2018 Summary of investigations and remedial actions

Former Kelly-Moore Manufacturing Facility
5400–5580 Airport Way South
Project # 0146970060 Kelly-Moore Paint Company, Inc.

Prepared for:

Kelly-Moore Paint Company, Inc.
301 W Hurst Boulevard, Hurst, TX 76053

October 8, 2019

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Kelly-Moore Paint Company, Inc.
301 W Hurst Boulevard, Hurst, TX 76053

Prepared by:

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October 8, 2019

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FORMER KELLY-MOORE MANUFACTURING FACILITY
2018 Summary of investigations and remedial actions
5400–5580 Airport Way South
Seattle, Washington

October 8, 2019
Project No. 0146970060

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.

John Long, L.G., L.Hg.
Licensed Geologist/Hydrogeologist #1354
Expiration Date: May 23, 2021

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1.0 Introduction

Wood Environment & Infrastructure Solutions, Inc. (Wood), formerly Amec Foster Wheeler Environment & Infrastructure, Inc., prepared this report on behalf of Kelly-Moore Paint Company, Inc. (Kelly-Moore) for the former Kelly-Moore manufacturing facility located at 5400–5410 Airport Way South, in Seattle, Washington (the site) (Figure 1). This report provides a summary of groundwater samples collected since the 2017 Summary of Investigations and Remedial Actions (Wood, 2018) was submitted to the Washington State Department of Ecology (Ecology) in June 2018 and provides information regarding implementation of the remedial actions discussed in the remedial investigation/feasibility study/ disproportionate cost analysis, which summarized the results of groundwater and soil sampling conducted since site activities began in 2011. Site activities conducted after June 2018 include dry and wet season groundwater sampling events, which were conducted in August 2018 and February 2019, respectively. Additionally, the soil vapor extraction (SVE) system operated during 2018 and 2019, and the air sparge system began operating in May 2019. Details about the site activities conducted during this reporting period are discussed below.

2.0 Groundwater sampling

Groundwater samples have been collected twice a year (during the wet and dry seasons) since June 2016. Tables 1 through 4 provide information on monitoring well construction, groundwater elevations, field parameters, and groundwater results.

2.1 Water level measurements and site hydrogeology

Monitoring well construction details are provided in Table 1. Depth-to-water measurements, top of casing (TOC) elevations, and groundwater elevations measured during the monitoring events are presented in Table 2. Groundwater depths were measured to the nearest 0.01 foot using a depth to water probe. Groundwater levels for each monitoring well were subtracted from the TOC elevations to determine groundwater elevations. TOC elevations were measured by Duane Hartman and Associates, of Seattle, Washington in 2016.

Groundwater elevation contours for water level measurements collected in August 2018 and February 2019 are presented on Figures 2 and 3. Water level measurements collected in September 2018 and February 2019 indicate that groundwater generally flows to the west-southwest, in agreement with measurements from previous years (Wood, 2018). 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 2018–2019 reporting period was approximately 0.5 foot of elevation difference.

2.2 Groundwater sampling methodology

Groundwater samples were collected using low flow methodology (EPA, 1988) following the Additional Investigation Work Plan (Amec Foster Wheeler, 2016).

A peristaltic pump and new polyethylene tubing were used to collect groundwater from each well at a flow rate of approximately 100–200 milliliters per minute. Groundwater parameters were measured during purging using a YSI multi-parameter water quality meter and were recorded by hand on field data sheets (Appendix A). Parameters measured were turbidity, temperature, pH, dissolved oxygen, specific conductivity, and oxidation reduction potential (Table 3). 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 Onsite Environmental, Inc., in Redmond, Washington, for laboratory analyses. Each groundwater sample was analyzed for the following:

- Volatile organic compounds (VOCs) by U.S. Environmental Protection Agency (EPA) Method 8260C;
- Polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270D with selected ion monitoring for some compounds;
- Total metals (arsenic, barium, cadmium, chromium, lead, selenium and silver) by EPA Method 200.8 and total mercury by EPA Method 7470A;
- Total petroleum hydrocarbons 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.

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

3.0 Groundwater analytical results

Groundwater results for commonly detected compounds are presented in Table 4, along with the results for detected compounds in sampling events conducted since 2011.

3.1 Total petroleum hydrocarbons

The highest concentrations of TPH-G have been observed in the groundwater from KMW-03, KMW-04, KMW-06, KMW-08, KMW-09, and KMW-10. Decreasing trends are observed in the groundwater samples collected from all of the monitoring wells except for KMW-06, KMW-09, and KMW-10.

During the most recent sampling event conducted in February 2019, the concentrations of TPH-G were below the Model Toxics Control Act Method A Cleanup Level of 800 micrograms per liter (µg/L) (where benzene is present) except for KMW-04 and KMW-06.

TPH-D and/or TPH-O have been detected in the groundwater from all of the monitoring wells except for KMW-07 at least once since sampling began in 2011. During the most recent sampling event, the concentrations of TPH-D exceeded the Model Toxics Control Act Method A Cleanup Level of 500 µg/L in the groundwater collected from KMW-03R, KMW-04, KMW-06, KMW-09, and KMW-10.

3.2 Volatile organic compounds

Groundwater samples were analyzed for the full list of VOC compounds. Benzene, 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 significant in the groundwater from KMW-04 and appear to have decreased in concentration 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.

Other VOC compounds detected in the groundwater are 1,2,4-trimethylbenzene and 1,3,5-trimethylbenzene, which were detected in the groundwater collected from KMW-04 and KMW-10.

Chlorinated VOCs were not detected in groundwater samples collected from the monitoring wells during the 2018 and 2019 sampling events, which is consistent with historical results.

3.3 Polycyclic aromatic hydrocarbons

During the August 2018 and February 2019 sampling events, no PAHs were detected in the groundwater. We will continue to monitor for PAHs in groundwater during the 2019–2020 reporting period.

3.4 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 cleanup levels, except for arsenic. For the 2018 and 2019 sampling events, arsenic was detected at concentrations that exceed the Ecology background level of 5.0 µg/L at KMW-04 during the August 2018 (14.5 µg/L) and February 2019 (17.4 µg/L) sampling events, and at KMW-10 during the February 2019 (6.72 µg/L) sampling event.

4.0 Soil vapor extraction/air sparge system operations

4.1 Design, installation, and operations

4.1.1 SVE system design & installation

SVE and air sparging were selected to address past releases of hydrocarbons associated with former paint manufacturing activities at this site. SVE uses a vacuum to extract soil vapors from the subsurface, while air sparging volatilizes hydrocarbons in the saturated zone to increase the contaminant removal rate. Both methods introduce oxygen into 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 were installed between the western SVE wells. Figure 4 shows the location of the SVE horizontal wells at the site, and Figure 5 shows the location 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 the western manifold, which is located in a fenced-off area near the treatment equipment. Figure 6 shows the current configuration of the SVE and air sparge system.

The SVE blower and air sparge compressor were installed adjacent to the western manifold along with a catalytic thermal oxidizer (CATOX) unit. The CATOX is used to treat the extracted soil vapor, as well as volatized 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).

Figure 7 is a process and instrumentation diagram showing the SVE and air sparge systems and the treatment equipment. As shown, both 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 personnel if the CATOX system has shut down or if specific maintenance tasks are required, such as disposal of condensate water that is produced by the SVE wells. The system is equipped with a 250-gallon polyethylene tote to store condensate water produced by the SVE wells, and the tote is

alarmed to ensure that it cannot overfill. The air sparging pump is configured to shut down immediately upon failure of the SVE system.

4.1.2 SVE and air sparge operations

The SVE system operated between November 2017 and October 2018. In October 2018, a vehicle crashed into the treatment compound area and the treatment system was promptly shut down until the damaged components could be inspected and repaired. The SVE system was restarted in April 2019, and operated independently until the air sparge system began operating in late May 2019. Since May 29, 2019, both the air sparge and SVE systems have been operating continuously. The SVE system is used to extract the vapors volatilized from the groundwater by the air sparge system.

4.2 SVE and air sparge performance evaluation

4.2.1 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. Field forms can be found in Appendix C. In compliance with PSCAA Registration No. 29932, monthly performance monitoring samples are field-analyzed by a flame ionization detector (FID) calibrated to 100 parts per million hexane. Monthly performance monitoring samples are also submitted to a local laboratory for additional analysis of benzene. Additionally, samples are collected from each SVE well monthly and are field-analyzed by FID. Individual SVE well vapor samples were submitted for laboratory analysis of benzene during SVE startup (November 2017) and during and after air sparging startup (May 2019 and June 2019). Analytical data for individual SVE well samples are provided in Table 5. All FID results are shown in Tables 6A and 6B. All analytical results for SVE performance monitoring are provided in Appendix D.

CATOX performance is determined by its destruction removal efficiency (DRE) for removed soil vapor compounds. DRE is calculated from FID results at the CATOX influent and at the effluent emissions stack and are shown in Table 7. DREs generally exceed 97 percent and demonstrate adequate system performance. Despite generally high DREs, reported DREs fell below 97 percent during the summer of 2018. On-site investigations and communication with the CATOX manufacturer did not identify any operational issues. PSCAA issued a Notice of Violation letter on April 17, 2019, due to the decreased destruction efficiencies in mid-2018. On April 25, 2019, Wood provided a response to the Notice of Violation, including a plan for future site actions that will be taken in the event that the DRE again falls below levels required by PSCAA Registration No. 29932. This corrective action memo is included as Appendix E.

4.2.2 SVE and air sparge optimization and performance monitoring

Table 6a provides FID readings for SVE concentrations prior to air sparge sparge startup, and Table 6b provides FID readings for SVE concentrations with air sparging. While the air sparge system has been running continuously since May 2019, in the future we may choose to cycle the air sparge system to increase mixing in the subsurface if SVE concentrations decline.

Since 2017, an estimated 8,400 pounds of TPH (as hexane equivalent) have been removed from the subsurface by the SVE in conjunction with the air-sparge system. Table 8 summarizes the performance data, and Figure 8 shows the mass removal rate over time as estimated from site performance data and FID measurements. The mass removal rate was calculated from the measured influent concentration and system flow rate during each site visit, and is based on the total system runtime between site visits. Thus,

the removal rate is high when influent concentration is high (such as during air sparge startup) and low when influent concentrations are low (such as at the end of the summer in 2018).

Mass removal rates are highest when SVE concentrations are high during periods of low groundwater elevations from June through October. We continue to optimize the flow from the wells to maximize the concentration of hydrocarbons at the CATOX influent. Individual well concentrations over time are shown in Figure 9. Since startup, the highest-concentration SVE wells have been SVE-03, SVE-05, SVE-10, and SVE-12. After air sparging began in May 2019, concentrations increased in all western wells except for SVE-09. We will continue to monitor SVE well concentrations and target high-concentration areas with SVE and air sparging to improve mass removal rates.

High site groundwater levels during the winter reduce the vadose zone volume and SVE influent concentrations. SVE concentrations at all wells fluctuate with the seasonal cycle, which may seasonally reduce SVE mass removal rates. Wet season operations are less efficient due to intermittent alarm conditions and periodic shutdowns associated with increased condensate production at the CATOX knockout pot. We will continue to operate the SVE and air sparge systems during the wet season and will work to optimize mass removal during dry season operations.

In addition to FID monitoring in the western parking lot during air sparging startup, indoor air samples were collected inside the northern building both prior to and after the startup of the air sparging system. Sample locations are shown on Figure 4. Samples were analyzed for VOCs using EPA Method TO-15 and analytical results are provided in Appendix F. As shown in Table 9, VOC concentrations during June 2019 (while air sparging) are comparable to and generally lower than compound concentrations during October 2018 (before air sparging). Both sets of analytical results meet permissable exposure limits for indoor air, suggesting that vapor intrusion from contaminated groundwater or volatilized contamination was not a concern on either day that indoor air sampling occurred.

5.0 Conclusions and recommendations

The following actions will be conducted before the end of 2019:

- Groundwater samples were collected for the dry season sampling event in August 2019.
- 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.

6.0 References

Amec Foster Wheeler, 2016, Additional Investigation Work Plan, Former Kelly-Moore Manufacturing Facility, 5400–5580 Airport Way South, Seattle, Washington, June.

U.S. Environmental Protection Agency (EPA), 1998, Groundwater Sampling Procedure Low Stress (Low Flow) Purging and Sampling, GW Sampling SOP, March 16.

Wood Environment & Infrastructure Solutions, Inc. (Wood), 2018, 2017 Summary of Investigations and Remedial Actions, Former Kelly-Moore Manufacturing Facility, 5400-5580 Airport Way South, Seattle, Washington, June 5.

Figures

N

0 1,000 2,000

APPROXIMATE SCALE IN FEET

wood.

SITE LOCATION
Kelly-Moore Paint Company
Seattle, Washington

By: APS	Date: 05/22/18	Project No. 14697
Wood Environment & Infrastructure Solutions, Inc.		Figure 1

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KMW-02R
11.67

KMW-07
11.67

KMW-08
~~11.67~~
11.65

KMW-03R
11.61

KMW-06
11.51

KMW-04
11.50

KMW-09
11.50

KMW-10
11.38

11.6

11.5

11.4

AIRPORT WAY SOUTH

AIRPORT WAY SOUTH

S. LUCILE ST.

EXPLANATION

- PROPERTY LINE
- KMW-04 / 11.50 — MONITORING WELL LOCATION AND GROUNDWATER ELEVATION IN FEET BELOW MEAN SEA LEVEL (NAVD88-FT)
- 11.5 — GROUNDWATER ELEVATION CONTOUR
- GROUNDWATER FLOW DIRECTION
- RAILROAD TRACK

0 30 60
APPROXIMATE SCALE IN FEET

DRAWN BY: APS CHECKED BY: JR

E:\14697\07 2019 RI\FS\KellyMoore-GW-MON-NETWORK_07819.dwg - AUGUST2018-GW - Jul. 19, 2019 2:57pm - adam.stanberg

AUGUST 2018 DRY SEASON GROUNDWATER CONTOURS

Kelly-Moore Paint Company
Seattle, Washington

wood.

By: APS	Date: 07/19/19	Project No. 14697
Wood Environment & Infrastructure Solutions, Inc.		Figure 2

KMW-02R
12.46

KMW-07
12.42

KMW-08
12.34

12.25

KMW-03R
12.17

12.0

KMW-04
11.96

KMW-06
12.03

KMW-09
11.99

11.75

KMW-10
11.74

AIRPORT WAY SOUTH

AIRPORT WAY SOUTH

S. LUCILE ST.

EXPLANATION

- PROPERTY LINE
- KMW-04 11.96 — MONITORING WELL LOCATION AND GROUNDWATER ELEVATION IN FEET BELOW MEAN SEA LEVEL (NAVD88-FT)
- 12.0 — GROUNDWATER ELEVATION CONTOUR
- GROUNDWATER FLOW DIRECTION
- RAILROAD TRACK

0 30 60

APPROXIMATE SCALE IN FEET

DRAWN BY: APS CHECKED BY: JB

S:\14697\017_2019-RIFS\KellyMoore-GW-MON-NETWORK_071919.dwg - FEBRUARY 2019-GW - Aug. 05, 2019 2:30pm - adam.stenberg

FEBRUARY 2019 WET SEASON GROUNDWATER CONTOURS
Kelly-Moore Paint Company
Seattle, Washington

By: APS	Date: 08/05/19	Project No. 14697
Wood Environment & Infrastructure Solutions, Inc.		Figure **3**

KMW-02R
KMW-07
KMW-08
KMW-03R
KMW-06
KMW-04
SVE-01
SVE-02
SVE-03
SVE-04
SVE-05
SVE-06
SVE-07
SVE-08
SVE-9
SVE-10
SVE-11
SVE-12
SVE-13
AS-1
AS-2
AS-3
EASTERN MANIFOLD
WESTERN MANIFOLD
SEE DRAWING 6
AIRPORT WAY SOUTH
AIRPORT WAY SOUTH
OHE
SD
SS
W
GAS
CB

EXPLANATION

- PROPERTY LINE
- KMW-04 — MONITORING WELL LOCATION
- SVE-07 — EASTERN HORIZONTAL SOIL VAPOR EXTRACTION WELL LOCATION
- EASTERN SOIL VAPOR EXTRACTION WELL TRENCH LAYOUT
- SVE-12 — WESTERN HORIZONTAL SOIL VAPOR EXTRACTION WELL LOCATION
- WESTERN SOIL VAPOR EXTRACTION WELL TRENCH LAYOUT
- AS-1 — INDOOR AIR SAMPLING LOCATION
- SD — STORMWATER LINE
- SS — SANITARY SEWER LINE
- GAS — GAS LINE
- OHE — OVERHEAD POWER LINE
- UNPAVED SURFACE

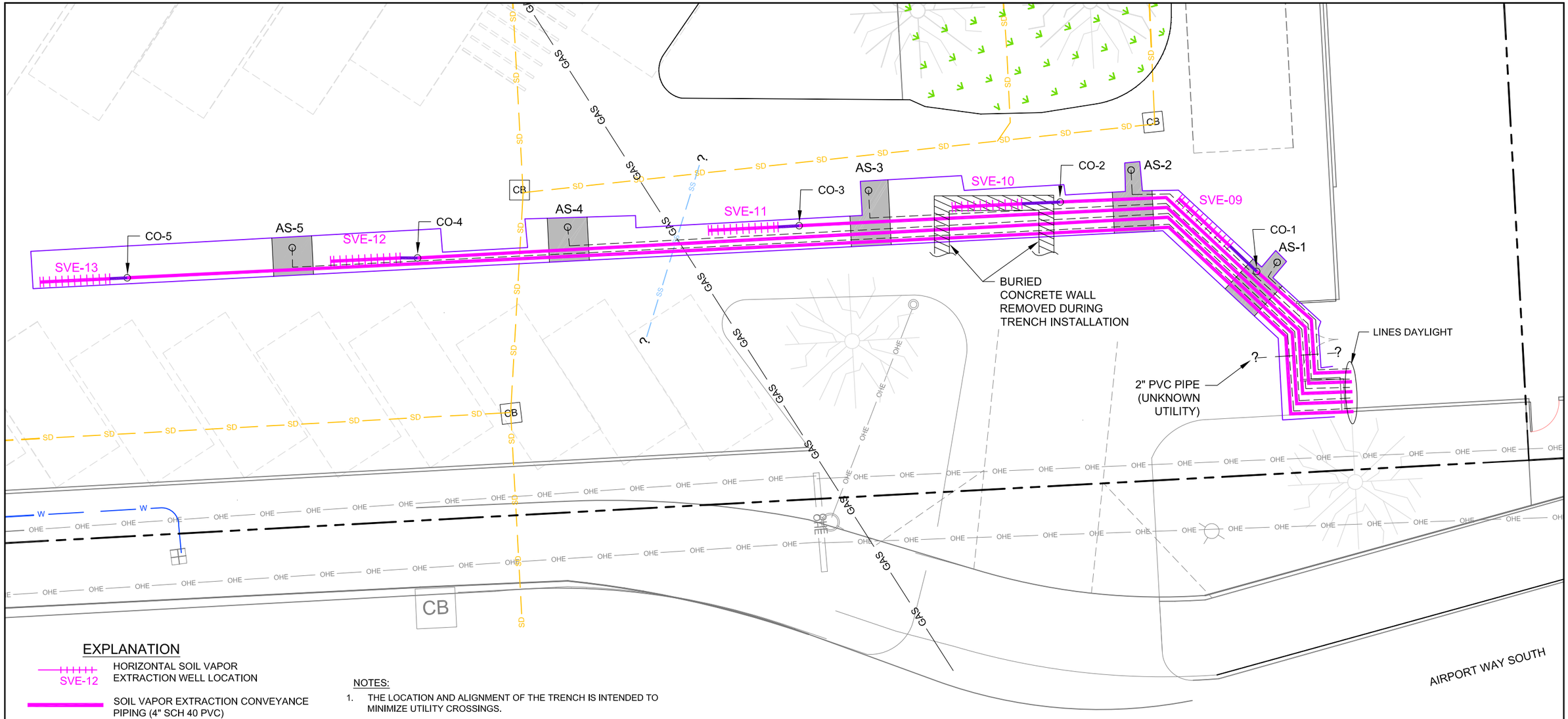
0 15 30
APPROXIMATE SCALE IN FEET

SVE WELL LAYOUT
Kelly-Moore Paint Company
Seattle, Washington

By: APS	Date: 07/22/19	Project No. 14697
Wood Environment & Infrastructure Solutions, Inc.		Figure 4

DRAWN BY: APS CHECKED BY: JB

S:\114697\017_2019-RIFS\KellyMoore-WesternSVEtrench_071919.dwg - FIG4-SITEPLAN - Jul. 22, 2019 3:40pm - adam.stenberg



EXPLANATION

- SVE-12 — HORIZONTAL SOIL VAPOR EXTRACTION WELL LOCATION
- SOIL VAPOR EXTRACTION CONVEYANCE PIPING (4" SCH 40 PVC)
- 4" PVC CLEANOUT
- AIR SPARGE LINE (1" SCH 80 PVC)
- AS-5 — AIR SPARGE WELL
- SD — STORMWATER LINE
- SS — SANITARY SEWER LINE
- TRENCH OUTLINE
- LOW PERMEABILITY FILL
- UNPAVED SURFACE

NOTES:

1. THE LOCATION AND ALIGNMENT OF THE TRENCH IS INTENDED TO MINIMIZE UTILITY CROSSINGS.
2. EXCAVATED SOIL WAS DISPOSED OFFSITE AS SOLID WASTE, EXCEPT THE PAVEMENT BASE COARSE.
3. PAVEMENT BASE COURSE WAS REUSED.
4. THE INTENT OF THE DESIGN IS TO CREATE HIGH PERMEABILITY ZONES FOR THE SVE PIPING, SEPARATED BY LOW PERMEABILITY BARRIERS.
5. ALL BACKFILL AROUND THE PIPING WAS 1.25" CLEAN GRAVEL.AND COVERED WITH A CONTINUOUS LAYER OF 20 MIL PVC GEOMEMBRANE. THE REMAINDER OF THE TRENCH WAS BACKFILLED WITH SEATTLE TYPE 17 UP TO THE PAVEMENT SUBGRADE.
6. THE LOW PERMEABILITY ZONES WAS BACKFILLED WITH SILTY SOIL MIXED CEMENT.

0 5 10
APPROXIMATE SCALE IN FEET

WESTERN SVE AND AIR SPARGE TRENCH
Kelly-Moore Paint Company
Seattle, Washington

By: APS	Date: 05/22/18	Project No. 14697
Wood Environment & Infrastructure Solutions, Inc.		Figure 5

DRAWN BY: APS CHECKED BY: JB

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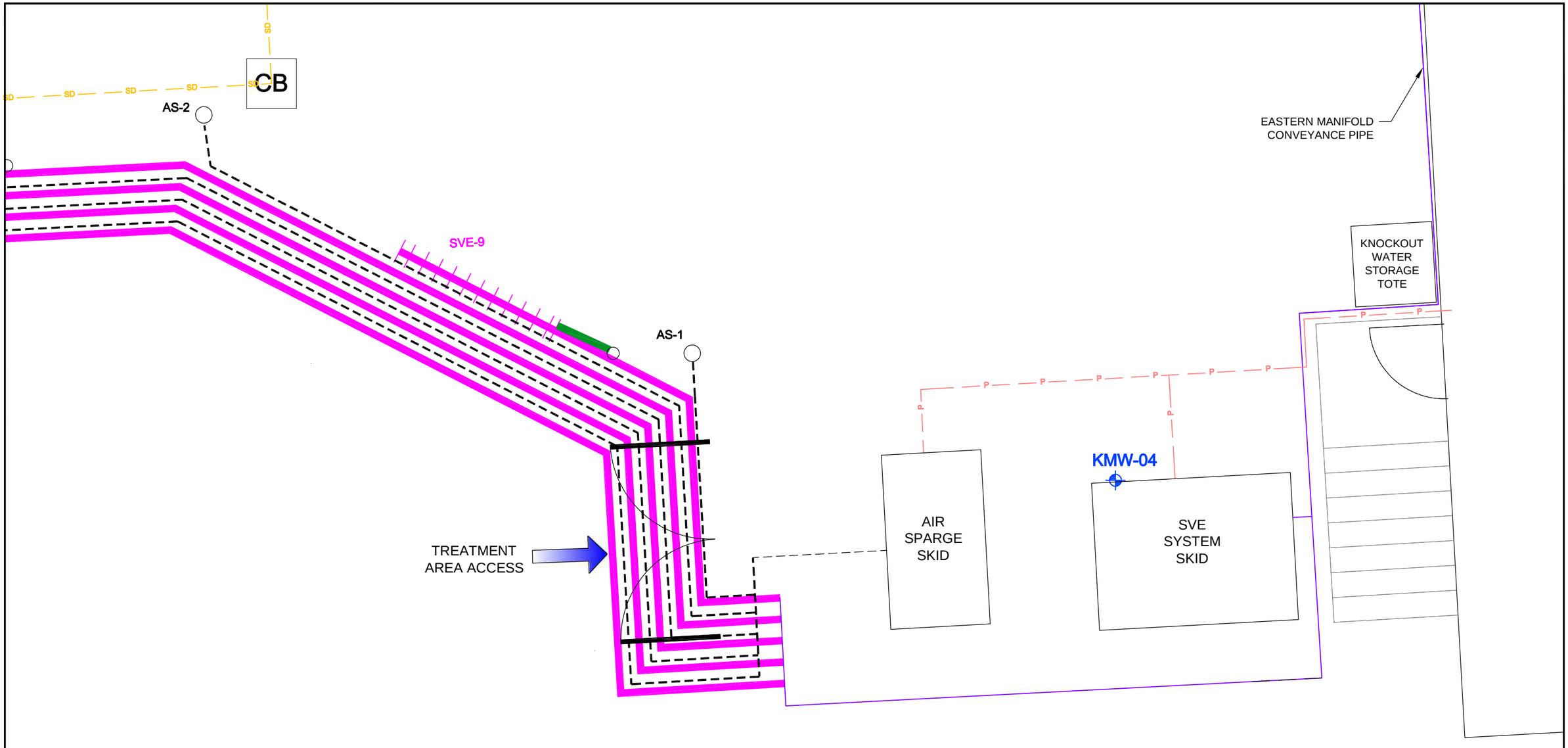

EXPLANATION

- SVE-9 — HORIZONTAL SOIL VAPOR EXTRACTION WELL LOCATION
- SOIL VAPOR EXTRACTION CONVEYANCE PIPING (4" SCH 40 PVC)
- 4" PVC CLEANOUT
- AIR SPARGE LINE (1" SCH 80 PVC)
- AS-1 — AIR SPARGE WELL
- SD — STORMWATER LINE
- OHE — OVERHEAD POWER LINE
- P — TREATMENT SYSTEM POWER

0 2 4
APPROXIMATE SCALE IN FEET

TREATMENT SYSTEM PLAN VIEW
Kelly-Moore Paint Company
Seattle, Washington

By: APS	Date: 07/19/19	Project No. 14697
Wood Environment & Infrastructure Solutions, Inc.		Figure 6

DRAWN BY: APS CHECKED BY: JB

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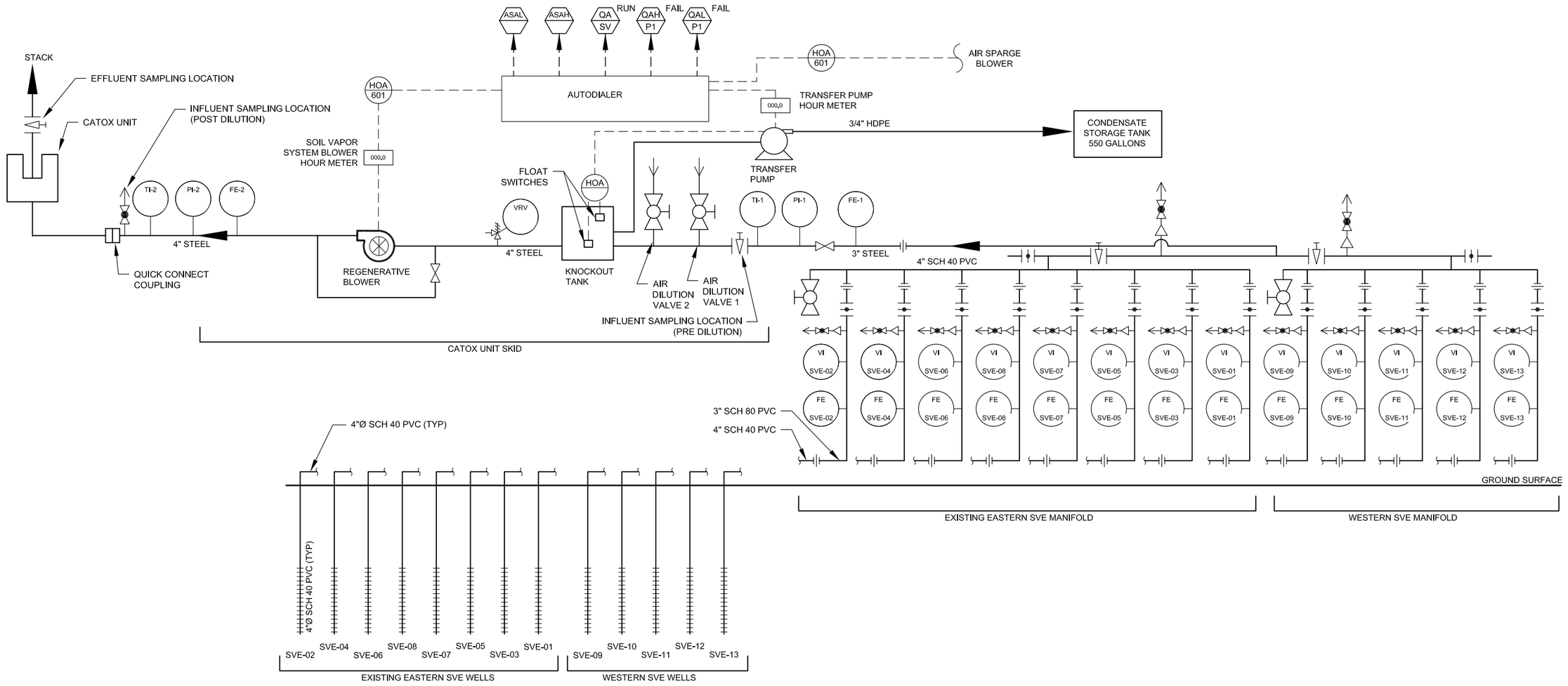


PIPING SYMBOLS

- UNION
- COMPRESSION PLUG
- BUTTERFLY VALVE
- GATE VALVE
- AIR DILUTION BALL VALVE
- REDUCER
- 1/4" SAMPLE PORT
- MICROSEEPS SAMPLE PORT

EQUIPMENT SYMBOLS

- REGENERATIVE BLOWER
- TRANSFER PUMP

INSTRUMENT LEGEND

- FIELD MOUNTED
- CONTROL PANEL MOUNTED
- VRV — VACUUM RELIEF VALVE

INSTRUMENT LEGEND CON'T

- VI — VACUUM INDICATOR
- TI — TEMPERATURE INDICATOR
- FE — FLOW ELEMENT
- HOA 601 — HAND OFF AUTO

INSTRUMENT LEGEND CON'T

- QA SV — EVENT ALARM
- QAL P1 — TRANSFER PUMP FAIL ALARM
- QAH P1 — TRANSFER PUMP HIGH LEVEL SWITCH FAIL ALARM
- ASAH — AIR SPARGE BLOWER HIGH PRESSURE ALARM
- ASAL — AIR SPARGE BLOWER LOW PRESSURE ALARM

ABBREVIATIONS

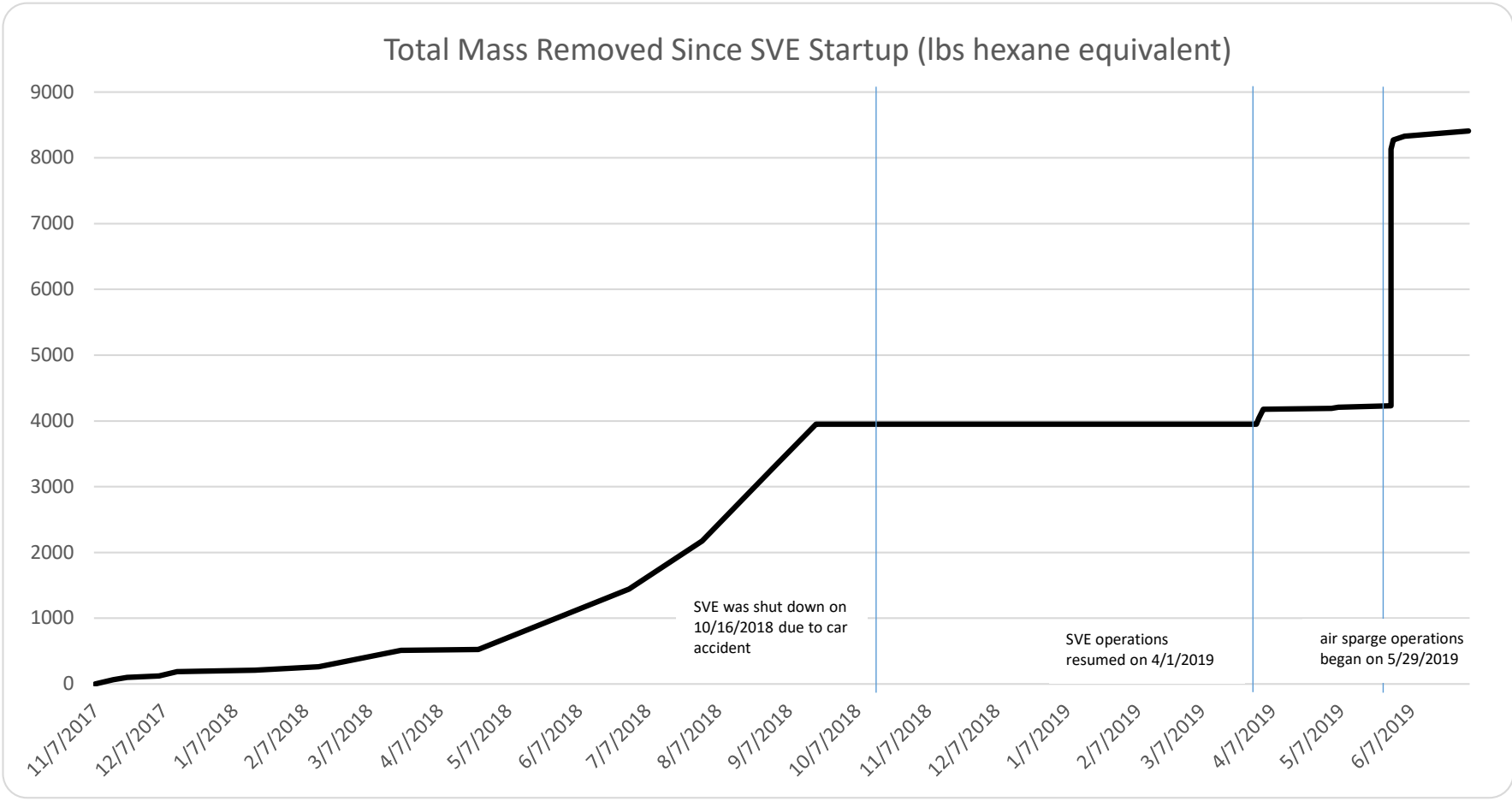
TYP	TYPICAL
PVC	POLYVINYL CHLORIDE
SCH	SCHEDULE
GAC	GRANULAR ACTIVATED CARBON

CATOX SYSTEM
PROCESS AND INSTRUMENTATION DIAGRAM
Kelly-Moore Paint Company
Seattle, Washington

By: APS	Date: 05/22/18	Project No. 14697
Wood Environment & Infrastructure Solutions, Inc.		Figure 7

DRAWN BY: APS CHECKED BY: JB

S:\14697\016_2018-RIFS\KellyMoore-WesternSVEtrench_052118_recover_1_1_4467.sv$.dwg - DWG4-GAC-PID - May. 22, 2018 4:37pm - adam.stenberg

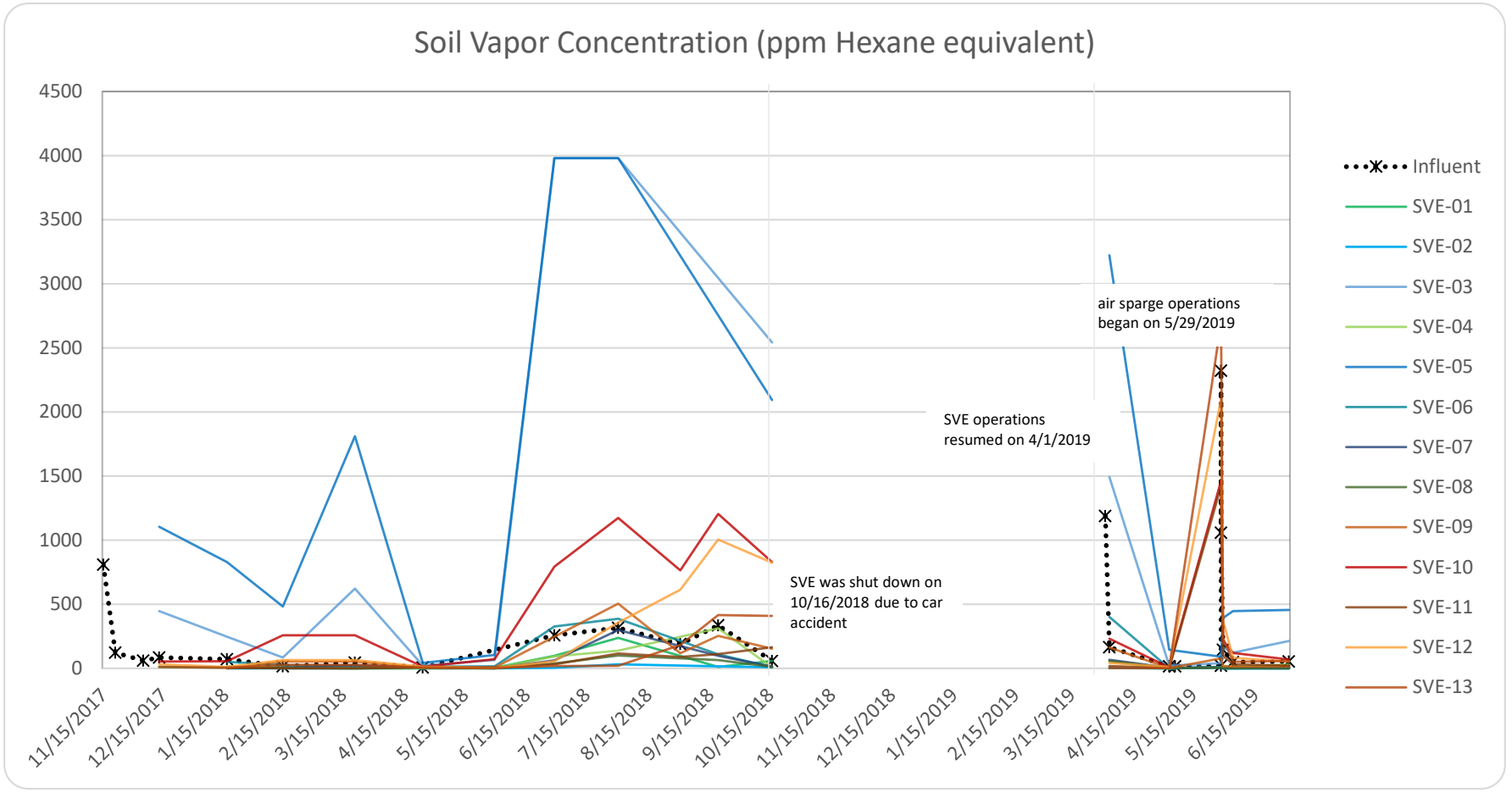


Abbreviations
lbs = pounds
SVE = soil vapor extraction

wood.

