min
				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

FORMS\COC\COCTO-15.DOC

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: <u>[Signature]</u>	<u>Gavin Hockeman</u>	<u>JHA</u>	<u>6-16-20</u>	
Received by: <u>[Signature]</u>	<u>Nhan Phan</u>	<u>F&B-I</u>	<u>6/16/20</u>	<u>12:50</u>
Relinquished by:				
Received by:				
Samples received at <u>21°C</u>				

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

July 28, 2020

Paul Stull, Project Manager
Wood Environment & Infrastructure Solutions, Inc.
One Union Square
600 University Street, Suite 600
Seattle, WA 98101

Dear Mr Stull:

Included are the results from the testing of material submitted on July 20, 2020 from the Kelly Moore, F&BI 007315 project. There are 6 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: paul.stull@woodplc.com
WEI0728R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on July 20, 2020 by Friedman & Bruya, Inc. from the Wood Environment & Infrastructure Solutions Kelly Moore, F&BI 007315 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Wood Environment & Infrastructure Solutions</u>
007315 -01	EFF_7-20-2020
007315 -02	INF_7-20-2020

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	EFF_7-20-2020	Client:	Wood Environment & Infrastructure
Date Received:	07/20/20	Project:	Kelly Moore, F&BI 007315
Date Collected:	07/20/20	Lab ID:	007315-01 1/7.0
Date Analyzed:	07/23/20	Data File:	072236.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat

	%	Lower	Upper
Surrogates:	Recovery:	Limit:	Limit:
4-Bromofluorobenzene	97	70	130

Compounds:	Concentration	
	ug/m3	ppbv
Benzene	55	17
Toluene	<130	<35
Ethylbenzene	<3	<0.7
m,p-Xylene	6.7	1.5
o-Xylene	<3	<0.7
Gasoline Range Organics	260,000	64,000

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	INF_7-20-2020	Client:	Wood Environment & Infrastructure
Date Received:	07/20/20	Project:	Kelly Moore, F&BI 007315
Date Collected:	07/20/20	Lab ID:	007315-02 1/2.8
Date Analyzed:	07/23/20	Data File:	072235.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat

	%	Lower	Upper
Surrogates:	Recovery:	Limit:	Limit:
4-Bromofluorobenzene	108	70	130

Compounds:	Concentration	
	ug/m3	ppbv
Benzene	<0.89	<0.28
Toluene	<53	<14
Ethylbenzene	<1.2	<0.28
m,p-Xylene	<2.4	<0.56
o-Xylene	<1.2	<0.28
Gasoline Range Organics	<1,200	<280

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Method Blank	Client:	Wood Environment & Infrastructure
Date Received:	Not Applicable	Project:	Kelly Moore, F&BI 007315
Date Collected:	Not Applicable	Lab ID:	00-1630 mb
Date Analyzed:	07/22/20	Data File:	072215.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat

	%	Lower	Upper
Surrogates:	Recovery:	Limit:	Limit:
4-Bromofluorobenzene	87	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
Gasoline Range Organics	<410	<100

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 07/28/20

Date Received: 07/20/20

Project: Kelly Moore, F&BI 007315

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES
FOR VOLATILES BY METHOD TO-15**

Laboratory Code: 007225-02 1/3.2 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 30)
Benzene	ug/m3	<1	<1	nm
Toluene	ug/m3	<60	<60	nm
Ethylbenzene	ug/m3	<1.4	<1.4	nm
m,p-Xylene	ug/m3	3.1	3.5	12
o-Xylene	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	78	70-130
Toluene	ug/m3	51	96	70-130
Ethylbenzene	ug/m3	59	93	70-130
m,p-Xylene	ug/m3	120	104	70-130
o-Xylene	ug/m3	59	105	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.

007315

SAMPLE CHAIN OF CUSTODY

(Gavin Klockman) ME 07-20-20

Report To Paul StullCompany WOOD EnvironmentalAddress 600 University St. Suite 600City, State, ZIP Seattle, WA 98101Phone 206 444 0444 Email paul.stull@woodplc.com

SAMPLERS (signature)

PROJECT NAME & ADDRESS

PO #

NOTES:

INVOICE TO

Page # 1 of 1

TURNAROUND TIME

☒ Standard☐ RUSH

Rush charges authorized by:

SAMPLE DISPOSAL

☒ Default: Clean after 3 days☐ Archive (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	Notes
EFF-7-20-2020	01	3386	220	IA / (SG)	7-20-20	30	9:45	0	9:50						X SW: 3386
INF-7-20-2020	02	3671	228	IA / (SG)	7-20-20	30	9:42	0	9:50						X SW: 3671
				IA / SG											
				IA / SG											
				IA / SG											
				IA / SG											
				IA / SG											
				IA / SG											
				IA / SG											
				IA / SG											

Samples received at 22 °C

Friedman & Bruya, Inc.

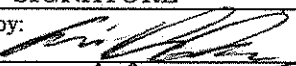
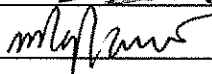
3012 16th Avenue West

Seattle, WA 98119-2029

Ph. (206) 285-8282

Fax (206) 283-5044

FORMS\COC\COCTO-15.DOC

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: 	Gavin Klockman	JMA		
Received by: 	Pham Phan	FERT	7/20/20	1135
Relinquished by:				
Received by:				

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

September 4, 2020

Paul Stull, Project Manager
Wood Environment & Infrastructure Solutions, Inc.
One Union Square
600 University Street, Suite 600
Seattle, WA 98101

Dear Mr Stull:

Included are the results from the testing of material submitted on August 27, 2020 from the Kelly Moore, F&BI 008419 project. There are 6 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
WEI0904R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on August 27, 2020 by Friedman & Bruya, Inc. from the Wood Environment & Infrastructure Solutions Kelly Moore, F&BI 008419 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Wood Environment & Infrastructure Solutions</u>
008419 -01	Eff_8-27-2020
008419 -02	Inf_8-27-2020

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Eff_8-27-2020	Client:	Wood Environment & Infrastructure
Date Received:	08/27/20	Project:	Kelly Moore, F&BI 008419
Date Collected:	08/27/20	Lab ID:	008419-01 1/2.8
Date Analyzed:	08/29/20	Data File:	082835.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	VM

	%	Lower	Upper
Surrogates:	Recovery:	Limit:	Limit:
4-Bromofluorobenzene	109	70	130

Compounds:	Concentration	
	ug/m3	ppbv
Benzene	<0.89	<0.28
Toluene	<53	<14
Ethylbenzene	<1.2	<0.28
m,p-Xylene	<2.4	<0.56
o-Xylene	<1.2	<0.28
Naphthalene	<0.73	<0.14
Gasoline Range Organics	<920	<220

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Inf_8-27-2020	Client:	Wood Environment & Infrastructure
Date Received:	08/27/20	Project:	Kelly Moore, F&BI 008419
Date Collected:	08/27/20	Lab ID:	008419-02 1/35
Date Analyzed:	08/29/20	Data File:	082836.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	VM

	%	Lower	Upper
Surrogates:	Recovery:	Limit:	Limit:
4-Bromofluorobenzene	125	70	130

Compounds:	Concentration	
	ug/m3	ppbv
Benzene	120	38
Toluene	<660	<170
Ethylbenzene	<15	<3.5
m,p-Xylene	110	25
o-Xylene	55	13
Naphthalene	<9.2	<1.7
Gasoline Range Organics	840,000	210,000

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Method Blank	Client:	Wood Environment & Infrastructure
Date Received:	Not Applicable	Project:	Kelly Moore, F&BI 008419
Date Collected:	Not Applicable	Lab ID:	00-1738 mb
Date Analyzed:	08/28/20	Data File:	082825.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	VM

	%	Lower	Upper
Surrogates:	Recovery:	Limit:	Limit:
4-Bromofluorobenzene	104	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	<0.26	<0.05
Gasoline Range Organics	<330	<80

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/04/20

Date Received: 08/27/20

Project: Kelly Moore, F&BI 008419

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES
FOR VOLATILES BY METHOD TO-15**

Laboratory Code: 008408-01 1/8 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 30)
Benzene	ug/m3	130	140	7
Toluene	ug/m3	<150	<150	nm
Ethylbenzene	ug/m3	29	32	10
m,p-Xylene	ug/m3	36	41	13
o-Xylene	ug/m3	13	15	14
Naphthalene	ug/m3	<2.1	<2.1	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/m3	43	98	70-130
Toluene	ug/m3	51	110	70-130
Ethylbenzene	ug/m3	59	116	70-130
m,p-Xylene	ug/m3	120	117	70-130
o-Xylene	ug/m3	59	115	70-130
Naphthalene	ug/m3	71	101	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.

Report To Paul Stull

Company WOOD Environmental

Address 600 University St. Suite 600

City, State, ZIP Seattle, WA 98101

Phone 6039414044 Email paul.stull@Wood plc.