TOTAL MASS REMOVAL BY SVE/AS
Kelly-Moore Paint Company

By: LCD	Date: 07/17/2019	Project No. 14697
Wood Environment & Infrastructure Solutions, Inc.		Figure 8



SOIL VAPOR EXTRACTION FID CONCENTRATIONS
Kelly-Moore Paint Company

By: LCD	Date: 07/17/2019	Project No. 14697
Wood Environment & Infrastructure Solutions, Inc.		Figure 9

Tables

TABLE 1: MONITORING WELL SURVEY DATA

Former Kelly-Moore Manufacturing Facility, Seattle, Washington

Well Name	WCS North Zone NAD 83(91)[3]		Ground Surface Elevation	Top of Casing Elevation
	Northing	Easting		
KMW-02R[1]	205743.9	1273010.4	22.01	21.63
KMW-03R[1]	205538.1	1273156.6	21.99	21.54
KMW-04[1]	205423.6	1273115.0	18.90	18.56
KMW-06[1]	205525.2	1273039.2	20.16	19.80
KMW-07[1]	205713.7	1273034.0	22.00	21.63
KMW-08[1]	205648.5	1273101.3	22.03	21.65
KMW-09[2]	205508.9	1273025.5	18.60	18.14
KMW-10[2]	205336.2	1272955.0	20.84	20.39

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
WCS = Washington Coordinate System

TABLE 2: GROUNDWATER ELEVATIONS

Former Kelly-Moore Manufacturing Facility, Seattle, Washington

Well ID	TOC Elevation (feet)[1]	Date	Depth to Water (feet below TOC)	Groundwater Elevation (feet)[1]
KMW-02R	21.63 [2]	8/15/2018	9.96	11.67
		2/7/2019	9.17	12.46
KMW-03R	21.54 [2]	8/15/2018	9.93	11.61
		2/7/2019	9.37	12.17
KMW-04	18.56 [2]	8/15/2018	7.06	11.50
		2/7/2019	6.60	11.96
KMW-06	19.80 [2]	8/15/2018	8.29	11.51
		2/7/2019	7.77	12.03
KMW-07	21.63 [2]	8/15/2018	9.96	11.67
		2/7/2019	9.21	12.42
KMW-08	21.65 [2]	8/15/2018	10.00	11.65
		2/7/2019	9.31	12.34
KMW-09	18.14 [3]	8/15/2018	6.64	11.50
		2/7/2019	6.15	11.99
KMW-10	20.39 [3]	8/15/2018	9.01	11.38
		2/7/2019	8.65	11.74

Notes:

1. Elevations in feet above mean sea level.
2. Surveys conducted on June 30, 2016. Vertical Datum: NAVD88. Benchmark: City of Seattle 2" Brass disk 3805-3801 located at the SW corner of Airport Way South and Corson Ave South, Elevation 18.532 feet
3. Surveys conducted on December 13, 2016. Same datum as June 30, 2016.

Abbreviations:

NAVD88 = North American Vertical Datum of 1988

TOC = top of casing

TABLE 3: GROUNDWATER PARAMETERS

Former Kelly-Moore Manufacturing Facility, Seattle, Washington

Monitoring Well	Date	pH	DO (mg/L)	SC (ms/cm)	ORP (mv)	Temperature (°C)	Turbidity (NTU)
KMW-02R	8/16/2018	5.85	0.55	0.173	274	14.5	30.8
	2/8/2019	5.95	0.81	0.245	130.1	14.1	8.1
KMW-03R	8/16/2018	7.03	0.47	0.378	112	18.3	10
	2/8/2019	6.97	0.51	0.582	-87.0	16.5	20.52
KMW-04	8/16/2018	6.09	0.63	0.326	99.0	18	7.9
	2/7/2019	6.22	0.62	0.341	-74.0	11.2	12.01
KMW-06	8/16/2018	6.33	0.37	0.421	-39.0	19.5	18.4
	2/7/2019	6.18	0.65	0.635	-32.0	14.2	12.4
KMW-07	8/16/2018	6.02	0.6	0.211	268	15.4	31
	2/8/2019	6.23	0.52	0.318	51.1	14.4	17.91
KMW-08	8/16/2018	5.95	0.58	0.211	248	15.7	10.1
	2/8/2019	6.05	0.74	0.250	91.4	13.9	30.9
KMW-09	8/16/2018	6.35	0.47	0.387	-24	18.4	12.2
	2/7/2019	6.47	0.57	0.400	-69	15.2	4.99
KMW-10	8/16/2018	6.25	0.46	0.416	-15	16.5	21.8
	2/7/2019	6.53	0.49	0.430	-82	13.9	15.6

Abbreviations

ºC = degrees Celsius
DO = dissolved oxygen
mg/L = milligrams per liter
ms/cm = milli Siemens per centimeter
mv = millivolts
NTU = nephelometric turbidity unit
ORP = oxidation reduction potential
SC = specific conductivity

TABLE 4: GROUNDWATER ANALYTICAL RESULTS[1, 2]

Former Kelly-Moore Manufacturing Facility, Seattle, Washington

Analyte	Preliminary Screening Level	KMW-01			KMW-02/02R[3]									KMW-03/03R[4]											
		3/28/2011	8/4/2011	6/7/2013	3/28/2011	8/4/2011	6/7/2013	6/30/2016	11/10/2016	9/1/2017	1/26/2018	8/16/2018	2/8/2019	3/28/2011	3/28/2011 (D)	8/4/2011	4/4/2013	6/7/2013	3/10/2015	7/1/2016	11/10/2016	11/10/2016 (D)	9/1/2017	1/26/2018	8/16/2018	2/8/2019
Total Metals (µg/L)																									
Arsenic	5	3.3 U	3.3 U	--	3.3 U	3.3 U	--	3.3 U	3.3 U	3.3 U	3.3 U	1.0 U	1.0 U	3.3 U	3.3 U	3.3 U	--	--	--	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	1.0 U	1.0 U
Chromium	100	11 U	--	--	11 U	--	--	11 U	11 U	11 U	11 U	1.0 U	1.0 U	11 U	11 U	--	--	--	--	11 U	11 U	11 U	11 U	11 U	1.0 U	**1.47**
Copper	640	--	11 U	--	--	11 U	--	--	--	--	--	5.0 U	5.0 U	--	--	11 U	--	--	--	--	--	--	--	--	5.0 U	5.0 U
Lead	15	1.1 U	1.1 U	--	1.1 U	1.1 U	--	1.1 U	1.1 U	1.1 U	1.1 U	1.0 U	1.0 U	1.1 U	1.1 U	1.1 U	--	--	--	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.0 U	1.0 U
Mercury	2.0	--	--	--	--	--	--	0.5 U	0.50 U	0.50 U	0.50 U	1.0 U	1.0 U	--	--	--	--	--	--	0.5 U	0.50 U	0.50 U	0.50 U	0.50 U	1.0 U	1.0 U
Nickel	100	--	--	--	--	--	--	--	--	--	--	**1.82**	**2.15**	--	--	--	--	--	--	--	--	--	--	--	**1.46**	**1.67**
Zinc	4800	--	--	--	--	--	--	--	--	--	--	5.0 U	5.0 U	--	--	--	--	--	--	--	--	--	--	--	5.0 U	5.0 U
Polycyclic Aromatic Hydrocarbons (µg/L)																									
Benzo(a)anthracene		0.0098 U	0.0095 U	--	0.0098 U	0.0096 U	--	0.0095 U	0.0094 U	0.0099 U	0.011 U	0.06 U	0.04 U	0.0096 U	0.0095 U	0.0095 U	--	--	--	**0.018**	0.0095 U	0.0095 U	0.0098 U	0.011 U	0.06 U	0.04 U
Benzo(a)pyrene	0.023	0.0098 U	0.0095 U	--	0.0098 U	0.0096 U	--	0.0095 U	0.0094 U	0.0099 U	0.011 U	0.06 U	0.04 U	0.0096 U	0.0095 U	0.0095 U	--	--	--	**0.011**	0.0095 U	0.0095 U	0.0098 U	0.011 U	0.06 U	0.04 U
Benzo(b)fluoranthene		0.0098 U	0.0095 U	--	0.0098 U	0.0096 U	--	0.0095 U	0.0094 U	0.0099 U	0.011 U	0.06 U	0.04 U	0.0096 U	0.0095 U	0.0095 U	--	--	--	**0.011**	0.0095 U	0.0095 U	0.0098 U	0.011 U	0.06 U	0.04 U
Benzo(ghi)perylene		0.0098 U	0.0095 U	--	0.0098 U	0.0096 U	--	0.0095 U	0.0094 U	0.0099 U	0.011 U	0.06 U	0.04 U	0.0096 U	0.0095 U	0.0095 U	--	--	--	**0.014**	0.0095 U	0.0095 U	0.0098 U	0.011 U	0.06 U	0.04 U
Benzo(j,k)fluoranthene		0.0098 U	0.0095 U	--	0.0098 U	0.0096 U	--	0.0095 U	0.0094 U	0.0099 U	0.011 U	0.06 U	0.04 U	0.0096 U	0.0095 U	0.0095 U	--	--	--	0.0095 U	0.0095 U	0.0095 U	0.0098 U	0.011 U	0.06 U	0.04 U
Chrysene		0.0098 U	0.0095 U	--	0.0098 U	0.0096 U	--	0.0095 U	0.0094 U	0.0099 U	0.011 U	0.06 U	0.04 U	0.0096 U	0.0095 U	0.0095 U	--	--	--	**0.012**	0.0095 U	0.0095 U	0.0098 U	0.011 U	0.06 U	0.04 U
Dibenz(a,h)anthracene		0.0098 U	0.0095 U	--	0.0098 U	0.0096 U	--	0.0095 U	0.0094 U	0.0099 U	0.011 U	0.06 U	0.04 U	0.0096 U	0.0095 U	0.0095 U	--	--	--	0.0095 U	0.0095 U	0.0095 U	0.0098 U	0.011 U	0.06 U	0.04 U
Indeno(1,2,3-cd)pyrene		0.0098 U	0.0095 U	--	0.0098 U	0.0096 U	--	0.0095 U	0.0094 U	0.0099 U	0.011 U	0.06 U	0.04 U	0.0096 U	0.0095 U	0.0095 U	--	--	--	**0.011**	0.0095 U	0.0095 U	0.0098 U	0.011 U	0.06 U	0.04 U
Total cPAHs	0.20	0.007 U	0.007 U	--	0.007 U	0.007 U	--	0.007 U	0.007 U	0.007 U	0.008 U	0.05 U	0.03 U	0.007 U	0.007 U	0.007 U	--	--	--	**0.016**	0.007 U	0.007 U	0.007 U	0.008 U	0.05 U	0.03 U
Polychlorinated Biphenyls (µg/L)																									
Aroclor 1016		--	--	--	--	--	--	0.047 U	--	--	--	--	--	--	--	--	--	--	--	0.047 U	--	--	--	--	--	--
Aroclor 1221		--	--	--	--	--	--	0.047 U	--	--	--	--	--	--	--	--	--	--	--	0.047 U	--	--	--	--	--	--
Aroclor 1232		--	--	--	--	--	--	0.047 U	--	--	--	--	--	--	--	--	--	--	--	0.047 U	--	--	--	--	--	--
Aroclor 1242		--	--	--	--	--	--	0.047 U	--	--	--	--	--	--	--	--	--	--	--	0.047 U	--	--	--	--	--	--
Aroclor 1248		--	--	--	--	--	--	0.047 U	--	--	--	--	--	--	--	--	--	--	--	0.047 U	--	--	--	--	--	--
Aroclor 1254		--	--	--	--	--	--	0.047 U	--	--	--	--	--	--	--	--	--	--	--	0.047 U	--	--	--	--	--	--
Aroclor 1260	0.04	--	--	--	--	--	--	0.047 U	--	--	--	--	--	--	--	--	--	--	--	0.047 U	--	--	--	--	--	--
Total PCBs	0.44							0.047 U												0.047 U						
Total Petroleum Hydrocarbons (µg/L)																									
Gasoline Range Organics	500	100 U	100 U	100 U	100 U	100 U	100 U	500 U	100 U	100 U	100 U	100 U	100 U	**7,700**	**7,000**	**6,100**	**1,800**	**1,100**	**1,100**	**300**	**130**	**170**	**270**	**150**	**290**	**140**
Diesel Range Organics	500	--	--	--	--	--	--	**260**	260 U	0.27 U	260 U	50 U	60 U	--	--	--	--	--	--	**660 J**	310 U	280 U	**330**	**510**	**350**	**1,700**
Lube Oil	800	--	--	--	--	--	--	410 U	410 U	0.43 U	410 U	250 U	300 U	--	--	--	--	--	--	410 U	410 U	410 U	430 U	410 U	250 U	300 U
Volatile Organic Compounds (µg/L)																									
1,2,4-Trimethylbenzene	80	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	1.0 U	1.0 U	--	--	--	1.0 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	1.0 U	1.0 U
1,3,5-Trimethylbenzene	80	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	1.0 U	1.0 U	--	--	--	1.0 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	1.0 U	1.0 U
Acetone	7200	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	12 U	5.0 U	5.0 U	5.0 U	50 U	50 U	--	--	--	25 U	5.0 U	--	12 U	**7.9**	**6.5**	5.0 U	5.0 U	50 U	50 U
Benzene	5.0	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.35 U	0.35 U	**8.1**	**8.4**	4.0 U	1.0 U	**0.41**	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.35 U	0.35 U
Ethylbenzene	700	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	1.0 U	1.0 U	**3,100**	**2,700**	**2,400**	**170**	**27**	--	**1.4**	**0.33**	**0.34**	0.20 U	0.20 U	1.0 U	1.0 U
m,p-Xylene	1600	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	2.0 U	2.0 U	**18**	**18**	**7.1**	2.0 U	0.4 U	--	**2.1**	**1.0**	**0.97**	0.40 U	0.40 U	2.0 U	2.0 U
Naphthalene	160	1.0 U	1.0 U	1.4 U	1.0 U	1.0 U	1.4 U	1.0 U	1.3 U	1.0 U	1.0 U	0.06 U	0.4 U	--	--	--	**19**	**9.8**	--	1.0 U	1.3 U	1.3 U	1.0 U	1.0 U	**0.078**	0.4 U
o-Xylene	1600	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	1.0 U	1.0 U	4.0 U	4.0 U	4.0 U	1.0 U	0.20 U	--	**0.35**	**0.35**	**0.37**	0.20 U	0.20 U	1.0 U	1.0 U
Toluene	640	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	4.0 U	4.0 U	5.0 U	1.0 U	--	**1.1**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	4.0	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	1.0 U	1.0 U	--	--	--	1.0 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	1.0 U	1.0 U
Vinyl Chloride	0.29	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--	--	1.0 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U

TABLE 4: GROUNDWATER ANALYTICAL RESULTS[1, 2]

Former Kelly-Moore Manufacturing Facility, Seattle, Washington

Analyte	KMW-04												KMW-05			KMW-06						KMW-07					
	3/28/2011	8/4/2011	8/4/2011 (D)	6/7/2013	3/10/2015	6/30/2016	6/30/2016 (D)	11/11/2016	8/31/2017	1/25/2018	8/16/2018	2/7/2019	3/28/2011	8/4/2011	6/7/2013	6/30/2016	11/11/2016	8/31/2017	1/24/2018	8/16/2018	2/7/2019	7/1/2016	11/10/2016	9/1/2017	1/26/2018	8/16/2018	2/8/2019
Total Metals (µg/L)																											
Arsenic	**12**	**12**	**10**	--	--	**12**	**12**	**20**	**14**	**7.6**	**14.5**	**17.4**	3.3 U	3.3 U	--	**3.5**	**3.4**	3.3 U	3.3 U	**4.83**	**3.04**	3.3 U	3.3 U	3.3 U	3.3 U	1.0 U	1.0 U
Chromium	11 U	--	--	--	--	11 U	11 U	11 U	11 U	11 U	1.0 UJ	**1.58**	11 U	--	--	11 U	11 U	11 U	11 U	**2.48 J**	**2**	11 U	11 U	11 U	11 U	1.0 U	1.0 U
Copper	--	11 U	11 U	--	--	--	--	--	--	--	5.0 UJ	**24.7**	--	11 U	--	--	--	--	--	**11.9 J**	**19.4**	--	--	--	--	5.0 U	5.0 U
Lead	1.1 U	1.1 U	1.1 U	--	--	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.0 U	**1.51**	1.1 U	1.1 U	--	**3.7**	**1.1**	**2.7**	**7.3**	**5.61**	**2.04**	1.1 U	1.1 U	1.1 U	1.1 U	1.0 U	1.0 U
Mercury	--	--	--	--	--	0.5 U	0.5 U	0.50 U	0.50 U	0.50 U	1.0 U	1.0 U	--	--	--	0.5 U	0.50 U	0.50 U	0.50 U	1.0 U	1.0 U	0.5 U	0.50 U	0.50 U	0.50 U	1.0 U	1.0 U
Nickel	--	--	--	--	--	--	--	--	--	--	**2.43 J**	**1.98**	--	--	--	--	--	--	--	**1.38 J**	**7.79**	--	--	--	--	1.0 U	**1.36**
Zinc	--	--	--	--	--	--	--	--	--	--	5.0 UJ	5.0 U	--	--	--	--	--	--	--	**5.72 J**	**135**	--	--	--	--	5.0 U	5.0 U
Polycyclic Aromatic Hydrocarbons (µg/L)																											
Benzo(a)anthracene	0.012 U	0.0095 U	0.0095 U	--	--	**0.011**	**0.014**	0.0094 U	0.0096 U	0.010 U	0.06 U	0.04 U	0.0095 U	0.0095 U	--	**0.047**	**0.013**	**0.041**	**0.055**	0.06 U	0.04 U	0.0095 U	0.0095 U	0.0099 U	0.011 U	0.06 U	0.04 U
Benzo(a)pyrene	0.012 U	0.0095 U	0.0095 U	--	--	0.0095 UJ	**0.015 J**	0.0094 U	0.0096 U	0.010 U	0.06 U	0.04 U	0.0095 U	0.0095 U	--	**0.038**	**0.022**	**0.033**	**0.071**	0.06 U	0.04 U	0.0095 U	0.0095 U	0.0099 U	0.011 U	0.06 U	0.04 U
Benzo(b)fluoranthene	0.012 U	0.0095 U	0.0095 U	--	--	0.0095 UJ	**0.022 J**	0.0094 U	**0.0120**	0.010 U	0.06 U	0.04 U	0.0095 U	0.0095 U	--	**0.047**	**0.021**	**0.034**	**0.082**	0.06 U	0.04 U	0.0095 U	0.0095 U	0.0099 U	0.011 U	0.06 U	0.04 U
Benzo(ghi)perylene	0.012 U	0.0095 U	0.0095 U	--	--	0.0095 UJ	**0.023 J**	0.0094 U	0.0096 U	0.010 U	0.06 U	0.04 U	0.0095 U	0.0095 U	--	**0.041**	**0.024**	**0.025**	**0.056**	0.06 U	0.04 U	0.0095 U	0.0095 U	0.0099 U	0.011 U	0.06 U	0.04 U
Benzo(j,k)fluoranthene	0.012 U	0.0095 U	0.0095 U	--	--	0.0095 U	0.0095 U	0.0094 U	0.0096 U	0.010 U	0.06 U	0.04 U	0.0095 U	0.0095 U	--	**0.018**	**0.031**	**0.018**	**0.034**	0.06 U	0.04 U	0.0095 U	0.0095 U	0.0099 U	0.011 U	0.06 U	0.04 U
Chrysene	0.012 U	0.0095 U	0.0095 U	--	--	0.0095 U	0.0095 U	0.0094 U	**0.0100**	0.010 U	0.06 U	0.04 U	0.0095 U	0.0095 U	--	**0.035**	**0.028**	**0.032**	**0.062**	0.06 U	0.04 U	0.0095 U	0.0095 U	0.0099 U	0.011 U	0.06 U	0.04 U
Dibenz(a,h)anthracene	0.012 U	0.0095 U	0.0095 U	--	--	0.0095 U	0.0095 U	0.0094 U	0.0096 U	0.010 U	0.06 U	0.04 U	0.0095 U	0.0095 U	--	0.0095 U	0.0095 U	0.0095 U	**0.0110**	0.06 U	0.04 U	0.0095 U	0.0095 U	0.0099 U	0.011 U	0.06 U	0.04 U
Indeno(1,2,3-cd)pyrene	0.012 U	0.0095 U	0.0095 U	--	--	0.0095 UJ	**0.016 J**	0.0094 U	0.0096 U	0.010 U	0.06 U	0.04 U	0.0095 U	0.0095 U	--	**0.028**	**0.023**	**0.023**	**0.054**	0.06 U	0.04 U	0.0095 U	0.0095 U	0.0099 U	0.011 U	0.06 U	0.04 U
Total cPAHs	0.009 U	0.007 U	0.007 U	--	--	**0.008**	**0.020 J**	0.007 U	**0.008**	0.008 U	0.05 U	0.03 U	0.007 U	0.007 U		**0.050**	**0.030**	**0.045**	**0.095**	0.05 U	0.03 U	0.007 U	0.007 U	0.007 U	0.008 U	0.05 U	0.03 U
Polychlorinated Biphenyls (µg/L)																											
Aroclor 1016	--	--	--	--	--	0.048 U	0.047 U	--	--	--	--	--	--	--	--	0.047 U	--	--	--	--	--	0.047 U	--	--	--	--	--
Aroclor 1221	--	--	--	--	--	0.048 U	0.047 U	--	--	--	--	--	--	--	--	0.047 U	--	--	--	--	--	0.047 U	--	--	--	--	--
Aroclor 1232	--	--	--	--	--	0.048 U	0.047 U	--	--	--	--	--	--	--	--	0.047 U	--	--	--	--	--	0.047 U	--	--	--	--	--
Aroclor 1242	--	--	--	--	--	0.048 U	0.047 U	--	--	--	--	--	--	--	--	0.047 U	--	--	--	--	--	0.047 U	--	--	--	--	--
Aroclor 1248	--	--	--	--	--	0.048 U	0.047 U	--	--	--	--	--	--	--	--	0.047 U	--	--	--	--	--	0.047 U	--	--	--	--	--
Aroclor 1254	--	--	--	--	--	0.048 U	0.047 U	--	--	--	--	--	--	--	--	0.047 U	--	--	--	--	--	0.047 U	--	--	--	--	--
Aroclor 1260	--	--	--	--	--	0.048 U	0.047 U	--	--	--	--	--	--	--	--	0.047 U	--	--	--	--	--	0.047 U	--	--	--	--	--
Total PCBs						0.048 U	0.047 U									0.047 U						0.047 U					
Total Petroleum Hydrocarbons (µg/L)																											
Gasoline Range Organics	**75,000**	**55,000**	**50,000**	**48,000**	**27,000**	**27,000**	**27,000**	**63,000**	**8,000**	**9,000**	**33,000**	**31,000**	100 U	100 U	100 U	**2,700**	**850**	**1,600**	**1,300**	**4,000**	**2,200**	500 U	100 U	100 U	100 U	100 U	100 U
Diesel Range Organics	--	--	--	--	--	**3,000 J**	**2,700 J**	6,400 U	**1,600**	**1,700**	**2,000**	**2,600**	--	--	--	**5,400 J**	**3,500**	**4,400**	**4,200**	**8,600**	**19,000**	260 U	260 U	280 U	260 U	50 U	60 U
Lube Oil	--	--	--	--	--	**510**	**870**	410 U	440 U	410 U	250 U	300 U	--	--	--	**1,500 J**	**1,200**	**1,600**	**600**	**680**	**790**	410 U	420 U	450 U	410 U	250 U	300 U
Volatile Organic Compounds (µg/L)																											
1,2,4-Trimethylbenzene	--	--	--	**77**	--	**44 J**	**65 J**	**160**	**97**	**110**	**54**	**67**	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	1.0 U	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	1.0 U	1.0 U
1,3,5-Trimethylbenzene	--	--	--	20 U	--	20 U	**20**	**52**	**30**	50 U	**17**	**33**	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	1.0 U	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	1.0 U	1.0 U
Acetone	--	--	--	500 U	--	1,200 U	1,200 U	1,000 U	500 U	1300 U	50 U	500 U	--	--	5.0 U	12 U	5.0 U	5.0 U	5.0 U	50 U	50 U	12 U	**6.5**	5.0 U	5.0 U	50 U	50.0 U
Benzene	**10**	**13**	**13**	20 U	--	20 U	20 U	20 U	20 U	50 U	0.35 U	3.5 U	1.0 U	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.35 U	0.35 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.35 U	0.35 U
Ethylbenzene	**5,700**	**3,700**	**3,400**	**3,400**	--	**3,700**	**4,300**	**5,200**	**4,300**	**4,700**	**2,600**	**2,800**	1.0 U	1.0 U	0.20 U	**0.38**	**0.25**	**0.27**	0.20 U	1.0 U	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	1.0 U	1.0 U
m,p-Xylene	**12,000**	**8,500**	**7,700**	**6,800**	--	**7,100**	**7,900**	**12,000**	**7,800**	**12,000**	**6,400**	**6,100**	1.0 U	1.0 U	0.4 U	**1.4**	**0.92**	**1.6**	**0.42**	2.0 U	2.0 U	0.4 U	**0.44**	0.40 U	0.40 U	2.0 U	2.0 U
Naphthalene	--	--	--	140 U	--	100 U	100 U	100 U	100 U	250 U	**5.1**	**3.3**	--	--	1.4 U	1.0 U	1.3 U	1.0 U	1.0 U	**0.16**	0.4 U	1.0 U	1.3 U	1.0 U	1.0 U	0.06 U	0.4 U
o-Xylene	**3,400**	**2,100**	**1,900**	**2,200**	--	**1,700**	**1,700**	**3,600**	**1,900**	**3,600**	**1,500**	**1,300**	1.0 U	1.0 U	0.20 U	**0.64**	**0.49**	**0.47**	0.20 U	1.0 U	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	1.0 U	1.0 U
Toluene	**7,400**	**5,800**	**5,500**	**3,800**	--	**1,400**	**1,300**	**5,300**	**980**	**5,500**	**610**	**190**	1.0 U	1.0 U	1 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	--	--	--	20 U	--	20 U	20 U	20 U	20 U	50 U	1.0 U	10 U	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	1.0 U	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	1.0 U	1.0 U
Vinyl Chloride	--	--	--	20 U	--	2.0 U	2.0 U	2.0 U	20 U	50 U	0.20 U	2.0 U	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.2 U

TABLE 4: GROUNDWATER ANALYTICAL RESULTS[1, 2]

Former Kelly-Moore Manufacturing Facility, Seattle, Washington

Analyte	KMW-08						KMW-09					KMW-10					
	7/1/2016	11/10/2016	9/1/2017	1/26/2018	8/16/2019	2/8/2019	11/11/2016	8/31/2017	1/24/2018	8/16/2018	2/7/2019	11/11/2016	8/31/2017	1/25/2018	1/25/2018 (D)	8/16/2018	2/7/2019
Total Metals (µg/L)																	
Arsenic	3.3 U	3.3 U	3.3 U	3.3 U	1.0 U	1.0 U	3.3 U	3.3 U	3.3 U	**2.04**	1.0 U	**9.1**	**10**	**6.8**	**5.7**	**4.61**	**6.72**
Chromium	11 U	11 U	11 U	11 U	1.0 U	1.0 U	11 U	11 U	11 U	**1.40 J**	**1.12**	11 U	11 U	11 U	11 U	**1.35 J**	**2.00 J**
Copper	--	--	--	--	5.0 U	5.0 U	--	--	--	**5.62 J**	5.0 U	--	--	--	--	5.0 UJ	5.0 UJ
Lead	1.1 U	1.1 U	1.1 U	1.1 U	1.0 U	1.0 U	1.1 U	1.1 U	**3.0**	**3.1**	1.0 U	1.1 U	1.1 U	**1.1**	1.1 U	1.0 U	1.0 U
Mercury	0.5 U	0.50 U	0.50 U	0.50 U	1.0 U	1.0 U	0.50 U	0.50 U	0.50 U	1.0 U	1.0 U	0.50 U	0.50 U	0.50 U	0.50 U	1.0 U	1.0 U
Nickel	--	--	--	--	**1.11**	**1.99**	--	--	--	**1.25 J**	1.0 U	--	--	--	--	1.0 UJ	1.0 UJ
Zinc	--	--	--	--	5.0 U	**10.1**	--	--	--	5.0 UJ	5.0 U	--	--	--	--	5.0 UJ	5.0 UJ
Polycyclic Aromatic Hydrocarbons (µg/L)																	
Benzo(a)anthracene	**0.086**	**0.015**	**0.012**	**0.018**	0.06 U	0.04 U	0.0098 U	0.0098 U	**0.020**	0.06 U	0.04 U	0.0098 U	0.0094 U	0.011 U	0.011 U	0.06 U	0.04 U
Benzo(a)pyrene	**0.11**	**0.013**	0.010 U	**0.015**	0.06 U	0.04 U	0.0098 U	0.0098 U	**0.021**	0.06 U	0.04 U	0.0098 U	0.0094 U	0.011 U	0.011 U	0.06 U	0.04 U
Benzo(b)fluoranthene	**0.12**	**0.020**	0.010 U	**0.018**	0.06 U	0.04 U	0.0098 U	0.0098 U	**0.017**	0.06 U	0.04 U	0.0098 U	0.0094 U	0.011 U	0.011 U	0.06 U	0.04 U
Benzo(ghi)perylene	**0.1**	0.0095 U	0.010 U	0.012 U	0.06 U	0.04 U	0.0098 U	0.0098 U	**0.011**	0.06 U	0.04 U	0.0098 U	0.0094 U	0.011 U	0.011 U	0.06 U	0.04 U
Benzo(j,k)fluoranthene	**0.046**	0.0095 U	0.010 U	0.012 U	0.06 U	0.04 U	0.0098 U	0.0098 U	**0.015**	0.06 U	0.04 U	0.0098 U	0.0094 U	0.011 U	0.011 U	0.06 U	0.04 U
Chrysene	**0.09**	**0.042**	**0.012**	**0.028**	0.06 U	0.04 U	0.0098 U	0.0098 U	**0.018**	0.06 U	0.04 U	0.0098 U	0.0094 U	0.011 U	0.011 U	0.06 U	0.04 U
Dibenz(a,h)anthracene	**0.024**	0.0095 U	0.010 U	0.012 U	0.06 U	0.04 U	0.0098 U	0.0098 U	0.011 U	0.06 U	0.04 U	0.0098 U	0.0094 U	0.011 U	0.011 U	0.06 U	0.04 U
Indeno(1,2,3-cd)pyrene	**0.063**	0.0095 U	0.010 U	0.012 U	0.06 U	0.04 U	0.0098 U	0.0098 U	**0.0130**	0.06 U	0.04 U	0.0098 U	0.0094 U	0.011 U	0.011 U	0.06 U	0.04 U
Total cPAHs	**0.14**	**0.018**	**0.008**	**0.021**	0.05 U	0.03 U	0.007 U	0.007 U	**0.028**	0.05 U	0.03 U	0.007 U	0.007 U	0.008 U	0.008 U	0.05 U	0.03 U
Polychlorinated Biphenyls (µg/L)																	
Aroclor 1016	0.047 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor 1221	0.047 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor 1232	0.047 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor 1242	0.047 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor 1248	0.047 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor 1254	0.047 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor 1260	0.047 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total PCBs	0.047 U																
Total Petroleum Hydrocarbons (µg/L)																	
Gasoline Range Organics	**1,000**	**400**	**130**	**120**	**230**	**120**	**370**	**360**	**760**	**940**	**450**	**110**	**3,400**	**270**	**260**	**4,800**	**200**
Diesel Range Organics	**770 J**	370 U	300 U	**450**	**160**	**440**	**1,700**	**2,300**	**3,100**	**3,600**	**3,100**	1,300 U	**1,800**	**2,300**	**2,300**	**1,400**	**970**
Lube Oil	410 U	410 U	480 U	410 U	250 U	300 U	**660**	**810**	**690**	**360**	300 U	420 U	430 U	410 U	410 U	250 U	320 U
Volatile Organic Compounds (µg/L)																	
1,2,4-Trimethylbenzene	0.20 U	0.20 U	0.20 U	0.20 U	1.0 U	1.0 U	0.2 U	0.20 U	0.20 U	1.0 U	1.0 U	**3.7**	**53**	**2.7**	**5.4**	**38**	1.0 U
1,3,5-Trimethylbenzene	0.20 U	0.20 U	0.20 U	0.20 U	1.0 U	1.0 U	0.2 U	0.20 U	0.20 U	1.0 U	1.0 U	**0.38**	**23**	**0.9**	**1.7**	**19**	1.0 U
Acetone	12 U	**10**	5.0 U	5.0 U	50 U	50.0 U	5.0 U	5.0 U	5.0 U	50 U	50 U	5.0 U	100 U	5.0 U	5.0 U	50 U	50 U
Benzene	0.20 U	**0.20**	0.20 U	0.20 U	0.35 U	0.35 U	0.2 U	0.20 U	0.20 U	0.35 U	0.35 U	**0.7**	**8.2**	0.20 U	0.20 U	**1.5**	0.35 U
Ethylbenzene	0.20 U	**0.31**	**0.36**	0.20 U	1.0 U	1.0 U	**3.1**	0.20 U	**0.44**	1.0 U	1.0 U	**1.6**	**810**	**14**	**30**	**370**	1.0 U
m,p-Xylene	0.4 U	**0.76**	**0.69**	0.40 U	2.0 U	2.0 U	**0.51**	0.40 U	0.40 U	2.0 U	2.0 U	**11**	**1100**	**28**	**65**	**1100**	**6.0**
Naphthalene	**1.5**	1.3 U	1.0 U	1.0 U	0.06 U	0.4 U	1.3 U	1.0 U	1.0 U	**0.12**	1.0 U	1.3 U	20 U	1.0 U	1.0 U	**0.51**	0.4 U
o-Xylene	0.20 U	**0.34**	0.20 U	0.20 U	1.0 U	1.0 U	0.2 U	0.20 U	0.20 U	1.0 U	1.0 U	**0.29**	**22**	**0.42**	**0.58**	1.0 U	1.0 U
Toluene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	20 U	**1.0**	**1.0**	1.0 U	1.0 U
Trichloroethene	0.20 U	0.20 U	0.20 U	0.20 U	1.0 U	1.0 U	0.2 U	0.20 U	0.20 U	1.0 U	1.0 U	0.2 U	4.0 U	0.20 U	0.20 U	1.0 U	1.0 U
Vinyl Chloride	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.2 U	0.2 U	0.20 U	0.20 U	0.20 U	0.2 U	0.2 U	4.0 U	0.20 U	0.20 U	0.20 U	0.2 U

Notes:

1. Data qualifiers are as follows:
   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.
2. Bold values indicate detections.
3. KMW-02 was abandoned by backfilling with bentonite on February 4, 2015, and was replaced June 28, 2016.
4. KMW-03 was destroyed during building demolition on June 3, 2015, and was replaced June 27, 2016.