SAMPLE CHAIN OF CUSTODY

ME 08/27/20

SAMPLERS (signature)	
PROJECT NAME & ADDRESS	PO #
NOTES:	INVOICE TO

Page # _____ of _____

TURNAROUND TIME

☒ Standard

☐ RUSH

Rush charges authorized by:

SAMPLE DISPOSAL

☒ Default: Clean after 3 days

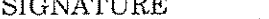

☐ Archive (Fee may apply)[illegible]

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: 	Grain Klockeman	JHA	8-27-20	12:30
Received by: 	S. Osborn	F&B, Inc	8/27/20	12:30
Relinquished by:				
Received by:				

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

September 29, 2020

Paul Stull, Project Manager
Wood Environment & Infrastructure Solutions, Inc.
One Union Square
600 University Street, Suite 600
Seattle, WA 98101

Dear Mr Stull:

Included are the results from the testing of material submitted on September 21, 2020 from the Kelly Moore, F&BI 009360 project. There are 7 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
WEI0929R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on September 21, 2020 by Friedman & Bruya, Inc. from the Wood Environment & Infrastructure Solutions Kelly Moore, F&BI 009360 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Wood Environment & Infrastructure Solutions</u>
009360 -01	Inf_9-21-2020
009360 -02	Eff_9-21-2020

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Inf_9-21-2020	Client:	Wood Environment & Infrastructure Solutions
Date Received:	09/21/20	Project:	Kelly Moore, F&BI 009360
Date Collected:	09/21/20	Lab ID:	009360-01 1/160
Date Analyzed:	09/25/20	Data File:	092431.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	ppbv
Benzene	<51	<16
Toluene	<3,000	<800
Ethylbenzene	110	26
m,p-Xylene	1,600	380
o-Xylene	710	160
Gasoline Range Organics	1,400,000	340,000

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Eff_9-21-2020	Client:	Wood Environment & Infrastructure Solutions
Date Received:	09/21/20	Project:	Kelly Moore, F&BI 009360
Date Collected:	09/21/20	Lab ID:	009360-02 1/2.9
Date Analyzed:	09/25/20	Data File:	092430.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat

	%	Lower	Upper
Surrogates:	Recovery:	Limit:	Limit:
4-Bromofluorobenzene	108	70	130

Compounds:	Concentration	
	ug/m3	ppbv
Benzene	<0.93	<0.29
Toluene	<55	<14
Ethylbenzene	<1.3	<0.29
m,p-Xylene	<2.5	<0.58
o-Xylene	<1.3	<0.29
Gasoline Range Organics	<950	<230

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Method Blank	Client:	Wood Environment & Infrastructure Solutions
Date Received:	Not Applicable	Project:	Kelly Moore, F&BI 009360
Date Collected:	Not Applicable	Lab ID:	00-2126 MB
Date Analyzed:	09/24/20	Data File:	092412.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat

	%	Lower	Upper
Surrogates:	Recovery:	Limit:	Limit:
4-Bromofluorobenzene	103	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
Gasoline Range Organics	<370	<80

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/29/20

Date Received: 09/21/20

Project: Kelly Moore, F&BI 009360

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES
FOR VOLATILES BY METHOD TO-15**

Laboratory Code: 009389-02 1/3.1 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 30)
Benzene	ug/m3	6.4	6.6	3
Toluene	ug/m3	<58	<58	nm
Ethylbenzene	ug/m3	<1.3	<1.3	nm
m,p-Xylene	ug/m3	3.0	3.4	12
o-Xylene	ug/m3	<1.3	<1.3	nm

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/29/20

Date Received: 09/21/20

Project: Kelly Moore, F&BI 009360

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES
FOR VOLATILES BY METHOD TO-15**

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/m3	43	102	70-130
Toluene	ug/m3	51	110	70-130
Ethylbenzene	ug/m3	59	118	70-130
m,p-Xylene	ug/m3	120	108	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.

009360

SAMPLE CHAIN OF CUSTODY

ME 09/21/20

Report To Paul StullCompany WOOD EnvironmentalAddress 600 University St. Suite 600City, State, ZIP Seattle, WA 98101Phone 509414044 Email paul.stull@wood.plc

SAMPLERS (signature)

Page # 1 of 1

TURNAROUND TIME

☒ Standard☐ RUSH

Rush charges authorized by:

SAMPLE DISPOSAL

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

PROJECT NAME & ADDRESS

PO #

Kelly Moore

NOTES:

INVOICE TO

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
Inf-9-21-2020	01			IA / (SG)	9-21-2020	30	9:47	0	9:51						X SN: 2300 Dura: 4 min
EFF-9-21-2020	02			IA / (SG)	9-21-2020	30	9:37	0	9:46						X SN: 2297 Dura: 9 min
				IA / SG											
				IA / SG											
				IA / SG											
				IA / SG											
				IA / SG											
				IA / SG											Samples received at 20 °C
				IA / SG											

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029

Ph. (206) 285-8282

Fax (206) 283-5044

SIGNATURE

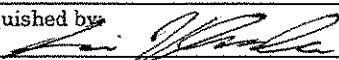
PRINT NAME

COMPANY

DATE

TIME

Relinquished by:



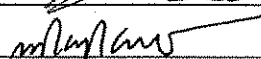
Gavin Hockeman

SHA

9-21-2020

11:30

Received by:



Phan Phan

FEB T

9-21-20

1130

Relinquished by:

Received by:

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

November 4, 2020

Paul Stull, Project Manager
Wood Environment & Infrastructure Solutions, Inc.
One Union Square
600 University Street, Suite 600
Seattle, WA 98101

Dear Mr Stull:

Included are the results from the testing of material submitted on October 26, 2020 from the Kelly Moore, F&BI 010440 project. There are 6 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
WEI1104R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on October 26, 2020 by Friedman & Bruya, Inc. from the Wood Environment & Infrastructure Solutions Kelly Moore, F&BI 010440 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Wood Environment & Infrastructure Solutions</u>
010440 -01	Eff_10-26-2020
010440 -02	Inf_10-26-2020

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Eff_10-26-2020	Client:	Wood Environment & Infrastructure Solutions
Date Received:	10/26/20	Project:	Kelly Moore, F&BI 010440
Date Collected:	10/26/20	Lab ID:	010440-01 1/2.7
Date Analyzed:	10/30/20	Data File:	102931.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat

	%	Lower	Upper
Surrogates:	Recovery:	Limit:	Limit:
4-Bromofluorobenzene	99	70	130

Compounds:	Concentration	
	ug/m3	ppbv
Benzene	<0.86	<0.27
Toluene	<51	<13
Ethylbenzene	<1.2	<0.27
m,p-Xylene	<2.3	<0.54
o-Xylene	<1.2	<0.27
Gasoline Range Organics	<890	<220

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Inf_10-26-2020	Client:	Wood Environment & Infrastructure Solutions
Date Received:	10/26/20	Project:	Kelly Moore, F&BI 010440
Date Collected:	10/26/20	Lab ID:	010440-02 1/35
Date Analyzed:	10/30/20	Data File:	102932.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat

	%	Lower	Upper
Surrogates:	Recovery:	Limit:	Limit:
4-Bromofluorobenzene	76	70	130

Compounds:	Concentration	
	ug/m3	ppbv
Benzene	<11	<3.5
Toluene	<660	<170
Ethylbenzene	<15	<3.5
m,p-Xylene	820	190
o-Xylene	390	89
Gasoline Range Organics	980,000	240,000

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Method Blank	Client:	Wood Environment & Infrastructure Solutions
Date Received:	Not Applicable	Project:	Kelly Moore, F&BI 010440
Date Collected:	Not Applicable	Lab ID:	00-2642 MB
Date Analyzed:	10/29/20	Data File:	102911.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat

	%	Lower	Upper
Surrogates:	Recovery:	Limit:	Limit:
4-Bromofluorobenzene	99	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
Gasoline Range Organics	<330	<80

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 11/04/20

Date Received: 10/26/20

Project: Kelly Moore, F&BI 010440

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES
FOR VOLATILES BY METHOD TO-15**

Laboratory Code: 010494-01 1/3.2 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 30)
Benzene	ug/m3	<1	<1	nm
Toluene	ug/m3	<60	<60	nm
Ethylbenzene	ug/m3	<1.4	<1.4	nm
m,p-Xylene	ug/m3	<2.8	<2.8	nm
o-Xylene	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	94	70-130
Toluene	ug/m3	51	107	70-130
Ethylbenzene	ug/m3	59	107	70-130
m,p-Xylene	ug/m3	120	103	70-130
o-Xylene	ug/m3	59	101	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.

010440

SAMPLE CHAIN OF CUSTODY

ME 10/26/20

Report To Paul StollCompany WDD EnvironmentalAddress WDD University St. Site 600City, State, ZIP Seattle, WA 98101Phone 206 374 1044 Email paul.stoll@wdd.comSAMPLERS (signature) [Signature]Page # 1 of 1

PROJECT NAME & ADDRESS

PO #

Kelly Moore

NOTES:

INVOICE TO

TURNAROUND TIME

☒ Standard☐ RUSH

Rush charges authorized by:

SAMPLE DISPOSAL

☒ Default: Clean after 3 days☐ Archive (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	Notes
Eff-10-26-2020	01			IA / <u>SG</u>	10-26-20	30"	9:48	0"	9:56					X	SW: 8527 Dura: 7 min
Inf-10-26-2020	02			IA / <u>SG</u>	10-26-20	30"	10:01	0"	10:12					X	SW: 8211 Dura: 11 min
				IA / SG											
				IA / SG											
				IA / SG											
				IA / SG											
				IA / SG											
				IA / SG											
				IA / SG											
				IA / SG											

Samples received at 16 °C

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:

Received by:

Relinquished by:

Received by:

Gavin KlockermanMy Y-h PhamJHAFBI10-26-2010/26/2012:5112:51

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

November 24, 2020

Scott Adamek, Project Manager
Wood Environment & Infrastructure Solutions, Inc.
One Union Square
600 University Street, Suite 600
Seattle, WA 98101

Dear Mr Adamek:

Included are the results from the testing of material submitted on November 18, 2020 from the Kelly Moore, F&BI 011336 project. There are 6 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: Christy Duitman
WEI1124R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on November 18, 2020 by Friedman & Bruya, Inc. from the Wood Environment & Infrastructure Solutions Kelly Moore, F&BI 011336 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Wood Environment & Infrastructure Solutions</u>
011336 -01	EFF_11-18-2020
011336 -02	INF_11-18-2020

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	EFF_11-18-2020	Client:	Wood Environment & Infrastructure
Date Received:	11/18/20	Project:	Kelly Moore, F&BI 011336
Date Collected:	11/18/20	Lab ID:	011336-01 1/2.9
Date Analyzed:	11/20/20	Data File:	111934.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat

	%	Lower	Upper
Surrogates:	Recovery:	Limit:	Limit:
4-Bromofluorobenzene	88	70	130

Compounds:	Concentration	
	ug/m3	ppbv
Benzene	<0.93	<0.29
Toluene	<55	<14
Ethylbenzene	<1.3	<0.29
m,p-Xylene	<2.5	<0.58
o-Xylene	<1.3	<0.29
Gasoline Range Organics	<950	<230

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	INF_11-18-2020	Client:	Wood Environment & Infrastructure
Date Received:	11/18/20	Project:	Kelly Moore, F&BI 011336
Date Collected:	11/18/20	Lab ID:	011336-02 1/37
Date Analyzed:	11/20/20	Data File:	111935.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	ppbv
Benzene	35	11
Toluene	<700	<180
Ethylbenzene	<16	<3.7
m,p-Xylene	130	30
o-Xylene	22	5.0
Gasoline Range Organics	140,000	33,000

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Method Blank	Client:	Wood Environment & Infrastructure
Date Received:	Not Applicable	Project:	Kelly Moore, F&BI 011336
Date Collected:	Not Applicable	Lab ID:	00-2698 MB
Date Analyzed:	11/16/20	Data File:	111610.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat

	%	Lower	Upper
Surrogates:	Recovery:	Limit:	Limit:
4-Bromofluorobenzene	85	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
Gasoline Range Organics	<330	<80

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 11/24/20

Date Received: 11/18/20

Project: Kelly Moore, F&BI 011336

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES
FOR VOLATILES BY METHOD TO-15**

Laboratory Code: 011335-01 1/3.3 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 30)
Benzene	ug/m3	<1.1	<1.1	nm
Toluene	ug/m3	<62	<62	nm
Ethylbenzene	ug/m3	<1.4	<1.4	nm
m,p-Xylene	ug/m3	<2.9	<2.9	nm
o-Xylene	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	88	70-130
Toluene	ug/m3	51	99	70-130
Ethylbenzene	ug/m3	59	107	70-130
m,p-Xylene	ug/m3	120	113	70-130
o-Xylene	ug/m3	59	111	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.

011336

SAMPLE CHAIN OF CUSTODY

ME 11/18/20

Page # 1 of 1

Report To Scott Adamek & Christy DuitmanCompany WOOD EnvironmentalAddress 600 University St. Suite 600City, State, ZIP Seattle, WA 98101Phone 425 305 8695 Email scott.adamek@woodplc.comPhone 509 334 6551 Email christy.duitman@woodplc.com

SAMPLERS (signature)

PROJECT NAME & ADDRESS

PO #

NOTES:

INVOICE TO

TURNAROUND TIME

☒ Standard☐ RUSH

Rush charges authorized by:

SAMPLE DISPOSAL

☒ Default: Clean after 3 days☐ Archive (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	Notes
EFF-10-18-2020	01	4177	242	IA / SG	11-18-2020	30"	10:36	2	10:43						SV: 4177 Dur: 7 min
INF-11-18-2020	02	3666	258	IA / SG	11-18-2020	30"	10:56	2	11:08						SV: 3666 Dur: 12 min
		1	1	IA / SG											
		Admco		IA / SG											
		2/11/18		IA / SG											
				IA / SG											
				IA / SG											
				IA / SG											
				IA / SG											
				IA / SG											

Samples received at 16 °C

Samples received at 16 °C

Friedman & Bruya, Inc.



3012 16th Avenue West

Seattle, WA 98119-2029

Ph. (206) 285-8282

Fax (206) 283-5044

FORMS\COC\COCTO-15.DOC

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: 	Gavin Klockegman	JHA	11-18-20	1430
Received by: 	Eric Green	ES	11/18/20	1430
Relinquished by:				
Received by:				

Samples received at 16 °C

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

December 18, 2020

Scott Adamek, Project Manager
Wood Environment & Infrastructure Solutions, Inc.
One Union Square
600 University Street, Suite 600
Seattle, WA 98101

Dear Mr Adamek:

Included are the results from the testing of material submitted on December 14, 2020 from the Kelly Moore, F&BI 012223 project. There are 6 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: Christy Duitman
WEI1218R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on December 14, 2020 by Friedman & Bruya, Inc. from the Wood Environment & Infrastructure Solutions Kelly Moore, F&BI 012223 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Wood Environment & Infrastructure Solutions</u>
012223 -01	Eff_12-14-2020
012223 -02	Inf_12-14-2020

The TO-15 gasoline range concentrations were quantified using a single point calibration at 80 ppbv.

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Eff_12-14-2020	Client:	Wood Environment & Infrastructure Solutions
Date Received:	12/14/20	Project:	Kelly Moore, F&BI 012223
Date Collected:	12/14/20	Lab ID:	012223-01 1/2.9
Date Analyzed:	12/16/20	Data File:	121528.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	ppbv
Benzene	<0.93	<0.29
Toluene	<55	<14
Ethylbenzene	<1.3	<0.29
m,p-Xylene	<2.5	<0.58
o-Xylene	<1.3	<0.29
Gasoline Range Organics	<950	<230

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Inf_12-14-2020	Client:	Wood Environment & Infrastructure Solutions
Date Received:	12/14/20	Project:	Kelly Moore, F&BI 012223
Date Collected:	12/14/20	Lab ID:	012223-02 1/37
Date Analyzed:	12/16/20	Data File:	121529.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat

	%	Lower	Upper
Surrogates:	Recovery:	Limit:	Limit:
4-Bromofluorobenzene	100	70	130

Compounds:	Concentration	
	ug/m3	ppbv
Benzene	<12	<3.7
Toluene	<700	<180
Ethylbenzene	<16	<3.7
m,p-Xylene	<32	<7.4
o-Xylene	<16	<3.7
Gasoline Range Organics	280,000	69,000

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Method Blank	Client:	Wood Environment & Infrastructure Solutions
Date Received:	Not Applicable	Project:	Kelly Moore, F&BI 012223
Date Collected:	Not Applicable	Lab ID:	00-2823 MB
Date Analyzed:	12/15/20	Data File:	121520.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	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
Gasoline Range Organics	<330	<80

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 12/18/20

Date Received: 12/14/20

Project: Kelly Moore, F&BI 012223

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES
FOR VOLATILES BY METHOD TO-15**

Laboratory Code: 012176-01 1/5.3 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 30)
Benzene	ug/m3	<1.7	<1.7	nm
Toluene	ug/m3	<100	<100	nm
Ethylbenzene	ug/m3	<2.3	<2.3	nm
m,p-Xylene	ug/m3	<4.6	<4.6	nm
o-Xylene	ug/m3	<2.3	<2.3	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/m3	43	109	70-130
Toluene	ug/m3	51	79	70-130
Ethylbenzene	ug/m3	59	95	70-130
m,p-Xylene	ug/m3	120	100	70-130
o-Xylene	ug/m3	59	98	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.

EUB 11/14 012123 012223

SAMPLE CHAIN OF CUSTODY

ME 12-14-20

Report To Scott Adamek & Christy DuitmanCompany WOOD EnvironmentalAddress 600 University St. Suite 600City, State, ZIP Seattle, WA 98101Phone 4253058695 Email scott.adamek@woodplc.com
5033346551 Email christy.duitman@woodplc.com

SAMPLERS (signature)

PROJECT NAME & ADDRESS

PO #

NOTES:

INVOICE TO

Page # 1 of 1

TURNAROUND TIME

☒ Standard☐ RUSH

Rush charges authorized by:

SAMPLE DISPOSAL

☒ Default: Clean after 3 days☐ Archive (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	Notes
EFF-12-14-2020	01	3666	31	IA / SG	12-14-20	30"	9:57	Q	10:05						X Data: 8 min
INF-12-14-2020	02	3250	18	IA / SG	12-14-20	30"	10:10	Q	10:18						X Data: 8 min
				IA / SG											
				IA / SG											
				IA / SG											
				IA / SG											
				IA / SG											
				IA / SG											
				IA / SG											

Samples received at 18 °CFriedman & Bruya, Inc.
3012 16th Avenue West

Seattle, WA 98119-2029

Ph. (206) 285-8282

Fax (206) 283-5044

FORMS\COC\COCTO-15.DOC

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: <u>[Signature]</u>	Gravin Klockner	JHA		
Received by: <u>[Signature]</u>	Nhan Phan	FBI	12/14/20	1410
Relinquished by:				
Received by:				

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

January 19, 2021

Scott Adamek, Project Manager
Wood Environment & Infrastructure Solutions, Inc.
One Union Square
600 University Street, Suite 600
Seattle, WA 98101

Dear Mr Adamek:

Included are the results from the testing of material submitted on January 11, 2021 from the Kelly Moore, F&BI 101114 project. There are 7 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: Christy Duitman
WEI0119R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on January 11, 2021 by Friedman & Bruya, Inc. from the Wood Environment & Infrastructure Solutions Kelly Moore, F&BI 101114 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Wood Environment & Infrastructure Solutions</u>
101114 -01	Eff_1_11_2021
101114 -02	Inf_1_11_2021

The TO-15 gasoline range concentrations were quantified using a single point calibration at 80 ppbv.