Abbreviations:

-- = not analyzed
µg/L = micrograms per liter
cPAHS = carcinogenic polycyclic aromatic hydrocarbons
(D) = duplicate sample collected
mg/L - milligram per liter
R = replaced

TABLE 5: SOIL VAPOR EXTRACTION SYSTEM ANALYTICAL SUMMARY[1, 2, 3]

Former Kelly-Moore Manufacturing Facility, Seattle, Washington

Sample	Date[4]	Benzene (ppmv)	TPH as Hexane (ppmv)
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	<10
	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**
Influent	11/7/17	**0.18**	**650 J**
	5/30/19	<0.1	**1,100**
	6/4/19	<0.1	**640**
Effluent	11/7/17	<0.03	**28**
	5/30/19	<0.1	**41**
	6/4/19	<0.1	**20**

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 reporting 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.

Abbreviations:

ppmv = parts per million volume
TPH = total petroleum hydrocarbons
SVE = soil vapor extraction

TABLE 6a : FLAME IONIZATION DETECTOR READINGS, SVE OPERATIONS WITHOUT AIR SPARGING

Former Kelly-Moore Manufacturing Facility, Seattle, Washington

Well	FID Readings[1] (ppmv)																
	11/7/2017	12/13/2017	1/16/2018	2/13/2018	3/21/2018	4/24/2018	5/30/2018	6/29/2018	7/31/2018	8/31/2018	9/19/2018	10/16/2018	4/1/2019	4/3/2019	5/3/2019	5/6/2019	5/29/2019
Western SVE Wells																	
West Manifold	331	19.4	NM	NM	NM	NM	8.3	NM	NM	191	321	273.4	NM	87	2.2	NM	13.2
SVE-09	NM	NM	0	53.5	53.5	7.6	7.1	246.3	505.3	118	253	154.2	NM	162.1	1.9	NM	12.1
SVE-10	NM	54.5	55.5	258.1	258.1	14.4	70.8	794.6	1173	764	1204	828.6	NM	232	8.5	NM	54.5
SVE-11	NM	NM	6.7	0.7	0.7	6.2	7.9	30.8	116.2	90	112	166	NM	19.2	3.5	NM	4.6
SVE-12	NM	30.7	10.7	65.2	65.2	14.8	3.1	55.9	357.9	613	1005	824.4	NM	42.9	12.3	NM	47.1
SVE-13	NM	11.7	4.1	27.6	27.6	7.4	3.3	18	20	183	417	409.6	NM	3.4	1.8	NM	4.2
Eastern SVE Wells																	
East Manifold	540	106.5	NM	NM	NM	NM	5	NM	NM	NM	340	54.2	NM	204.4	4.9	NM	20.9
SVE-02	NM	NM	0	0.4	0	0.1	0.2	4.3	32	NM	16.5	9.7	NM	4.4	0	NM	0.2
SVE-04	NM	NM	16.6	8.3	0	0.5	0.7	94.9	137.8	NM	313	8.2	NM	54.3	0	NM	28.3
SVE-06	NM	NM	52.5	24.5	20.8	13.9	15	326.9	387.6	NM	109	8.3	NM	401.7	1	NM	11
SVE-08	NM	NM	1.9	3.5	1.2	6.3	0.4	38.4	100.6	NM	64	11.1	NM	57.7	3.2	NM	2.4
SVE-07	NM	NM	4.7	4.2	24.8	7.5	0.8	61.9	299.6	NM	98	13.5	NM	66.8	4.5	NM	7.8
SVE-05	NM	1,105	828.9	483.7	1,811	43	105	>3980	>3980	NM	NM	2,093	NM	3,222	144	NM	490
SVE-03	NM	446.8	246.7	85.9	622.8	21.8	65.8	>3980	>3980	NM	NM	2543	NM	1494	21.5	NM	147.2
SVE-01	NM	11.0	6.3	2.7	2.1	5.8	4.9	98.6	238	NM	12.7	58.4	NM	3.6	0	NM	0
Influent	358	85.6	72.3	16.4	45.2	6.8	NM	258.1	315.7	190	336	58.4	1188	165	16.1	15.4	21.6
Effluent	0	1.2	0.2	0.6	0.7	0.2	NM	17.3	28.8	5.9	17.7	11.1	9	1.1	0.1	0.1	0

Notes:

1. FID was calibrated to 100 ppmv isobutulene prior to 3/21/2018. After 3/21/2018, FID was calibrated to 100-ppmv hexane

Abbreviations:

FID = flame ionization detector
NM = not measured
ppmv = parts per million by volume
SVE = soil vapor extraction

TABLE 6b : FLAME IONIZATION DETECTOR READINGS, SVE OPERATIONS WITH AIR SPARGING

Former Kelly-Moore Manufacturing Facility, Seattle, Washington

Well	FID Readings[1,2] (ppmv)				
	5/29/2019	5/29/2019	5/30/2019	6/4/2019	7/2/2019
Western SVE Wells					
West Manifold	NM	NM	173	43.2	38.4
SVE-09	NM	79.2	18.1	14	15.9
SVE-10	NM	1464	216	120	69.5
SVE-11	NM	1421	99	32.6	23.8
SVE-12	NM	2101	371	82.5	52.9
SVE-13	NM	2696	235	52.1	58
Eastern SVE Wells					
East Manifold	NM	NM	93.3	88.9	154
SVE-02	NM	11.2	0	0	0
SVE-04	NM	9.3	18.6	14.3	30.3
SVE-06	NM	7.3	0	0	0
SVE-08	NM	6.1	1	2	0.3
SVE-07	NM	6.1	2.5	3.4	5.7
SVE-05	NM	92	393	446	457
SVE-03	NM	40.3	163.1	121.8	213
SVE-01	NM	6.3	0.6	0	4.5
Influent	2322	1058	144.3	50.4	53
Effluent	79.5	20.1	3	1.2	0

Notes:

1. FID was calibrated to 100 ppmv hexane.
2. Air sparging in the western SVE area began on May 29, 2019

Abbreviations:

FID = flame ionization detector
NM = not measured
ppmv = parts per million by volume
SVE = soil vapor extraction

TABLE 7: SOIL VAPOR EXTRACTION SYSTEM DESTRUCTION REMOVAL EFFICIENCIES

Former Kelly-Moore Manufacturing Facility, Seattle, Washington

Date	FID Reading at Influent[1] (ppm)	FID Reading at Effluent[1] (ppm)	Destruction Removal Efficiency[2] (percent)
11/7/17	358.0	0.0	100.0%
11/15/17	547.5	3.7	99.3%
11/21/17	123.7	1.9	98.5%
12/5/17	59.6	0.2	99.7%
12/13/17	85.6	1.2	98.6%
1/16/18	72.3	0.2	99.7%
2/13/18	16.4	0.6	96.3%
3/21/18	45.0	0.7	98.4%
4/24/18	6.8	0.2	97.1%
6/29/18	258.1	17.3	93.3%
7/31/18	315.7	28.8	90.9%
8/31/18	190.0	5.9	96.9%
9/19/18	336.0	17.7	94.7%
10/16/18	58.4	11.1	81.0%
4/1/19	1188.0	9.0	99.2%
4/3/19	165.0	1.1	99.3%
5/3/19	16.1	0.1	99.4%
5/6/19	15.4	0.1	99.4%
5/29/19	21.6	0.0	100.0%
5/29/19	2322.0	79.5	96.6%
5/29/19	1058.0	20.1	98.1%
5/30/19	144.3	3.0	97.9%
6/4/19	50.4	1.2	97.6%
7/2/19	53.0	0.0	100.0%

Notes:

1. After 3/21/2018, all FID measurements are calibrated to 100 ppm hexane in accordance with Puget Sound Clean Air Agency requirements.
2. Destruction removal efficiency generally exceeds the Puget Sound Clean Air Agency standard of 95% removal. In mid-2018, destruction removal efficiency was reduced. Troubleshooting and investigation suggested that FID calibration drift and sampling error were the likely cause.

Abbreviations:

FID = flame ionization detector

ppm = parts per million

TABLE 8: SOIL VAPOR EXTRACTION SYSTEM PERFORMANCE SUMMARY

Former Kelly-Moore Manufacturing Facility, Seattle, Washington

Date	Soil Vapor Concentration[1] (ppm as Hexane)	Destruction Removal Efficiency (%)	Operating Factor[2] (% Runtime)	Extraction Flow Rate (SCFM)[3]	Mass Removal Rate (Hexane equivalent) (lb/hr)	Total Mass Removed (Hexane equivalent) (lbs)
11/7/17	358.0	100%	100%	215	0.35	0
11/15/17	547.5	99%	80%	215	0.43	64
11/21/17	123.7	98%	100%	215	0.12	100
12/5/17	59.6	100%	99%	135	0.04	123
12/13/17	85.6	99%	84%	249	0.08	188
1/16/18	72.3	100%	45%	127	0.02	211
2/13/18	16.4	96%	100%	240	0.02	260
3/21/18	45.0	98%	99%	353	0.07	509
4/24/18	6.8	97%	88%	142	0.00	526
6/29/18	258.1	93%	71%	225	0.19	1441
7/31/18	315.7	91%	36%	251	0.13	2172
8/31/18	190.0	97%	100%	242	0.21	3277
9/19/18	336.0	95%	100%	83	0.13	3948
10/16/18	58.4	81%	100%	238	0.06	3949
4/1/19	1188.0	99%	100%	237	1.28	4038
4/3/19	165.0	99%	99%	236	0.18	4177
5/3/19	16.1	99%	100%	191	0.01	4189
5/6/19	15.4	99%	98%	187	0.01	4207
5/29/19	21.6	100%	93%	184	0.02	4230
5/29/19	2322.0	97%	100%	184	1.95	6910
5/29/19	1058.0	98%	100%	184	0.89	8132
5/30/19	144.3	98%	95%	161	0.10	8272
6/4/19	50.4	98%	100%	160	0.04	8328
7/2/19	53.0	100%	99%	154	0.04	8408

Notes:

1. After 3/21/2018, all FID measurements are calibrated to 100ppm Hexane in accordance with Puget Sound Clean Air Agency requirements.
2. Operating factor is calculated as the percentage of operating time standard of 95% removal. In mid-2018, removal efficiency was reduced. Troubleshooting and investigation suggested that FID calibration drift and sampling error were likely the cause of this issue.
3. Reported flow rates on 11/7/2017, 11/15/2017, 2/13/2018, and 4/1/2019 are estimates

Abbreviations:

ppm = parts per million, volume
FID = flame ionization detector
NM = not measured
SCFM = standard cubic feet per minute

TABLE 9: AIR QUALITY MONITORING RESULTS [1, 2]

Former Kelly-Moore Manufacturing Facility, Seattle, Washington

Results reported in micrograms per cubic meter (µg/m^3)

Compound	MTCA Method B Indoor Air Cleanup Level[3]		MTCA Method C Indoor Air Cleanup Level[4]		KM-AS-1-101618 (Above SVE-05)		KM-AS-1-060519 (Above SVE-05)		KM-AS-2-101618 (Above SVE-03)		KM-AS-2-060519 (Above SVE-03)		KM-AS-3-101618 (Ambient)		KM-AS-3-060519 (Ambient)	
	Non cancer	Cancer	Non cancer	Cancer												
1,1,1-Trichloroethane	2,286	-	5,000	-	0.55	U	0.55	U	0.55	U	0.55	U	0.55	U	0.55	U
1,1,2,2-Tetrachloroethane	-	0.043	-	0.431	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U
1,1,2-Trichloroethane	0.091	0.156	0.200	1.563	0.055	U	0.11	U	0.055	U	0.11	U	0.055	U	0.11	U
1,1-Dichloroethane	-	1.56	-	15.63	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U
1,1-Dichloroethene	91.4	-	200.0	-	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U
1,2,3-Trimethylbenzene	-	-	-	-	2.5	U	NA		2.5	U	NA		2.5	U	NA	
1,2,4-Trichlorobenzene	0.914	-	2.000	-	0.74	U	0.74	U	0.74	U	0.74	U	0.74	U	0.74	U
1,2,4-Trimethylbenzene	3.20	-	7.00	-	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
1,2-Dibromoethane	4.11	0.004	9.00	0.042	0.077	U	0.077	U	0.077	U	0.077	U	0.077	U	0.077	U
1,2-Dichlorobenzene	91.4	-	200.0	-	0.6	U	0.6	U	0.6	U	0.6	U	0.6	U	0.6	U
1,2-Dichloroethane	3.20	0.096	7.00	0.962	**0.19**		**0.11**		**0.17**		**0.11**		0.11		0.077	
1,2-Dichloropropane	1.83	0.250	4.00	2.500	0.23	U	0.23	U	0.23	U	0.23	U	0.23	U	0.23	U
1,3,5-Trimethylbenzene	-	-	-	-	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
1,3-Butadiene	0.914	0.083	2.000	0.833	**0.48**		0.022	U	**0.44**		0.022		0.19		0.022	U
1,3-Dichlorobenzene	-	-	-	-	0.6	U	0.6	U	0.6	U	0.6	U	0.6	U	0.6	U
1,4-Dichlorobenzene	366	0.227	800	2.273	0.24	U	0.24	U	0.24	U	0.24	U	0.24	U	0.24	U
1,4-Dioxane	13.7	0.500	30.0	5.000	0.36	U	0.36	U	0.36	U	0.36	U	0.36	U	0.36	U
1-Butanol	-	-	-	-	6.1	U	NA		6.1	U	NA		6.1	U	NA	
2-Butanone	2,286	-	5,000	-	**15**		**17**		**15**		**17**		2.9	U	2.9	U
2-Hexanone	-	-	-	-	4.1	U	4.1	U	4.1	U	4.1	U	4.1	U	4.1	U
2-Pentanone	-	-	-	-	3.5	U	NA		3.5	U	NA		3.5	U	NA	
3-Hexanone	-	-	-	-	4.1	U	NA		4.1	U	NA		4.1	U	NA	
3-Pentanone	-	-	-	-	3.5	U	NA		3.5	U	NA		3.5	U	NA	
Acetaldehyde	4.11	1.14	9.00	11.36	**87**		NA		**32**		NA		9	U	NA	
Acetone	14,171	-	31,000	-	**47**		**18**		**41**		**16**		17		7.5	
Acetonitrile	27.4	-	60.0	-	1.7	U	NA		1.7	U	NA		1.7	U	NA	
Acrolein	-	-	-	-	**2.6**		**1.1**		**1.6**		0.92	U	0.92	U	0.92	U
Acrylonitrile	0.914	0.037	2.000	0.368	0.22	U	NA		0.22	U	NA		0.22	U	NA	
Benzene	13.7	0.321	30.0	3.205	**1.9**		0.32	U	**1.7**		0.32	U	0.98		0.32	U
Benzyl chloride	0.457	0.051	1.000	0.510	0.052	U	0.052	U	0.052	U	0.052	U	0.052	U	0.052	U
Bromoform	-	2.27	-	22.73	2.1	U	2.1	U	2.1	U	2.1	U	2.1	U	2.1	U
Bromomethane	2.29	-	5.00	-	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U
Butanal	-	-	-	-	2.9	U	NA		2.9	U	NA		2.9	U	NA	
Carbon disulfide	320	-	700	-	6.2	U	6.2	U	6.2	U	6.2	U	6.2	U	6.2	U
Carbon tetrachloride	45.7	0.417	100.0	4.167	0.63	U	0.63	U	0.63	U	0.63	U	0.63	U	0.63	U
CFC-11	320	-	700	-	**1.9**		2.2	U	**1.8**		2.2	U	1.7		2.2	U
CFC-113	13,714	-	30,000	-	0.82		0.77	U	0.77	U	0.77	U	0.77	U	0.77	U
CFC-12	45.7	-	100.0	-	3.1		2.2		3.1		2.3		3.1		2.3	
Chlorobenzene	22.9	-	50.0	-	0.46	U	0.46	U	0.46	U	0.46	U	0.46	U	0.46	U
Chlorodifluoromethane	22,857	-	50,000	-	**1.9**		NA		**1.8**		NA		1.5		NA	
Chloroethane	4,571	-	10,000	-	0.26	U	2.6	U	0.26	U	2.6	U	0.26	U	2.6	U
Chloroform	44.8	0.109	98.0	1.087	**0.35**		**0.24**		**0.29**		**0.24**		0.14		0.083	
Chloromethane	41.1	-	90.0	-	**1.5**		2.1	U	1.4		2.1	U	1.4		2.1	U
cis-1,2-Dichloroethene	-	-	-	-	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U
cis-1,3-Dichloropropene	-	-	-	-	0.45	U	0.45	U	0.45	U	0.51		0.45	U	0.45	U
Cyclohexane	2,743	-	6,000	-	6.9	U	6.9	U	6.9	U	6.9	U	6.9	U	6.9	U
Cyclopentane	-	-	-	-	**0.41**		NA		0.29	U	NA		0.29	U	NA	
Dibromochloromethane	-	0.093	-	0.926	0.085	U	0.085	U	0.085	U	0.085	U	0.085	U	0.085	U
Dichlorobromomethane	-	0.068	-	0.676	0.067	U	0.067	U	0.067	U	0.067	U	0.067	U	0.067	U
Ethanol	-	-	-	-	**5,900**	J	**1,500**	J	**5,300**	J	**1,400**	J	29	J	150	J
Ethylbenzene	457	-	1,000	-	**1.3**		0.43	U	**1.2**		0.43	U	0.61		0.43	U
F-114	-	-	-	-	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U

TABLE 9: AIR QUALITY MONITORING RESULTS [1, 2]

Former Kelly-Moore Manufacturing Facility, Seattle, Washington

Results reported in micrograms per cubic meter (µg/m^3)

Compound	MTCA Method B Indoor Air Cleanup Level[3]		MTCA Method C Indoor Air Cleanup Level[4]		KM-AS-1-101618 (Above SVE-05)		KM-AS-1-060519 (Above SVE-05)		KM-AS-2-101618 (Above SVE-03)		KM-AS-2-060519 (Above SVE-03)		KM-AS-3-101618 (Ambient)		KM-AS-3-060519 (Ambient)	
	Non cancer	Cancer	Non cancer	Cancer												
Hexachlorobutadiene	-	0.114	-	1.136	0.21	U	0.21	U	0.21	U	0.21	U	0.21	U	0.21	U
Hexanal	-	-	-	-	**11**		NA		**7.9**		NA		4.1	U	NA	
Hexane	320	-	700	-	**4.2**		3.5	U	3.5	U	3.5	U	3.5	U	3.5	U
Iodomethane	-	-	-	-	0.58	U	NA		0.58	U	NA		0.58	U	NA	
Isobutene	-	-	-	-	**1.5**		NA		**1.4**		NA		0.92	U	NA	
Isoprene	-	-	-	-	**0.51**		NA		**0.59**		NA		0.28	U	NA	
Isopropyl alcohol	-	-	-	-	**13**		8.6	U	**11**		8.6	U	8.6	U	8.6	U
m, p-Xylene	-	-	-	-	**5**		1.2		**4.5**		1.3		2		1.1	
Methacrolein	-	-	-	-	2.9	U	NA		2.9	U	NA		2.9	U	NA	
Methyl isobutyl ketone	1,371	-	3,000	-	4.1	U	4.1	U	4.1	U	4.1	U	4.1	U	4.1	U
Methyl t-butyl ether	1,371	9.6	3,000	96.2	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U
Methyl vinyl ketone	-	-	-	-	2.9	U	NA		2.9	U	NA		2.9	U	NA	
Methylene chloride	274	250	600	2,500	87	U	87	U	87	U	87	U	87	U	87	U
Naphthalene	1.37	0.074	3.00	0.735	0.59	J	**0.14**		0.55	J	**0.14**		0.27	J	0.079	U
o-Xylene	45.7	-	100.0	-	**1.7**		**0.44**		**1.5**		**0.46**		0.70		0.43	U
Pentanal	-	-	-	-	3.5	U	NA		3.5	U	NA		3.5	U	NA	
Pentane	-	-	-	-	**9**		3	U	**8.5**		3	U	5.3		3	U
Propene	-	-	-	-	**23**		0.69	U	**20**		0.69	U	4.5		0.69	U
Styrene	457	-	1,000	-	**1.3**		0.85	U	**1.1**		0.86	U	0.85	U	0.85	U
Tetrachloroethene	18.3	9.62	40.0	96.15	0.68	U	6.8	U	0.68	U	6.8	U	0.68	U	6.8	U
Toluene	2,286	-	5,000	-	**7.5**		**2.3**		**7.0**		**2.1**		3.4		1.5	
trans-1,2-Dichloroethene	27.4	-	-	-	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U
trans-1,3-Dichloropropene	-	-	-	-	0.45	U	0.45	U	0.45	U	0.45	U	0.45	U	0.45	U
Trichloroethene	0.914	0.370	2.000	6.300	0.27	U	0.27	U	0.27	U	0.27	U	0.27	U	0.27	U
Vinyl acetate	91.4	-	200.0	-	7	U	7	U	7	U	7	U	7	U	7	U
Vinyl chloride	45.7	-	100.0	-	0.26	U	0.26	U	0.26	U	0.26	U	0.26	U	0.26	U

Notes

1. Data qualifiers are as follows
   J = The result is estimated.
   U = Analyte not detected above the indicated laboratory reporting limit.
2. Values in **bold** were above the outdoor ambient concentration.
3. MTCA Method B Indoor Air Cleanup Levels, Draft Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action, October 2009 and updated in April 2018.
4. MTCA Method C Indoor Air Cleanup Levels, Draft Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action, October 2009 and updated in April 2018.

Abbreviations

- = there is no clean up level for this compound
MTCA = Model Toxics Control Act
NA = not analyzed

Appendix A

WATER LEVEL MONITORING RECORD

amec foster wheeler

Project Name: Kelly-Moore Project and Task Number: 14697

Date: 8/16/18 Measured by: Luke Kerner Instrument Used: Solinst Model 101

Note: For you convenience, the following abbreviations may be used.

P = Pumping I = Inaccessible D = Dedicated Pump

ST = Steel Tape ES = Electric Sounder MP = Measuring Point WL = Water Level

Well No.	Time	MP Elevation (feet)	Water Level Below MP (feet)	Water Level Elevation (feet)	Previous Water Level Below MP	Remarks
KMW-02R	1358	21.63	9.96	11.67		
KMW-03R	1353	21.54	9.93	11.61		
KMW-04	1350	18.56	7.06	11.50		
KMW-06	1400	19.80	8.29	11.51		
KMW-07	1356	21.63	9.96	11.67		
KMW-08	1354	21.65	10.00	11.65		
KMW-09	1402	18.14	6.64	11.50		
KMW-10	1404	20.39	9.01	11.38		

amec foster wheeler

GROUNDWATER SAMPLING LOG
Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER KMW-02R

Project Name: Kelly-Moore

Date: 8/16/18

Project Number: 14697

Weather Conditions: Overcast, Slight Rain

Location: Seattle, WA

Sampler: L. Kerner

Wind Speed/Direction: N/A

WELL INFORMATION

Casing Diameter (in): 2

Top of Casing Elevation (ft): 9.96

Initial Depth to Water (ft): 2

Wellhead Condition: Good

Groundwater Elevation (ft):

Depth of Well Casing (ft):

Actual Purge Volume (gal): ≈2-2.5

PURGING MEASUREMENTS

WL (ft btoc)	Time	pH (std. units)	SC (ms/cm)	Temp. (°C)	ORP (mv)	DO (mg/L)	Turbidity (NTUs)	Notes
9.96	8:26	5.95	0.178	14.3	276.6	12.1	17.1	
9.95	8:31	5.87	0.175	14.7	282.3	0.99	15.9	
9.95	8:36	5.87	0.175	14.8	243	0.88	18.3	
9.96	8:39	5.85	0.174	14.8	251.3	0.80	25.0	
9.95	8:41	5.85	0.174	14.7	262	0.72	29.2	
9.95	844	5.85	0.174	14.7	264.3	0.69	29.1	
9.95	847	5.85	0.174	14.6°	269	0.66	35.9	
9.95	852	5.86	0.173	14.5	209	0.62	40	
9.96	857	5.85	0.173	14.6°	246	0.59	45	
9.95	9:02	5.85	0.173	14.5	256.7	0.57	48	
9.95	9:05	5.85	0.173	14.5	265	0.56	59	Bubbles in Turbidity
9.95	9:08	5.85	0.173	14.5	269	0.55	33 31.5	
9.95	911	5.85	0.173	14.5	272	0.54	31.2	
9.95	914	5.85	0.173	14.5	274	0.55	30.8	

Sample ID No.: KMW-02R-08/16/18

Water Level Ind. Model & No.: Solinst 101

ORP/DO Meter Model & No.: YSI - ProDSS

Purge Equipment Used: Peristaltic w/ Dedicated Tubing

Sampling Equipment Used: YSI - Pro DSS

Purge Start Time: 8:24

Purge Completion Time: 914

Average Purge Rate (mL/min): 175-200

Analytical Lab: Friedman & Bruya

Sample Collection Time: 9:15

Purging Method: Peristaltic SAA

Sample Containers Used: Lab Provided

Chemical Analyses: See COC

Other Field Observations: Indoors. Leave New tubing inside well. Turbidity and ORP did not stabilize after >45 minutes.

amec foster wheeler

GROUNDWATER SAMPLING LOG
Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER KMW-03R

Project Name: Kelly Moore

Date: 8/16/18

Project Number: 14697

Weather Conditions: Overcast

Location: Seattle WA

Sampler: L. Kerns

Wind Speed/Direction: N/A

WELL INFORMATION

Casing Diameter (in): 2

Top of Casing Elevation (ft):

Initial Depth to Water (ft): 9.93

Wellhead Condition: Good

Groundwater Elevation (ft):

Depth of Well Casing (ft):

Actual Purge Volume (gal): 2.5

PURGING MEASUREMENTS

WL (ft btoc)	Time	pH (std. units)	SC (ms/cm)	Temp. (°C)	ORP (mv)	DO (mg/L)	Turbidity (NTUs)	Notes
9.93	1210	6.89	0.412	18.3	235.5	~~1.69~~ 0.90	7.8	
9.93	1215	6.96	0.398	18.3	203	0.60	10.2	
9.93	1220	6.99	0.397	18.4	164	0.57	16.5	
9.93	1225	7.00	0.389	18.3	158	0.55	19.2	Bubbles in meter. Turn upside down
9.94'	1230	7.02	0.382	18.2	143	0.51	10	
9.95'	1235	7.03	0.384	18.3	133	0.50	10	
9.95'	1238	7.03	0.378	18.3	122	0.49	11	
9.95'	1241	7.04	0.376	18.2	114	0.47	11	
9.95'	1244	7.03	0.378	18.3	112	0.47	10	

Sample ID No.: KMW-03R-081618

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

ORP/DO Meter Model & No.: YSI Pro DSS

Purge Equipment Used: Geo Pump I

Sampling Equipment Used: YSI Pro DSS

Purge Start Time: 1205

Purge Completion Time: 1245

Average Purge Rate (mL/min): ≈200

Analytical Lab: Friedman & Bruya

Sample Collection Time: 1250

Purging Method: SAA

Sample Containers Used: LAB Provided

Chemical Analyses: See COC

Other Field Observations: INDOORS. No Smell, Clear.
+ Take Duplicate Sample KMW-03R-9-081618 @ 1255

amec foster wheeler

GROUNDWATER SAMPLING LOG
Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER KMW-04

Project Name: Kelly - Moore
Date: 8/16/18
Project Number: 14697
Weather Conditions: Overcast
Location: Seattle, WA
Sampler: L. Kerner
Wind Speed/Direction:

WELL INFORMATION

Casing Diameter (in): 2
Groundwater Elevation (ft):
Top of Casing Elevation (ft):
Depth of Well Casing (ft):
Initial Depth to Water (ft): 7.06
Actual Purge Volume (gal): 2gal
Wellhead Condition: Good. Could use new Bolts

PURGING MEASUREMENTS

WL (ft btoc)	Time	pH (std. units)	SC (ms/cm)	Temp. (°C)	ORP (mv)	DO (mg/L)	Turbidity (NTUs)	Notes
7.06	1350	6.23	0.370	16.7	130	1.12	7.0	Silt in beginning some
7.06	1355	6.16	0.353	17.0	123	0.70	9.0	
7.07	1400	6.11	0.326	17.2	121	0.68	9.5	
7.07	1405	6.11	0.326	17.2	110	0.66	8.0	
7.07	1408	6.09	0.325	17.5	104	0.65	7.8	Sun comes out.
7.08	1411	6.09	0.326	17.8	101	0.64	7.9	
7.08	1414	6.09	0.326	18.0	99	0.63	7.9	

Sample ID No.: KMW-04-081618
Water Level Ind. Model & No.: Solinst Model 101
ORP/DO Meter Model & No.: YSI Pro Dss
Purge Equipment Used: GeoPump I w/ Dedicated Tubing
Sampling Equipment Used: YSI Pro DSS

Purge Start Time: 1345
Sample Collection Time: 1430
Purge Completion Time: 1414
Purging Method: Peristaltic SAA
Average Purge Rate (mL/min): 200
Sample Containers Used: LAB Provided 9 total
Analytical Lab: Friedman Bruya
Chemical Analyses: See COC

Other Field Observations: No Smell, No Sheen

amec foster wheeler

GROUNDWATER SAMPLING LOG
Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER KMW-06

Project Name: Kelly-Moore

Date: 8/16/18

Project Number: 14697

Weather Conditions: Overcast

Location: Seattle, WA

Sampler: L. Kerner

Wind Speed/Direction: NONE

WELL INFORMATION

Casing Diameter (in): 2

Groundwater Elevation (ft):

Top of Casing Elevation (ft):

Depth of Well Casing (ft):

Initial Depth to Water (ft): 8.29'

Actual Purge Volume (gal): ~2gal

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
8.29	1439	6.30	0.502	19.4	110	0.71	23.5	Clear
8.30	1444	6.31	0.485	19.8	66	0.52	23.5	
8.30	1449	6.32	0.471	19.8	48	0.46	21	
8.30	1454	6.32	0.456	19.9	30	0.43	21.4	
8.30	1459	6.33	0.446	19.9	11	0.40	17.7	
8.31'	1504	6.33	0.438	19.9	-6	0.39	17.4	
8.31'	1509	6.33	0.432	19.9	-21	0.38	19.6	
8.30'	1512	6.33	0.430	19.9	-27	0.37	20.6	
8.30'	1515	6.33	0.427	19.9	-32	0.37	18.2	
8.30'	1518	6.33	0.424	19.9	-36	0.37	18.0	
8.30'	1520	6.33	0.421	19.8	-39	0.37	18.4	

Sample ID No.: KMW-06-

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

ORP/DO Meter Model & No.: YSI Pro DSS

Purge Equipment Used: Geo Pump I w/ Dedicated Tubing

Sampling Equipment Used: YSI Pro DSS

Purge Start Time: 1434

Sample Collection Time: 1520

Purge Completion Time: 1520

Purging Method: SAA

Average Purge Rate (mL/min): 200

Sample Containers Used: LAB Provided 9 TOT

Analytical Lab: Friedman Bruya

Chemical Analyses: See COC

Other Field Observations: ORP & SC would not stabilize after 45 minutes. Collect Sample.

amec foster wheeler

GROUNDWATER SAMPLING LOG
Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER KMW-07

Project Name: Kelly - Moore

Date: 8/16/18

Project Number: 14697

Weather Conditions: OVERCAST

Location: Seattle, WA

Sampler: L Kerner

Wind Speed/Direction: N/A

WELL INFORMATION

Casing Diameter (in): 2

Top of Casing Elevation (ft):

Initial Depth to Water (ft): 9.96

Wellhead Condition: OK

Groundwater Elevation (ft):

Depth of Well Casing (ft):

Actual Purge Volume (gal): 7

PURGING MEASUREMENTS

WL (ft btoc)	Time	pH (std. units)	SC (ms/cm)	Temp. (°C)	ORP (mv)	DO (mg/L)	Turbidity (NTUs)	Notes
9.96	940	6.08	0.210	15	312.5	1.00	22.4	
9.96	945	6.02	0.210	14.9	311.5	0.79	27.0	
9.98	9:50	6.00	0.214	15	308.5	0.72	27.8	
9.99	9:53	6.05	0.213	15	305	0.67	30	
9.98	9:56	6.05	0.213	15	224	0.65	29	
9.98	9:59	6.04	0.213	15.2	245	0.64	28	
9.98	10:02	6.03	0.212	15.0	256	0.61	30	
9.98	10:05	6.03	0.212	15	260	0.60	31	
9.98	10:08	6.02	0.212	15.2	264.5	0.61	30	
9.98	10:11	6.02	0.212	15.3	266	0.61	29	
--	10:14	6.02	0.211	15.4	267	0.60	30	
--	10:17	6.02	0.211	15.4	268	0.60	31	
--	10:20							

Sample ID No.: KMW-07-081618

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

ORP/DO Meter Model & No.: YSI Pro DSS

Purge Equipment Used: Geo Pump w/ dedicated Tubing.