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Eff_1_11_2021	Client:	Wood Environment & Infrastructure Solutions
Date Received:	01/11/21	Project:	Kelly Moore, F&BI 101114
Date Collected:	01/11/21	Lab ID:	101114-01 1/3.0
Date Analyzed:	01/14/21	Data File:	011321.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	ppbv
Benzene	<0.96	<0.3
Toluene	<57	<15
Ethylbenzene	<1.3	<0.3
m,p-Xylene	<2.6	<0.6
o-Xylene	<1.3	<0.3
Gasoline Range Organics	<980	<240

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Inf_1_11_2021	Client:	Wood Environment & Infrastructure Solutions
Date Received:	01/11/21	Project:	Kelly Moore, F&BI 101114
Date Collected:	01/11/21	Lab ID:	101114-02 1/37
Date Analyzed:	01/14/21	Data File:	011322.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	ppbv
Benzene	<12	<3.7
Toluene	<700	<180
Ethylbenzene	<16	<3.7
m,p-Xylene	<32	<7.4
o-Xylene	<16	<3.7
Gasoline Range Organics	140,000	35,000

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Method Blank	Client:	Wood Environment & Infrastructure Solutions
Date Received:	Not Applicable	Project:	Kelly Moore, F&BI 101114
Date Collected:	Not Applicable	Lab ID:	01-92 MB
Date Analyzed:	01/13/21	Data File:	011314.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	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
Gasoline Range Organics	<330	<80

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 01/19/21

Date Received: 01/11/21

Project: Kelly Moore, F&BI 101114

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES FOR
VOLATILES BY METHOD TO-15**

Laboratory Code: 101114-02 1/37 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 30)
Benzene	ug/m3	<12	<12	nm
Toluene	ug/m3	<700	<700	nm
Ethylbenzene	ug/m3	<16	<16	nm
m,p-Xylene	ug/m3	<32	<32	nm
o-Xylene	ug/m3	<16	<16	nm

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 01/19/21

Date Received: 01/11/21

Project: Kelly Moore, F&BI 101114

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES FOR
VOLATILES BY METHOD TO-15**

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	97	70-130
Ethylbenzene	ug/m3	59	110	70-130
m,p-Xylene	ug/m3	120	103	70-130
o-Xylene	ug/m3	59	105	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.



01-11-2

scott.adamek@woodplc.com
Email christy.Duitman@woodplc.com

INVOICE TO

☐ Archive (Fee may apply)

ANALYSIS REQUESTED

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: 	Gavin Klockerman	JHA	1-11-21	12:48
Received by: 	Ann W Bunge	F&B	1/11/21	1248
Relinquished by:				
Received by:				

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

February 17, 2021

Scott Adamek, Project Manager
Wood Environment & Infrastructure Solutions, Inc.
One Union Square
600 University Street, Suite 600
Seattle, WA 98101

Dear Mr Adamek:

Included are the results from the testing of material submitted on February 9, 2021 from the Kelly Moore, F&BI 102156 project. There are 6 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: Christy Duitman
WEI0217R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on February 9, 2021 by Friedman & Bruya, Inc. from the Wood Environment & Infrastructure Solutions Kelly Moore, F&BI 102156 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Wood Environment & Infrastructure Solutions</u>
102156 -01	Eff_2-9-2021
102156 -02	Inf_2-9-2021

The toluene concentration in sample Eff_2-9-2021 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 TO-15

Client Sample ID:	Eff_2-9-2021	Client:	Wood Environment & Infrastructure Solutions
Date Received:	02/09/21	Project:	Kelly Moore, F&BI 102156
Date Collected:	02/09/21	Lab ID:	102156-01 1/5.0
Date Analyzed:	02/11/21	Data File:	021120.D
Matrix:	Air	Instrument:	GCMS12
Units:	ug/m3	Operator:	VM

	%	Lower	Upper
Surrogates:	Recovery:	Limit:	Limit:
4-Bromofluorobenzene	95	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
Gasoline Range Organics	<1,600	<400

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Inf_2-9-2021	Client:	Wood Environment & Infrastructure Solutions
Date Received:	02/09/21	Project:	Kelly Moore, F&BI 102156
Date Collected:	02/09/21	Lab ID:	102156-02 1/38
Date Analyzed:	02/11/21	Data File:	021122.D
Matrix:	Air	Instrument:	GCMS12
Units:	ug/m3	Operator:	VM

	%	Lower	Upper
Surrogates:	Recovery:	Limit:	Limit:
4-Bromofluorobenzene	101	70	130

Compounds:	Concentration	
	ug/m3	ppbv
Benzene	32	9.9
Toluene	41,000 ve	11,000 ve
Ethylbenzene	310	72
m,p-Xylene	790	180
o-Xylene	160	37
Gasoline Range Organics	370,000	91,000

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Method Blank	Client:	Wood Environment & Infrastructure Solutions
Date Received:	Not Applicable	Project:	Kelly Moore, F&BI 102156
Date Collected:	Not Applicable	Lab ID:	01-243 MB
Date Analyzed:	02/11/21	Data File:	021113.D
Matrix:	Air	Instrument:	GCMS12
Units:	ug/m3	Operator:	VM

	%	Lower	Upper
Surrogates:	Recovery:	Limit:	Limit:
4-Bromofluorobenzene	103	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
Gasoline Range Organics	<330	<80

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 02/17/21

Date Received: 02/09/21

Project: Kelly Moore, F&BI 102156

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES
FOR VOLATILES BY METHOD TO-15**

Laboratory Code: 102156-01 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	93	70-130
Toluene	ug/m3	51	109	70-130
Ethylbenzene	ug/m3	59	100	70-130
m,p-Xylene	ug/m3	120	101	70-130
o-Xylene	ug/m3	59	102	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.

102156

SAMPLE CHAIN OF CUSTODY

ME 02/09/21

Report To Scott Adamek & Christy DuitmanCompany WOOD EnvironmentalAddress 600 University St. Suite 600City, State, ZIP Seattle, WA 98101

503 334 6551

Christy.Duitman@woodapple.com

Phone 206 342 1778Email Scott.Adamek@woodapple.com

SAMPLERS (signature)

PROJECT NAME & ADDRESS

PO #

NOTES:

INVOICE TO

TURNAROUND TIME

☒ Standard☐ RUSH

Rush charges authorized by:

SAMPLE DISPOSAL

☒ Default: Clean after 3 days☐ Archive (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	TH- Gas as Release by TO15	Notes
EFF-2-9-2021	01	3311	308	IA / (SG)	2-9-21	30	13:08	0	13:14						X	Dura: 6min SN: 3311
Inf-2-9-2021	02	3667	307	IA / (SG)	2-9-21	30	13:20	0	13:26						X	Dura: 6min SN: 3667
				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:

Received by:

Relinquished by:

Received by:

Gavin Klobekernan

Khoi Hoang

JHA

FBE

2-9-2021

2-9-21

1430

14:30

Samples received at 20 °C

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

March 19, 2021

Scott Adamek, Project Manager
Wood Environment & Infrastructure Solutions, Inc.
One Union Square
600 University Street, Suite 600
Seattle, WA 98101

Dear Mr Adamek:

Included are the results from the testing of material submitted on March 9, 2021 from the Kelly Moore, F&BI 103161 project. There are 6 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: Christy Duitman
WEI0319R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on March 9, 2021 by Friedman & Bruya, Inc. from the Wood Environment & Infrastructure Solutions Kelly Moore, F&BI 103161 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Wood Environment & Infrastructure Solutions</u>
103161 -01	Eff_3-9-2021
103161 -02	Inf_3-9-2021

The TO-15 gasoline range concentrations were quantified using a single point calibration at 80 ppbv.

The toluene concentration for sample Inf_3-9-2021 exceeded the calibration range. The data were flagged accordingly.

All other quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Eff_3-9-2021	Client:	Wood Environment & Infrastructure
Date Received:	03/09/21	Project:	Kelly Moore, F&BI 103161
Date Collected:	03/09/21	Lab ID:	103161-01 1/5.0
Date Analyzed:	03/16/21	Data File:	031529.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat

	%	Lower	Upper
Surrogates:	Recovery:	Limit:	Limit:
4-Bromofluorobenzene	99	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
Gasoline Range Organics	<1,600	<400

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Inf_3-9-2021	Client:	Wood Environment & Infrastructure
Date Received:	03/09/21	Project:	Kelly Moore, F&BI 103161
Date Collected:	03/09/21	Lab ID:	103161-02 1/41
Date Analyzed:	03/16/21	Data File:	031530.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat

	% Recovery:	Lower Limit:	Upper Limit:
Surrogates:			
4-Bromofluorobenzene	109	70	130

Compounds:	Concentration ug/m3	ppbv
Benzene	57	18
Toluene	47,000 ve	13,000 ve
Ethylbenzene	320	73
m,p-Xylene	1,100	260
o-Xylene	250	57
Gasoline Range Organics	420,000	100,000

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Method Blank	Client:	Wood Environment & Infrastructure
Date Received:	Not Applicable	Project:	Kelly Moore, F&BI 103161
Date Collected:	Not Applicable	Lab ID:	01-546 mb
Date Analyzed:	03/15/21	Data File:	031511.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat

	%	Lower	Upper
Surrogates:	Recovery:	Limit:	Limit:
4-Bromofluorobenzene	98	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
Gasoline Range Organics	<330	<80

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 03/19/21

Date Received: 03/09/21

Project: Kelly Moore, F&BI 103161

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES
FOR VOLATILES BY METHOD TO-15**

Laboratory Code: 103161-01 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
Naphthalene	ug/m3	<1.3	<1.3	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/m3	43	100	70-130
Toluene	ug/m3	51	101	70-130
Ethylbenzene	ug/m3	59	100	70-130
m,p-Xylene	ug/m3	120	101	70-130
o-Xylene	ug/m3	59	102	70-130
Naphthalene	ug/m3	71	103	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.

103161

SAMPLE CHAIN OF CUSTODY

ME 03/09/21

Report To Scott Adamek & Christy DuitmanCompany WOOD EnvironmentalAddress 600 University St. Suite 600City, State, ZIP Seattle, WA 98101Phone 425 305 8695 Email Scott.Adamek@woodplc.comPhone 533 346 551 Email Christy.Duitman@woodplc.comSAMPLERS (signature) 

PROJECT NAME & ADDRESS

PO #

Kelly Moore

NOTES:

INVOICE TO

Page # 1 of 1

TURNAROUND TIME

☒ Standard☐ RUSH

Rush charges authorized by: _____

SAMPLE DISPOSAL

☒ Default: Clean after 3 days☐ Archive (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	Notes
EFF-3-9-2021	01			IA / <u>SG</u>	3-9-2021	30	10:20	Ø	10:27						X SU: 2435 Duration: 7 min
Inf-3-9-2021	02			IA / <u>SG</u>	3-9-2021	30	10:34	Ø	10:39						X SU: 3385 Duration: 5 min
				IA / SG											
				IA / SG											
				IA / SG											
				IA / SG											
				IA / SG											
				IA / SG											

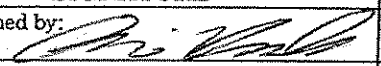

Friedman & Bruya, Inc.
3012 16th Avenue West

Seattle, WA 98119-2029

Ph. (206) 285-8282

Fax (206) 283-5044

FORMS\COC\COCTO-15.DOC

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: 	Gavin Klockernan	JHA	3-9-2021	13:24
Received by: 	Khai Hoang	FBI	3-9-2021	13:24
Relinquished by:				
Received by:		Samples received at	18	°C

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

April 13, 2021

Scott Adamek, Project Manager
Wood Environment & Infrastructure Solutions, Inc.
One Union Square
600 University Street, Suite 600
Seattle, WA 98101

Dear Mr Adamek:

Included are the results from the testing of material submitted on April 6, 2021 from the Kelly Moore, F&BI 104088 project. There are 6 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: Christy Duitman
WEI0413R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on April 6, 2021 by Friedman & Bruya, Inc. from the Wood Environment & Infrastructure Solutions Kelly Moore, F&BI 104088 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Wood Environment & Infrastructure Solutions</u>
104088 -01	Eff_4-6-2021
104088 -02	Inf_4-6-2021

The TO-15 gasoline range concentrations were quantified using a single point calibration at 80 ppbv.

The toluene concentration for sample Inf_4-6-2021 exceeded the calibration range. The data were flagged accordingly.

All other quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Eff_4-6-2021	Client:	Wood Environment & Infrastructure
Date Received:	04/06/21	Project:	Kelly Moore, F&BI 104088
Date Collected:	04/06/21	Lab ID:	104088-01 1/4.7
Date Analyzed:	04/08/21	Data File:	040729.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	ppbv
Benzene	<1.5	<0.47
Toluene	<89	<23
Ethylbenzene	<2	<0.47
m,p-Xylene	<4.1	<0.94
o-Xylene	<2	<0.47
Gasoline Range Organics	<1,600	<380

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Inf_4-6-2021	Client:	Wood Environment & Infrastructure
Date Received:	04/06/21	Project:	Kelly Moore, F&BI 104088
Date Collected:	04/06/21	Lab ID:	104088-02 1/37
Date Analyzed:	04/08/21	Data File:	040730.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat

	% Recovery:	Lower Limit:	Upper Limit:
Surrogates:			
4-Bromofluorobenzene	114	70	130

Compounds:	Concentration	
	ug/m3	ppbv
Benzene	20	6.2
Toluene	32,000 ve	8,500 ve
Ethylbenzene	110	26
m,p-Xylene	750	170
o-Xylene	220	50
Gasoline Range Organics	320,000	79,000

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Method Blank	Client:	Wood Environment & Infrastructure
Date Received:	Not Applicable	Project:	Kelly Moore, F&BI 104088
Date Collected:	Not Applicable	Lab ID:	01-796 MB
Date Analyzed:	04/07/21	Data File:	040711a.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	ppbv
2-Propanol	<8.6	<3.5
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
Gasoline Range Organics	<330	<80

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/13/21

Date Received: 04/06/21

Project: Kelly Moore, F&BI 104088

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES
FOR VOLATILES BY METHOD TO-15**

Laboratory Code: 104071-01 1/5.4 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 30)
Benzene	ug/m3	5.9	5.8	2
Toluene	ug/m3	<100	<100	nm
Ethylbenzene	ug/m3	8.9	8.8	1
m,p-Xylene	ug/m3	36	36	0
o-Xylene	ug/m3	9.7	9.8	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/m3	43	96	70-130
Toluene	ug/m3	51	99	70-130
Ethylbenzene	ug/m3	59	93	70-130
m,p-Xylene	ug/m3	120	95	70-130
o-Xylene	ug/m3	59	98	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.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

May 19, 2021

Scott Adamek, Project Manager
Wood Environment & Infrastructure Solutions, Inc.
One Union Square
600 University Street, Suite 600
Seattle, WA 98101

Dear Mr Adamek:

Included are the results from the testing of material submitted on May 11, 2021 from the Kelly Moore, F&BI 105174 project. There are 6 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
WEI0519R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on May 11, 2021 by Friedman & Bruya, Inc. from the Wood Environment & Infrastructure Solutions Kelly Moore, F&BI 105174 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Wood Environment & Infrastructure Solutions</u>
105174 -01	Eff_5-11-2021
105174 -02	Inf_5-11-2021

The TO-15 gasoline range concentrations were quantified using a single point calibration at 80 ppbv.

The toluene concentration in sample Inf_5-11-2021 exceeded the calibration range of the instrument. The data were flagged accordingly.

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Eff_5-11-2021	Client:	Wood Environment & Infrastructure Solutions
Date Received:	05/11/21	Project:	Kelly Moore, F&BI 105174
Date Collected:	05/11/21	Lab ID:	105174-01 1/7.5
Date Analyzed:	05/14/21	Data File:	051330.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat

	%	Lower	Upper
Surrogates:	Recovery:	Limit:	Limit:
4-Bromofluorobenzene	97	70	130

Compounds:	Concentration	
	ug/m3	ppbv
Benzene	<2.4	<0.75
Toluene	<140	<37
Ethylbenzene	<3.3	<0.75
m,p-Xylene	<6.5	<1.5
o-Xylene	<3.3	<0.75
Gasoline Range Organics	<2,500	<600

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Inf_5-11-2021	Client:	Wood Environment & Infrastructure Solutions
Date Received:	05/11/21	Project:	Kelly Moore, F&BI 105174
Date Collected:	05/11/21	Lab ID:	105174-02 1/37
Date Analyzed:	05/14/21	Data File:	051331.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat

	% Recovery:	Lower Limit:	Upper Limit:
Surrogates:			
4-Bromofluorobenzene	112	70	130

Compounds:	Concentration	
	ug/m3	ppbv
Benzene	21	6.5
Toluene	10,000 ve	2,700 ve
Ethylbenzene	47	11
m,p-Xylene	550	130
o-Xylene	250	57
Gasoline Range Organics	510,000	120,000

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Method Blank	Client:	Wood Environment & Infrastructure Solutions
Date Received:	Not Applicable	Project:	Kelly Moore, F&BI 105174
Date Collected:	Not Applicable	Lab ID:	01-1075 MB
Date Analyzed:	05/13/21	Data File:	051311.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat

	%	Lower	Upper
Surrogates:	Recovery:	Limit:	Limit:
4-Bromofluorobenzene	98	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
Gasoline Range Organics	<330	<80

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 05/19/21

Date Received: 05/11/21

Project: Kelly Moore, F&BI 105174

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES
FOR VOLATILES BY METHOD TO-15**

Laboratory Code: 105074-01 1/6.0 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 30)
2-Propanol	ug/m3	<52	<52	nm
Benzene	ug/m3	13	13	0
Toluene	ug/m3	1,200	1,200	0
Ethylbenzene	ug/m3	89	88	1
m,p-Xylene	ug/m3	350	350	0
o-Xylene	ug/m3	140	140	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
2-Propanol	ug/m3	33	100	70-130
Benzene	ug/m3	43	102	70-130
Toluene	ug/m3	51	98	70-130
Ethylbenzene	ug/m3	59	99	70-130
m,p-Xylene	ug/m3	120	100	70-130
o-Xylene	ug/m3	59	100	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.