Sampling Equipment Used: YSI Pro DSS

Purge Start Time: 9:35

Purge Completion Time: 10:17

Average Purge Rate (mL/min): 200

Analytical Lab: Fremont Analytical

Sample Collection Time: ~~9:20~~ 10:20

Purging Method: SAA

Sample Containers Used: 27 Bottles

Chemical Analyses: See COC

Other Field Observations: Odors. MS/MSD - 3x volume

amec foster wheeler

GROUNDWATER SAMPLING LOG
Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER KMW-08

Project Name: Kelly-Moore

Date: 8/16/18

Project Number: 14697

Weather Conditions: Overcast

Location: Seattle, WA

Sampler: L. Kerner

Wind Speed/Direction: N/A

WELL INFORMATION

Casing Diameter (in): 2

Top of Casing Elevation (ft):

Initial Depth to Water (ft): 10'

Wellhead Condition:

Groundwater Elevation (ft):

Depth of Well Casing (ft):

Actual Purge Volume (gal): 2.5 gl

PURGING MEASUREMENTS

WL (ft btoc)	Time	pH (std. units)	SC (ms/cm)	Temp. (°C)	ORP (mv)	DO (mg/L)	Turbidity (NTUs)	Notes
10'	1110	6.88	0.717	15.7	263	0.91	1200	Drain water, orange FLOC
10.01'	1115	5.94	0.199	15.8	260	7.6	25	
10'	1120	5.92	0.197	15.7	252	0.68	12.9	
9.99'	1125	5.93	0.203	15.7	234	0.62	9.1	
9.99'	1128	5.93	0.204	15.7	244	0.61	~~8.4~~ 9.3	
10.00'	1131	5.94	0.208	15.7	248	0.59	9.2	
10.01'	1134	5.94	0.209	15.7	249	0.58	9.5	
10.02'	1137	5.95	0.211	15.7	248	0.58	10.1	

Sample ID No.: KMW-08-081618

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

ORP/DO Meter Model & No.: YSI ProRss

Purge Equipment Used: Geo Pump peristaltic w/ Dedicated Tubing

Sampling Equipment Used: YSI ProRss

Purge Start Time: 1105

Purge Completion Time: 1137

Average Purge Rate (mL/min): 200

Analytical Lab: Friedman Bruya

Sample Collection Time: 1140

Purging Method: Peristaltic

Sample Containers Used: Lab provided

Chemical Analyses: See COC

Other Field Observations: Indoors. Heavy orange floc first 2000 mL

GROUNDWATER SAMPLING LOG
Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER KMW-09

Project Name: Kelly-Moore

Date: 8/16/18

Project Number: 14697

Weather Conditions: OVERCAST

Location: Cunningham

Sampler: L Kerner

Wind Speed/Direction: NONE / NA

WELL INFORMATION

Casing Diameter (in): 2

Top of Casing Elevation (ft):

Initial Depth to Water (ft): 6.64'

Wellhead Condition: GOOD

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
6.64	1540	6.32	0.447	18.1	99	0.81	35.5	
6.65	1545	6.34	0.441	18.2	61	0.58	8.0	
6.65	1550	6.36	0.432	18.5	25	0.52	7.5	
6.65	1555	6.35	0.421	18.7	11	0.50	7.3	
6.65	1600	6.36	0.407	18.8	-5	0.48	7.0	
6.65	1605	6.36	0.395	19.3	-22	0.47	8.2	
6.65	1608	6.41	0.391	20.2	-28	0.47	7.5	
6.65	1611	6.39	0.387	20.6	-33	0.47	7.8	
6.66	1614	6.35	0.390	18.4	-27	0.47	11.0	
6.65	1617	6.35	0.391	18.4	-23	0.47	12.0	
6.65	1620	6.35	0.387	18.4	-24	0.47	12.2	
~~6.65~~								
"								

Sample ID No.: KMW-09-08/16/18

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

ORP/DO Meter Model & No.: YSI Pro DSS

Purge Equipment Used: GeoPump III w/ Dedicated Tubing

Sampling Equipment Used: YSI Pro DSS

Purge Start Time: 1535

Purge Completion Time: 1620

Average Purge Rate (mL/min): ~200

Analytical Lab: Friedman Bruya

Sample Collection Time: 1620

Purging Method: SOP

Sample Containers Used: LAB Provides 9 TOA

Chemical Analyses: See COC

Other Field Observations: Some sheen in Purge water

amec foster wheeler

GROUNDWATER SAMPLING LOG
Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER KMW-10

Project Name: Kelly-Moore

Date: 08/16/18

Project Number: 14697

Weather Conditions: SUNNY

Location: Seattle

Sampler: L Kerner

Wind Speed/Direction: NONE

WELL INFORMATION

Casing Diameter (in): 2

Groundwater Elevation (ft):

Top of Casing Elevation (ft):

Depth of Well Casing (ft):

Initial Depth to Water (ft):

Actual Purge Volume (gal): 2.5

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
	1650	6.24	0.405	16.7	169	1.05	37	
	1655	6.26	0.407	17.0	125	7.00	24	
	1700	6.26	0.414	16.6	75	6.3	27	
	1705	6.27	0.412	16.6	48	0.53	22.8	
	1710	6.26	0.413	16.5	30	0.50	22.0	
	1715	6.25	0.418	16.5	10	0.47	22.3	
	~~1720~~ 1718	6.25	0.415	16.5	25	0.47	21.9	
	1721	6.25	0.415	16.5	-5	0.47	21.8	
	1724	6.25	0.416	16.5	-8	0.47	21.7	
	1727	6.25	0.415	16.5	-12	0.46	22	
	1730	6.25	0.416	16.5	-15	0.46	21.8	

Sample ID No.: KMW-10-081618

Water Level Ind. Model & No.:

ORP/DO Meter Model & No.: YSI Pro RSS

Purge Equipment Used: Geo Pump

Sampling Equipment Used: YSI Pro RSS

Purge Start Time: 1645

Sample Collection Time: 1730

Purge Completion Time: 1730

Purging Method: SAA

Average Purge Rate (mL/min): 200

Sample Containers Used: LAB Provided

Analytical Lab: Friedman Bruya

Chemical Analyses: See COC

Other Field Observations: Parameters all Stable besides ORP

WATER LEVEL MONITORING RECORD

wood.

Project Name: Kelly-Moore Project and Task Number: 14697009

Date: 02/07/2019 Measured by: L. Kerner Instrument Used: Water Level Meter

Note: For you convenience, the following abbreviations may be used.

P = Pumping I = Inaccessible D = Dedicated Pump
ST = Steel Tape ES = Electric Sounder MP = Measuring Point WL = Water Level

Well No.	Time	MP Elevation (feet)	Water Level Below MP (feet)	Water Level Elevation (feet)	Previous Water Level Below MP	Remarks
KMW-02R	928	21.63'	9.17'	12.46	11.67	
KMW-03R	935	24.54'	9.37	12.17	11.61	
KMW-04	1003	18.56'	6.60	11.96	11.50	
KMW-06	938	19.80'	7.77	1203	11.51	
KMW-07	931	21.63'	9.21'	12.42	11.67	
KMW-08	933	21.65'	9.31'	12.34	11.65	
KMW-09	940	18.14'	6.15	11.99	11.50	
KMW-10	943	20.39'	8.65	11.74	11.38	

wood.

GROUNDWATER SAMPLING LOG
Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER- KMW-02R

Project Name: Kelly-Moore

Project Number: 14697009
Location: Seattle, WA
Sampler: Lucas Kerner

Date: 2/8/19
Weather Conditions: INDOORS
Wind Speed/Direction: N/A

WELL INFORMATION

Casing Diameter (in): 2"
Top of Casing Elevation (ft): 21.63'
Initial Depth to Water (ft): 9.17
Wellhead Condition: OK

Groundwater Elevation (ft): 12.46
Depth of Well Casing (ft):
Actual Purge Volume (gal): 2.5 gallons

PURGING MEASUREMENTS

WL (ft btoc)	Time	pH (std. units)	SC (ms/cm)	Temp. (°C)	ORP (mv)	DO (mg/L)	Turbidity (NTUs)	Notes
9.19	923	5.99	0.257	13.9	106	1.60	10.4	
9.21	926	5.96	0.750	14.0	118.7	1.21	10.20	
9.20	929	5.96	0.246	14.0	124.9	1.11	11.12	
9.21	932	5.95	0.245	14.0	129.4	1.04	11.40	
9.22	935	5.95	0.245	14.1	128.5	0.90	7.74	
9.23	938	5.97	0.240	14.0	127.4	0.82	6.91	
9.22	941	5.96	0.241	14.1	129.1	0.80	7.81	
9.24	944	5.95	0.245	14.1	130.1	0.81	8.1	
9.25	947							
				Stable DTW				

Sample ID No.: KMW-02R- 020819
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: 920
Purge Completion Time: 944
Average Purge Rate (mL/min): 220 mL/min
Analytical Lab: Friedman & Bruya Inc.

Sample Collection Time: 945
Purging Method: SAA
Sample Containers Used: Lab Provided
Chemical Analyses: See COC

Other Field Observations:

wood.

GROUNDWATER SAMPLING LOG
Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER- KMW-03R

Project Name: Kelly-Moore

Date: 2/8/19

Project Number: 14697009

Weather Conditions: INDOORS N/A

Location: Seattle, WA

Sampler: Lucas Kerner

Wind Speed/Direction: N/A

WELL INFORMATION

Casing Diameter (in): 2"

Top of Casing Elevation (ft): 21.54'

Initial Depth to Water (ft): 9.32

Wellhead Condition: OKAY

Groundwater Elevation (ft): 12.17

Depth of Well Casing (ft):

Actual Purge Volume (gal): 7.591

PURGING MEASUREMENTS

WL (ft btoc)	Time	pH (std. units)	SC (ms/cm)	Temp. (°C)	ORP (mv)	DO (mg/L)	Turbidity (NTUs)	Notes
9.50	1113	6.82	0.570	16.4	-49	1.43	9.80	
9.55	1116	6.91	0.617	16.5	-66	0.82	6.70	
9.56	1119	6.95	0.625	16.6	-72	0.71	7.21	
9.58	1122	6.99	0.635	16.6	-80	0.61	11.85	
9.55	1125	7.01	0.591	16.6	-83	0.56	15.6	
9.57	1128	7.03	0.581	16.6	-85	0.54	19.8	
9.57	1131	6.95	0.586	16.5	-85	0.52	20.7	
9.57	1134	6.99	0.583	16.5	-86.4	0.51	20.4	
9.57	1137	6.97	0.582	16.5	-87	0.51	20.52	
				Stable				

Sample ID No.: KMW-03R- 020819

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: 1110

Purge Completion Time: 1137

Average Purge Rate (mL/min): 175 mL/min

Analytical Lab: Friedman & Bruya Inc.

Sample Collection Time: 1140

Purging Method: SAA

Sample Containers Used: Lab Provided

Chemical Analyses: See COC

Other Field Observations:

wood.

GROUNDWATER SAMPLING LOG
Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER- KMW-04

Project Name: Kelly-Moore

Date: 02/07/19

Project Number: 14697009

Weather Conditions: 30°F SUNNY

Location: Seattle, WA

Sampler: Lucas Kerner

Wind Speed/Direction: N/A

WELL INFORMATION

Casing Diameter (in): 2"

Top of Casing Elevation (ft): 18.56'

Initial Depth to Water (ft): 6.60

Wellhead Condition: OK

Groundwater Elevation (ft): 11.96

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
6.65	1030	6.14	0.274	11.9	-70	3.15	20.50	
6.63	1033	6.23	0.285	12.1	-69	1.17	18.41	
6.64	1036	6.24	0.294	11.8	-60	0.96	18.43	
6.64	1039	6.24	0.305	11.9	-68	0.82	16.15	
6.63	1042	6.24	0.315	11.8	-74	0.75	15.91	
6.63	1045	6.21	0.318	11.2	-72	0.74	15.30	
6.64	1048	6.22	0.334	11.2	-75	0.66	14.64	
6.64	1051	6.22	0.343	10.9	-76	0.64	12.98	
6.64	1054	6.22	0.343	11.2	-76	0.61	12.95	
6.63	1057	6.22	0.341	11.2	-74	0.62	12.01	
	~~#1~~							
	~~#3~~			Stable				
	~~#6~~							
	~~#9~~							

Sample ID No.: KMW-04-070719

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: 10:28

Purge Completion Time: 1057

Average Purge Rate (mL/min): ~~100 mL/min~~ 150 mL/min

Analytical Lab: Friedman & Bruya Inc.

Sample Collection Time: 1115

Purging Method: SAA

Sample Containers Used: Lab Provided

Chemical Analyses: See COC

Other Field Observations: Well Monument Frozen w/ water

wood.

GROUNDWATER SAMPLING LOG
Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER- KMW-06

Project Name: Kelly-Moore

Date: 07/07/19

Project Number: 14697009

Weather Conditions: 42° SUNNY

Location: Seattle, WA

Sampler: Lucas Kerner

Wind Speed/Direction: N/A

WELL INFORMATION

Casing Diameter (in): 2"

Top of Casing Elevation (ft): 19.80'

Initial Depth to Water (ft): 7.77

Wellhead Condition: OK

Groundwater Elevation (ft): 12.03

Depth of Well Casing (ft):

Actual Purge Volume (gal): ≈2.5 l

PURGING MEASUREMENTS

WL (ft btoc)	Time	pH (std. units)	SC (ms/cm)	Temp. (°C)	ORP (mv)	DO (mg/L)	Turbidity (NTUs)	Notes
7.80	1319	6.21	0.623	14.3	-6.5	2.27	13.88	
7.79	1322	6.20	0.640	14.2	-17.1	1.11	12.72	
7.80	1325	6.19	0.639	14.2	-25	0.80	12.73	
7.87	1328	6.18	0.641	14.2	-26.5	0.74	12.52	
7.81	1331	6.18	0.639	14.3	-28.2	0.67	12.45	
7.80	1334	6.18	0.635	14.2	-32	0.65	12.40	
			Stable					

Sample ID No.: KMW-06-070719

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: 1316

Purge Completion Time: 1334

Average Purge Rate (mL/min): 150 mL/min

Analytical Lab: Friedman & Bruya Inc.

Sample Collection Time: ~~1400~~ 1340

Purging Method: SAA

Sample Containers Used: Lab Provided

Chemical Analyses: See COC

Other Field Observations: MS/MSD Collected

wood.

GROUNDWATER SAMPLING LOG
Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER- KMW-07

Project Name: Kelly-Moore

Date: 2/8/19

Project Number: 14697009

Weather Conditions: INDOORS - N/A

Location: Seattle, WA

Sampler: Lucas Kerner

Wind Speed/Direction: N/A

WELL INFORMATION

Casing Diameter (in): 2"

Top of Casing Elevation (ft): 21.63'

Initial Depth to Water (ft): 9.41

Wellhead Condition: OKAY

Groundwater Elevation (ft): 12.42'

Depth of Well Casing (ft):

Actual Purge Volume (gal): 7 gallons

PURGING MEASUREMENTS

WL (ft btoc)	Time	pH (std. units)	SC (ms/cm)	Temp. (°C)	ORP (mv)	DO (mg/L)	Turbidity (NTUs)	Notes
9.25	1158	6.31	0.330	14.41	32	1.33	75.0	
9.24	1201	6.28	0.327	14.4	38	0.78	14.51	
9.25	1204	6.26	0.325	14.4	43	0.61	15.88	
9.26	1207	6.23	0.321	14.4	50	0.58	17.81	
9.25	1210	6.22	0.320	14.4	52.2	0.55	18.71	
9.26	1213	6.23	0.319	14.4	51.9	0.52	18.68	
9.24	1216	6.23	0.318	14.4	51.1	0.52	17.91	
			Stable	DC				

Sample ID No.: KMW-07- 020819

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: 1155

Purge Completion Time: 1210

Average Purge Rate (mL/min): 175 mL/min

Analytical Lab: Friedman & Bruya Inc.

Sample Collection Time: 1220

Purging Method: SAA

Sample Containers Used: Lab Provided

Chemical Analyses: See COC

Other Field Observations:

wood.

GROUNDWATER SAMPLING LOG
Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER- KMW-08

Project Name: Kelly-Moore

Date: 7/8/19

Project Number: 14697009

Weather Conditions: INDOORS/N/A

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): 9.31

Wellhead Condition: OKAY

Groundwater Elevation (ft): 12.34'

Depth of Well Casing (ft):

Actual Purge Volume (gal): 2 gallons

PURGING MEASUREMENTS

WL (ft btoc)	Time	pH (std. units)	SC (ms/cm)	Temp. (°C)	ORP (mv)	DO (mg/L)	Turbidity (NTUs)	Notes
9.38	1020	6.13	0.240	13.1	78	2.8	7.0	
9.38	1023	6.05	0.241	13.8	89	1.34	5.7	
9.39	1026	6.04	0.23	13.8	97	1.00	44	
9.40	1029	6.04	0.240	13.8	110	0.78	35.6	
9.40	1032	6.05	0.249	13.9	96	0.79	31.2	
9.40	1035	6.05	0.247	13.9	95.3	0.75	31.2	
9.40	1038	6.05	0.250	13.9	91.4	0.74	30.9	
			Stable					

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: 1017

Purge Completion Time: 1038

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

Analytical Lab: Friedman & Bruya Inc.

Sample Collection Time: ~~1340~~ 1040

Purging Method: SAA

Sample Containers Used: Lab Provided

Chemical Analyses: See COC

Other Field Observations:

wood.

GROUNDWATER SAMPLING LOG
Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER- KMW-09

Project Name: Kelly-Moore

Date: 07/07/19

Project Number: 14697009

Weather Conditions: 390 Cloudy

Location: Seattle, WA

Sampler: Lucas Kerner

Wind Speed/Direction: NW 4mph

WELL INFORMATION

Casing Diameter (in): 2"

Top of Casing Elevation (ft): 18.14'

Initial Depth to Water (ft): 6.15

Wellhead Condition: Good

Groundwater Elevation (ft): 11.99'

Depth of Well Casing (ft):

Actual Purge Volume (gal): 1.5 gal

PURGING MEASUREMENTS

WL (ft btoc)	Time	pH (std. units)	SC (ms/cm)	Temp. (°C)	ORP (mv)	DO (mg/L)	Turbidity (NTUs)	Notes
6.15	1433	6.58	0.404	19.2	-57	4.50	6.80	
6.17	1436	6.48	0.401	15.2	-60	1.20	5.75	
6.19	1439	6.48	0.400	15.2	-65	0.79	5.40	
6.18	1442	6.47	0.400	15.2	-66	0.68	5.09	
6.19	1445	6.47	0.400	15.2	-68	0.63	5.54	
6.19	1548	6.47	0.399	15.2	-69	0.58	4.95	
6.19	1551	6.47	0.400	15.2	-69	0.57	4.99	
			Stable					

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: 1430

Purge Completion Time: 1551

Average Purge Rate (mL/min): 125

Analytical Lab: Friedman & Bruya Inc.

Sample Collection Time: 1575

Purging Method: SAA

Sample Containers Used: Lab Provided

Chemical Analyses: See COC

Other Field Observations:

wood.

GROUNDWATER SAMPLING LOG
Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER- KMW-10

Project Name: Kelly-Moore

Date: 07/07/19

Project Number: 14697009

Weather Conditions: 70° SUNNY

Location: Seattle, WA

Sampler: Lucas Kerner

Wind Speed/Direction: N/A

WELL INFORMATION

Casing Diameter (in): 2"

Top of Casing Elevation (ft): 20.39'

Initial Depth to Water (ft): 8.65

Wellhead Condition: OKAY

Groundwater Elevation (ft): 11.74'

Depth of Well Casing (ft):

Actual Purge Volume (gal): ~~1.5 GAL~~ 2gal

PURGING MEASUREMENTS

WL (ft btoc)	Time	pH (std. units)	SC (ms/cm)	Temp. (°C)	ORP (mv)	DO (mg/L)	Turbidity (NTUs)	Notes
	1203	6.54	0.423	13.1	-44	7.8	61	
8.65	1206	6.56	0.430	13.1	-59.1	1.13	42	
8.71	1209	6.55	0.432	13.4	-68	0.84	28	
8.68	1212	6.54	0.430	13.6	-69.8	0.74	41	
8.68	1215	6.54	0.429	13.7	-71.0	0.70	37	
8.68	1218	6.54	0.433	13.8	-73.2	0.64	27.5	
8.66	1221	6.54	0.432	12.5	-74	0.65	29.9	
8.69	1224	6.54	0.429	14.2	-77	0.54	23.0	
8.71	1227	6.54	0.427	14.3	-79	0.51	16	
8.71	1230	6.54	0.429	14.0	-80.3	0.51	16.1	
8.71	1233	6.54	0.429	13.9	-81	0.50	15.6	
8.69	1236	6.53	0.430	13.9	-82	0.49	15.6	
	1239							
	1242							
	1245							

Sample ID No.: KMW-10- 070719

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: 1200

Purge Completion Time: 1236

Average Purge Rate (mL/min): 150

Analytical Lab: Friedman & Bruya Inc.

Sample Collection Time: 1245

Purging Method: SAA

Sample Containers Used: Lab Provided

Chemical Analyses: See COC

Other Field Observations: Dup Taken: KMW-10-9-070719 @ 1250

Appendix B

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
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www.friedmanandbruya.com

February 18, 2019

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

Dear Ms Thimsen:

Included are the results from the testing of material submitted on February 8, 2019 from the Kelly Moore 14697009, F&BI 902134 project. There are 45 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
WEI0218R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on February 8, 2019 by Friedman & Bruya, Inc. from the Wood Environment & Infrastructure Solutions Kelly Moore 14697009, F&BI 902134 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Wood Environment & Infrastructure Solutions
902134 -01	KMW-02R-020819
902134 -02	KMW-03R-020819
902134 -03	KMW-04-020719
902134 -04	KMW-06-020719
902134 -05	KMW-08-020819
902134 -06	KMW-09-020719
902134 -07	KMW-10-020719
902134 -08	KMW-10-9-020719
902134 -09	KMW-7-020819
902134 -10	Trip Blanks

A 6020B internal standard failed the acceptance criteria for samples KMW-10-020719 and KMW-10-9-020719. The samples were diluted and reanalyzed with acceptable results. Both data sets were reported.

The 8270D matrix spike and matrix spike duplicate failed the relative percent difference for several compounds. The analytes were not detected therefore the data were acceptable.

1,1-Dichloroethane in the 8260C laboratory control sample exceeded the acceptance criteria. The analyte was not detected in the sample, therefore the data were acceptable.

All other quality control requirements were acceptable.

Date of Report: 02/18/19
Date Received: 02/08/19
Project: Kelly Moore 14697009, F&BI 902134
Date Extracted: 02/12/19
Date Analyzed: 02/12/19

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE USING METHOD NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Gasoline Range	Surrogate (% Recovery) (Limit 51-134)
KMW-02R-020819 902134-01	<100	92
KMW-03R-020819 902134-02	140	97
KMW-04-020719 902134-03 1/10	31,000	108
KMW-06-020719 902134-04	2,200	ip
KMW-08-020819 902134-05	120	96
KMW-09-020719 902134-06	450	107
KMW-10-020719 902134-07	200	109
KMW-10-9-020719 902134-08	210	109
KMW-7-020819 902134-09	<100	94
Method Blank 09-321 MB	<100	103

Date of Report: 02/18/19
Date Received: 02/08/19
Project: Kelly Moore 14697009, F&BI 902134
Date Extracted: 02/12/19
Date Analyzed: 02/12/19

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)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 47-140)
KMW-02R-020819 902134-01 1/1.2	<60	<300	95
KMW-03R-020819 902134-02 1/1.2	1,700 x	<300	110
KMW-04-020719 902134-03 1/1.2	2,600 x	<300	64
KMW-06-020719 902134-04 1/1.2	19,000 x	790 x	63
KMW-08-020819 902134-05 1/1.2	440 x	<300	102
KMW-09-020719 902134-06 1/1.2	3,100 x	<300	64
KMW-10-020719 902134-07 1/1.3	970 x	<320	75
KMW-10-9-020719 902134-08 1/1.2	1,300 x	<300	105
KMW-7-020819 902134-09 1/1.2	<60	<300	106
Method Blank 09-358 MB	<60	<300	100

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	KMW-02R-020819	Client:	Wood Environment & Infrastructure Solutions
Date Received:	02/08/19	Project:	Kelly Moore 14697009
Date Extracted:	02/12/19	Lab ID:	902134-01 1/2
Date Analyzed:	02/13/19	Data File:	021311.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	99	31	160
Benzo(a)anthracene-d12	112	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<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	<0.04

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	KMW-03R-020819	Client:	Wood Environment & Infrastructure Solutions
Date Received:	02/08/19	Project:	Kelly Moore 14697009
Date Extracted:	02/12/19	Lab ID:	902134-02 1/2
Date Analyzed:	02/13/19	Data File:	021312.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	97	31	160
Benzo(a)anthracene-d12	111	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.4
Acenaphthylene	1.7
Acenaphthene	0.14
Fluorene	0.099
Phenanthrene	0.041
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	<0.04

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	KMW-04-020719	Client:	Wood Environment & Infrastructure Solutions
Date Received:	02/08/19	Project:	Kelly Moore 14697009
Date Extracted:	02/12/19	Lab ID:	902134-03 1/2
Date Analyzed:	02/13/19	Data File:	021313.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	80	31	160
Benzo(a)anthracene-d12	80	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	3.3
Acenaphthylene	<0.04
Acenaphthene	0.069
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	<0.04

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	KMW-06-020719	Client:	Wood Environment & Infrastructure Solutions
Date Received:	02/08/19	Project:	Kelly Moore 14697009
Date Extracted:	02/12/19	Lab ID:	902134-04 1/2
Date Analyzed:	02/13/19	Data File:	021314.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	83	31	160
Benzo(a)anthracene-d12	87	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.4
Acenaphthylene	28 ve
Acenaphthene	0.71
Fluorene	0.36
Phenanthrene	<0.04
Anthracene	<0.04
Fluoranthene	0.11
Pyrene	0.15
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	<0.04

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	KMW-06-020719	Client:	Wood Environment & Infrastructure Solutions
Date Received:	02/08/19	Project:	Kelly Moore 14697009
Date Extracted:	02/12/19	Lab ID:	902134-04 1/100
Date Analyzed:	02/14/19	Data File:	021411.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	80 d	31	160
Benzo(a)anthracene-d12	74 d	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<20
Acenaphthylene	38
Acenaphthene	<2
Fluorene	<2
Phenanthrene	<2
Anthracene	<2
Fluoranthene	<2
Pyrene	<2
Benz(a)anthracene	<2
Chrysene	<2
Benzo(a)pyrene	<2
Benzo(b)fluoranthene	<2
Benzo(k)fluoranthene	<2
Indeno(1,2,3-cd)pyrene	<2
Dibenz(a,h)anthracene	<2
Benzo(g,h,i)perylene	<2

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	KMW-08-020819	Client:	Wood Environment & Infrastructure Solutions
Date Received:	02/08/19	Project:	Kelly Moore 14697009
Date Extracted:	02/12/19	Lab ID:	902134-05 1/2
Date Analyzed:	02/13/19	Data File:	021317.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	95	31	160
Benzo(a)anthracene-d12	109	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.4
Acenaphthylene	<0.04
Acenaphthene	0.15
Fluorene	0.26
Phenanthrene	<0.04
Anthracene	0.095
Fluoranthene	0.14
Pyrene	0.20
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	<0.04

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	KMW-09-020719	Client:	Wood Environment & Infrastructure Solutions
Date Received:	02/08/19	Project:	Kelly Moore 14697009
Date Extracted:	02/12/19	Lab ID:	902134-06 1/2
Date Analyzed:	02/13/19	Data File:	021318.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	83	31	160
Benzo(a)anthracene-d12	93	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.4
Acenaphthylene	4.5
Acenaphthene	2.4
Fluorene	0.34
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	<0.04

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	KMW-10-020719	Client:	Wood Environment & Infrastructure Solutions
Date Received:	02/08/19	Project:	Kelly Moore 14697009
Date Extracted:	02/12/19	Lab ID:	902134-07 1/2
Date Analyzed:	02/13/19	Data File:	021319.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	78	31	160
Benzo(a)anthracene-d12	90	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.4
Acenaphthylene	<0.04
Acenaphthene	0.041
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	<0.04

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	KMW-10-9-020719	Client:	Wood Environment & Infrastructure Solutions
Date Received:	02/08/19	Project:	Kelly Moore 14697009
Date Extracted:	02/12/19	Lab ID:	902134-08 1/2
Date Analyzed:	02/13/19	Data File:	021320.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	89	31	160
Benzo(a)anthracene-d12	98	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.4
Acenaphthylene	<0.04
Acenaphthene	0.049
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	<0.04

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	KMW-7-020819	Client:	Wood Environment & Infrastructure Solutions
Date Received:	02/08/19	Project:	Kelly Moore 14697009
Date Extracted:	02/12/19	Lab ID:	902134-09 1/2
Date Analyzed:	02/13/19	Data File:	021321.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	96	31	160
Benzo(a)anthracene-d12	106	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<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	<0.04

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	Wood Environment & Infrastructure Solutions
Date Received:	Not Applicable	Project:	Kelly Moore 14697009
Date Extracted:	02/12/19	Lab ID:	09-359 mb
Date Analyzed:	02/13/19	Data File:	021306.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	96	31	160
Benzo(a)anthracene-d12	107	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<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	<0.02

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-02R-020819	Client:	Wood Environment & Infrastructure Solutions
Date Received:	02/08/19	Project:	Kelly Moore 14697009
Date Extracted:	02/12/19	Lab ID:	902134-01
Date Analyzed:	02/12/19	Data File:	902134-01.096
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	2.15
Zinc	<5

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-03R-020819	Client:	Wood Environment & Infrastructure Solutions
Date Received:	02/08/19	Project:	Kelly Moore 14697009
Date Extracted:	02/12/19	Lab ID:	902134-02
Date Analyzed:	02/12/19	Data File:	902134-02.103
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<1
Chromium	1.47
Copper	<5
Lead	<1
Mercury	<1
Nickel	1.67
Zinc	<5

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-04-020719	Client:	Wood Environment & Infrastructure Solutions
Date Received:	02/08/19	Project:	Kelly Moore 14697009
Date Extracted:	02/12/19	Lab ID:	902134-03
Date Analyzed:	02/12/19	Data File:	902134-03.104
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	17.4
Chromium	1.58
Copper	24.7
Lead	1.51
Mercury	<1
Nickel	1.98
Zinc	<5

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-06-020719	Client:	Wood Environment & Infrastructure Solutions
Date Received:	02/08/19	Project:	Kelly Moore 14697009
Date Extracted:	02/12/19	Lab ID:	902134-04
Date Analyzed:	02/12/19	Data File:	902134-04.105
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	3.04
Chromium	2.00
Copper	19.4
Lead	2.04
Mercury	<1
Nickel	7.79
Zinc	135

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-08-020819	Client:	Wood Environment & Infrastructure Solutions
Date Received:	02/08/19	Project:	Kelly Moore 14697009
Date Extracted:	02/12/19	Lab ID:	902134-05
Date Analyzed:	02/12/19	Data File:	902134-05.109
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	1.99
Zinc	10.1

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-09-020719	Client:	Wood Environment & Infrastructure Solutions
Date Received:	02/08/19	Project:	Kelly Moore 14697009
Date Extracted:	02/12/19	Lab ID:	902134-06
Date Analyzed:	02/12/19	Data File:	902134-06.110
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<1
Chromium	1.12
Copper	<5
Lead	<1
Mercury	<1
Nickel	<1
Zinc	<5

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-10-020719	Client:	Wood Environment & Infrastructure Solutions
Date Received:	02/08/19	Project:	Kelly Moore 14697009
Date Extracted:	02/12/19	Lab ID:	902134-07
Date Analyzed:	02/12/19	Data File:	902134-07.111
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	6.72
Chromium	2.00 J
Copper	<5 J
Lead	<1
Mercury	<1
Nickel	<1 J
Zinc	<5 J

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-10-020719	Client:	Wood Environment & Infrastructure Solutions
Date Received:	02/08/19	Project:	Kelly Moore 14697009
Date Extracted:	02/12/19	Lab ID:	902134-07 x2
Date Analyzed:	02/13/19	Data File:	902134-07 x2.030
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	6.55
Chromium	2.33
Copper	<10
Lead	<2
Mercury	<2
Nickel	<2
Zinc	<10

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-10-9-020719	Client:	Wood Environment & Infrastructure Solutions
Date Received:	02/08/19	Project:	Kelly Moore 14697009
Date Extracted:	02/12/19	Lab ID:	902134-08
Date Analyzed:	02/12/19	Data File:	902134-08.112
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	6.52
Chromium	2.00 J
Copper	<5 J
Lead	<1
Mercury	<1
Nickel	<1 J
Zinc	<5 J

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-10-9-020719	Client:	Wood Environment & Infrastructure Solutions
Date Received:	02/08/19	Project:	Kelly Moore 14697009
Date Extracted:	02/12/19	Lab ID:	902134-08 x2
Date Analyzed:	02/13/19	Data File:	902134-08 x2.031
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	6.38
Chromium	2.17
Copper	<10
Lead	<2
Mercury	<2
Nickel	<2
Zinc	<10

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-7-020819	Client:	Wood Environment & Infrastructure Solutions
Date Received:	02/08/19	Project:	Kelly Moore 14697009
Date Extracted:	02/12/19	Lab ID:	902134-09
Date Analyzed:	02/12/19	Data File:	902134-09.113
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	1.36
Zinc	<5

Analysis For Total Metals By EPA Method 6020B

Client ID:	Method Blank	Client:	Wood Environment & Infrastructure Solutions
Date Received:	NA	Project:	Kelly Moore 14697009
Date Extracted:	02/12/19	Lab ID:	I9-95 mb
Date Analyzed:	02/12/19	Data File:	I9-95 mb.094
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

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	KMW-02R-020819	Client:	Wood Environment & Infrastructure Solutions
Date Received:	02/08/19	Project:	Kelly Moore 14697009
Date Extracted:	02/14/15	Lab ID:	902134-01
Date Analyzed:	02/14/19	Data File:	021421.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	MS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	57	121
Toluene-d8	100	63	127
4-Bromofluorobenzene	100	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	<1	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	<1	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<1
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)	<10	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		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	KMW-03R-020819	Client:	Wood Environment & Infrastructure Solutions
Date Received:	02/08/19	Project:	Kelly Moore 14697009
Date Extracted:	02/14/15	Lab ID:	902134-02
Date Analyzed:	02/14/19	Data File:	021422.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	MS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	57	121
Toluene-d8	99	63	127
4-Bromofluorobenzene	99	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	<1	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	<1	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<1
1,1-Dichloroethane	<1	n-Propylbenzene	1.5
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)	<10	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		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	KMW-04-020719	Client:	Wood Environment & Infrastructure Solutions
Date Received:	02/08/19	Project:	Kelly Moore 14697009
Date Extracted:	02/14/15	Lab ID:	902134-03 1/10
Date Analyzed:	02/14/19	Data File:	021431.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	MS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	57	121
Toluene-d8	94	63	127
4-Bromofluorobenzene	90	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	<10	1,2-Dibromoethane (EDB)	<10
Chloroethane	<10	Chlorobenzene	<10
Trichlorofluoromethane	<10	Ethylbenzene	2,500 ve
Acetone	<500	1,1,1,2-Tetrachloroethane	<10
1,1-Dichloroethene	<10	m,p-Xylene	5,400 ve
Hexane	<10	o-Xylene	1,200
Methylene chloride	<50	Styrene	<10
Methyl t-butyl ether (MTBE)	<10	Isopropylbenzene	26
trans-1,2-Dichloroethene	<10	Bromoform	<10
1,1-Dichloroethane	<10	n-Propylbenzene	23
2,2-Dichloropropane	<10	Bromobenzene	<10
cis-1,2-Dichloroethene	<10	1,3,5-Trimethylbenzene	33
Chloroform	<10	1,1,2,2-Tetrachloroethane	<10
2-Butanone (MEK)	<100	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	67
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	190	Hexachlorobutadiene	<10
trans-1,3-Dichloropropene	<10	Naphthalene	<10
1,1,2-Trichloroethane	<10	1,2,3-Trichlorobenzene	<10
2-Hexanone	<100		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	KMW-04-020719	Client:	Wood Environment & Infrastructure Solutions
Date Received:	02/08/19	Project:	Kelly Moore 14697009
Date Extracted:	02/14/15	Lab ID:	902134-03 1/100
Date Analyzed:	02/14/19	Data File:	021430.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	MS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	57	121
Toluene-d8	100	63	127
4-Bromofluorobenzene	102	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	<100	1,2-Dibromoethane (EDB)	<100
Chloroethane	<100	Chlorobenzene	<100
Trichlorofluoromethane	<100	Ethylbenzene	2,800
Acetone	<5,000	1,1,1,2-Tetrachloroethane	<100
1,1-Dichloroethene	<100	m,p-Xylene	6,100
Hexane	<100	o-Xylene	1,300
Methylene chloride	<500	Styrene	<100
Methyl t-butyl ether (MTBE)	<100	Isopropylbenzene	<100
trans-1,2-Dichloroethene	<100	Bromoform	<100
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)	<1,000	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	<100
Benzene	<35	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	190	Hexachlorobutadiene	<100
trans-1,3-Dichloropropene	<100	Naphthalene	<100
1,1,2-Trichloroethane	<100	1,2,3-Trichlorobenzene	<100
2-Hexanone	<1,000		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	KMW-06-020719	Client:	Wood Environment & Infrastructure Solutions
Date Received:	02/08/19	Project:	Kelly Moore 14697009
Date Extracted:	02/14/15	Lab ID:	902134-04
Date Analyzed:	02/14/19	Data File:	021428.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	MS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	57	121
Toluene-d8	99	63	127
4-Bromofluorobenzene	106	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	<1	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	<1	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	8.3
trans-1,2-Dichloroethene	<1	Bromoform	<1
1,1-Dichloroethane	<1	n-Propylbenzene	12
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)	<10	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	1.2
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		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	KMW-08-020819	Client:	Wood Environment & Infrastructure Solutions
Date Received:	02/08/19	Project:	Kelly Moore 14697009
Date Extracted:	02/14/15	Lab ID:	902134-05
Date Analyzed:	02/14/19	Data File:	021423.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	MS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	107	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	<1	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	<1	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<1
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)	<10	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		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	KMW-09-020719	Client:	Wood Environment & Infrastructure Solutions
Date Received:	02/08/19	Project:	Kelly Moore 14697009
Date Extracted:	02/14/15	Lab ID:	902134-06
Date Analyzed:	02/14/19	Data File:	021424.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	MS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	57	121
Toluene-d8	107	63	127
4-Bromofluorobenzene	100	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	<1	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	<1	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	1.6
trans-1,2-Dichloroethene	<1	Bromoform	<1
1,1-Dichloroethane	<1	n-Propylbenzene	1.6
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)	<10	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		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	KMW-10-020719	Client:	Wood Environment & Infrastructure Solutions
Date Received:	02/08/19	Project:	Kelly Moore 14697009
Date Extracted:	02/14/15	Lab ID:	902134-07
Date Analyzed:	02/14/19	Data File:	021425.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	MS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	57	121
Toluene-d8	106	63	127
4-Bromofluorobenzene	105	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	<1	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	6.0
Hexane	<1	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	10
trans-1,2-Dichloroethene	<1	Bromoform	<1
1,1-Dichloroethane	<1	n-Propylbenzene	8.5
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)	<10	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		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	KMW-10-9-020719	Client:	Wood Environment & Infrastructure Solutions
Date Received:	02/08/19	Project:	Kelly Moore 14697009
Date Extracted:	02/14/15	Lab ID:	902134-08
Date Analyzed:	02/14/19	Data File:	021426.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	MS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	57	121
Toluene-d8	104	63	127
4-Bromofluorobenzene	99	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	<1	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	6.1
Hexane	<1	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	9.1
trans-1,2-Dichloroethene	<1	Bromoform	<1
1,1-Dichloroethane	<1	n-Propylbenzene	7.5
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)	<10	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		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	KMW-7-020819	Client:	Wood Environment & Infrastructure Solutions
Date Received:	02/08/19	Project:	Kelly Moore 14697009
Date Extracted:	02/14/15	Lab ID:	902134-09
Date Analyzed:	02/14/19	Data File:	021427.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	MS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	57	121
Toluene-d8	94	63	127
4-Bromofluorobenzene	99	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	<1	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	<1	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<1
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)	<10	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		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Trip Blanks	Client:	Wood Environment & Infrastructure Solutions
Date Received:	02/08/19	Project:	Kelly Moore 14697009
Date Extracted:	02/14/15	Lab ID:	902134-10
Date Analyzed:	02/14/19	Data File:	021429.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	MS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	57	121
Toluene-d8	103	63	127
4-Bromofluorobenzene	100	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	<1	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	<1	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<1
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)	<10	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		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Wood Environment & Infrastructure Solutions
Date Received:	Not Applicable	Project:	Kelly Moore 14697009
Date Extracted:	02/14/19	Lab ID:	09-0281 mb
Date Analyzed:	02/14/19	Data File:	021413.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	MS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	105	57	121
Toluene-d8	102	63	127
4-Bromofluorobenzene	103	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	<1	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	<1	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<1
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)	<10	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		