105174

SAMPLE CHAIN OF CUSTODY

ME 05-11-21

Report To Scott Adamek & Christy DuitmanCompany WOOD EnvironmentalAddress 600 University St. Suite 600City, State, ZIP Seattle, WA 98101Phone 2063346551 Email christy.duitman@woodplc.comPhone 2063421778 Email scott.adamek@woodplc.com

SAMPLERS (signature)

PROJECT NAME & ADDRESS

PO #

NOTES:

INVOICE TO

Page # 1 of 1

TURNAROUND TIME

☒ Standard☐ RUSH

Rush charges authorized by:

SAMPLE DISPOSAL

☒ Default: Clean after 3 days☐ Archive (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	TPH-Gas as Heptane BTEX by TO15	Notes
EFF-5-9-2021				IA / SG	5-9-2021	29	9:27	Ø	9:40							Dura: 15 min SN: 3344
INF-5-9-2021				IA / SG	5-9-2021											Dura: SN: 3344
EFF-5-11-2021	01			IA / SG	5-11-2021	29	9:27	Ø	9:40							Dura: 13 min SN: 3344
INF-5-11-2021	02			IA / SG	5-11-2021	29	9:48	Ø	9:56							Dura: 8 min SN: 3416
				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>[Signature]</u>	Gavin Hockeman	JHA	5-9-2021	1230
Received by: <u>[Signature]</u>	Whan Phan	FeB I	5-11-21	1230
Relinquished by:				
Received by:				
Samples received at <u>20°C</u>				

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

June 24, 2021

Scott Adamek, Project Manager
Wood Environment & Infrastructure Solutions, Inc.
One Union Square
600 University Street, Suite 600
Seattle, WA 98101

Dear Mr Adamek:

Included are the results from the testing of material submitted on June 16, 2021 from the Kelly Moore, F&BI 106271 project. There are 6 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: Christy Duitman
WEI0624R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on June 16, 2021 by Friedman & Bruya, Inc. from the Wood Environment & Infrastructure Solutions Kelly Moore, F&BI 106271 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Wood Environment & Infrastructure Solutions</u>
106271 -01	Eff_6-16-2021
106271 -02	Inf_6-16-2021

The TO-15 gasoline range concentrations were quantified using a single point calibration at 80 ppbv.

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Eff_6-16-2021	Client:	Wood Environment & Infrastructure
Date Received:	06/16/21	Project:	Kelly Moore, F&BI 106271
Date Collected:	06/16/21	Lab ID:	106271-01 1/4.8
Date Analyzed:	06/19/21	Data File:	061834.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	ppbv
Benzene	<1.5	<0.48
Toluene	<90	<24
Ethylbenzene	<2.1	<0.48
m,p-Xylene	<4.2	<0.96
o-Xylene	<2.1	<0.48
Gasoline Range Organics	<1,600	<380

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Inf_6-16-2021	Client:	Wood Environment & Infrastructure
Date Received:	06/16/21	Project:	Kelly Moore, F&BI 106271
Date Collected:	06/16/21	Lab ID:	106271-02 1/37
Date Analyzed:	06/19/21	Data File:	061835.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat

	%	Lower	Upper
Surrogates:	Recovery:	Limit:	Limit:
4-Bromofluorobenzene	120	70	130

Compounds:	Concentration	
	ug/m3	ppbv
Benzene	<12	<3.7
Toluene	1,100	300
Ethylbenzene	<16	<3.7
m,p-Xylene	43	9.9
o-Xylene	35	8.0
Gasoline Range Organics	490,000	120,000

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Method Blank	Client:	Wood Environment & Infrastructure
Date Received:	Not Applicable	Project:	Kelly Moore, F&BI 106271
Date Collected:	Not Applicable	Lab ID:	01-1221 MB
Date Analyzed:	06/18/21	Data File:	061819.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	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
Gasoline Range Organics	<330	<80

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 06/24/21

Date Received: 06/16/21

Project: Kelly Moore, F&BI 106271

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES
FOR VOLATILES BY METHOD TO-15**

Laboratory Code: 106317-07 1/6.2 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 30)
Benzene	ug/m3	<2	<2	nm
Toluene	ug/m3	<120	<120	nm
Ethylbenzene	ug/m3	<2.7	<2.7	nm
m,p-Xylene	ug/m3	<5.4	<5.4	nm
o-Xylene	ug/m3	<2.7	<2.7	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/m3	43	80	70-130
Toluene	ug/m3	51	86	70-130
Ethylbenzene	ug/m3	59	75	70-130
m,p-Xylene	ug/m3	120	80	70-130
o-Xylene	ug/m3	59	81	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.

106271

SAMPLE CHAIN OF CUSTODY

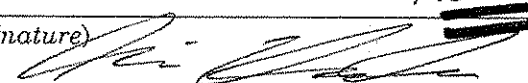
ME 06/16/21

Report To Scott Adamek & Christy DuitmanCompany WOOD EnvironmentalAddress 600 University St. Suite 600City, State, ZIP Seattle, WA 98101

5033346551

Phone 2063421778

christy.Duitman@woodplc.com

Email Scott.Adamek@woodplc.comSAMPLERS (signature) Page # 1 of 1

TURNAROUND TIME

☒ Standard☐ RUSH

Rush charges authorized by: _____

SAMPLE DISPOSAL

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

PROJECT NAME & ADDRESS

PO #

Kelly Moore

NOTES:

INVOICE TO

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	TH-Gas as Hexane BTEX by TO15	Notes
EFF-6-16-2021	01	2437	206	IA / (SG)	6-16-21	30	9:41	Ø	9:48						X	Dura: 7 min SN: 2437
Inf-6-16-2021	02	3312	230	IA / (SG)	6-16-21	30	9:58	Ø	10:06						X	Dura: 8 min SN: 3312
				IA / SG												
				IA / SG												
				IA / SG												
				IA / SG												
				IA / SG												
				IA / SG												
				IA / SG												
				IA / SG												

Samples received at 240C

Friedman & Bruya, Inc.

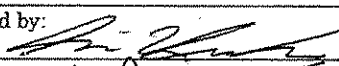
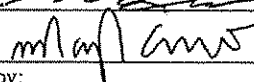
3012 16th Avenue West

Seattle, WA 98119-2029

Ph. (206) 285-8282

Fax (206) 283-5044

FORMS\COC\COCTO-15.DOC

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: 	Gavin Khodeman	JMA	6-16-2021	14:38
Received by: 	Nham Phan	FCBI	6/16/21	1438
Relinquished by:				
Received by:				

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

August 13, 2021

Scott Adamek, Project Manager
Wood Environment & Infrastructure Solutions, Inc.
One Union Square
600 University Street, Suite 600
Seattle, WA 98101

Dear Mr Adamek:

Included are the results from the testing of material submitted on August 5, 2021 from the Kelly Moore, F&BI 108075 project. There are 6 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
WEI0813R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on August 5, 2021 by Friedman & Bruya, Inc. from the Wood Environment & Infrastructure Solutions Kelly Moore, F&BI 108075 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Wood Environment & Infrastructure Solutions</u>
108075 -01	Eff_8-5-2021
108075 -02	Inf_8-5-2021

All quality control requirements were acceptable.

The toluene concentration in sample Inf_8-5-2021 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 TO-15

Client Sample ID:	Eff_8-5-2021	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/05/21	Project:	Kelly Moore, F&BI 108075
Date Collected:	08/05/21	Lab ID:	108075-01 1/5
Date Analyzed:	08/07/21	Data File:	080632.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	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
Gasoline Range Organics	<1,600	<400

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Inf_8-5-2021	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/05/21	Project:	Kelly Moore, F&BI 108075
Date Collected:	08/05/21	Lab ID:	108075-02 1/39
Date Analyzed:	08/07/21	Data File:	080633.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat

	%	Lower	Upper
Surrogates:	Recovery:	Limit:	Limit:
4-Bromofluorobenzene	127	70	130

Compounds:	Concentration	
	ug/m3	ppbv
Benzene	<12	<3.9
Toluene	4,000 ve	1,100 ve
Ethylbenzene	39	8.9
m,p-Xylene	230	53
o-Xylene	150	34
Gasoline Range Organics	1,800,000	430,000

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Method Blank	Client:	Wood Environment & Infrastructure Solutions
Date Received:	Not Applicable	Project:	Kelly Moore, F&BI 108075
Date Collected:	Not Applicable	Lab ID:	01-1719 MB
Date Analyzed:	08/06/21	Data File:	080612.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat

	%	Lower	Upper
Surrogates:	Recovery:	Limit:	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
Gasoline Range Organics	<330	<80

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 08/13/21

Date Received: 08/05/21

Project: Kelly Moore, F&BI 108075

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES
FOR VOLATILES BY METHOD TO-15**

Laboratory Code: 108061-02 1/6.9 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 30)
Benzene	ug/m3	7.0	6.7	4
Toluene	ug/m3	<130	<130	nm
Ethylbenzene	ug/m3	4.3	4.2	2
m,p-Xylene	ug/m3	16	16	0
o-Xylene	ug/m3	6.0	6.0	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/m3	43	90	70-130
Toluene	ug/m3	51	98	70-130
Ethylbenzene	ug/m3	59	90	70-130
m,p-Xylene	ug/m3	120	94	70-130
o-Xylene	ug/m3	59	98	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.