Date of Report: 02/18/19
Date Received: 02/08/19
Project: Kelly Moore 14697009, F&BI 902134

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

Laboratory Code: 902134-04 (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	2,200	140 b	154 b	53-117	10

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Gasoline	ug/L (ppb)	1,000	103	69-134

Date of Report: 02/18/19
Date Received: 02/08/19
Project: Kelly Moore 14697009, F&BI 902134

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: 902134-04 (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)	3,000	19,000	140 b	0 b	64-141	200 b

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)	3,000	105	108	61-133	3

Date of Report: 02/18/19
Date Received: 02/08/19
Project: Kelly Moore 14697009, F&BI 902134

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR PAHS BY EPA METHOD 8270D SIM

Laboratory Code: 902134-04 1/2 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	1	<0.4	84	80	10-172	5
Acenaphthylene	ug/L (ppb)	1	28	26 b	2 b	38-137	171 b
Acenaphthene	ug/L (ppb)	1	0.71	49 b	53 b	20-150	8 b
Fluorene	ug/L (ppb)	1	0.36	49 b	50 b	10-181	2 b
Phenanthrene	ug/L (ppb)	1	<0.04	67	67	58-109	0
Anthracene	ug/L (ppb)	1	<0.04	70	71	47-114	1
Fluoranthene	ug/L (ppb)	1	0.11	71	77	10-171	8
Pyrene	ug/L (ppb)	1	0.15	65	74	63-107	13
Benz(a)anthracene	ug/L (ppb)	1	<0.04	53 vo	69	60-93	26 vo
Chrysene	ug/L (ppb)	1	<0.04	48 vo	62	60-102	25 vo
Benzo(b)fluoranthene	ug/L (ppb)	1	<0.04	45 vo	65	62-91	36 vo
Benzo(k)fluoranthene	ug/L (ppb)	1	<0.04	38 vo	67	51-98	55 vo
Benzo(a)pyrene	ug/L (ppb)	1	<0.04	42 vo	64	60-86	42 vo
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	1	<0.04	34	60	10-98	55 vo
Dibenz(a,h)anthracene	ug/L (ppb)	1	<0.04	31	58	10-97	61 vo
Benzo(g,h,i)perylene	ug/L (ppb)	1	<0.04	31	54	10-102	54 vo

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)	1	88	92	67-116	4
Acenaphthylene	ug/L (ppb)	1	100	103	65-119	3
Acenaphthene	ug/L (ppb)	1	98	102	66-118	4
Fluorene	ug/L (ppb)	1	99	107	64-125	8
Phenanthrene	ug/L (ppb)	1	88	89	67-120	1
Anthracene	ug/L (ppb)	1	91	96	65-122	5
Fluoranthene	ug/L (ppb)	1	88	97	65-127	10
Pyrene	ug/L (ppb)	1	96	92	62-130	4
Benz(a)anthracene	ug/L (ppb)	1	96	100	60-118	4
Chrysene	ug/L (ppb)	1	91	94	66-125	3
Benzo(b)fluoranthene	ug/L (ppb)	1	103	101	55-135	2
Benzo(k)fluoranthene	ug/L (ppb)	1	97	105	62-125	8
Benzo(a)pyrene	ug/L (ppb)	1	96	100	58-127	4
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	1	104	105	36-142	1
Dibenz(a,h)anthracene	ug/L (ppb)	1	87	93	37-133	7
Benzo(g,h,i)perylene	ug/L (ppb)	1	90	97	34-135	7

Date of Report: 02/18/19
Date Received: 02/08/19
Project: Kelly Moore 14697009, F&BI 902134

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

Laboratory Code: 902134-04 (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	3.04	109	110	75-125	1
Chromium	ug/L (ppb)	20	2.00	88	89	75-125	1
Copper	ug/L (ppb)	20	19.4	86	89	75-125	3
Lead	ug/L (ppb)	10	2.04	101	102	75-125	1
Mercury	ug/L (ppb)	5	<1	114	117	75-125	3
Nickel	ug/L (ppb)	20	7.79	84	86	75-125	2
Zinc	ug/L (ppb)	50	135	96	101	75-125	5

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	ug/L (ppb)	10	100	80-120
Chromium	ug/L (ppb)	20	101	80-120
Copper	ug/L (ppb)	20	103	80-120
Lead	ug/L (ppb)	10	102	80-120
Mercury	ug/L (ppb)	5	116	80-120
Nickel	ug/L (ppb)	20	102	80-120
Zinc	ug/L (ppb)	50	105	80-120

Date of Report: 02/18/19
Date Received: 02/08/19
Project: Kelly Moore 14697009, F&BI 902134

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

Laboratory Code: 902134-04 (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	102	102	10-172	0
Chloromethane	ug/L (ppb)	50	<10	98	99	25-166	1
Vinyl chloride	ug/L (ppb)	50	<0.2	101	101	36-166	0
Bromomethane	ug/L (ppb)	50	<1	96	95	47-169	1
Chloroethane	ug/L (ppb)	50	<1	98	97	46-160	1
Trichlorofluoromethane	ug/L (ppb)	50	<1	105	101	44-165	4
Acetone	ug/L (ppb)	250	<50	83	83	10-182	0
1,1-Dichloroethene	ug/L (ppb)	50	<1	102	99	60-136	3
Hexane	ug/L (ppb)	50	<1	99	93	52-150	6
Methylene chloride	ug/L (ppb)	50	<5	106	109	67-132	3
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	91	91	74-127	0
trans-1,2-Dichloroethene	ug/L (ppb)	50	<1	97	98	72-129	1
1,1-Dichloroethane	ug/L (ppb)	50	<1	100	94	70-128	6
2,2-Dichloropropane	ug/L (ppb)	50	<1	100	95	36-154	5
cis-1,2-Dichloroethene	ug/L (ppb)	50	<1	97	93	71-127	4
Chloroform	ug/L (ppb)	50	<1	96	89	65-132	8
2-Butanone (MEK)	ug/L (ppb)	250	<10	89	84	10-129	6
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	102	99	69-133	3
1,1,1-Trichloroethane	ug/L (ppb)	50	<1	98	89	60-146	10
1,1-Dichloropropene	ug/L (ppb)	50	<1	98	95	69-133	3
Carbon tetrachloride	ug/L (ppb)	50	<1	100	96	56-152	4
Benzene	ug/L (ppb)	50	<0.35	98	95	76-125	3
Trichloroethene	ug/L (ppb)	50	<1	92	94	66-135	2
1,2-Dichloropropane	ug/L (ppb)	50	<1	88	95	78-125	8
Bromodichloromethane	ug/L (ppb)	50	<1	91	99	61-150	8
Dibromomethane	ug/L (ppb)	50	<1	87	94	66-141	8
4-Methyl-2-pentanone	ug/L (ppb)	250	<10	90	99	10-185	10
cis-1,3-Dichloropropene	ug/L (ppb)	50	<1	90	96	72-132	6
Toluene	ug/L (ppb)	50	<1	91	98	76-122	7
trans-1,3-Dichloropropene	ug/L (ppb)	50	<1	88	101	76-130	14
1,1,2-Trichloroethane	ug/L (ppb)	50	<1	97	101	68-131	4
2-Hexanone	ug/L (ppb)	250	<10	102	102	10-185	0
1,3-Dichloropropane	ug/L (ppb)	50	<1	99	98	71-128	1
Tetrachloroethene	ug/L (ppb)	50	<1	100	99	10-226	1
Dibromochloromethane	ug/L (ppb)	50	<1	107	106	70-139	1
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	<1	101	101	69-134	0
Chlorobenzene	ug/L (ppb)	50	<1	95	95	77-122	0
Ethylbenzene	ug/L (ppb)	50	<1	99	95	69-135	4
1,1,1,2-Tetrachloroethane	ug/L (ppb)	50	<1	98	101	73-137	3
m,p-Xylene	ug/L (ppb)	100	<2	96	96	69-135	0
o-Xylene	ug/L (ppb)	50	<1	93	92	60-140	1
Styrene	ug/L (ppb)	50	<1	98	97	71-133	1
Isopropylbenzene	ug/L (ppb)	50	8.3	93	93	65-142	0
Bromoform	ug/L (ppb)	50	<1	107	106	65-142	1
n-Propylbenzene	ug/L (ppb)	50	12	108 b	103 b	58-144	5 b
Bromobenzene	ug/L (ppb)	50	<1	107	105	75-124	2
1,3,5-Trimethylbenzene	ug/L (ppb)	50	<1	103	98	66-137	5
1,1,2,2-Tetrachloroethane	ug/L (ppb)	50	<1	118	119	51-154	1
1,2,3-Trichloropropane	ug/L (ppb)	50	<1	108	104	53-150	4
2-Chlorotoluene	ug/L (ppb)	50	<1	106	99	66-127	7
4-Chlorotoluene	ug/L (ppb)	50	<1	105	99	65-130	6
tert-Butylbenzene	ug/L (ppb)	50	<1	98	95	65-137	3
1,2,4-Trimethylbenzene	ug/L (ppb)	50	<1	100	95	59-146	5
sec-Butylbenzene	ug/L (ppb)	50	1.2	98	100	64-140	2
p-Isopropyltoluene	ug/L (ppb)	50	<1	95	97	65-141	2
1,3-Dichlorobenzene	ug/L (ppb)	50	<1	97	98	72-123	1
1,4-Dichlorobenzene	ug/L (ppb)	50	<1	95	95	69-126	0
1,2-Dichlorobenzene	ug/L (ppb)	50	<1	96	94	69-128	2
1,2-Dibromo-3-chloropropane	ug/L (ppb)	50	<10	116	124	32-164	7
1,2,4-Trichlorobenzene	ug/L (ppb)	50	<1	106	105	66-136	1
Hexachlorobutadiene	ug/L (ppb)	50	<1	104	103	60-143	1
Naphthalene	ug/L (ppb)	50	<1	116	113	44-164	3
1,2,3-Trichlorobenzene	ug/L (ppb)	50	<1	108	108	69-148	0

Date of Report: 02/18/19
Date Received: 02/08/19
Project: Kelly Moore 14697009, F&BI 902134

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

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Dichlorodifluoromethane	ug/L (ppb)	50	121	25-158
Chloromethane	ug/L (ppb)	50	112	45-156
Vinyl chloride	ug/L (ppb)	50	116	50-154
Bromomethane	ug/L (ppb)	50	110	55-143
Chloroethane	ug/L (ppb)	50	116	58-146
Trichlorofluoromethane	ug/L (ppb)	250	119	50-150
Acetone	ug/L (ppb)	250	93	53-131
1,1-Dichloroethene	ug/L (ppb)	50	116	67-136
Hexane	ug/L (ppb)	50	116	57-137
Methylene chloride	ug/L (ppb)	50	128	39-148
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	115	64-147
trans-1,2-Dichloroethene	ug/L (ppb)	50	122	68-128
1,1-Dichloroethane	ug/L (ppb)	50	122 vo	79-121
2,2-Dichloropropane	ug/L (ppb)	50	129	55-143
cis-1,2-Dichloroethene	ug/L (ppb)	50	119	80-123
Chloroform	ug/L (ppb)	50	114	80-121
2-Butanone (MEK)	ug/L (ppb)	250	97	57-149
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	101	73-132
1,1,1-Trichloroethane	ug/L (ppb)	50	108	83-130
1,1-Dichloropropene	ug/L (ppb)	50	106	77-129
Carbon tetrachloride	ug/L (ppb)	50	110	75-158
Benzene	ug/L (ppb)	50	101	69-134
Trichloroethene	ug/L (ppb)	50	96	80-120
1,2-Dichloropropane	ug/L (ppb)	50	98	77-123
Bromodichloromethane	ug/L (ppb)	50	96	81-133
Dibromomethane	ug/L (ppb)	50	93	82-125
4-Methyl-2-pentanone	ug/L (ppb)	250	89	65-138
cis-1,3-Dichloropropene	ug/L (ppb)	50	93	82-132
Toluene	ug/L (ppb)	50	100	72-122
trans-1,3-Dichloropropene	ug/L (ppb)	50	88	80-136
1,1,2-Trichloroethane	ug/L (ppb)	50	96	75-124
2-Hexanone	ug/L (ppb)	250	79	60-136
1,3-Dichloropropane	ug/L (ppb)	50	87	76-126
Tetrachloroethene	ug/L (ppb)	50	103	76-121
Dibromochloromethane	ug/L (ppb)	50	101	84-133
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	88	82-125
Chlorobenzene	ug/L (ppb)	50	94	83-114
Ethylbenzene	ug/L (ppb)	50	103	77-124
1,1,1,2-Tetrachloroethane	ug/L (ppb)	50	114	84-127
m,p-Xylene	ug/L (ppb)	100	101	83-125
o-Xylene	ug/L (ppb)	50	105	81-121
Styrene	ug/L (ppb)	50	100	84-119
Isopropylbenzene	ug/L (ppb)	50	104	85-117
Bromoform	ug/L (ppb)	50	107	74-136
n-Propylbenzene	ug/L (ppb)	50	99	74-126
Bromobenzene	ug/L (ppb)	50	96	80-121
1,3,5-Trimethylbenzene	ug/L (ppb)	50	103	78-123
1,1,2,2-Tetrachloroethane	ug/L (ppb)	50	98	66-126
1,2,3-Trichloropropane	ug/L (ppb)	50	92	67-124
2-Chlorotoluene	ug/L (ppb)	50	101	77-127
4-Chlorotoluene	ug/L (ppb)	50	95	78-128
tert-Butylbenzene	ug/L (ppb)	50	104	80-123
1,2,4-Trimethylbenzene	ug/L (ppb)	50	104	79-122
sec-Butylbenzene	ug/L (ppb)	50	109	80-125
p-Isopropyltoluene	ug/L (ppb)	50	106	81-123
1,3-Dichlorobenzene	ug/L (ppb)	50	98	85-116
1,4-Dichlorobenzene	ug/L (ppb)	50	95	84-121
1,2-Dichlorobenzene	ug/L (ppb)	50	98	85-116
1,2-Dibromo-3-chloropropane	ug/L (ppb)	50	110	57-141
1,2,4-Trichlorobenzene	ug/L (ppb)	50	107	72-130
Hexachlorobutadiene	ug/L (ppb)	50	110	53-141
Naphthalene	ug/L (ppb)	50	112	64-133
1,2,3-Trichlorobenzene	ug/L (ppb)	50	111	65-136

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

902134

ME 02-08-19

UW5/C05/

Report To Crystal Thimsen

Company Wood

Address 600 University St #600

City, State, ZIP Seattle, WA 98101

Phone 781-724-1019 Email crystal.thimsen@woodplc.com

SAMPLERS (signature)

PROJECT NAME: Kelly Moore

PO #: 14697009

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	TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM	Total Metals				Notes
						ANALYSES REQUESTED											
KMW-02R-020819	01A	2/8/19	945	Water	9		X	X		X		X	X				
KMW-03R-020819	02	2/8/19	1140		9												
KMW-04-020719	03	2/7/19	1115		9												
KMW-06-020719	04	2/7/19	1340		19									TPH/BTEX/PAH/VOC/SVOC/Metals			MS/MSD
KMW-08-020819	05	2/8/19	1040		9												
KMW-09-020719	06	2/7/19	1515		9												
KMW-10-020719	07	2/7/19	1245		9												
KMW-10-9-020719	08	2/7/19	1250		9												
KMW-7-020819	09	2/8/19	1220		9												
TRIP-BLANKS	10	—	—		6												

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Lucas Keene	Wood	2/8/19	1407
Received by:	Liz Webber-Bruya	FTBI	2/8/19	1407
Relinquished by:				
Received by:		Samples received at 2 °C		

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

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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August 27, 2018

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

Dear Ms Thimsen:

Included are the results from the testing of material submitted on August 17, 2018 from the Kelly-Moore, F&BI 808402 project. There are 46 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. 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
WEI0827R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on August 17, 2018 by Friedman & Bruya, Inc. from the Wood Environment & Infrastructure Solutions Kelly-Moore, F&BI 808402 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Wood Environment & Infrastructure Solutions
808402 -01	KMW-02R-081618
808402 -02	KMW-03R-081618
808402 -03	KMW-04-081618
808402 -04	KMW-06-081618
808402 -05	KMW-07-081618
808402 -06	KMW-08-081618
808402 -07	KMW-09-081618
808402 -08	KMW-10-081618
808402 -09	KMW-03R-9-081618

A 6020A internal standard failed the acceptance criteria for sample KMW-04-081618, KMW-06-081618, KMW-09-081618, and KMW-10-081618 due to matrix interferences. The data were flagged accordingly. The sample was diluted and reanalyzed.

The 8260C calibration standard failed the acceptance criteria for 2-butanone and 2-hexanone. The data were flagged accordingly.

Phenanthrene was detected in the 8270D SIM method blank at a level within 10 times the concentration detected in several samples. The data were flagged accordingly.

All other quality control requirements were acceptable.

Date of Report: 08/27/18
Date Received: 08/17/18
Project: Kelly-Moore, F&BI 808402
Date Extracted: 08/20/18
Date Analyzed: 08/20/18 and 08/21/18

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE USING METHOD NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Gasoline Range	Surrogate (% Recovery) (Limit 51-134)
KMW-02R-081618 808402-01	<100	101
KMW-03R-081618 808402-02	290	114
KMW-04-081618 808402-03 1/10	33,000	123
KMW-06-081618 808402-04	4,000	ip
KMW-07-081618 808402-05	<100	96
KMW-08-081618 808402-06	230	109
KMW-09-081618 808402-07	940	114
KMW-10-081618 808402-08 1/10	4,800	108
KMW-03R-9-081618 808402-09	380	126
Method Blank 08-1759 MB	<100	96

Date of Report: 08/27/18
Date Received: 08/17/18
Project: Kelly-Moore, F&BI 808402
Date Extracted: 08/17/18
Date Analyzed: 08/17/18

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)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 41-152)
KMW-02R-081618 808402-01	<50	<250	70
KMW-03R-081618 808402-02	350 x	<250	73
KMW-04-081618 808402-03	2,000 x	<250	69
KMW-06-081618 808402-04	8,600	680 x	71
KMW-07-081618 808402-05	<50	<250	62
KMW-08-081618 808402-06	160 x	<250	62
KMW-09-081618 808402-07	3,600	360 x	67
KMW-10-081618 808402-08	1,400 x	<250	73
KMW-03R-9-081618 808402-09	450 x	<250	70
Method Blank 08-1856 MB	<50	<250	55

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-02R-081618	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/17/18	Project:	Kelly-Moore, F&BI 808402
Date Extracted:	08/20/18	Lab ID:	808402-01
Date Analyzed:	08/20/18	Data File:	808402-01.049
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	1.82
Zinc	<5

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-03R-081618	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/17/18	Project:	Kelly-Moore, F&BI 808402
Date Extracted:	08/20/18	Lab ID:	808402-02
Date Analyzed:	08/20/18	Data File:	808402-02.050
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	1.46
Zinc	<5

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-04-081618	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/17/18	Project:	Kelly-Moore, F&BI 808402
Date Extracted:	08/20/18	Lab ID:	808402-03
Date Analyzed:	08/20/18	Data File:	808402-03.051
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	14.5
Chromium	<1 J
Copper	<5 J
Lead	<1
Mercury	<1
Nickel	2.43 J
Zinc	<5 J

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-04-081618	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/17/18	Project:	Kelly-Moore, F&BI 808402
Date Extracted:	08/20/18	Lab ID:	808402-03 x10
Date Analyzed:	08/20/18	Data File:	808402-03 x10.095
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	14.5
Chromium	<10
Copper	<50
Lead	<10
Mercury	<10
Nickel	<10
Zinc	<50

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-06-081618	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/17/18	Project:	Kelly-Moore, F&BI 808402
Date Extracted:	08/20/18	Lab ID:	808402-04
Date Analyzed:	08/20/18	Data File:	808402-04.052
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	4.83
Chromium	2.48 J
Copper	11.9 J
Lead	5.61
Mercury	<1
Nickel	1.38 J
Zinc	5.72 J

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-06-081618	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/17/18	Project:	Kelly-Moore, F&BI 808402
Date Extracted:	08/20/18	Lab ID:	808402-04 x10
Date Analyzed:	08/20/18	Data File:	808402-04 x10.107
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<10
Chromium	<10
Copper	<50
Lead	<10
Mercury	<10
Nickel	<10
Zinc	<50

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-07-081618	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/17/18	Project:	Kelly-Moore, F&BI 808402
Date Extracted:	08/20/18	Lab ID:	808402-05
Date Analyzed:	08/20/18	Data File:	808402-05.054
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

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-08-081618	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/17/18	Project:	Kelly-Moore, F&BI 808402
Date Extracted:	08/20/18	Lab ID:	808402-06
Date Analyzed:	08/20/18	Data File:	808402-06.086
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	1.11
Zinc	<5

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-09-081618	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/17/18	Project:	Kelly-Moore, F&BI 808402
Date Extracted:	08/20/18	Lab ID:	808402-07
Date Analyzed:	08/20/18	Data File:	808402-07.087
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	2.04
Chromium	1.40 J
Copper	5.62 J
Lead	3.10
Mercury	<1
Nickel	1.25 J
Zinc	<5 J

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-09-081618	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/17/18	Project:	Kelly-Moore, F&BI 808402
Date Extracted:	08/20/18	Lab ID:	808402-07 x10
Date Analyzed:	08/21/18	Data File:	808402-07 x10.030
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<10
Chromium	<10
Copper	<50
Lead	<10
Mercury	<10
Nickel	<10
Zinc	<50

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-10-081618	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/17/18	Project:	Kelly-Moore, F&BI 808402
Date Extracted:	08/20/18	Lab ID:	808402-08
Date Analyzed:	08/20/18	Data File:	808402-08.088
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	4.61
Chromium	1.35 J
Copper	<5 J
Lead	<1
Mercury	<1
Nickel	<1 J
Zinc	<5 J

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-10-081618	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/17/18	Project:	Kelly-Moore, F&BI 808402
Date Extracted:	08/20/18	Lab ID:	808402-08 x10
Date Analyzed:	08/22/18	Data File:	808402-08 x10.043
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<10
Chromium	<10
Copper	<50
Lead	<10
Mercury	<10
Nickel	<10
Zinc	<50

Analysis For Total Metals By EPA Method 6020B

Client ID:	KMW-03R-9-081618	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/17/18	Project:	Kelly-Moore, F&BI 808402
Date Extracted:	08/20/18	Lab ID:	808402-09
Date Analyzed:	08/20/18	Data File:	808402-09.089
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	1.82
Zinc	<5

Analysis For Total Metals By EPA Method 6020B

Client ID:	Method Blank	Client:	Wood Environment & Infrastructure Solutions
Date Received:	NA	Project:	Kelly-Moore, F&BI 808402
Date Extracted:	08/20/18	Lab ID:	I8-535 mb
Date Analyzed:	08/20/18	Data File:	I8-535 mb.053
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 Volatile Compounds By EPA Method 8260C

Client Sample ID:	KMW-02R-081618	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/17/18	Project:	Kelly-Moore, F&BI 808402
Date Extracted:	08/17/18	Lab ID:	808402-01
Date Analyzed:	08/17/18	Data File:	081730.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	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	<1	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	<1	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<1
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)	<10 ca	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 ca		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	KMW-03R-081618	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/17/18	Project:	Kelly-Moore, F&BI 808402
Date Extracted:	08/17/18	Lab ID:	808402-02
Date Analyzed:	08/17/18	Data File:	081731.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	57	121
Toluene-d8	98	63	127
4-Bromofluorobenzene	97	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	<1	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	<1	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	3.6
trans-1,2-Dichloroethene	<1	Bromoform	<1
1,1-Dichloroethane	<1	n-Propylbenzene	7.4
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)	<10 ca	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	1.8
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 ca		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	KMW-04-081618	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/17/18	Project:	Kelly-Moore, F&BI 808402
Date Extracted:	08/17/18	Lab ID:	808402-03
Date Analyzed:	08/17/18	Data File:	081732.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	57	121
Toluene-d8	95	63	127
4-Bromofluorobenzene	84	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	<1	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	860 ve
Acetone	<50	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	2,800 ve
Hexane	4.3	o-Xylene	1,100 ve
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	21
trans-1,2-Dichloroethene	<1	Bromoform	<1
1,1-Dichloroethane	<1	n-Propylbenzene	19
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	<1	1,3,5-Trimethylbenzene	17
Chloroform	<1	1,1,2,2-Tetrachloroethane	<1
2-Butanone (MEK)	<10 ca	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	54
Benzene	<0.35	sec-Butylbenzene	1.4
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	600 ve	Hexachlorobutadiene	<1
trans-1,3-Dichloropropene	<1	Naphthalene	5.1
1,1,2-Trichloroethane	<1	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10 ca		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	KMW-04-081618	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/17/18	Project:	Kelly-Moore, F&BI 808402
Date Extracted:	08/17/18	Lab ID:	808402-03 1/100
Date Analyzed:	08/20/18	Data File:	082017.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	57	121
Toluene-d8	100	63	127
4-Bromofluorobenzene	97	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	<100	1,2-Dibromoethane (EDB)	<100
Chloroethane	<100	Chlorobenzene	<100
Trichlorofluoromethane	<100	Ethylbenzene	2,600
Acetone	<5,000	1,1,1,2-Tetrachloroethane	<100
1,1-Dichloroethene	<100	m,p-Xylene	6,400
Hexane	<100	o-Xylene	1,500
Methylene chloride	<500	Styrene	<100
Methyl t-butyl ether (MTBE)	<100	Isopropylbenzene	<100
trans-1,2-Dichloroethene	<100	Bromoform	<100
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)	<1,000	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	<100
Benzene	<35	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	610	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 8260C

Client Sample ID:	KMW-06-081618	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/17/18	Project:	Kelly-Moore, F&BI 808402
Date Extracted:	08/17/18	Lab ID:	808402-04
Date Analyzed:	08/20/18	Data File:	082009.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	57	121
Toluene-d8	97	63	127
4-Bromofluorobenzene	106	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	<1	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	<1	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	18
trans-1,2-Dichloroethene	<1	Bromoform	<1
1,1-Dichloroethane	<1	n-Propylbenzene	25
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)	<10	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	2.6
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		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	KMW-07-081618	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/17/18	Project:	Kelly-Moore, F&BI 808402
Date Extracted:	08/17/18	Lab ID:	808402-05
Date Analyzed:	08/17/18	Data File:	081734.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	57	121
Toluene-d8	99	63	127
4-Bromofluorobenzene	96	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	<1	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	<1	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<1
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)	<10 ca	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 ca		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	KMW-08-081618	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/17/18	Project:	Kelly-Moore, F&BI 808402
Date Extracted:	08/17/18	Lab ID:	808402-06
Date Analyzed:	08/17/18	Data File:	081735.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	57	121
Toluene-d8	98	63	127
4-Bromofluorobenzene	96	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	<1	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	<1	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<1
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)	<10 ca	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 ca		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	KMW-09-081618	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/17/18	Project:	Kelly-Moore, F&BI 808402
Date Extracted:	08/17/18	Lab ID:	808402-07
Date Analyzed:	08/17/18	Data File:	081736.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	57	121
Toluene-d8	97	63	127
4-Bromofluorobenzene	96	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	<1	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	<1	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	11
trans-1,2-Dichloroethene	<1	Bromoform	<1
1,1-Dichloroethane	<1	n-Propylbenzene	11
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)	<10 ca	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 ca		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	KMW-10-081618	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/17/18	Project:	Kelly-Moore, F&BI 808402
Date Extracted:	08/17/18	Lab ID:	808402-08
Date Analyzed:	08/17/18	Data File:	081737.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	57	121
Toluene-d8	98	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	<1	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	320 ve
Acetone	<50	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	930 ve
Hexane	<1	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	14
trans-1,2-Dichloroethene	<1	Bromoform	<1
1,1-Dichloroethane	<1	n-Propylbenzene	13
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	<1	1,3,5-Trimethylbenzene	18
Chloroform	<1	1,1,2,2-Tetrachloroethane	<1
2-Butanone (MEK)	<10 ca	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	36
Benzene	1.5	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 ca		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	KMW-10-081618	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/17/18	Project:	Kelly-Moore, F&BI 808402
Date Extracted:	08/17/18	Lab ID:	808402-08 1/10
Date Analyzed:	08/20/18	Data File:	082016.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	57	121
Toluene-d8	100	63	127
4-Bromofluorobenzene	97	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	<10	1,2-Dibromoethane (EDB)	<10
Chloroethane	<10	Chlorobenzene	<10
Trichlorofluoromethane	<10	Ethylbenzene	370
Acetone	<500	1,1,1,2-Tetrachloroethane	<10
1,1-Dichloroethene	<10	m,p-Xylene	1,100
Hexane	<10	o-Xylene	<10
Methylene chloride	<50	Styrene	<10
Methyl t-butyl ether (MTBE)	<10	Isopropylbenzene	15
trans-1,2-Dichloroethene	<10	Bromoform	<10
1,1-Dichloroethane	<10	n-Propylbenzene	14
2,2-Dichloropropane	<10	Bromobenzene	<10
cis-1,2-Dichloroethene	<10	1,3,5-Trimethylbenzene	19
Chloroform	<10	1,1,2,2-Tetrachloroethane	<10
2-Butanone (MEK)	<100	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	38
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		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	KMW-03R-9-081618	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/17/18	Project:	Kelly-Moore, F&BI 808402
Date Extracted:	08/17/18	Lab ID:	808402-09
Date Analyzed:	08/18/18	Data File:	081738.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	57	121
Toluene-d8	97	63	127
4-Bromofluorobenzene	97	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	<1	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	<1	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	4.1
trans-1,2-Dichloroethene	<1	Bromoform	<1
1,1-Dichloroethane	<1	n-Propylbenzene	8.5
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)	<10 ca	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	1.9
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 ca		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Wood Environment & Infrastructure Solutions
Date Received:	Not Applicable	Project:	Kelly-Moore, F&BI 808402
Date Extracted:	08/17/18	Lab ID:	08-1788 mb
Date Analyzed:	08/17/18	Data File:	081710.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	57	121
Toluene-d8	98	63	127
4-Bromofluorobenzene	96	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	<1	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	<1	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<1
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)	<10	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		

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	KMW-02R-081618	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/17/18	Project:	Kelly-Moore, F&BI 808402
Date Extracted:	08/17/18	Lab ID:	808402-01 1/2
Date Analyzed:	08/17/18	Data File:	081709.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	109	31	160
Benzo(a)anthracene-d12	117	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.06
Acenaphthylene	<0.06
Acenaphthene	<0.06
Fluorene	<0.06
Phenanthrene	<0.06
Anthracene	<0.06
Fluoranthene	<0.06
Pyrene	<0.06
Benz(a)anthracene	<0.06
Chrysene	<0.06
Benzo(a)pyrene	<0.06
Benzo(b)fluoranthene	<0.06
Benzo(k)fluoranthene	<0.06
Indeno(1,2,3-cd)pyrene	<0.06
Dibenz(a,h)anthracene	<0.06
Benzo(g,h,i)perylene	<0.06

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	KMW-03R-081618	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/17/18	Project:	Kelly-Moore, F&BI 808402
Date Extracted:	08/17/18	Lab ID:	808402-02 1/2
Date Analyzed:	08/17/18	Data File:	081710.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	107	31	160
Benzo(a)anthracene-d12	115	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	0.078
Acenaphthylene	<0.06
Acenaphthene	0.27
Fluorene	0.18
Phenanthrene	0.074 fb
Anthracene	<0.06
Fluoranthene	<0.06
Pyrene	<0.06
Benz(a)anthracene	<0.06
Chrysene	<0.06
Benzo(a)pyrene	<0.06
Benzo(b)fluoranthene	<0.06
Benzo(k)fluoranthene	<0.06
Indeno(1,2,3-cd)pyrene	<0.06
Dibenz(a,h)anthracene	<0.06
Benzo(g,h,i)perylene	<0.06

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	KMW-04-081618	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/17/18	Project:	Kelly-Moore, F&BI 808402
Date Extracted:	08/17/18	Lab ID:	808402-03 1/2
Date Analyzed:	08/17/18	Data File:	081711.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	106	31	160
Benzo(a)anthracene-d12	108	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	3.9
Acenaphthylene	<0.06
Acenaphthene	0.082
Fluorene	<0.06
Phenanthrene	0.071 fb
Anthracene	<0.06
Fluoranthene	<0.06
Pyrene	<0.06
Benz(a)anthracene	<0.06
Chrysene	<0.06
Benzo(a)pyrene	<0.06
Benzo(b)fluoranthene	<0.06
Benzo(k)fluoranthene	<0.06
Indeno(1,2,3-cd)pyrene	<0.06
Dibenz(a,h)anthracene	<0.06
Benzo(g,h,i)perylene	<0.06

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	KMW-06-081618	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/17/18	Project:	Kelly-Moore, F&BI 808402
Date Extracted:	08/17/18	Lab ID:	808402-04 1/2
Date Analyzed:	08/17/18	Data File:	081712.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	102	31	160
Benzo(a)anthracene-d12	105	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	0.16
Acenaphthylene	8.2
Acenaphthene	2.2
Fluorene	0.79
Phenanthrene	0.20
Anthracene	0.12
Fluoranthene	0.18
Pyrene	0.21
Benz(a)anthracene	<0.06
Chrysene	<0.06
Benzo(a)pyrene	<0.06
Benzo(b)fluoranthene	<0.06
Benzo(k)fluoranthene	<0.06
Indeno(1,2,3-cd)pyrene	<0.06
Dibenz(a,h)anthracene	<0.06
Benzo(g,h,i)perylene	<0.06

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	KMW-07-081618	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/17/18	Project:	Kelly-Moore, F&BI 808402
Date Extracted:	08/17/18	Lab ID:	808402-05 1/2
Date Analyzed:	08/17/18	Data File:	081713.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	109	31	160
Benzo(a)anthracene-d12	108	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.06
Acenaphthylene	<0.06
Acenaphthene	<0.06
Fluorene	<0.06
Phenanthrene	<0.06
Anthracene	<0.06
Fluoranthene	<0.06
Pyrene	<0.06
Benz(a)anthracene	<0.06
Chrysene	<0.06
Benzo(a)pyrene	<0.06
Benzo(b)fluoranthene	<0.06
Benzo(k)fluoranthene	<0.06
Indeno(1,2,3-cd)pyrene	<0.06
Dibenz(a,h)anthracene	<0.06
Benzo(g,h,i)perylene	<0.06

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	KMW-08-081618	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/17/18	Project:	Kelly-Moore, F&BI 808402
Date Extracted:	08/17/18	Lab ID:	808402-06 1/2
Date Analyzed:	08/17/18	Data File:	081716.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	106	31	160
Benzo(a)anthracene-d12	122	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.06
Acenaphthylene	<0.06
Acenaphthene	0.11
Fluorene	0.34
Phenanthrene	<0.06
Anthracene	0.16
Fluoranthene	0.24
Pyrene	0.23
Benz(a)anthracene	<0.06
Chrysene	<0.06
Benzo(a)pyrene	<0.06
Benzo(b)fluoranthene	<0.06
Benzo(k)fluoranthene	<0.06
Indeno(1,2,3-cd)pyrene	<0.06
Dibenz(a,h)anthracene	<0.06
Benzo(g,h,i)perylene	<0.06

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	KMW-09-081618	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/17/18	Project:	Kelly-Moore, F&BI 808402
Date Extracted:	08/17/18	Lab ID:	808402-07 1/2
Date Analyzed:	08/17/18	Data File:	081717.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	104	31	160
Benzo(a)anthracene-d12	109	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	0.12
Acenaphthylene	<0.06
Acenaphthene	3.8
Fluorene	0.69
Phenanthrene	0.062 fb
Anthracene	<0.06
Fluoranthene	<0.06
Pyrene	<0.06
Benz(a)anthracene	<0.06
Chrysene	<0.06
Benzo(a)pyrene	<0.06
Benzo(b)fluoranthene	<0.06
Benzo(k)fluoranthene	<0.06
Indeno(1,2,3-cd)pyrene	<0.06
Dibenz(a,h)anthracene	<0.06
Benzo(g,h,i)perylene	<0.06

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	KMW-10-081618	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/17/18	Project:	Kelly-Moore, F&BI 808402
Date Extracted:	08/17/18	Lab ID:	808402-08 1/2
Date Analyzed:	08/17/18	Data File:	081718.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	108	31	160
Benzo(a)anthracene-d12	116	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	0.51
Acenaphthylene	0.069
Acenaphthene	0.061
Fluorene	<0.06
Phenanthrene	<0.06
Anthracene	<0.06
Fluoranthene	<0.06
Pyrene	<0.06
Benz(a)anthracene	<0.06
Chrysene	<0.06
Benzo(a)pyrene	<0.06
Benzo(b)fluoranthene	<0.06
Benzo(k)fluoranthene	<0.06
Indeno(1,2,3-cd)pyrene	<0.06
Dibenz(a,h)anthracene	<0.06
Benzo(g,h,i)perylene	<0.06

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	KMW-03R-9-081618	Client:	Wood Environment & Infrastructure Solutions
Date Received:	08/17/18	Project:	Kelly-Moore, F&BI 808402
Date Extracted:	08/17/18	Lab ID:	808402-09 1/2
Date Analyzed:	08/17/18	Data File:	081719.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	108	31	160
Benzo(a)anthracene-d12	116	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.06
Acenaphthylene	<0.06
Acenaphthene	0.27
Fluorene	0.17
Phenanthrene	0.066 fb
Anthracene	<0.06
Fluoranthene	<0.06
Pyrene	<0.06
Benz(a)anthracene	<0.06
Chrysene	<0.06
Benzo(a)pyrene	<0.06
Benzo(b)fluoranthene	<0.06
Benzo(k)fluoranthene	<0.06
Indeno(1,2,3-cd)pyrene	<0.06
Dibenz(a,h)anthracene	<0.06
Benzo(g,h,i)perylene	<0.06

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	Wood Environment & Infrastructure Solutions
Date Received:	Not Applicable	Project:	Kelly-Moore, F&BI 808402
Date Extracted:	08/17/18	Lab ID:	08-1857 mb
Date Analyzed:	08/17/18	Data File:	081706.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	105	31	160
Benzo(a)anthracene-d12	113	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.03
Acenaphthylene	<0.03
Acenaphthene	<0.03
Fluorene	<0.03
Phenanthrene	<0.03
Anthracene	<0.03
Fluoranthene	<0.03
Pyrene	<0.03
Benz(a)anthracene	<0.03
Chrysene	<0.03
Benzo(a)pyrene	<0.03
Benzo(b)fluoranthene	<0.03
Benzo(k)fluoranthene	<0.03
Indeno(1,2,3-cd)pyrene	<0.03
Dibenz(a,h)anthracene	<0.03
Benzo(g,h,i)perylene	<0.03

Date of Report: 08/27/18
Date Received: 08/17/18
Project: Kelly-Moore, F&BI 808402

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

Laboratory Code: 808402-05 (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	97	100	53-117	3

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Gasoline	ug/L (ppb)	1,000	96	69-134

Date of Report: 08/27/18
Date Received: 08/17/18
Project: Kelly-Moore, F&BI 808402

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: 808402-05 (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	91	84	50-150	8

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Diesel Extended	ug/L (ppb)	2,500	84	63-142

Date of Report: 08/27/18
Date Received: 08/17/18
Project: Kelly-Moore, F&BI 808402

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

Laboratory Code: 808402-05 (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	109	102	75-125	7
Chromium	ug/L (ppb)	20	<1	95	94	75-125	1
Copper	ug/L (ppb)	20	<5	93	89	75-125	4
Lead	ug/L (ppb)	10	<1	93	90	75-125	3
Mercury	ug/L (ppb)	5	<1	92	91	75-125	1
Nickel	ug/L (ppb)	20	<1	94	91	75-125	3
Zinc	ug/L (ppb)	50	<5	97	90	75-125	7

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	ug/L (ppb)	10	97	80-120
Chromium	ug/L (ppb)	20	107	80-120
Copper	ug/L (ppb)	20	106	80-120
Lead	ug/L (ppb)	10	101	80-120
Mercury	ug/L (ppb)	5	98	80-120
Nickel	ug/L (ppb)	20	107	80-120
Zinc	ug/L (ppb)	50	92	80-120

Date of Report: 08/27/18
Date Received: 08/17/18
Project: Kelly-Moore, F&BI 808402

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

Laboratory Code: 808402-05 (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	100	101	10-172	1
Chloromethane	ug/L (ppb)	50	<10	90	92	25-166	2
Vinyl chloride	ug/L (ppb)	50	<0.2	95	97	36-166	2
Bromomethane	ug/L (ppb)	50	<1	105	106	47-169	1
Chloroethane	ug/L (ppb)	50	<1	93	93	46-160	0
Trichlorofluoromethane	ug/L (ppb)	50	<1	102	103	44-165	1
Acetone	ug/L (ppb)	250	<50	90	89	10-182	1
1,1-Dichloroethene	ug/L (ppb)	50	<1	110	109	60-136	1
Hexane	ug/L (ppb)	50	<1	98	100	52-150	2
Methylene chloride	ug/L (ppb)	50	<5	106	104	67-132	2
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	106	104	74-127	2
trans-1,2-Dichloroethene	ug/L (ppb)	50	<1	105	105	72-129	0
1,1-Dichloroethane	ug/L (ppb)	50	<1	100	101	70-128	1
2,2-Dichloropropane	ug/L (ppb)	50	<1	130	121	36-154	7
cis-1,2-Dichloroethene	ug/L (ppb)	50	<1	103	101	71-127	2
Chloroform	ug/L (ppb)	50	<1	101	100	65-132	1
2-Butanone (MEK)	ug/L (ppb)	250	<10	89	92	10-129	3
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	95	96	69-133	1
1,1,1-Trichloroethane	ug/L (ppb)	50	<1	109	108	60-146	1
1,1-Dichloropropene	ug/L (ppb)	50	<1	100	100	69-133	0
Carbon tetrachloride	ug/L (ppb)	50	<1	107	106	56-152	1
Benzene	ug/L (ppb)	50	<0.35	98	97	76-125	1
Trichloroethene	ug/L (ppb)	50	<1	97	97	66-135	0
1,2-Dichloropropane	ug/L (ppb)	50	<1	95	97	78-125	2
Bromodichloromethane	ug/L (ppb)	50	<1	99	99	61-150	0
Dibromomethane	ug/L (ppb)	50	<1	97	97	66-141	0
4-Methyl-2-pentanone	ug/L (ppb)	250	<10	95	101	10-185	6
cis-1,3-Dichloropropene	ug/L (ppb)	50	<1	96	99	72-132	3
Toluene	ug/L (ppb)	50	<1	97	96	76-122	1
trans-1,3-Dichloropropene	ug/L (ppb)	50	<1	96	99	76-130	3
1,1,2-Trichloroethane	ug/L (ppb)	50	<1	93	97	68-131	4
2-Hexanone	ug/L (ppb)	250	<10	82	93	10-185	13
1,3-Dichloropropane	ug/L (ppb)	50	<1	94	97	71-128	3
Tetrachloroethene	ug/L (ppb)	50	<1	104	103	10-226	1
Dibromochloromethane	ug/L (ppb)	50	<1	98	100	70-139	2
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	<1	94	98	69-134	4
Chlorobenzene	ug/L (ppb)	50	<1	96	97	77-122	1
Ethylbenzene	ug/L (ppb)	50	<1	96	97	69-135	1
1,1,1,2-Tetrachloroethane	ug/L (ppb)	50	<1	105	103	73-137	2
m,p-Xylene	ug/L (ppb)	100	<2	98	99	69-135	1
o-Xylene	ug/L (ppb)	50	<1	101	101	60-140	0
Styrene	ug/L (ppb)	50	<1	98	101	71-133	3
Isopropylbenzene	ug/L (ppb)	50	<1	101	99	65-142	2
Bromoform	ug/L (ppb)	50	<1	95	98	65-142	3
n-Propylbenzene	ug/L (ppb)	50	<1	99	99	58-144	0
Bromobenzene	ug/L (ppb)	50	<1	97	99	75-124	2
1,3,5-Trimethylbenzene	ug/L (ppb)	50	<1	102	100	66-137	2
1,1,2,2-Tetrachloroethane	ug/L (ppb)	50	<1	93	95	51-154	2
1,2,3-Trichloropropane	ug/L (ppb)	50	<1	88	93	53-150	6
2-Chlorotoluene	ug/L (ppb)	50	<1	99	98	66-127	1
4-Chlorotoluene	ug/L (ppb)	50	<1	96	98	65-130	2
tert-Butylbenzene	ug/L (ppb)	50	<1	102	96	65-137	6
1,2,4-Trimethylbenzene	ug/L (ppb)	50	<1	102	99	59-146	3
sec-Butylbenzene	ug/L (ppb)	50	<1	102	99	64-140	3
p-Isopropyltoluene	ug/L (ppb)	50	<1	101	99	65-141	2
1,3-Dichlorobenzene	ug/L (ppb)	50	<1	97	97	72-123	0
1,4-Dichlorobenzene	ug/L (ppb)	50	<1	95	96	69-126	1
1,2-Dichlorobenzene	ug/L (ppb)	50	<1	98	97	69-128	1
1,2-Dibromo-3-chloropropane	ug/L (ppb)	50	<10	96	93	32-164	3
1,2,4-Trichlorobenzene	ug/L (ppb)	50	<1	120	114	66-136	5
Hexachlorobutadiene	ug/L (ppb)	50	<1	114	109	60-143	4
Naphthalene	ug/L (ppb)	50	<1	110	105	44-164	5
1,2,3-Trichlorobenzene	ug/L (ppb)	50	<1	119	114	69-148	4

Date of Report: 08/27/18
Date Received: 08/17/18
Project: Kelly-Moore, F&BI 808402

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

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)	50	104	107	25-158	3
Chloromethane	ug/L (ppb)	50	92	96	45-156	4
Vinyl chloride	ug/L (ppb)	50	98	101	50-154	3
Bromomethane	ug/L (ppb)	50	107	111	55-143	4
Chloroethane	ug/L (ppb)	50	95	97	58-146	2
Trichlorofluoromethane	ug/L (ppb)	250	104	104	50-150	0
Acetone	ug/L (ppb)	250	93	89	53-131	4
1,1-Dichloroethene	ug/L (ppb)	50	109	107	67-136	2
Hexane	ug/L (ppb)	50	98	96	57-137	2
Methylene chloride	ug/L (ppb)	50	105	103	39-148	2
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	105	105	64-147	0
trans-1,2-Dichloroethene	ug/L (ppb)	50	105	102	68-128	3
1,1-Dichloroethane	ug/L (ppb)	50	100	98	79-121	2
2,2-Dichloropropane	ug/L (ppb)	50	123	126	55-143	2
cis-1,2-Dichloroethene	ug/L (ppb)	50	101	100	80-123	1
Chloroform	ug/L (ppb)	50	100	98	80-121	2
2-Butanone (MEK)	ug/L (ppb)	250	96	94	57-149	2
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	97	95	73-132	2
1,1,1-Trichloroethane	ug/L (ppb)	50	109	109	83-130	0
1,1-Dichloropropene	ug/L (ppb)	50	100	98	77-129	2
Carbon tetrachloride	ug/L (ppb)	50	106	107	75-158	1
Benzene	ug/L (ppb)	50	98	97	69-134	1
Trichloroethene	ug/L (ppb)	50	98	96	80-120	2
1,2-Dichloropropane	ug/L (ppb)	50	98	96	77-123	2
Bromodichloromethane	ug/L (ppb)	50	100	98	81-133	2
Dibromomethane	ug/L (ppb)	50	98	97	82-125	1
4-Methyl-2-pentanone	ug/L (ppb)	250	103	101	65-138	2
cis-1,3-Dichloropropene	ug/L (ppb)	50	100	97	82-132	3
Toluene	ug/L (ppb)	50	97	95	72-122	2
trans-1,3-Dichloropropene	ug/L (ppb)	50	98	95	80-136	3
1,1,2-Trichloroethane	ug/L (ppb)	50	97	94	75-124	3
2-Hexanone	ug/L (ppb)	250	94	92	60-136	2
1,3-Dichloropropane	ug/L (ppb)	50	98	95	76-126	3
Tetrachloroethene	ug/L (ppb)	50	104	102	76-121	2
Dibromochloromethane	ug/L (ppb)	50	100	97	84-133	3
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	98	96	82-125	2
Chlorobenzene	ug/L (ppb)	50	97	95	83-114	2
Ethylbenzene	ug/L (ppb)	50	100	97	77-124	3
1,1,1,2-Tetrachloroethane	ug/L (ppb)	50	102	101	84-127	1
m,p-Xylene	ug/L (ppb)	100	101	99	83-125	2
o-Xylene	ug/L (ppb)	50	101	100	81-121	1
Styrene	ug/L (ppb)	50	100	100	84-119	0
Isopropylbenzene	ug/L (ppb)	50	100	98	85-117	2
Bromoform	ug/L (ppb)	50	98	97	74-136	1
n-Propylbenzene	ug/L (ppb)	50	100	96	74-126	4
Bromobenzene	ug/L (ppb)	50	99	97	80-121	2
1,3,5-Trimethylbenzene	ug/L (ppb)	50	100	98	78-123	2
1,1,2,2-Tetrachloroethane	ug/L (ppb)	50	96	94	66-126	2
1,2,3-Trichloropropane	ug/L (ppb)	50	93	91	67-124	2
2-Chlorotoluene	ug/L (ppb)	50	98	95	77-127	3
4-Chlorotoluene	ug/L (ppb)	50	98	95	78-128	3
tert-Butylbenzene	ug/L (ppb)	50	98	96	80-123	2
1,2,4-Trimethylbenzene	ug/L (ppb)	50	100	98	79-122	2
sec-Butylbenzene	ug/L (ppb)	50	100	97	80-125	3
p-Isopropyltoluene	ug/L (ppb)	50	100	97	81-123	3
1,3-Dichlorobenzene	ug/L (ppb)	50	97	95	85-116	2
1,4-Dichlorobenzene	ug/L (ppb)	50	96	94	84-121	2
1,2-Dichlorobenzene	ug/L (ppb)	50	97	95	85-116	2
1,2-Dibromo-3-chloropropane	ug/L (ppb)	50	95	95	57-141	0
1,2,4-Trichlorobenzene	ug/L (ppb)	50	115	115	72-130	0
Hexachlorobutadiene	ug/L (ppb)	50	109	110	53-141	1
Naphthalene	ug/L (ppb)	50	107	108	64-133	1
1,2,3-Trichlorobenzene	ug/L (ppb)	50	114	116	65-136	2

Date of Report: 08/27/18
Date Received: 08/17/18
Project: Kelly-Moore, F&BI 808402

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR PAHS BY EPA METHOD 8270D SIM

Laboratory Code: 808402-05 1/2 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	1	<0.06	94	92	10-172	2
Acenaphthylene	ug/L (ppb)	1	<0.06	100	99	38-137	1
Acenaphthene	ug/L (ppb)	1	<0.06	95	94	20-150	1
Fluorene	ug/L (ppb)	1	<0.06	99	99	10-181	0
Phenanthrene	ug/L (ppb)	1	<0.06	96	95	58-109	1
Anthracene	ug/L (ppb)	1	<0.06	99	101	47-114	2
Fluoranthene	ug/L (ppb)	1	<0.06	99	98	10-171	1
Pyrene	ug/L (ppb)	1	<0.06	96	96	63-107	0
Benz(a)anthracene	ug/L (ppb)	1	<0.06	92	92	60-93	0
Chrysene	ug/L (ppb)	1	<0.06	92	90	60-102	2
Benzo(b)fluoranthene	ug/L (ppb)	1	<0.06	68	66	62-91	3
Benzo(k)fluoranthene	ug/L (ppb)	1	<0.06	63	61	51-98	3
Benzo(a)pyrene	ug/L (ppb)	1	<0.06	64	61	60-86	5
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	1	<0.06	36	31	10-98	15
Dibenz(a,h)anthracene	ug/L (ppb)	1	<0.06	38	32	10-97	17
Benzo(g,h,i)perylene	ug/L (ppb)	1	<0.06	37	31	10-102	18

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)	1	90	94	67-116	4
Acenaphthylene	ug/L (ppb)	1	90	100	65-119	11
Acenaphthene	ug/L (ppb)	1	90	96	66-118	6
Fluorene	ug/L (ppb)	1	90	98	64-125	9
Phenanthrene	ug/L (ppb)	1	93	97	67-120	4
Anthracene	ug/L (ppb)	1	94	99	65-122	5
Fluoranthene	ug/L (ppb)	1	93	97	65-127	4
Pyrene	ug/L (ppb)	1	97	95	62-130	2
Benz(a)anthracene	ug/L (ppb)	1	95	98	60-118	3
Chrysene	ug/L (ppb)	1	96	100	66-125	4
Benzo(b)fluoranthene	ug/L (ppb)	1	101	98	55-135	3
Benzo(k)fluoranthene	ug/L (ppb)	1	92	98	62-125	6
Benzo(a)pyrene	ug/L (ppb)	1	93	97	58-127	4
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	1	99	104	36-142	5
Dibenz(a,h)anthracene	ug/L (ppb)	1	93	104	37-133	11
Benzo(g,h,i)perylene	ug/L (ppb)	1	94	100	34-135	6

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 compound 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. Compounds in the sample matrix interfered with the quantitation of the analyte.

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.

3008402

SAMPLE CHAIN OF CUSTODY

ME 08-17-18 1B3 / E04 / VW5

Page # _____ of _____

Report To Crystal Thimsen

Company Wood

Address 600 University Street, Suite 600

City, State, ZIP Seattle, WA, 98101

Phone 781-741-1019 Email CRYSTAL.THIMSEN@WOODPLC.com

SAMPLERS (signature) L. Kerner

PROJECT NAME: Kelly-Moore

PO #:

REMARKS: Metals = As, Cr, Cu, Pb, Hg, Ni, Zn -- per CT 8/20/18 ME

INVOICE TO:

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	TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM	Total Metals				Notes
KMW-02R-081618	01A-1	8/16/18	0915	-	9		X	X		X		X	X				
KMW-03R-081618	02		1250		9												
KMW-04-081618	03		1430		9												
KMW-06-081618	04		1520		9												
KMW-07-081618	05A-2		10:20		26												MS/MSD
KMW-08-081618	06 A-1		11:40		9												
KMW-09-081618	07		16:20		9												
KMW-10-081618	08		17:30		9												
KMW-03R-9-081618	09		12:55		9												
																	Samples received at 4 °C

ANALYSES REQUESTED

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Lucas Kerner	WOOD	8/17/18	0710
Received by:	Michael Endahl	FedEx	8/17/18	0710
Relinquished by:				
Received by:				

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

Appendix C

SVE System Monthly Inspection Log

Visual/Audio Inspection

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	Y	No issues
Control Pump (Regenerative Blower)	Y	(On) / Off)
Entrainment Pump (Transfer Pump)	Y	(Auto / Hand / Off)
Pressure Gauges/Flow Meters	Y	All functioning
Knockout Tank (record level)	Y 30	% full
Knockout Water Tote (record level)	Y 60	% full
Dilution Valve Status	Y	Closed
Recirculation Valve Status	Y	Open

CATOX Screen Readings

Item	Reading	Operating Range
Catox In (T_1)	663 °F	>650°F
Catox Out (T_2)	637 °F	600 – 650 °F
Heat Ex (T_3)	358 °F	300 – 400 °F
Flow	225 SCFM	<300 SCFM
LEL	13 %	5-15 %

System Gauge Readings

Item	Reading
FE – 1	2.9 "WC
PI – 1	0 "WC (vacuum)
TI – 1	59°F °F
FE-2	1.2 "WC

FID Measurements

Location	Time	FID Reading (ppm)	Valve Position (record notch)	Vacuum ("WC)	Differential Pressure ("WC)
Western Manifold	—	—			
SVE – 13	0846	18.9	3	4.5	0.05
SVE – 12	0857	55.9	6	4.6	0.16
SVE – 11	0857	30.8	3	3.0	0.07
SVE – 10	0904	744.6	6	4.0	0.07
SVE – 09	0911	246.3	6	3.8	0.11
Eastern manifold	—	—			
SVE - 01	0917	98.6	3	2.2	0.14
SVE – 03	0920	>3980	6	3.4	0.05
SVE – 05	0924	>3980	6	2.6	0.10
SVE – 07	0928	61.9	6	17.5	0.07
SVE – 08	0932	38.4	3	2.5	0.26
SVE – 06	0936	326.9	3	2.8	0.18
SVE – 04	0940	44.9	3	2.9	0.09
SVE – 02	0946	4.3	3	3.8	0.08
SVE Influent	0955	258.1			
SVE Effluent	1006	17.3			

Influent Sample ID: INF062918
Influent Sample Time: 0959

Effluent Sample ID: EFF062918
Effluent Sample Time: 1010

Field Representative (Print and Sign): William Young

Date of Visit: 6/29/18

SVE System Monthly Inspection Log

Visual/Audio Inspection

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	Y	No issues
Control Pump (Regenerative Blower)	Y	(On / Off)
Entrainment Pump (Transfer Pump)	Y	(Auto / Hand / Off)
Pressure Gauges/Flow Meters	Y	all functional
Knockout Tank (record level)	7/10/16	% full
Knockout Water Tote (record level)	7/10	% full
Dilution Valve Status	Open slightly	
Recirculation Valve Status	Open slightly	

After modifications → ↑ recirc ↑ dilution air

CATOX Screen Readings

Item	Reading	Operating Range
Catox In (T_1)	653 °F	>650°F
Catox Out (T_2)	626 °F	600 – 650 °F
Heat Ex (T_3)	345 °F	300 – 400 °F
Flow	235 SCFM	<300 SCFM
LEL	17 %	5-15 %

System Gauge Readings

Item	Reading
FE – 1	"WC
PI – 1	"WC (vacuum)
TI – 1	°F
FE-2	"WC

FID Measurements

Location	Time	FID Reading (ppm)	Valve Position (record notch)	Vacuum ("WC)	Differential Pressure ("WC)
Western Manifold					
SVE – 13					
SVE – 12					
SVE – 11					
SVE – 10					
SVE – 09					
Eastern manifold					
SVE - 01					
SVE – 03					
SVE – 05					
SVE – 07					
SVE – 08					
SVE – 06					
SVE – 04					
SVE – 02					
SVE Influent					
SVE Effluent					

Influent Sample ID: _____
Influent Sample Time: _____

Effluent Sample ID: _____
Effluent Sample Time: _____

Field Representative (Print and Sign): William Young _____ Date of Visit: 7/13/16

William Young

SVE System Monthly Inspection Log

Visual/Audio Inspection

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	Y	No issues
Control Pump (Regenerative Blower)	Y	(On / Off)
Entrainment Pump (Transfer Pump)	Y	(Auto / Hand / Off)
Pressure Gauges/Flow Meters	Y	working
Knockout Tank (record level)	0	% full
Knockout Water Tote (record level)	75	% full
Dilution Valve Status	Y	open
Recirculation Valve Status	Y	open

CATOX Screen Readings

Item	Reading	Operating Range
Catox In (T_1)	636 °F	>650°F
Catox Out (T_2)	634 °F	600 – 650 °F
Heat Ex (T_3)	352 °F	300 – 400 °F
Flow	29 SCFM	<300 SCFM
LEL	14 %	5-15 %

System Gauge Readings

Item	Reading
FE – 1	1.4 "WC
PI – 1	-1 "WC (vacuum)
TI – 1	62 °F
FE-2	1.3 "WC

FID Measurements

Location	Time	FID Reading (ppm)	Valve Position (record notch)	Vacuum ("WC)	Differential Pressure ("WC)
Western Manifold	—	—			
SVE – 13	1000	29.9	3	3.2	0.17
SVE – 12	1005	357.9	6	1.5	0.07
SVE – 11	1010	116.2	3	1.5	0.10
SVE – 10	1015	1773	6	0.5	0.04
SVE – 09	1021	505.3	6	1.5	0.11
Eastern manifold	—	—			
SVE - 01	1024	238	3	8.5	0.07
SVE – 03	1029	>3960	6	0	0.06
SVE – 05	1035	>3960	6	0	0.03
SVE – 07	1039	209.6	6	21	0.11
SVE – 08	1044	100.5	3	0	0.07
SVE – 06	1055	362.6	3	0.5	0.04
SVE – 04	1058	137.8	3	0	0.06
SVE – 02	1100	32.0	3	3.0	0.05
SVE Influent	1114	315.7			
SVE Effluent	1120	28.6			

Influent Sample ID: INF 073118
Influent Sample Time: 1114

Effluent Sample ID: EFF 073118
Effluent Sample Time: 1120

Field Representative (Print and Sign): William Kenny

Date of Visit: 7/31

SVE System Monthly Inspection Log

Visual/Audio Inspection

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	Y	good
Control Pump (Regenerative Blower)	Y	(On) / Off)
Entrainment Pump (Transfer Pump)	Y	(Auto) / Hand / Off)
Pressure Gauges/Flow Meters	Y	some gauges seem faulty, see field notes
Knockout Tank (record level)	Y	% full ~~60%~~ (~200 gal) 10%
Knockout Water Tote (record level)	Y	% full 60% - 70%
Dilution Valve Status	Y	open
Recirculation Valve Status	Y	open / no recirculation

CATOX Screen Readings

Item	Reading	Operating Range
Catox In (T_1)	680 °F	>650°F
Catox Out (T_2)	633 °F	600 – 650 °F
Heat Ex (T_3)	356 °F	300 – 400 °F
Flow	242 SCFM	<300 SCFM
LEL	5 %	5-15 %

System Gauge Readings

Item	Reading
FE – 1	~~1.8~~ 0.4 "WC
PI – 1	-1.8 "WC (vacuum)
TI – 1	66 °F
FE-2	1.4 "WC

initially dilution valve closed
gauge = 1.8" wc
manometer = 3.4" wc

FID Measurements

readings from dig. manometer

P gauge (discrepancy)

Location	Time	FID Reading (ppm)	Valve Position (record notch)	Vacuum ("WC)	Differential Pressure ("WC)	
Western Manifold	1220	191				
SVE – 13	1218	183	3	0.8	0.01	—
SVE – 12	1216	613	6	1.6	0.03	—
SVE – 11	1214	90	3	0.5	0.03	9.0
SVE – 10	1212	764	6	1.6	0.02	—
SVE – 09	1210	118	6	1.6	0.04	0.9
Eastern manifold						
SVE - 01						
SVE – 03	not measured due to holiday weekend and laboratory hold times per CAT					
SVE – 05						
SVE – 07						
SVE – 08						
SVE – 06						
SVE – 04						
SVE – 02						
SVE Influent	1222	190				
SVE Effluent	1221	5.9				

Influent Sample ID: INF-083118
Influent Sample Time: ~~EFF-083118~~ 1232

Effluent Sample ID: EFF-083118
Effluent Sample Time: 1226

Field Representative (Print and Sign): Lindsey Davidge Date of Visit: 8/31/2018

SVE System Monthly Inspection Log

Kelly Moore 09-19-18
5400 AIRPORT WAY SO. SEATTLE, WA 98108

Visual/Audio Inspection

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	yes	
Control Pump (Regenerative Blower)	yes	(On / Off) ON
Entrainment Pump (Transfer Pump)	yes	(Auto / Hand / Off) Auto
Pressure Gauges/Flow Meters	yes	PI-1 in "of Hg-Vac, NOT "H_2O Vac.
Knockout Tank (record level)	yes	% full 5% or 3 gal
Knockout Water Tote (record level)	110 yes	% full 90% full @ 110 gal - 250 gal Max.
Dilution Valve Status	yes	open approx 50% - unchanged
Recirculation Valve Status	yes	Open ?% unknown - unchanged

CATOX Screen Readings

Item	Reading	Operating Range
Catox In (T_1)	651 °F	>650°F
Catox Out (T_2)	645 °F	600 – 650 °F
Heat Ex (T_3)	353 °F	300 – 400 °F
Gth Flow CFM	93 SCFM	<300 SCFM
LEL	13 %	5-15 %

System Gauge Readings

Item	Reading
FE – 1	3.0 "WC
PI – 1 1.0 "Hg	~~0.0 "WC~~ (vacuum) "Hg
TI – 1	638. °F
FE-2	1.5 "WC

FID Measurements

Location	Time	FID Reading FID (ppm) ~~303~~		Valve Position (record notch)	Vacuum ("WC)	Differential Pressure ("WC)
Western Manifold	1100 Hrs	FID 321	PID 203	50% open - 3		
SVE – 13	1127 Hrs	417	216	~~100%~~ open - 6	12.2 "WC	0.00 "WC
SVE – 12	1123 Hrs	1005	629	100% open - 6	2.3 "WC	0.03 "WC
SVE – 11	1120 Hrs	112	89	50% open - 3	15.9 "WC	0.00 "WC
SVE – 10	1114 Hrs	1204	589	100% open - 6	0.11 "WC	0.00 "WC
SVE – 09	1106 Hrs	253	164	100% open - 6	0.0 "WC	0.05 "WC
Eastern manifold	1226 HRS	340	169			
SVE - 01	1229 HRS	12.7	12.1	50% open - 3	0.0 "WC	0.48 "WC
SVE – 03	1235 HRS	FLAME OUT - 2XS	1140	60% open - 4	0.0 "WC	0.00 "WC
SVE – 05	1241 HRS	FLAME OUT	1061	60% open - 4	1.0 "WC	0.00 "WC
SVE – 07	1248 HRS	98	93	75% open - 4.5	26.5 "WC	0.00 "WC
SVE – 08	1250 HRS	64	51	75% open - 4.5	0.05 "WC	0.00 "WC
SVE – 06	1358 HRS	109	106.5	60% open - 3	1.00 "WC	0.00 "WC
SVE – 04	1301 HRS	313	224	50% open - 3	0.08 "WC	0.00 "WC
SVE – 02	1304 HRS	16.5	10.2	50% open - 3	4.00 "WC	0.00 "WC
SVE Influent	1334	336	187			
SVE Effluent	1330	17.7	16.2			

Influent Sample ID: INF-091918
Influent Sample Time: 1410 HRS

Effluent Sample ID: EFF-091918
Effluent Sample Time: 1355

Field Representative (Print and Sign): GEORGE HAGAN George Hagan Date of Visit: 09-19-2018

SVE-03 - FID - FLAME OUT WARNING 2 TIMES - NO FID READING
SVE-05 FID - FLAME OUT - NO FID READING

SAMPLE CHAIN OF CUSTODY

Page # 1 of 1

Report To Crystal Thimsen
Company WOOD Environmental
Address 600 University St. Suite 600
City, State, ZIP Seattle WA 98101
Phone 206.838.8469 Email CRYSTAL.THIMSEN@WOODPLC.COM

SAMPLERS (*signature*)

PROJECT NAME: Kelly Moore

PO #

REMARKS

INVOICE TO

TURNAROUND TIME
- [x] Standard Turnaround
- [ ] RUSH
- Rush charges authorized by:

SAMPLE DISPOSAL
- [x] Dispose after 30 days
- [ ] Archive Samples
- [ ] Other

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	Benzene				Notes
EFF-091918		09.19.18	1355 HW	TEDLAR BAG	2			X					X				
INF-091918		09.19.18	1410 HW	" "	2			X					X				

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: George Hagan	GEORGE HAGAN	JHA ENV INC.	9/19/18	1539 HW
Received by:	Matt Langston	FBT Inc	9/19/18	1539
Relinquished by:				
Received by:				

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

Samples received at ____ °C

SVE System Monthly Inspection Log

Visual/Audio Inspection

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	Y	NO ISSUES
Control Pump (Regenerative Blower)	Y	(On) / Off)
Entrainment Pump (Transfer Pump)	Y	(Auto / Hand / Off)
Pressure Gauges/Flow Meters	Y	All working
Knockout Tank (record level)	Y	% full ~~<5~~ 40%
Knockout Water Tote (record level)	Y	% full <5%
Dilution Valve Status	Y	open
Recirculation Valve Status	Y	open

CATOX Screen Readings

Item	Reading	Operating Range
Catox In (T_1)	660 °F	>650°F
Catox Out (T_2)	663 °F	600 – 650 °F
Heat Ex (T_3)	348 °F	300 – 400 °F
Flow	138 SCFM	<300 SCFM
LEL	13.1 %	5-15 %

System Gauge Readings

Item	Reading
FE – 1	2.3 "WC
PI – 1	0 "WC (vacuum)
TI – 1	50 °F
FE-2	1.3 "WC

FID Measurements

Location	Time	FID Reading (ppm)	Valve Position (record notch)	Vacuum ("WC)	Differential Pressure ("WC)
Western Manifold	1025	273.4			
SVE – 13	1020	409.6	3	20.1	0.6
SVE – 12	1016	824.4	6	4.0	0.5
SVE – 11	1012	166.0	3	22.5	0.6
SVE – 10	1004	526.5	5	2.1	WE 0.4 0.2
SVE – 09	0956	154.2	~~6~~ 6	~~0.6~~ 1.9	WE ~~0.6~~ 0.3
Eastern manifold	1030	54.2			
SVE - 01	1034	58.4	3	0.5	0.1
SVE – 03	1038	2543	~~3~~ 6	0.5	0.6
SVE – 05	1042	2093	~~3~~ 6	0.5	0.3
SVE – 07	1046	17.5	3		0.7
SVE – 08	1049	11.1	3	1.0	0.9
SVE – 06	1053	8.3	3	2.5	0.8
SVE – 04	1057	6.2	3	1.9	0.9
SVE – 02	1102	9.7	3	3.0	0.4
SVE Influent	1107	58.4			
SVE Effluent	1111	11.1			

Influent Sample ID: ~~INF-0 WT~~ INF-101618
Influent Sample Time: 1115

Effluent Sample ID: EFF-101618
Effluent Sample Time: 1125

Field Representative (Print and Sign): William Young

Date of Visit: 10-16-18

5400 Airport Way South, Seattle, WA. Kelly Moore 4/1/2019

SVE System Monthly Inspection Log

Visual/Audio Inspection SVE - CATOX RESTARTED Tony @ 1100 - HRS

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	y	4- Vacuum Gauges on Manifold are broken.
Control Pump (Regenerative Blower)	y	(On / Off) on in Auto
Entrainment Pump (Transfer Pump)	y	(Auto / Hand / Off) operational in Auto.
Pressure Gauges/Flow Meters	y	Vacuum Gauges need replaced at least -4.
Knockout Tank (record level)	y	% full ~5%
Knockout Water Tote (record level)	y	% full 10%
Dilution Valve Status	yes	100% CLOSED
Recirculation Valve Status	yes	50% open

CATOX Screen Readings

Item	Reading	Operating Range
Catox In (T_1)	650 °F	>650°F
Catox Out (T_2)	633 °F	600 – 650 °F
Heat Ex (T_3)	342 °F	300 – 400 °F
Flow	NO READ SCFM	<300 SCFM
LEL	8 %	5-15 %

System Gauge Readings

Item	Reading
FE – 1	2.25 "WC
PI – 1	1.0 "WC (vacuum)
TI – 1	52 °F
FE-2	0.2 "WC

PROVED AIR SPARGE ALARM CONTROLS
LOW PRESSURE CUTOUT @ 0.0 PSI.
HIGH PRESSURE CUTOUT @ 23.0 PSI
HIGH TEMP CUT OUT @ 154°F (SETTING) NOT PROVED.