108075

SAMPLE CHAIN OF CUSTODY ME 08/05/21

Report To Scott Adamek & Christy DuitmanCompany Wood EnvironmentalAddress 600 University St. Suite 600City, State, ZIP Seattle, WA 98101Phone 2063346551Email christy.duitman@woodpic.comPhone 20633421778Email scott.adamek@woodpic.comSAMPLERS (signature) [Signature]Page # 1 of 1

PROJECT NAME & ADDRESS

PO #

NOTES:

INVOICE TO

TURNAROUND TIME

☒ Standard☐ RUSH

Rush charges authorized by: _____

SAMPLE DISPOSAL

☒ Default: Clean after 3 days☐ Archive (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	TPH - Gas as Requested by TO15	Notes
EFF-8-5-2021	01			IA / (SG)	8-5-21	29	9:55	Ø	10:03						X	Pura: 8 min SN: 3675
Inf-8-5-2021	02			IA / (SG)	8-5-21	30	10:10	Ø	10:18						X	Pura: 8 min SN: 3312
				IA / SG												
				IA / SG												
				IA / SG												
				IA / SG												
				IA / SG												
				IA / SG												
				IA / SG												

Samples received at 26 °CFriedman & 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>[Signature]</u>	Gavin Hockeman	JHA	8-5-2021	11:50
Received by: <u>[Signature]</u>	Khai Hoang	FBI	8-5-2021	11:50
Relinquished by:				
Received by:				

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

September 15, 2021

Scott Adamek, Project Manager
Wood Environment & Infrastructure Solutions, Inc.
One Union Square
600 University Street, Suite 600
Seattle, WA 98101

Dear Mr Adamek:

Included are the results from the testing of material submitted on September 7, 2021 from the Kelly Moore, F&BI 109099 project. There are 6 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: Christy Duitman
WEI0915R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on September 7, 2020 by Friedman & Bruya, Inc. from the Wood Environment & Infrastructure Solutions Kelly Moore, F&BI 109099 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Wood Environment & Infrastructure Solutions</u>
109099 -01	Eff_9-7-2021
109099 -02	Inf_9-7-2021

The TO-15 gasoline range organics concentration was determined using a single point calibration at 80 ppbv.

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Eff_9-7-2021	Client:	Wood Environment & Infrastructure
Date Received:	09/07/21	Project:	Kelly Moore, F&BI 109099
Date Collected:	09/07/21	Lab ID:	109099-01 1/5
Date Analyzed:	09/09/21	Data File:	090824.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat

	%	Lower	Upper
Surrogates:	Recovery:	Limit:	Limit:
4-Bromofluorobenzene	96	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
Gasoline Range Organics	<1,600	<400

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Inf_9-7-2021	Client:	Wood Environment & Infrastructure
Date Received:	09/07/21	Project:	Kelly Moore, F&BI 109099
Date Collected:	09/07/21	Lab ID:	109099-02 1/38
Date Analyzed:	09/09/21	Data File:	090825.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat

	%	Lower	Upper
Surrogates:	Recovery:	Limit:	Limit:
4-Bromofluorobenzene	105	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
Gasoline Range Organics	600,000	150,000

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Method Blank	Client:	Wood Environment & Infrastructure
Date Received:	Not Applicable	Project:	Kelly Moore, F&BI 109099
Date Collected:	Not Applicable	Lab ID:	01-2013 MB
Date Analyzed:	09/08/21	Data File:	090811.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat

	%	Lower	Upper
Surrogates:	Recovery:	Limit:	Limit:
4-Bromofluorobenzene	99	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
Gasoline Range Organics	<330	<80

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/15/21

Date Received: 09/07/21

Project: Kelly Moore, F&BI 109099

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES
FOR VOLATILES BY METHOD TO-15**

Laboratory Code: 109108-02 1/8.2 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 30)
Benzene	ug/m3	75	74	1
Toluene	ug/m3	<150	<150	nm
Ethylbenzene	ug/m3	7.3	7.0	4
m,p-Xylene	ug/m3	33	32	3
o-Xylene	ug/m3	12	12	0

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	103	70-130
m,p-Xylene	ug/m3	120	107	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.

Report To Scott Alamek + Christy Postman

Company WOOD Environmental

Address 600 University St. Suite 600

City, State, ZIP Seattle, WA 98101

5033346551 christy.duitman@woodpic.com
Phone 7063421778 Email scott.adams@woodpic.com

Phone 763421778 Email scott.adams@protopics.com

SAMPLERS (signature)

PROJECT NAME & ADDRESS

PO #

NOTES:

INVOICE TO

Page # 1 of 1

TURNAROUND TIME

X Standard

☐ RUSH

Rush charges authorized by:

SAMPLE DISPOSAL

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

SAMPLE INFORMATION

ANALYSIS REQUESTED



Sample Name	Lab ID	Canister ID	Flow Cont. ID	Reporting Level:	Date Sampled	Initial	Field	Final	Field	TO15 Full Scan	TO15 BTEXN	TO15 cVOCs	APH	Helium	TTH-Cas as Hexane by TO15	Notes
				IA=Indoor Air SG=Soil Gas (Circle One)		Vac. ("Hg)	Initial Time	Vac. ("Hg)	Final Time							
Eff-9-7-2021	01	3483	206	IA / SG	9-7-2021	29	9:41	Ø	9:48						X	Dura: 7 min SN: 3483
Inl-9-7-2021	02	2434	204	IA / SG	9-7-2021	29.5	9:55	Ø	10:03						X	Dura: 8 min SN: 2434
				IA / SG												
				IA / SG												
				IA / SG												
				IA / SG												
				IA / SG												
				IA / SG												
				IA / SG												Samples received at 23°C

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: 	Gavin Hocherman	SHA	9-7-2011	11:50
Received by: 	Khai Hoang	FBI	9-7-2011	11:50
Relinquished by:				
Received by:				

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

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Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

July 20, 2021

Scott Adamek, Project Manager
Wood Environment & Infrastructure Solutions, Inc.
One Union Square
600 University Street, Suite 600
Seattle, WA 98101

Dear Mr Adamek:

Included are the results from the testing of material submitted on July 13, 2021 from the Kelly Moore, F&BI 107178 project. There are 6 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: christy.duitman@woodplc.com
WEI0720R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on July 13, 2021 by Friedman & Bruya, Inc. from the Wood Environment & Infrastructure Solutions Kelly Moore, F&BI 107178 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Wood Environment & Infrastructure Solutions</u>
107178 -01	Eff_7-13-2021
107178 -02	Inf_7-13-2021

The TO-15 gasoline range concentrations were quantified using a single point calibration at 80 ppbv.

The TO-15 toluene concentration for sample Inf_7-13-2021 exceeded the calibration range. The data were flagged accordingly.

All other quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Eff_7-13-2021	Client:	Wood Environment & Infrastructure
Date Received:	07/13/21	Project:	Kelly Moore, F&BI 107178
Date Collected:	07/13/21	Lab ID:	107178-01 1/4.9
Date Analyzed:	07/16/21	Data File:	071530.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	ppbv
Benzene	<1.6	<0.49
Toluene	<92	<24
Ethylbenzene	<2.1	<0.49
m,p-Xylene	<4.3	<0.98
o-Xylene	<2.1	<0.49
Gasoline Range Organics	<1,600	<390

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Inf_7-13-2021	Client:	Wood Environment & Infrastructure
Date Received:	07/13/21	Project:	Kelly Moore, F&BI 107178
Date Collected:	07/13/21	Lab ID:	107178-02 1/38
Date Analyzed:	07/16/21	Data File:	071531.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat

	%	Lower	Upper
Surrogates:	Recovery:	Limit:	Limit:
4-Bromofluorobenzene	108	70	130

Compounds:	Concentration	
	ug/m3	ppbv
Benzene	<12	<3.8
Toluene	42,000 ve	11,000 ve
Ethylbenzene	290	67
m,p-Xylene	1,800	430
o-Xylene	820	190
Gasoline Range Organics	2,400,000	580,000

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Method Blank	Client:	Wood Environment & Infrastructure
Date Received:	Not Applicable	Project:	Kelly Moore, F&BI 107178
Date Collected:	Not Applicable	Lab ID:	01-1582 MB
Date Analyzed:	07/15/21	Data File:	071512.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat

	%	Lower	Upper
Surrogates:	Recovery:	Limit:	Limit:
4-Bromofluorobenzene	87	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
Gasoline Range Organics	<330	<80

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 07/20/21

Date Received: 07/13/21

Project: Kelly Moore, F&BI 107178

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES
FOR VOLATILES BY METHOD TO-15**

Laboratory Code: 107217-01 1/6.1 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 30)
Benzene	ug/m3	<1.9	<1.9	nm
Toluene	ug/m3	<110	<110	nm
Ethylbenzene	ug/m3	2.7	2.6	4
m,p-Xylene	ug/m3	12	11	9
o-Xylene	ug/m3	4.7	4.7	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/m3	43	90	70-130
Toluene	ug/m3	51	95	70-130
Ethylbenzene	ug/m3	59	80	70-130
m,p-Xylene	ug/m3	120	88	70-130
o-Xylene	ug/m3	59	91	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.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

October 14, 2021

Scott Adamek, Project Manager
Wood Environment & Infrastructure
One Union Square
600 University Street, Suite 600
Seattle, WA 98101

Dear Mr Adamek:

Included are the results from the testing of material submitted on October 5, 2021 from the Kelly Moore, F&BI 110081 project. There are 6 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: Christy Duitman
WEI1014R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on October 5, 2021 by Friedman & Bruya, Inc. from the Wood Environment & Infrastructure Kelly Moore, F&BI 110081 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Wood Environment & Infrastructure</u>
110081 -01	Eff_10-5-2021
110081 -02	Inf_10-5-2021

The TO-15 gasoline range organics concentration was determined using a single point calibration at 80 ppbv.