FID Measurements

Location	Time	FID Reading (ppm)	Valve Position (record notch)	Vacuum ("WC)	Differential Pressure ("WC)
Western Manifold	N/A	N/A			
SVE – 13			N/A	N/A	N/A
SVE – 12					
SVE – 11					
SVE – 10					
SVE – 09					
Eastern manifold					
SVE - 01			N/A	N/A	N/A
SVE – 03					
SVE – 05					
SVE – 07					
SVE – 08					
SVE – 06					
SVE – 04					
SVE – 02					
SVE Influent	1205	1138 PPM			
SVE Effluent	~~1205~~ 1206	@1200 - 9.0 PPM			

Influent Sample ID: NONE TAKEN
Influent Sample Time: S

Effluent Sample ID: NONE TAKEN
Effluent Sample Time: S

Field Representative (Print and Sign): George Hagen Date of Visit: 04-01-2019

SVE System Monthly Inspection Log 04-03-2019

Visual/Audio Inspection Kelly Moore 5400 Airport Way South Seattle, WA

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	yes	4- Vacuum Gauges on VE Manifold Broken
Control Pump (Regenerative Blower)	yes	(On / Off) ON
Entrainment Pump (Transfer Pump)	yes	(Auto / Hand / Off) AUTO
Pressure Gauges/Flow Meters	yes	
Knockout Tank (record level)	yes	% full 0
Knockout Water Tote (record level)	yes	% full 10%
Dilution Valve Status	yes	100% Closed
Recirculation Valve Status	yes	100% Closed

CATOX Screen Readings @ 1236 Hrs

Item	Reading	Operating Range
Catox In (T_1)	664 °F	>650°F
Catox Out (T_2)	630 °F	600 – 650 °F
Heat Ex (T_3)	337 °F	300 – 400 °F
Flow	6.61 SCFM	<300 SCFM
LEL	4 %	5-15 %

Hour meter 69.41

System Gauge Readings @ 1236 Hrs

Item	Reading
FE – 1	4.99 "WC
PI – 1	1.25 ~~"WC~~ (vacuum) "Hg
TI – 1	51 °F
FE-2	1.0 "WC

FID Measurements

Value Recorded From Scrolling LED Display - #4 Spot.

Location	Time	FID Reading (ppm)	Valve Position (record notch)	Vacuum ("WC)	Differential Pressure ("WC)
Western Manifold	1258-Hrs	87.0 PPM			
SVE – 13	1256-Hrs	3.4 PPM	50% open - 4	14.5" Broken	0.023"
SVE – 12	1254-Hrs	42.9 PPM	100% open - 7	5.5"	0.011"
SVE – 11	1253-Hrs	19.2 PPM	50% open - 4	21" - Broken	0.034"
SVE – 10	1251-Hrs	232.0 PPM	100% open - 7	5.75"	0.003"
SVE – 09	1250-Hrs	162.1 PPM	100% open - 7	1.0"	0.040"
Eastern manifold	1304-Hrs	204.4 PPM			
SVE - 01	1305-Hrs	3.6 PPM	50% open - 4	2.5"	0.036"
SVE – 03	1307-Hrs	1494. PPM	50% open - 4	3.5"	4.380"
SVE – 05	1309-Hrs	3222. PPM	60% open - 5	2.25"	0.001"
SVE – 07	1311-Hrs	66.8 PPM	75% open - 6	730" Broken	0.001"
SVE – 08	1313-Hrs	57.7 PPM	75% open - 6	4.5"	0.002"
SVE – 06	1315-Hrs	401.7 PPM	60% open - 5	4.0"	0.002"
SVE – 04	1316-Hrs	54.3 PPM	50% open - 4	4.5"	0.003"
SVE – 02	1318-Hrs	4.4 PPM	50% open	5.25"	0.032"
SVE Influent	1151	165 PPM			
SVE Effluent	1139	1.1 PPM			

Influent Sample ID: INF-040319 2-Tedlar Bags
Influent Sample Time: 1157 Hrs

Effluent Sample ID: EFF-040319 2-Tedlar Bags
Effluent Sample Time: 1143-Hrs

Field Representative (Print and Sign): George Hagan
George Hagan

Date of Visit: 04.03-2019

SVE System Monthly Inspection Log 05-03-19

Visual/Audio Inspection Kelly Moore 5400 Airport Way South, Seattle

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	yes	
Control Pump (Regenerative Blower)	yes	(On / Off) ON
Entrainment Pump (Transfer Pump)	yes	(Auto / Hand / Off) off
Pressure Gauges/Flow Meters	yes	Several Vacuum-Manifold Gauges Broken.
Knockout Tank (record level)	yes	% full 40%
Knockout Water Tote (record level)	yes	% full 10%
Dilution Valve Status	yes	100% Closed
Recirculation Valve Status	yes	100% Closed

CATOX Screen Readings

Item	Reading	Operating Range
Catox In (T_1)	655 °F	>650°F
Catox Out (T_2)	660 °F	600 – 650 °F
Heat Ex (T_3)	350 °F	300 – 400 °F
Flow	191 SCFM	<300 SCFM
LEL	3 %	5-15 %

System Gauge Readings

Item	Reading
FE – 1	? "WC
PI – 1	1 ~~"WC~~ "Hg (vacuum)
TI – 1	53 °F
FE-2	1 "WC

Hour Meter 788.62 Hrs

FID Measurements

Location	Time	FID Reading (ppm)	0-Closed, 7-Full open Valve Position (record notch)	Vacuum ("WC)	Differential Pressure ("WC)
Western Manifold	1233 HW	2.2 PPM			
SVE – 13	1244	1.8 PPM	4	9.5" wc	0.01" WC
SVE – 12	1242	12.3 PPM	7	6" wc	0.02" wc
SVE – 11	1240	3.5 PPM	4	Broken - 23"	0.03" wc
SVE – 10	1238	8.5 PPM	7	4.5" wc	0.02" H2O
SVE – 09	1236	1.9 PPM	7 100% open	4 "wc	0.05" wc
Eastern manifold	1308-HW	4.9 PPM			
SVE - 01	1310	0.0 PPM	4	2.50" wc	0.05" wc
SVE – 03	1312	21.5 PPM	5	3.25" wc	0.01" wc
SVE – 05	1314	144.2 PPM	5	4.50" wc	0.009" wc
SVE – 07	1316	4.5 PPM	6	>30" Broken	0.009" wc
SVE – 08	1318	3.2 PPM	6	4.50" wc	0.006" wc
SVE – 06	1320	1.0 PPM	6	4.50" wc	0.01" wc
SVE – 04	1322	0.0 PPM	5	3.50" wc	0.01" wc
SVE – 02	1324	0.0 PPM	5	5.50" wc	0.05" wc
SVE Influent	1030	16.1 PPM			
SVE Effluent	1025	0.1 PPM			

Influent Sample ID: INF-050319
Influent Sample Time: 1030-HRS

Effluent Sample ID: EFF-050319
Effluent Sample Time: 1025-HRS

Field Representative (Print and Sign): George Hagan Date of Visit: 5/3/2019

George Hagan

SVE System Monthly Inspection Log

05-06-19

Visual/Audio Inspection

KELLY MOORE, SEATTLE, 5400 AIRPORT WAY SOUTH.

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	@ Manifolds 4 gauges Broken
Knockout Tank (record level)	yes	% full 5 % Full
Knockout Water Tote (record level)	yes	% full 10 % Full
Dilution Valve Status	yes	100 % Closed
Recirculation Valve Status	yes	100 % Closed

CATOX Screen Readings

Item	Reading	Operating Range
Catox In (T_1)	640 °F	>650°F
Catox Out (T_2)	606 °F	600 – 650 °F
Heat Ex (T_3)	343 °F	300 – 400 °F
Flow	187 SCFM	<300 SCFM
LEL	2 %	5-15 %

System Gauge Readings

Hour Meter 860.02 N.M.

Item	Reading
FE – 1	"WC
PI – 1	21 "WC (vacuum) GH Hg
TI – 1	59 °F
FE-2	0.9 "WC

System operational after my arrival, Shut System down, Replaced Moisture K.O. Tank Pump Head + wye Strainer, Calibrated the LEL Sensor, Screened VOC's via FID. Recorded System Data, Monitored ops, all OK House Keeping done around area.

FID Measurements

Location	Time	FID Reading (ppm)	Valve Position (record notch)	Vacuum ("WC)	Differential Pressure ("WC)
Western Manifold	N/A	N/A			
SVE – 13			N/A	N/A	N/A
SVE – 12					
SVE – 11					
SVE – 10					
SVE – 09					
Eastern manifold					
SVE - 01					
SVE – 03					
SVE – 05					
SVE – 07					
SVE – 08					
SVE – 06					
SVE – 04					
SVE – 02					
SVE Influent	1323	15.4 PPM			
SVE Effluent	1320	0.1 PPM			

Influent Sample ID: No Sample
Influent Sample Time: —

Effluent Sample ID: No Sample
Effluent Sample Time: —

Field Representative (Print and Sign): GEORGE HAGAN George Hagan Date of Visit: 5-06-19

SVE System Monthly Inspection Log Kelly Moore 05-28-19 - Alarm response

Visual/Audio Inspection 1130 Hrs - System off @ my arrival. Restarted & Monitored.

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	yes	3 to 4 Vac Gauges Bad.
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 3%
Knockout Water Tote (record level)	yes	% full 10%
Dilution Valve Status	yes	100% closed
Recirculation Valve Status	yes	100% closed

CATOX Screen Readings

Item	Reading	Operating Range
Catox In (T_1)	613 °F	>650°F
Catox Out (T_2)	585 °F	600 – 650 °F
Heat Ex (T_3)	341 °F	300 – 400 °F
Flow	180 SCFM	<300 SCFM
LEL	1 %	5-15 %

CH

Hour Meter ~~1,337~~ 1,347.26

System Gauge Readings

Item	Reading
FE – 1	4.30 "WC
PI – 1	~~0~~ "WC (vacuum) "Hg
TI – 1	60° °F
FE-2	0.50 "WC

FID Measurements

Location	Time	FID Reading (ppm)	Valve Position (record notch)	Vacuum ("WC)	Differential Pressure ("WC)
Western Manifold					
SVE – 13			No manifold data today.		
SVE – 12			System Restart & Monitor.		
SVE – 11			CH		
SVE – 10					
SVE – 09					
Eastern manifold					
SVE - 01					
SVE – 03					
SVE – 05					
SVE – 07					
SVE – 08					
SVE – 06					
SVE – 04					
SVE – 02					
SVE Influent					
SVE Effluent					

Influent Sample ID: N/A
Influent Sample Time: —

Effluent Sample ID: N/A
Effluent Sample Time: —

Field Representative (Print and Sign): Bruce Hagan Date of Visit: 05-28-19

Air Sparge Start up Shake Down.

SVE System Monthly Inspection Log 05-29-2019 - Kelly Moore 5000 Airport Way S,

Visual/Audio Inspection On site - Baystal & Lindsay - Wood. MARC - Kelly Moore,

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	5-Gauges Replaced Today
Knockout Tank (record level)	yes	% full 3% Full
Knockout Water Tote (record level)	yes	% full 10% Full
Dilution Valve Status	yes	100% Closed
Recirculation Valve Status	yes	100% Closed

CATOX Screen Readings

Item	Reading	Operating Range
Catox In (T_1)	617 °F	>650°F
Catox Out (T_2)	586 °F	600 – 650 °F
Heat Ex (T_3)	342 °F	300 – 400 °F
Flow	184 SCFM	<300 SCFM
LEL	1 %	5-15 %

System Gauge Readings

Item	Reading
FE – 1	4.6 "WC
PI – 1	~~0 "WC~~ (vacuum)
TI – 1	58 °F
FE-2	0.4 "WC

FID Measurements

Location	Time	FID Reading (ppm)	Valve Position (record notch)	Vacuum ("WC)	Differential Pressure ("WC)	
Western Manifold	0943	13.2 PPM				1536 PID readings see Lindsay's Log book Notes
SVE – 13	0956	4.2 PPM	4	3"WC	0.015	
SVE – 12	0954	47.1 PPM	7	5"WC	0.100	
SVE – 11	0953	4.6	4	3"WC	0.025	
SVE – 10	0951	54.5PPM	7	5.5"WC	0.002	
SVE – 09	0945	12.1 PPM	7	5"WC	0.03	
Eastern manifold	1052	20.9 PPM				
SVE - 01	1053	0.0 PPM	4	2"WC	0.013	6.3 ppm
SVE – 03	1055	147.2 PPM	5	3.75"WC	0.016	40.3ppm
SVE – 05	1057	490 PPM	5	4"WC	0.006	92.0ppm
SVE – 07	1101	7.8PPM	6	5"WC	0.048	6.1 ppm
SVE – 08	1102	2.4 PPM	6	4"WC	0.005	6.1 ppm
SVE – 06	1104	11.0 PPM	5	3.60"WC	0.004	7.3 ppm
SVE – 04	1105	28.30PPM	4	4.50"WC	0.005	9.3 ppm
SVE – 02	1106	0.2 PPM	4	4"WC	0.021	11.2 ppm
SVE Influent	0940	21.6 PPM				
SVE Effluent	0938	0.0PPM				

Influent Sample ID: N/A
Influent Sample Time: -

Effluent Sample ID: N/A
Effluent Sample Time: -

Field Representative (Print and Sign): George Hagan Date of Visit: 05-29-19

Air Sparge blower Started @1120 Hrs.

Air Sparge Started @ 1120 Hrs

Reading - manifold AS 19.4 Hrs

Sept Tem

Time	AS1 SCFM & PSI	AS2	AS3	AS4	AS5	Blower Temp & psi	Post Cooler PSI & Temp	
1132	5.5 SCFM / 2 PSI	5.0 SCFM / 1.0 PSI	5 / 1.5	5. / 1.5	5.5 SCFM / 1.0	175°F / 0	79°F / 2.5	
1325	6.25 SCFM / 2.25 PSI	4.75 SCFM / 1.0 PSI	4.75 SCFM / 1.5 PSI	5 SCFM / 1. PSI	5 SCFM / 1.5 PSI	165°F TEMP / 0 PSI	84°F Temp / 1.5 PSI	
1400 Hrs	INCREASED AIR FLOW TO 10 SCFM @ EACH WELL POINT							LEL @ 1
1415	REDUCED AIR FLOW TO 8 SCFM IN AS 4 + AS 5							

LINDSAY TANNING NOTES FROM THIS POINT FORWARD

SVE System Monthly Inspection Log 5-30-19 Kelly Moore

Visual/Audio Inspection 5400 Airport Way So. Seattle WA

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	yes	yes
Control Pump (Regenerative Blower)	yes	(On / Off) on
Entrainment Pump (Transfer Pump)	yes	(Auto / Hand / Off) Auto
Pressure Gauges/Flow Meters	yes	
Knockout Tank (record level)	yes	% full 5%
Knockout Water Tote (record level)	yes	% full 10%
Dilution Valve Status	yes	100% Closed
Recirculation Valve Status	yes	100% Closed

CATOX Screen Readings

Item	Reading	Operating Range
Catox In (T_1)	632 °F	>650°F
Catox Out (T_2)	626 °F	600 – 650 °F
Heat Ex (T_3)	362 °F	300 – 400 °F
Flow	161 SCFM	<300 SCFM
LEL	3 %	5-15 %

System Gauge Readings

Item	Reading
FE – 1	4.3" "WC
PI – 1	14.5" "WC (vacuum)
TI – 1	59 °F
FE-2	0.4" "WC

Air Sparge start 5-29-19, 1st Sampling event Post Startup.

FID Measurements HR Meter 1393H+16M @ 1134-HRS

Location	Time	FID Reading (ppm)	Valve Position (record notch)	Vacuum ("WC)	Differential Pressure ("WC)	Sample Time
Western Manifold	0906	173, PPM				
SVE – 13	0902	235, PPM	7	5.0"	0.074 "WC	0904
SVE – 12	0858	371, PPM	7	8.5"	0.009 "WC	0900
SVE – 11	0854	99, PPM	7	5.60"	0.112 "WC	0855
SVE – 10	0848	216, PPM	7	7.25"	0.000 "WC	0850
SVE – 09	0842	18.1 PPM	4	4.25"	0.022 "WC	0844
Eastern manifold	0943	93.PPM				
SVE - 01	0945	0.6 PPM	2	0.50"WC	-0.004 "WC	0948
SVE – 03	0950	163.1 PPM	2	4.75"WC	0.013 "WC	0952
SVE – 05	0954	393, PPM	2	4" WC	0.000" WC	0956
SVE – 07	0958	2.5 PPM	2	7.5" WC	0.005" WC	1000
SVE – 08	1002	1.0	2	8" WC	-0.004" WC	1004
SVE – 06	1006	0.0 PPM	2	2" WC	-0.003 "WC	1008
SVE – 04	1010	18.6 PPM	2	2.5" WC	-0.002" WC	1012
SVE – 02	1014	0.0 PPM	2	5" WC	-0.002" WC	1016
SVE Influent	0834	144.3 PPM				
SVE Effluent	0829	3.0 PPM				

Influent Sample ID: 053019-INF
Influent Sample Time: 0835 - HRS

Effluent Sample ID: 053019-EFF
Effluent Sample Time: 0830 - HRS

Field Representative (Print and Sign): George Hagan Date of Visit: 05-30-19

AIR SPARGE DATA ON BACK

Kelly Moore

Air Sparge System data 05-30-19 G. Hagen

Hr Meter 43.4 Hrs @ 1130 - Hrs BLOWER

Hr Meter 43.8 Hrs @ 1130 Hrs ~~Post~~ COOLING

BLOWER

TEMP - 168 °F

~~PSI~~ PSI - 4.25

POST COOLING

TEMP - 81 °F

PSI - 3.5 PSI

WELL	FLOW SCFM	PRESSURE PSI
ASP1	8.0	3.25
ASP2	10.5	3.00
ASP3	10.5	3.00
ASP4	9.5	3.00
ASP5	9.5	2.75

SVE System Monthly Inspection Log. *Kelly Moore.* Date: 06-04-19

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) ON
Entrainment Pump (Transfer Pump)	yes	(Auto / Hand / Off) AUTO
Pressure Gauges/Flow Meters	yes	
Knockout Tank (record level)	yes	% full 5%
Knockout Water Tote (record level)	yes	% full 10%
Dilution Valve Status	yes	
Recirculation Valve Status	yes	

CATOX Screen Readings

Item	Units	Reading	Operating Range
Catox In (T_1)	°F	613	>650
Catox Out (T_2)	°F	610	600 – 650
Heat Ex (T_3)	°F	353	300 – 400
Flow	SCFM	154	<300
LEL	%	1	5-15

0850 BUMP TEST FID 99.4 PPM

System Gauge Readings

Item	Units	Reading
FE – 1	"WC	3.95" WC
PI – 1	"WC (vacuum)	14.5" WC
TI – 1	°F	60°F
FE-2	"WC	0.4" WC

FID Measurements

Location	Time	FID Reading (ppm)	Valve Position (record notch)	Vacuum ("WC)	Differential Pressure ("WC)	Sample Time
Western Manifold	0930	43.2 PPM			0.088" WC	
SVE – 13	0951	52.1 PPM	7	5.5 "WC	GH ~~5.652" WC~~	0953
SVE – 12	0946	82.5 PPM	7	5.75 "WC	0.013 "WC	0949
SVE – 11	0942	32.6 PPM	7	6" WC	0.190" WC	0944
SVE – 10	0938	120. PPM	7	6" WC	0.000" WC	0940
SVE – 09	0932	14.0 PPM	4	1.75" WC	0.011 " WC	0934
Eastern manifold	1049	88.9 PPM				
SVE - 01	1058	0.0 PPM	2	0.50" WC	0.004" WC	1102
SVE – 03	1103	121.8 PPM	GH 2 TO 3	4.50 "WC	0.012" WC	1105
SVE – 05	1107	446.0 PPM	GH 2 TO 4	4.50 "WC	0.083" WC	1109
SVE – 07	1112	3.4 PPM	2	9.00" WC	0.007" WC	1114 hrs
SVE – 08	1115	2.0 PPM	2	9.00" WC	0.000" WC	1117
SVE – 06	1119	0.0 PPM	2	2.25" WC	0.002" WC	1121
SVE – 04	1124	14.3 PPM	2	2.25" WC	0.000" WC	1126
SVE – 02	1128	0.0 PPM	2	4.00 " WC	0.000" WC	1129
SVE Influent	0901	50.4 PPM				
SVE Effluent	0853	1.2 PPM				

Influent Sample ID: INF-060419
Influent Sample Time: 0903

Effluent Sample ID: EFF-060419
Effluent Sample Time: 0856

Field Representative (Print and Sign): GEORGE HAGAN George Hagen Date of Visit: 6-4-19

SVE-05 Valve opened to notch 4
SVE-03 Valve opened to notch 3

AS System Monthly Inspection Log

Visual/Audio Inspection

Item	Inspected (Y/N)	Condition (Cracks, leaks, non-operational gauges, etc.)
Above Ground Piping	yes	
Regenerative Blower	yes	(Auto / Hand / Off) Auto
Heat Exchanger	yes	(Auto / Hand / Off) Auto
Pressure Gauges/Flow Meters	yes	
Vent Valve Status	yes	open 80'/.

System Gauge Readings

Before Heat Exchanger

Item	Units	Reading	Operating Range
PI – 3	psi	5.25 PSI	0 TO 30
TI – 3	°F	163 °F	150 – 200

After Heat Exchanger

Item	Units	Reading	Operating Range
PI – 4	psi	4.25 PSI	0 - ~~5~~ 30
TI – 4	°F	79 °F	150 – 200

GH

Air Flow Monitoring

Location	Time	Valve Position (record appx angle)	Pressure (psi)	Air Flow (SCFM)
AS – 1	1006 Hrs	open 20'/.	3.0	8.0
AS – 2	1007 Hrs	open 25'/.	2.75	10.50
AS – 3	1008 Hrs	open 25'/.	3.0	10.50
AS – 4	1009 Hrs	open 20'/.	3.0	9.50
AS – 5	1010 Hrs	open 20'/.	2.75	9.50

Additional Notes.

See Log entry with today's date.

Field Representative (Print and Sign): George Hagan GEORGE HAGAN Date of Visit: 6-4-19

SVE System Monthly Inspection Log. *Kelly Moore.* Date: 06-05-19

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 3% Full
Knockout Water Tote (record level)	yes	% full 10% Full
Dilution Valve Status	yes	
Recirculation Valve Status	yes	

CATOX Screen Readings

Item	Units	Reading	Operating Range
Catox In (T_1)	°F	613	>650
Catox Out (T_2)	°F	623	600 – 650
Heat Ex (T_3)	°F	361	300 – 400
Flow	SCFM	160	<300
LEL	%	3	5-15

System Gauge Readings

Item	Units	Reading
FE – 1	"WC	3.71
PI – 1	"WC (vacuum)	14" H_2O
TI – 1	°F	61 °F
FE-2	"WC	0.03" H_2O

Hour Meter 1,539"-

Summer Canister Vapor samples Collected today.

LEL CALIBRATED Today.

FID Measurements

Location	Time	FID Reading (ppm)	Valve Position (record notch)	Vacuum ("WC)	Differential Pressure ("WC)
Western Manifold					
SVE – 13	No Manifold datae today.				
SVE – 12		No FID data today			
SVE – 11					
SVE – 10					
SVE – 09					
Eastern manifold					
SVE - 01					
SVE – 03					
SVE – 05					
SVE – 07					
SVE – 08					
SVE – 06					
SVE – 04					
SVE – 02					
SVE Influent					
SVE Effluent					

Influent Sample ID: N/A
Influent Sample Time: —

Effluent Sample ID: N/A
Effluent Sample Time: —

Field Representative (Print and Sign): George Hagan GEORGE HAGAN Date of Visit: 06/05/2019

AS System Monthly Inspection Log Kelly Moore 06/05/19

Page 2 of 2

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	open yes	open 80%

Hr Meter Air Sparge Pump 189.7 Hr/10 HR. METER, HEAT EXCHANGER 190.2 Hr/10

System Gauge Readings

Before Heat Exchanger

Item	Units	Reading	Operating Range
PI – 3	psi	5.0	0
TI – 3	°F	165°F	150 – 200

After Heat Exchanger

Item	Units	Reading	Operating Range
PI – 4	psi		0 - 5
TI – 4	°F	84°F	150 – 200

Air Flow Monitoring

Location	Time	Valve Position (record appx angle)	Pressure (psi)	Air Flow (SCFM)
AS – 1	1405	20% open	3.0	8.25
AS – 2	1416	25% open	2.5	10.75
AS – 3	1417	25% open	3.0	10.50
AS – 4	1418	25% open	3.0	9.75
AS – 5	1419	20% open	2.5	9.75

Additional Notes.

Collected 8 Hr Summa Canister samples, 3 ea, Two inside the Ware House & one on the building exterior. I conducted the Monthly LEL Calibration. Changed paper in chart Recorder.

Field Representative (Print and Sign): George Hagan GEORGE HAGAN Date of Visit: 06-05-2019

Appendix D

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 2, 2018

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

Dear Ms Thimsen:

Included are the results from the testing of material submitted on April 25, 2018 from the Kelley Moore 0146970060.00009, F&BI 804419 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
AFW0502R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on April 25, 2018 by Friedman & Bruya, Inc. from the Wood Environment & Infrastructure Solutions Kelley Moore 0146970060.00009, F&BI 804419 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Wood Environment & Infrastructure Solutions
804419 -01	WF-042418
804419 -02	EFF-042418

All quality control requirements were acceptable.

Date of Report: 05/02/18
Date Received: 04/25/18
Project: Kelley Moore 0146970060.00009, F&BI 804419
Date Extracted: 04/26/18
Date Analyzed: 04/26/18

**RESULTS FROM THE ANALYSIS OF AIR SAMPLES
FOR BENZENE AND TPH AS GASOLINE
USING MODIFIED METHODS 8021B AND NWTPH-Gx**

Results Reported as mg/m^3

Sample ID Laboratory ID	Benzene	Gasoline Range	Surrogate (% Recovery) (Limit 50-150)
WF-042418 804419-01	<0.1	80	82
EFF-042418 804419-02	<0.1	15	82
Method Blank 08-870 MB	<0.1	<10	82

Date of Report: 05/02/18
Date Received: 04/25/18
Project: Kelley Moore 0146970060.00009, F&BI 804419

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES FOR BENZENE AND TPH AS GASOLINE USING MODIFIED EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 804419-02 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	mg/m^3	<0.1	<0.1	nm
Gasoline	mg/m^3	15	17	12

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	mg/m^3	5.0	86	70-130
Gasoline	mg/m^3	100	137	86-144

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 compound 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. Compounds in the sample matrix interfered with the quantitation of the analyte.

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.

804419

Chain of Custody Record & Laboratory Analysis Request

ME 04-25-18

Friedman & Bruya

~~Analytical Resources, Incorporated~~
~~Analytical Chemists and Consultants~~
~~4611 South 134th Place, Suite 100~~
~~Tukwila, WA 98168~~
206-695-6200 206-695-6201 (fax)
www.arilabs.com

ARI Assigned Number:	Turn-around Requested: Standard	Page: 1 of 1	
ARI Client Company: Amec Foster Wheeler	Phone: 781-724-1014	Date: 4/24/18	Ice Present?
Client Contact: Crystal Thimsen		No. of Coolers:	Cooler Temps:
Client Project Name: Kelly Moore			
Client Project #: 0114697.0060.00009	Samplers: William Young		

Sample ID	Lab ID	Date	Time	Matrix	No. Containers	Analysis Requested: TPH-G	Analysis Requested: Benzene	Notes/Comments
INF-042418	01A-B	4/24	1750	A	2	x	x	
EFF-042418	02A-B	4/24	1810	A	2	x	x	

Samples received at 19 °C

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: William Young	Printed Name: Elizabeth Webber-Bruya	Printed Name:	Printed Name:
	Company: Amec Foster Wheeler	Company: FBI	Company:	Company:
	Date & Time: 4/25/18 800	Date & Time: 4/25/18 800	Date & Time:	Date & Time:

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 6, 2018

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

Dear Ms Thimsen:

Included are the results from the testing of material submitted on May 30, 2018 from the 14697, F&BI 805514 project. There are 4 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. 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

WEI0606R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on May 30, 2018 by Friedman & Bruya, Inc. from the Wood Environment & Infrastructure Solutions 14697, F&BI 805514 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Wood Environment & Infrastructure Solutions
805514 -01	INF-053018
805514 -02	EFF-053018

All quality control requirements were acceptable.

Date of Report: 06/06/18
Date Received: 05/30/18
Project: 14697, F&BI 805514
Date Extracted: 06/01/18
Date Analyzed: 06/01/18

**RESULTS FROM THE ANALYSIS OF AIR SAMPLES
FOR BENZENE AND TPH AS GASOLINE
USING MODIFIED METHODS 8021B AND NWTPH-Gx**

Results Reported as mg/m^3

Sample ID Laboratory ID	Benzene	Gasoline Range	Surrogate (% Recovery) (Limit 50-150)
INF-053018 805514-01	<0.1	170	103
EFF-053018 805514-02	<0.1	160	102
Method Blank 08-1136 MB2	<0.1	<10	89

Date of Report: 06/06/18
Date Received: 05/30/18
Project: 14697, F&BI 805514

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES FOR BENZENE AND TPH AS GASOLINE USING MODIFIED EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 805501-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	mg/m^3	<0.1	<0.1	nm
Gasoline	mg/m^3	<10	<10	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	mg/m^3	5.0	95	70-130
Gasoline	mg/m^3	100	109	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 compound 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. Compounds in the sample matrix interfered with the quantitation of the analyte.

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.

805514

Chain of Custody Record & Laboratory Analysis Request

ME 05-30-18

Friedman & Bruya
Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)
www.arilabs.com

ARI Assigned Number:	Turn-around Requested: Std	Page: 1 of 1	
ARI Client Company: Amec Foster Wheeler	Phone: 206-342-1779	Date: 5/30/18	Ice Present?
Client Contact: Crystal Thimsen		No. of Coolers:	Cooler Temps:
Client Project Name: Kelly Moore			
Client Project #: 14697	Samplers: William Young		

Sample ID	Lab ID	Date	Time	Matrix	No. Containers	Analysis Requested: TPH-G	Analysis Requested: Benzene	Notes/Comments
INF-053018	01A-B	5/30	1545	A	2	X	X	
EFF-053018	02A-B	5/30	1550	A	2	X	X	

Comments/Special Instructions	Relinquished by: (Signature)	Printed Name:	Company:	Date & Time:	Received by: (Signature)	Printed Name:	Company:	Date & Time:	Relinquished by: (Signature)	Printed Name:	Company:	Date & Time:	Received by: (Signature)	Printed Name:	Company:	Date & Time:
	William Young	William Young	Amec Foster Wheeler	5/30/18 1634					William Young	William Young	Amec Foster Wheeler	5/30/18 1634	Jan Shimazu	Jan Shimazu	FBF	5/30/18 @ 16:34

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 10, 2018

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

Dear Ms Thimsen:

Included are the results from the testing of material submitted on June 29, 2018 from the Kelly Moore 14697, F&BI 806572 project. There are 4 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. 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
WEI0710R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on June 29, 2018 by Friedman & Bruya, Inc. from the Wood Environment & Infrastructure Solutions Kelly Moore 14697, F&BI 806572 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Wood Environment & Infrastructure Solutions
806572 -01	INF062918
806572 -02	EFF062918

All quality control requirements were acceptable.

Date of Report: 07/10/18
Date Received: 06/29/18
Project: Kelly Moore 14697, F&BI 806572
Date Extracted: 07/02/18
Date Analyzed: 07/02/18

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/m^3

Sample ID Laboratory ID	Benzene	Gasoline Range	Surrogate (% Recovery) (Limit 50-150)
INF 062918 806572-01	<0.1	530	107
EFF062918 806572-02	<0.1	520	103
Method Blank 08-1389 MB	<0.1	<10	75

Date of Report: 07/10/18
Date Received: 06/29/18
Project: Kelly Moore 14697, F&BI 806572

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: 806572-02 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	mg/m^3	<0.1	<0.1	nm
Gasoline	mg/m^3	520	530	2

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	mg/m^3	5.0	81	70-130
Gasoline	mg/m^3	100	137	86-144

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 compound 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. Compounds in the sample matrix interfered with the quantitation of the analyte.

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.

806572

SAMPLE CHAIN OF CUSTODY

NE: 06/29/18

Page # 1 of 1

Report To Crystal Thimsen

Company Wood

Address 600 University St # 600

City, State, ZIP Seattle, WA. 98119

Phone 206-342-1779 Email crystal.thimsen@woodplc.com

SAMPLERS (signature) William Young

PROJECT NAME: Kelly Moore

PO # 14697

REMARKS: Std. Turnaround

INVOICE TO

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	TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM	Benzene				Notes
INF062918	01AB	6/29/18	0850	Air	2			X					X				
EFF062918	02AB	6/29/18	1010	Air	2			X					X				

ANALYSES REQUESTED

Samples received at 21 °C

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: William Young	William Young	Wood	6/29/18	1140
Received by: Nhan Phan	Nhan Phan	FEBI	6/29/18	1110
Relinquished by:				
Received by:				

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

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 6, 2018

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

Dear Ms Thimsen:

Included are the results from the testing of material submitted on July 31, 2018 from the Kelly Moore, F&BI 807615 project. There are 4 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. 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
WEI0806R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on July 31, 2018 by Friedman & Bruya, Inc. from the Wood Environment & Infrastructure Solutions Kelly Moore, F&BI 807615 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Wood Environment & Infrastructure Solutions
807615 -01	EFF073118
807615 -02	INF073118

All quality control requirements were acceptable.

Date of Report: 08/06/18
Date Received: 07/31/18
Project: Kelly Moore, F&BI 807615
Date Extracted: 08/01/18
Date Analyzed: 08/01/18

**RESULTS FROM THE ANALYSIS OF AIR SAMPLES
FOR BENZENE AND TPH AS GASOLINE
USING MODIFIED METHODS 8021B AND NWTPH-Gx**

Results Reported as mg/m^3

Sample ID Laboratory ID	Benzene	Gasoline Range	Surrogate (% Recovery) (Limit 50-150)
EFF073118 807615-01	<0.1	450	123
INF073118 807615-02	<0.1	730	139
Method Blank 08-1653 MB	<0.1	<10	90

Date of Report: 08/06/18
Date Received: 07/31/18
Project: Kelly Moore, F&BI 807615

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES FOR BENZENE AND TPH AS GASOLINE USING MODIFIED EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 807615-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	mg/m^3	<0.1	<0.1	nm
Gasoline	mg/m^3	450	460	3

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	mg/m^3	5.0	96	70-130
Gasoline	mg/m^3	100	125	86-144

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 compound 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. Compounds in the sample matrix interfered with the quantitation of the analyte.

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.

807615

SAMPLE CHAIN OF CUSTODY ME 7/31/18

Report To Crystal Thimsen
Company Wood
Address 600 University St #600
City, State, ZIP Seattle, WA 98119
Phone 206 838-8464 Email crystal.thimsen@woodplc.com

SAMPLERS (signature)
PROJECT NAME: Williams Kelly Manor
PO #
REMARKS
INVOICE TO

Page # 1 of 1

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	TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM	Benzene				Notes
EFF073116	01	7/31/16	1120	A	2			X					X				
INF073116	02	7/31/16	1111	A	2			X					X				
													Samples received at 27 °C				

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	William Young	Wood	7/31	1343
Received by:	Liza Radford	FEBI	7/31	1343
Relinquished by:				
Received by:				

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

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 7, 2018

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

Dear Ms Thimsen:

Included are the results from the testing of material submitted on August 31, 2018 from the Kelly-Moore, F&BI 808717 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
WEI0907R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on August 31, 2018 by Friedman & Bruya, Inc. from the Wood Environment & Infrastructure Solutions Kelly-Moore, F&BI 808717 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Wood Environment & Infrastructure Solutions
808717 -01	EFF-083118
808717 -02	INF-083118

All quality control requirements were acceptable.