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Eff_10-5-2021	Client:	Wood Environment & Infrastructure
Date Received:	10/05/21	Project:	Kelly Moore, F&BI 110081
Date Collected:	10/05/21	Lab ID:	110081-01 1/5.3
Date Analyzed:	10/07/21	Data File:	100628.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat

	%	Lower	Upper
Surrogates:	Recovery:	Limit:	Limit:
4-Bromofluorobenzene	87	70	130

Compounds:	Concentration	
	ug/m3	ppbv
Benzene	<1.7	<0.53
Toluene	<100	<26
Ethylbenzene	<2.3	<0.53
m,p-Xylene	<4.6	<1.1
o-Xylene	<2.3	<0.53
Gasoline Range Organics	<1,700	<420

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Inf_10-5-2021	Client:	Wood Environment & Infrastructure
Date Received:	10/05/21	Project:	Kelly Moore, F&BI 110081
Date Collected:	10/05/21	Lab ID:	110081-02 1/40
Date Analyzed:	10/07/21	Data File:	100629.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	ppbv
Benzene	<13	<4
Toluene	<750	<200
Ethylbenzene	<17	<4
m,p-Xylene	<35	<8
o-Xylene	<17	<4
Gasoline Range Organics	290,000	70,000

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Method Blank	Client:	Wood Environment & Infrastructure
Date Received:	Not Applicable	Project:	Kelly Moore, F&BI 110081
Date Collected:	Not Applicable	Lab ID:	01-2222 MB
Date Analyzed:	10/06/21	Data File:	100614.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat

	%	Lower	Upper
Surrogates:	Recovery:	Limit:	Limit:
4-Bromofluorobenzene	87	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
Gasoline Range Organics	<330	<80

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/14/21

Date Received: 10/05/21

Project: Kelly Moore, F&BI 110081

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES
FOR VOLATILES BY METHOD TO-15**

Laboratory Code: 110124-01 1/5.8 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 30)
Benzene	ug/m3	<1.9	<1.9	nm
Toluene	ug/m3	<110	<110	nm
Ethylbenzene	ug/m3	80	78	3
m,p-Xylene	ug/m3	460	450	2
o-Xylene	ug/m3	150	140	7

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/m3	43	91	70-130
Toluene	ug/m3	51	94	70-130
Ethylbenzene	ug/m3	59	86	70-130
m,p-Xylene	ug/m3	120	93	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

10-05-21

Report To 110081 Scott Atencio + Christy Duitman
 Company WOOD Environmental
 Address 600 University St. Suite 600
 City, State, ZIP Seattle, WA 98101
 Phone 5033346551 Email christy.duitman@woodplc.com
2063421778 Email Scott.Atencio@woodplc.com

SAMPLERS (signature)

PROJECT NAME & ADDRESS

PO #

NOTES:

INVOICE TO

Page # 1 of 1

TURNAROUND TIME

☒ Standard

☐ RUSH

Rush charges authorized by:

SAMPLE DISPOSAL

☒ Default: Clean after 3 days

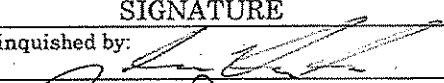
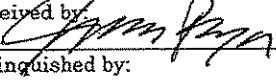
☐ Archive (Fee may apply)

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	THA-Gas and Hexane BTEX by TO15	Notes
EFF-10-5-2021	01	3483	01	IA / <u>SG</u>	10-5-21	30	10:01	0	10:10						X	Dura: 9 min SN: 3483
Inf-10-5-2021	02	3416	111	IA / <u>SG</u>	10-5-21	30	10:18	0	10:25						X	Dura: 7 min SN: 3416
			131015	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: 	Gavin Hockeman	JHA	10-5-21	12:19
Received by: 	James Bruya	F&B	10/5	12:19
Relinquished by:				
Received by:				

Samples received at 30 °C

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
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www.friedmanandbruya.com

November 22, 2021

Scott Adamek, Project Manager
Wood Environment & Infrastructure
One Union Square
600 University Street, Suite 600
Seattle, WA 98101

Dear Mr Adamek:

Included are the results from the testing of material submitted on November 11, 2021 from the Kelly Moore, F&BI 111213 project. There are 6 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: Christy Duitman
WEI1122R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on November 11, 2021 by Friedman & Bruya, Inc. from the Wood Environment & Infrastructure Kelly Moore, F&BI 111213 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Wood Environment & Infrastructure</u>
111213 -01	Eff_11-11-2021
111213 -02	Inf_11-11-2021

The TO-15 gasoline range concentrations were quantified using a single point calibration at 80 ppbv hexane.

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Eff_11-11-2021	Client:	Wood Environment & Infrastructure
Date Received:	11/11/21	Project:	Kelly Moore, F&BI 111213
Date Collected:	11/11/21	Lab ID:	111213-01 1/5.8
Date Analyzed:	11/16/21	Data File:	111533.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat

	%	Lower	Upper
Surrogates:	Recovery:	Limit:	Limit:
4-Bromofluorobenzene	88	70	130

Compounds:	Concentration	
	ug/m3	ppbv
Benzene	<1.9	<0.58
Toluene	<110	<29
Ethylbenzene	<2.5	<0.58
m,p-Xylene	<5	<1.2
o-Xylene	<2.5	<0.58
Gasoline Range Organics	<1,900	<460

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Inf_11-11-2021	Client:	Wood Environment & Infrastructure
Date Received:	11/11/21	Project:	Kelly Moore, F&BI 111213
Date Collected:	11/11/21	Lab ID:	111213-02 1/44
Date Analyzed:	11/16/21	Data File:	111534.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat

	%	Lower	Upper
Surrogates:	Recovery:	Limit:	Limit:
4-Bromofluorobenzene	100	70	130

Compounds:	Concentration	
	ug/m3	ppbv
Benzene	<14	<4.4
Toluene	<830	<220
Ethylbenzene	<19	<4.4
m,p-Xylene	<38	<8.8
o-Xylene	<19	<4.4
Gasoline Range Organics	89,000	22,000

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Method Blank	Client:	Wood Environment & Infrastructure
Date Received:	Not Applicable	Project:	Kelly Moore, F&BI 111213
Date Collected:	Not Applicable	Lab ID:	01-2575 MB
Date Analyzed:	11/15/21	Data File:	111512.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat

	%	Lower	Upper
Surrogates:	Recovery:	Limit:	Limit:
4-Bromofluorobenzene	86	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
Gasoline Range Organics	<330	<80

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 11/22/21

Date Received: 11/11/21

Project: Kelly Moore, F&BI 111213

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES
FOR VOLATILES BY METHOD TO-15**

Laboratory Code: 111238-01 1/5.3 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 30)
Benzene	ug/m3	<1.7	<1.7	nm
Toluene	ug/m3	<100	<100	nm
Ethylbenzene	ug/m3	4.0	4.0	0
m,p-Xylene	ug/m3	14	14	0
o-Xylene	ug/m3	4.0	4.0	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/m3	43	103	70-130
Toluene	ug/m3	51	110	70-130
Ethylbenzene	ug/m3	59	105	70-130
m,p-Xylene	ug/m3	120	109	70-130
o-Xylene	ug/m3	59	113	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.

Report To: Scott Alameda & Christy Dittman

Company WOOD Environmental

Address: 600 University St. Suite 600

City, State, ZIP Seattle, WA 98101

50333416551

Phone 2063421778

Christy.Ditman@wisc.edu

Email H. Adamek@woodplc.com

SAMPLERS (signature)

[illegible]

PO #

NOTES:

INVOICE TO

TURNAROUND TIME

☒ Standard

☐ RUSH

Rush charges authorized by:

SAMPLE DISPOSAL

☒ Default: Clean after 3 days

☐ Archive (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	Notes
Eff-11-11-2021	01	8535	07	IA / SG	11-11-21	30	9:29	Ø	9:36					X	Dura: 7 min SN: 8535
InF-11-11-2021	02	8539	109	IA / SG	11-11-21	29	9:43	Ø	9:49					X	Dura: 6 min SN: 8539
		(NP) → 11/11		IA / SG											
				IA / SG											
				IA / SG											
				IA / SG											
				IA / SG											
				IA / SG											
				IA / SG											Samples received at 17°C

Friedman & Bruya, Inc.

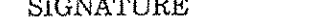

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FORMS\COC\COCTO-15.DOC

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: 	Gavin Hockeman	JHA	11/11/21	11:09
Received by: 	Nham Pham	FEB	11/11/21	11:09
Relinquished by:				
Received by:				