Date of Report: 09/07/18
Date Received: 08/31/18
Project: Kelly-Moore, F&BI 808717
Date Extracted: 08/31/18
Date Analyzed: 08/31/18

RESULTS FROM THE ANALYSIS OF AIR SAMPLES FOR BENZENE AND TPH AS GASOLINE USING MODIFIED METHODS 8021B AND NWTPH-Gx

Results Reported as mg/m^3

Sample ID Laboratory ID	Benzene	Gasoline Range	Surrogate (% Recovery) (Limit 50-150)
EFF-083118 808717-01	<0.1	23	89
INF-083118 808717-02	<0.1	550	131
Method Blank 08-1941 MB	<0.1	<10	87

Date of Report: 09/07/18
Date Received: 08/31/18
Project: Kelly-Moore, F&BI 808717

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES FOR BENZENE AND TPH AS GASOLINE USING MODIFIED EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 808717-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	mg/m^3	<0.1	<0.1	nm
Gasoline	mg/m^3	23	46	67 a

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	mg/m^3	5.0	90	70-130
Gasoline	mg/m^3	100	128	86-144

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 compound 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. Compounds in the sample matrix interfered with the quantitation of the analyte.

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.

808717

SAMPLE CHAIN OF CUSTODY

ME 08/31/18

Page # 1 of 1

Report To Crystal Thimsen
Company Wood Environmental Solutions
Address 600 University St. Ste. 600
City, State, ZIP Seattle, WA 98101
Phone 206.838.8469 Email crystal.thimsen@amecfw.com

SAMPLERS (signature)
PROJECT NAME: Kelly-Moore
PO #
REMARKS
INVOICE TO

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	TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM	benzene				Notes
						ANALYSES REQUESTED											
EFF-083118	01 AB	8/31/18	1226	tedlar bag	2			X					X				FID=5.9 ppm
INF-083118	02 V	8/31/18	1232	tedlar bag	2			X					X				FID=190 ppm

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Lindsay Davidge	Wood	8/31/18	1330
Received by:	D Ho	F&BI	8-31-18	13-36
Relinquished by:				
Received by:				

Samples received at 22 °C

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

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 25, 2018

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

Dear Ms Thimsen:

Included are the results from the testing of material submitted on September 19, 2018 from the Kelly Moore, F&BI 809326 project. There are 4 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. 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
WEI0925R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on September 19, 2018 by Friedman & Bruya, Inc. from the Wood Environment & Infrastructure Solutions Kelly Moore, F&BI 809326 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Wood Environment & Infrastructure Solutions
809326 -01	EFF-091918
809326 -02	INF-091918

All quality control requirements were acceptable.

Date of Report: 09/25/18
Date Received: 09/19/18
Project: Kelly Moore, F&BI 809326
Date Extracted: 09/20/18
Date Analyzed: 09/20/18

**RESULTS FROM THE ANALYSIS OF AIR SAMPLES
FOR BENZENE AND TPH AS GASOLINE
USING MODIFIED METHODS 8021B AND NWTPH-Gx**

Results Reported as mg/m^3

Sample ID Laboratory ID	Benzene	Gasoline Range	Surrogate (% Recovery) (Limit 50-150)
EFF-091918 809326-01	<0.1	59	82
INF-091918 809326-02	<0.1	470	109
Method Blank 08-1970 MB	<0.1	<10	79

Date of Report: 09/25/18
Date Received: 09/19/18
Project: Kelly Moore, F&BI 809326

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES FOR BENZENE AND TPH AS GASOLINE USING MODIFIED EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 809326-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	mg/m^3	<0.1	<0.1	nm
Gasoline	mg/m^3	59	56	5

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	mg/m^3	5.0	83	70-130
Gasoline	mg/m^3	100	141	86-144

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 compound 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. Compounds in the sample matrix interfered with the quantitation of the analyte.

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.

809326

SAMPLE CHAIN OF CUSTODY ME 09-19-18

Page # 1 of 1

Report To Crystal Thimsen

Company WOOD Environmental

Address 600 University St. Suite 600

City, State, ZIP Seattle WA 98101

Phone 206.838.8469 Email CRYSTAL.THIMSEN@WOODPLC.COM

SAMPLERS (signature) [redacted]

PROJECT NAME: Kelly Moore

PO #:

REMARKS:

INVOICE TO:

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	TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM	Benzene				Notes
EFF-091918	01 A-B	09-19-18	1355 HW	TEDLAR BAG	2			X					X				
INF-091918	02 T	09-19-18	1410 HW	" "	2			X					X				

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: George Hagan	GEORGE HAGAN	JHA ENV. INC.	9/19/18	1539 HW
Received by:	Matt Langston	FBInc	9/19/18	1539
Relinquished by:				
Received by:				

Samples received at 21 °C

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

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 23, 2018

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

Dear Ms Thimsen:

Included are the results from the testing of material submitted on October 16, 2018 from the Kelly Moore 14697, F&BI 810312 project. There are 4 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. 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
WEI1023R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on October 16, 2018 by Friedman & Bruya, Inc. from the Wood Environment & Infrastructure Solutions Kelly Moore 14697, F&BI 810312 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Wood Environment & Infrastructure Solutions
810312 -01	INF-101618
810312 -02	EFF-101618

All quality control requirements were acceptable.

Date of Report: 10/23/18
Date Received: 10/16/18
Project: Kelly Moore 14697, F&BI 810312
Date Extracted: 10/19/18
Date Analyzed: 10/19/18

**RESULTS FROM THE ANALYSIS OF AIR SAMPLES
FOR BENZENE AND TPH AS GASOLINE
USING MODIFIED METHODS 8021B AND NWTPH-Gx**

Results Reported as mg/m^3

Sample ID Laboratory ID	Benzene	Gasoline Range	Surrogate (% Recovery) (Limit 50-150)
INF-101618 810312-01	<0.1	1,900	149
EFF-101618 810312-02	<0.1	460	101
Method Blank 08-2356 MB	<0.1	<10	72

Date of Report: 10/23/18
Date Received: 10/16/18
Project: Kelly Moore 14697, F&BI 810312

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES FOR BENZENE AND TPH AS GASOLINE USING MODIFIED EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 810312-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	mg/m^3	<0.1	<0.1	nm
Gasoline	mg/m^3	1,900	2,100 ve	10

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	mg/m^3	5.0	75	70-130
Gasoline	mg/m^3	100	139	86-144

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 compound 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. Compounds in the sample matrix interfered with the quantitation of the analyte.

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.

810312

SAMPLE CHAIN OF CUSTODY

ME 10/16/18

Page # 1 of 1

Report To Crystal Thimsen

Company Wood

Address 600 University St. # 600

City, State, ZIP Seattle, Wa, 98101

Phone 781-721-1019 Email Crystal.Thimsen@wood.com

SAMPLERS (*signature*)

PROJECT NAME	PO #
Kelly Moore	116917
REMARKS	INVOICE TO

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: TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM	Pentane				Notes
INF-101618	01 A-B	10/16	1115	A	2			X					X				
EFF-101618	02 V	10/16	1125	A	2			X					X				

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	William Young	Wood	10/16	1256
Received by:	Nhan Phan	Fed Ex	10/16/18	V
Relinquished by:				
Received by:				

Samples received at 19 °C

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

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 9, 2019

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

Dear Ms Thimsen:

Included are the results from the testing of material submitted on April 4, 2019 from the Kelly Moore, F&BI 904101 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
WEI0409R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on April 4, 2019 by Friedman & Bruya, Inc. from the Wood Environment & Infrastructure Solutions Kelly Moore, F&BI 904101 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Wood Environment & Infrastructure Solutions
904101 -01	EFF-040319
904101 -02	INF-040319

All quality control requirements were acceptable.

Date of Report: 04/09/19
Date Received: 04/04/19
Project: Kelly Moore, F&BI 904101
Date Extracted: 04/05/19
Date Analyzed: 04/05/19

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/m^3

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 50-150)
EFF-040319 904101-01	<0.1	<0.1	<0.1	<0.3	10	105
INF-040319 904101-02	<0.1	0.59	5.6	15	670	ip
Method Blank 09-529 MB	<0.1	<0.1	<0.1	<0.3	<10	98

Date of Report: 04/09/19
Date Received: 04/04/19
Project: Kelly Moore, F&BI 904101

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: 904101-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	mg/m^3	<0.1	<0.1	nm
Toluene	mg/m^3	<0.1	<0.1	nm
Ethylbenzene	mg/m^3	<0.1	<0.1	nm
Xylenes	mg/m^3	<0.3	<0.3	nm
Gasoline	mg/m^3	10	<10	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	mg/m^3	5.0	92	70-130
Toluene	mg/m^3	5.0	96	70-130
Ethylbenzene	mg/m^3	5.0	112	70-130
Xylenes	mg/m^3	15	109	70-130
Gasoline	mg/m^3	100	95	86-144

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.

904101

SAMPLE CHAIN OF CUSTODY

ME 04/04/19

Page # 1 of 1

Report To Crystal Thimsen

Company Wood Environmental Solutions

Address 600 University St Suite 600

City, State, ZIP Seattle, WA 98101

Phone 206 838-8469 : Email crystal.thimsen@amecfw.com

SAMPLERS (signature) George Hagan	
PROJECT NAME Kelly Moore	PO #
REMARKS	INVOICE TO

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	TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM	Benzene				Notes
EFF-040319	01AB	04-03-19	1143-HRS	TEDLAR BAG 1-L	2EA			X					X				PID 1.1 PPM
INF-040319	02AB	04-03-19	1157-HRS	TEDLAR BAG-1-L	2EA			X					X				PID 165 PPM

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: George Hagan	George Hagan	JHA Environmental	04-03-19	
Received by:	Wilson Yamamas	FedEx	4.4.19	1002 am
Relinquished by:				
Received by:	Nhan Phan	FCBI	4/4/19	1030

Samples received at 9 °C

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

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 9, 2019

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

Dear Ms Thimsen:

Included are the results from the testing of material submitted on May 6, 2019 from the Kelly Moore, F&BI 905100 project. There are 4 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
WEI0509R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on May 6, 2019 by Friedman & Bruya, Inc. from the Wood Environment & Infrastructure Solutions Kelly Moore, F&BI 905100 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Wood Environment & Infrastructure Solutions
905100 -01	EFF-050319
905100 -02	INF-050319

All quality control requirements were acceptable.

Date of Report: 05/09/19
Date Received: 05/06/19
Project: Kelly Moore, F&BI 905100
Date Extracted: 05/06/19
Date Analyzed: 05/06/19

RESULTS FROM THE ANALYSIS OF AIR SAMPLES FOR BENZENE USING MODIFIED METHODS 8021B

Results Reported as mg/m^3

Sample ID Laboratory ID	Benzene	Surrogate (% Recovery) (Limit 50-150)
EFF-050319 905100-01	<0.1	114
INF-050319 905100-02	<0.1	127
Method Blank 09-833 MB	<0.1	113

Date of Report: 05/09/19
Date Received: 05/06/19
Project: Kelly Moore, F&BI 905100

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES FOR BENZENE USING MODIFIED EPA METHOD 8021B

Laboratory Code: 905100-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	mg/m^3	<0.1	<0.1	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	mg/m^3	5.0	86	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.

SAMPLE CHAIN OF CUSTODY

905100

ME 05-06-19

Page 1 of 1

Report To Crystal Thimsen

Company WOOD ENV. SOLUTIONS

Address 600 UNIVERSITY ST SUITE 600

City, State, ZIP SEATTLE, WA, 98101

Phone 206.838.8469 Email CRYSTAL.THIMSEN@AMECFW.COM

SAMPLERS (signature) George Hagan

PROJECT NAME Kelly Moore

PO #

REMARKS

INVOICE TO

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	TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM	Benzene				Notes
EFF-050319	01	5-3-19	1025 HRS	TEDLAR	1								X				FID 0.1 PPM
INF-050319	02	5-3-19	1030 HRS	TEDLAR	1								X				FID 16.1 PPM

ANALYSES REQUESTED

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: George Hagan	GEORGE HAGAN	JHA ENV.	5-3-19	1121 HRS
Received by: E.D. M-B	LIZ WEBBER-BRYCE	FRIBI	5/6/19	940
Relinquished by:				
Received by:				

Samples received at 20 °C

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

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 10, 2019

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

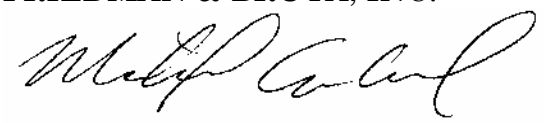
Dear Ms Thimsen:

Included are the results from the testing of material submitted on June 4, 2019 from the Kelly Moore, F&BI 906031 project. There are 5 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
WEI0610R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on June 4, 2019 by Friedman & Bruya, Inc. from the Wood Environment & Infrastructure Solutions Kelly Moore, F&BI 906031 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Wood Environment & Infrastructure Solutions
906031 -01	EFF-060419
906031 -02	INF-060419
906031 -03	SVE09-060419
906031 -04	SVE10-060419
906031 -05	SVE11-060419
906031 -06	SVE12-060419
906031 -07	SVE13-060419
906031 -08	SVE01-060419
906031 -09	SVE03-060419
906031 -10	SVE05-060419
906031 -11	SVE07-060419
906031 -12	SVE08-060419
906031 -13	SVE06-060419
906031 -14	SVE04-060419
906031 -15	SVE02-060419

All quality control requirements were acceptable.

Date of Report: 06/10/19
Date Received: 06/04/19
Project: Kelly Moore, F&BI 906031
Date Extracted: 06/04/19
Date Analyzed: 06/05/19

**RESULTS FROM THE ANALYSIS OF AIR SAMPLES
FOR BENZENE AND TPH AS GASOLINE
USING MODIFIED METHODS 8021B AND NWTPH-Gx**

Results Reported as mg/m^3

Sample ID Laboratory ID	Benzene	Gasoline Range	Surrogate (% Recovery) (Limit 50-150)
EFF-060419 906031-01	<0.1	20	86
INF-060419 906031-02	<0.1	640	113
SVE09-060419 906031-03	<0.1	440	105
SVE10-060419 906031-04 1/5	<0.5	2,300	101
SVE11-060419 906031-05	<0.1	660	100
SVE12-060419 906031-06 1/2	<0.2	1,400	98
SVE13-060419 906031-07	<0.1	760	91
SVE01-060419 906031-08	<0.1	14	85
SVE03-060419 906031-09	<0.1	2,400	ip
SVE05-060419 906031-10 1/5	<0.5	3,500	130

Date of Report: 06/10/19
Date Received: 06/04/19
Project: Kelly Moore, F&BI 906031
Date Extracted: 06/04/19
Date Analyzed: 06/05/19

**RESULTS FROM THE ANALYSIS OF AIR SAMPLES
FOR BENZENE AND TPH AS GASOLINE
USING MODIFIED METHODS 8021B AND NWTPH-Gx**

Results Reported as mg/m^3

Sample ID Laboratory ID	Benzene	Gasoline Range	Surrogate (% Recovery) (Limit 50-150)
SVE07-060419 906031-11	<0.1	230	91
SVE08-060419 906031-12	<0.1	16	85
SVE06-060419 906031-13	<0.1	33	89
SVE04-060419 906031-14	<0.1	400	103
SVE02-060419 906031-15	<0.1	14	79
Method Blank 09-1280 MB	<0.1	<10	76

Date of Report: 06/10/19
Date Received: 06/04/19
Project: Kelly Moore, F&BI 906031

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES FOR BENZENE AND TPH AS GASOLINE USING MODIFIED EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 906031-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	mg/m^3	<0.1	<0.1	nm
Gasoline	mg/m^3	20	19	5

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	mg/m^3	5.0	91	70-130
Gasoline	mg/m^3	100	131	86-144

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.

906031

SAMPLE CHAIN OF CUSTODY

ME 06/04/19 Page # 1 of 2

Report To CRYSTAL THOMSEN

Company WOOD E+I

Address 600 UNIVERSITY ST. STE 600

City, State, ZIP SEATTLE, WA 98101

Phone 206 839-3469 Email CRYSTAL.THOMSEN@AMEC.COM

SAMPLERS (signature): George Hagen

PROJECT NAME: Kelly MOORE

PO #:

REMARKS:

INVOICE TO:

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	TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM	Benzene				Notes
						ANALYSES REQUESTED											
EFF-060419	01	6-4-19	0856	1-LITER AIR	ONE TEDLAR BAG			X					X				FID 1.2 PPM
INF-060419	02	"	0903	"	"			X					X				FID 50.4 PPM
SVE09-060419	03	"	0939 ~~0932~~ GH	"	"			X					X				
SVE10-060419	04	"	0940 GH ~~0938~~	"	"			X					X				
SVE11-060419	05	"	0944 ~~0942~~ GH	"	"			X					X				
SVE12-060419	06	"	0949 GH ~~0946~~	"	"			X					X				
SVE13-060419	07	"	0953 ~~0951~~ GH	"	"			X					X				
SVE01-060419	08	"	1102	"	"			X					X				
SVE03-060419	09	"	1105	"	"			X					X				
SVE05-060419	10	"	1109	"	"			X					X				

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: George Hagen	GEORGE HAGEN	JHA ENV.	6-4-19	1248
Received by:	Eric Foss	FedEx	6/4/19	12PM
Relinquished by:				
Received by:			21	

Samples received at ____°C

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

906031

SAMPLE CHAIN OF CUSTODY

ME 06/04/19

Page # 2 of 2

Report To Crystal Thiemsen

Company WOOD E+I

Address 600 University ST STE: 600

City, State, ZIP Seattle, WA

Phone 206 338-8469 Email Crystal.Thiemsen@amecfw.com

SAMPLERS (signature) George Hagen

PROJECT NAME: Kelly Moore

PO #:

REMARKS:

INVOICE TO:

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	TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM	Benzene				Notes
SVE07-060419	11	6-4-19	1109	1-LITER AIR	ONE TEDLAR BAG			X					X				
SVE08-060419	12	6-4-19	1117	" "	"			X					X				
SVE06-060419	13	" "	1121	" "	"			X					X				
SVE04-060419	14	" "	1126	" "	"			X					X				
SVE02-060419	15	" "	1129	" "	"			X					X				

ANALYSES REQUESTED

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: George Hagen	GEORGE HAGAN	IHA ENV	6-4-19	1248
Received by:	Eric Lov	FedEx	6/4/19	12:P
Relinquished by:				
Received by:			21	

Samples received at ____ °C

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

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 10, 2019

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

Dear Ms Thimsen:

Included are the results from the testing of material submitted on July 5, 2019 from the Kelly Moore, F&BI 907102 project. There are 4 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
WEI0710R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on July 5, 2019 by Friedman & Bruya, Inc. from the Wood Environment & Infrastructure Solutions Kelly Moore, F&BI 907102 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Wood Environment & Infrastructure Solutions
907102 -01	070219-EFF
907102 -02	070219-INF

All quality control requirements were acceptable.

Date of Report: 07/10/19
Date Received: 07/05/19
Project: Kelly Moore, F&BI 907102
Date Extracted: 07/05/19
Date Analyzed: 07/05/19

RESULTS FROM THE ANALYSIS OF AIR SAMPLES FOR BENZENE USING MODIFIED METHODS 8021B

Results Reported as mg/m^3

Sample ID Laboratory ID	Benzene	Surrogate (% Recovery) (Limit 50-150)
070219-EFF 907102-01	<0.1	88
070219-INF 907102-02	<0.1	93
Method Blank 09-1585 MB	<0.1	92

Date of Report: 07/10/19
Date Received: 07/05/19
Project: Kelly Moore, F&BI 907102

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES FOR BENZENE USING MODIFIED EPA METHOD 8021B

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Benzene	mg/m^3	5.0	97	97	70-130	0

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.

~~907102~~ GAB 907102 **SAMPLE CHA OF CUSTODY** ME 07-05-19

Page # 1 of 1

Report To Crystal Thiemsen

Company WOOD

Address 600 University St Suite 600

City, State, ZIP Seattle, WA 98101

Phone 206 338 8469 Email

SAMPLERS (signature) George Hagan

PROJECT NAME: Kelly Moore

PO #

REMARKS

INVOICE TO

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	TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM	Benzene				Notes
						ANALYSES REQUESTED											
070219-EFF	01	07-02-19	0942-HES	1-LITER TEDLAR	1								X				FID-0.0PPM
070219-INF	02	07-02-19	0951-HES	1-LITER TEDLAR	1								X				FID-53.0 PPM

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: George Hagan	GEORGE HAGAN	JHA-ENV. INC.	07-02-19	
Received by: Melissa Merrell	Melissa Merrell	Wood E&I S	07-02-19	
Relinquished by: John Long	John Long	" "	7/5/19	13:00
Received by: FED-EX 4940 1096 7868				

Samples received at 22 °C

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

Appendix E

Wood Environment & Infrastructure Solutions, Inc.
600 University Street, Suite 600
Seattle, Washington 98101
USA
T: 206-342-1760
www.woodplc.com

April 25, 2019

Project 014697

Ivan Rivera
Inspector
Puget Sound Clean Air Agency
1904 3rd Avenue, Suite 105
Seattle, WA 98101

Subject: Corrective Actions Memo
Former Kelly-Moore Manufacturing Facility
5400–5800 Airport Way South
Seattle, Washington

Dear Ivan,

Wood Environment & Infrastructure Solutions, Inc. (Wood) has prepared this corrective action memo on behalf of Kelly-Moore Paint Company, Inc. (Kelly-Moore), in response to the Notice of Violation that was issued on April 17, 2019 due to destruction removal efficiencies (DREs) that did not meet the limits in Section 4 of operating permit number 11291.

In addition to the corrective actions detailed below, we contacted the manufacturer of the catalytic oxidation (Catox) unit, Drewelow Remediation Equipment, to confirm that the catalyst was new when installed at the site and that the correct catalyst was selected for site's compounds of concern. The catalyst manufacturer confirmed the correct catalyst was selected. The manufacturer also stated that the life of the catalyst should be up to 30 years, and that we should be able to achieve the permit-required DREs using that Catox unit.

Wood is implementing the following corrective actions in response to the exceedances:

1. Monthly inspections will include monthly calibration of the lower explosive limit meter. The manufacturer has provided an up-to-date procedure for this unit.
2. Total petroleum hydrocarbon (TPH) readings will be conducted using a handheld flame ionization detector (FID):
    a. Sampling will continue to be conducted monthly during routine monthly inspections.
    b. New tubing will be used each month for collecting the samples.
    c. Samples will be collected first from the effluent port and second from the influent port.
    d. Influent and effluent samples will be collected in a Tedlar bag, and TPH concentrations will be measured and recorded with an FID calibrated to hexane per permit condition #7. The influent and effluent samples will be collected in the same Tedlar bag used for the FID screening and will be sent to the laboratory for benzene analysis by U.S. Environmental Protection Agency Method 8021.

3. The DREs will be calculated on site using TPH concentrations measured by the FID, and will be communicated to the project manager before leaving the site. The spreadsheet used to calculate the DREs will be programmed to flag any exceedances in the operating permit conditions.

In case of future exceedances of the DRE, the following corrective actions will be implemented:

1. Ensure the FID is calibrated correctly and working properly.
2. Clean the catalyst using the following procedure:
    a. Raise "Catox-In" set-point from 650 to 950 degrees Fahrenheit (^{0}F) on Clean Air only adjusting the recirculation valve as needed.
    b. Run at 950^{0}F for at least 60 minutes.
    c. Reduce the set-point from 950 to 650^{0}F.
    d. Open process valve.
    e. Close dilution air based on "Catox-Out" temperature.
    f. Do not exceed 950^{0}F Catox-Out temperature.
3. Run Catox-In set-point at 700^{0}F instead of 650^{0}F. Increasing the temperature should improve the DRE.
4. Reduce flow rate.

If these steps are completed, and the DRE does not change, Wood will shut off the Catox unit and allow it to cool. After the unit is cool and it is safe, Wood will inspect the catalyst to check for any uneven distribution of the catalyst and will inspect the condition of the refractory material inside the catalyst chamber. Assuming the refractory material is intact, and if the catalyst is not evenly distributed, we will re-distribute it evenly and restart the unit.

If the DRE condition is still not resolved after redistribution of the catalyst, we will contact the manufacturer and obtain a new catalyst, which will be installed before the Catox unit is restarted.

We feel that our discussions directly with the Catox manufacturer has provided us with a solid understanding of the approach we will take in the future to operate the Catox unit correctly to avoid future exceedances of the DRE permit conditions and to identify the corrective actions we outlined above. We hope that these corrective actions address your concerns and reassure you that there will be no more violations of the DRE permit conditions.

Sincerely,

Wood Environment & Infrastructure Solutions, Inc.

Crystal Thimsen
Senior Scientist
Direct Tel: (206) 838-8469
E-mail: crystal.thimsen@woodplc.com

John Long, LHg.
Senior Associate Hydrogeologist
Direct Tel: (206) 342-1979
E-mail: John.Long3@woodplc.com

CT/JL:al
\\sea2-fs1\archive\14697 kelly moore paint company\036\corrective actions memo_sx.docx

Appendix F

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 26, 2018

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

Dear Ms Thimsen:

Included are the results from the testing of material submitted on October 16, 2018 from the Kelly Moore 14697, F&BI 810322 project. There are 8 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
WEI1026R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on October 16, 2018 by Friedman & Bruya, Inc. from the Wood Environment & Infrastructure Solutions Kelly Moore 14697, F&BI 810322 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Wood Environment & Infrastructure Solutions
810322 -01	KM-AS-1-101618
810322 -02	KM-AS-2-101618
810322 -03	KM-AS-3-101618

Naphthalene was detected in the TO-15 method blank at a level greater than one tenth the concentration detected in the samples. The data were flagged accordingly.

Ethanol exceeded the calibration range in samples KM-AS-1-101618 and KM-AS-2-101618 and carried over into sample KM-AS-3-101618. 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:	KM-AS-1-101618	Client:	Wood Environment & Infrastructure Solutions
Date Received:	10/16/18	Project:	Kelly Moore 14697, F&BI 810322
Date Collected:	10/16/18	Lab ID:	810322-01
Date Analyzed:	10/19/18	Data File:	101908.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	MS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
4-Bromofluorobenzene	100	70	130

Compounds:	Concentration ug/m3	Concentration ppbv	Compounds:	ug/m3	ppbv
Chlorodifluoromethane	1.9	0.53	1-Butanol	<6.1	<2
Propene	23	13	Carbon tetrachloride	<0.63	<0.1
Dichlorodifluoromethane	3.1	0.62	Benzene	1.9	0.60
Chloromethane	1.5	0.71	Cyclohexane	<6.9	<2
F-114	<0.7	<0.1	2-Pentanone	<3.5	<1
Isobutene	1.5	0.65	3-Pentanone	<3.5	<1
Acetaldehyde	87	48	Pentanal	<3.5	<1
Vinyl chloride	<0.26	<0.1	1,2-Dichloropropane	<0.23	<0.05
1,3-Butadiene	0.48	0.22	1,4-Dioxane	<0.36	<0.1
Bromomethane	<1.6	<0.4	Bromodichloromethane	<0.067	<0.01
Chloroethane	<0.26	<0.1	Trichloroethene	<0.27	<0.05
Ethanol	5,900 ve	3,100 ve	cis-1,3-Dichloropropene	<0.45	<0.1
Acetonitrile	<1.7	<1	4-Methyl-2-pentanone	<4.1	<1
Acrolein	2.6	1.2	trans-1,3-Dichloropropene	<0.45	<0.1
Acrylonitrile	<0.22	<0.1	Toluene	7.5	2.0
Pentane	9.0	3.1	1,1,2-Trichloroethane	<0.055	<0.01
Trichlorofluoromethane	1.9	0.34	3-Hexanone	<4.1	<1
Acetone	47	20	2-Hexanone	<4.1	<1
2-Propanol	13	5.2	Hexanal	11	2.6
Isoprene	0.51	0.18	Tetrachloroethene	<0.68	<0.1
Iodomethane	<0.58	<0.1	Dibromochloromethane	<0.085	<0.01
1,1-Dichloroethene	<0.4	<0.1	1,2-Dibromoethane (EDB)	<0.077	<0.01
Methacrolein	<2.9	<1	Chlorobenzene	<0.46	<0.1
trans-1,2-Dichloroethene	<0.4	<0.1	Ethylbenzene	1.3	0.31
Cyclopentane	0.41	0.14	1,1,2,2-Tetrachloroethane	<0.14	<0.02
Methyl vinyl ketone	<2.9	<1	m,p-Xylene	5.0	1.1
Butanal	<2.9	<1	o-Xylene	1.7	0.38
Methylene chloride	<87	<25	Styrene	1.3	0.30
CFC-113	0.82	0.11	Bromoform	<2.1	<0.2
Carbon disulfide	<6.2	<2	Benzyl chloride	<0.052	<0.01
Methyl t-butyl ether (MTBE)	<1.8	<0.5	1,3,5-Trimethylbenzene	<2.5	<0.5
Vinyl acetate	<7	<2	1,2,4-Trimethylbenzene	<2.5	<0.5
1,1-Dichloroethane	<0.4	<0.1	1,3-Dichlorobenzene	<0.6	<0.1
cis-1,2-Dichloroethene	<0.4	<0.1	1,4-Dichlorobenzene	<0.24	<0.04
Hexane	4.2	1.2	1,2,3-Trimethylbenzene	<2.5	<0.5
Chloroform	0.35	0.072	1,2-Dichlorobenzene	<0.6	<0.1
2-Butanone (MEK)	15	5.0	1,2,4-Trichlorobenzene	<0.74	<0.1
1,2-Dichloroethane (EDC)	0.19	0.046	Naphthalene	0.59 fb	0.11 fb
1,1,1-Trichloroethane	<0.55	<0.1	Hexachlorobutadiene	<0.21	<0.02

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	KM-AS-2-101618	Client:	Wood Environment & Infrastructure Solutions
Date Received:	10/16/18	Project:	Kelly Moore 14697, F&BI 810322
Date Collected:	10/16/18	Lab ID:	810322-02
Date Analyzed:	10/19/18	Data File:	101909.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	MS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
4-Bromofluorobenzene	100	70	130

Compounds:	Concentration ug/m3	Concentration ppbv	Compounds:	ug/m3	ppbv
Chlorodifluoromethane	1.8	0.49	1-Butanol	<6.1	<2
Propene	20	11	Carbon tetrachloride	<0.63	<0.1
Dichlorodifluoromethane	3.1	0.63	Benzene	1.7	0.52
Chloromethane	1.4	0.70	Cyclohexane	<6.9	<2
F-114	<0.7	<0.1	2-Pentanone	<3.5	<1
Isobutene	1.4	0.60	3-Pentanone	<3.5	<1
Acetaldehyde	32	18	Pentanal	<3.5	<1
Vinyl chloride	<0.26	<0.1	1,2-Dichloropropane	<0.23	<0.05
1,3-Butadiene	0.44	0.20	1,4-Dioxane	<0.36	<0.1
Bromomethane	<1.6	<0.4	Bromodichloromethane	<0.067	<0.01
Chloroethane	<0.26	<0.1	Trichloroethene	<0.27	<0.05
Ethanol	5,300 ve	2,800 ve	cis-1,3-Dichloropropene	<0.45	<0.1
Acetonitrile	<1.7	<1	4-Methyl-2-pentanone	<4.1	<1
Acrolein	1.6	0.69	trans-1,3-Dichloropropene	<0.45	<0.1
Acrylonitrile	<0.22	<0.1	Toluene	7.0	1.9
Pentane	8.5	2.9	1,1,2-Trichloroethane	<0.055	<0.01
Trichlorofluoromethane	1.8	0.32	3-Hexanone	<4.1	<1
Acetone	41	17	2-Hexanone	<4.1	<1
2-Propanol	11	4.3	Hexanal	7.9	1.9
Isoprene	0.59	0.21	Tetrachloroethene	<0.68	<0.1
Iodomethane	<0.58	<0.1	Dibromochloromethane	<0.085	<0.01
1,1-Dichloroethene	<0.4	<0.1	1,2-Dibromoethane (EDB)	<0.077	<0.01
Methacrolein	<2.9	<1	Chlorobenzene	<0.46	<0.1
trans-1,2-Dichloroethene	<0.4	<0.1	Ethylbenzene	1.2	0.28
Cyclopentane	<0.29	<0.1	1,1,2,2-Tetrachloroethane	<0.14	<0.02
Methyl vinyl ketone	<2.9	<1	m,p-Xylene	4.5	1.0
Butanal	<2.9	<1	o-Xylene	1.5	0.34
Methylene chloride	<87	<25	Styrene	1.1	0.25
CFC-113	<0.77	<0.1	Bromoform	<2.1	<0.2
Carbon disulfide	<6.2	<2	Benzyl chloride	<0.052	<0.01
Methyl t-butyl ether (MTBE)	<1.8	<0.5	1,3,5-Trimethylbenzene	<2.5	<0.5
Vinyl acetate	<7	<2	1,2,4-Trimethylbenzene	<2.5	<0.5
1,1-Dichloroethane	<0.4	<0.1	1,3-Dichlorobenzene	<0.6	<0.1
cis-1,2-Dichloroethene	<0.4	<0.1	1,4-Dichlorobenzene	<0.24	<0.04
Hexane	<3.5	<1	1,2,3-Trimethylbenzene	<2.5	<0.5
Chloroform	0.29	0.060	1,2-Dichlorobenzene	<0.6	<0.1
2-Butanone (MEK)	15	5.0	1,2,4-Trichlorobenzene	<0.74	<0.1
1,2-Dichloroethane (EDC)	0.17	0.041	Naphthalene	0.55 fb	0.10 fb
1,1,1-Trichloroethane	<0.55	<0.1	Hexachlorobutadiene	<0.21	<0.02

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	KM-AS-3-101618	Client:	Wood Environment & Infrastructure Solutions
Date Received:	10/16/18	Project:	Kelly Moore 14697, F&BI 810322
Date Collected:	10/16/18	Lab ID:	810322-03
Date Analyzed:	10/19/18	Data File:	101910.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	MS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
4-Bromofluorobenzene	101	70	130

Compounds:	Concentration ug/m3	Concentration ppbv	Compounds:	ug/m3	ppbv
Chlorodifluoromethane	1.5	0.42	1-Butanol	<6.1	<2
Propene	4.5	2.6	Carbon tetrachloride	<0.63	<0.1
Dichlorodifluoromethane	3.1	0.62	Benzene	0.98	0.31
Chloromethane	1.4	0.66	Cyclohexane	<6.9	<2
F-114	<0.7	<0.1	2-Pentanone	<3.5	<1
Isobutene	<0.92	<0.4	3-Pentanone	<3.5	<1
Acetaldehyde	<9	<5	Pentanal	<3.5	<1
Vinyl chloride	<0.26	<0.1	1,2-Dichloropropane	<0.23	<0.05
1,3-Butadiene	0.19	0.086	1,4-Dioxane	<0.36	<0.1
Bromomethane	<1.6	<0.4	Bromodichloromethane	<0.067	<0.01
Chloroethane	<0.26	<0.1	Trichloroethene	<0.27	<0.05
Ethanol	29 c	15 c	cis-1,3-Dichloropropene	<0.45	<0.1
Acetonitrile	<1.7	<1	4-Methyl-2-pentanone	<4.1	<1
Acrolein	<0.92	<0.4	trans-1,3-Dichloropropene	<0.45	<0.1
Acrylonitrile	<0.22	<0.1	Toluene	3.4	0.91
Pentane	5.3	1.8	1,1,2-Trichloroethane	<0.055	<0.01
Trichlorofluoromethane	1.7	0.30	3-Hexanone	<4.1	<1
Acetone	17	7.0	2-Hexanone	<4.1	<1
2-Propanol	<8.6	<3.5	Hexanal	<4.1	<1
Isoprene	<0.28	<0.1	Tetrachloroethene	<0.68	<0.1
Iodomethane	<0.58	<0.1	Dibromochloromethane	<0.085	<0.01
1,1-Dichloroethene	<0.4	<0.1	1,2-Dibromoethane (EDB)	<0.077	<0.01
Methacrolein	<2.9	<1	Chlorobenzene	<0.46	<0.1
trans-1,2-Dichloroethene	<0.4	<0.1	Ethylbenzene	0.61	0.14
Cyclopentane	<0.29	<0.1	1,1,2,2-Tetrachloroethane	<0.14	<0.02
Methyl vinyl ketone	<2.9	<1	m,p-Xylene	2.0	0.47
Butanal	<2.9	<1	o-Xylene	0.70	0.16
Methylene chloride	<87	<25	Styrene	<0.85	<0.2
CFC-113	<0.77	<0.1	Bromoform	<2.1	<0.2
Carbon disulfide	<6.2	<2	Benzyl chloride	<0.052	<0.01
Methyl t-butyl ether (MTBE)	<1.8	<0.5	1,3,5-Trimethylbenzene	<2.5	<0.5
Vinyl acetate	<7	<2	1,2,4-Trimethylbenzene	<2.5	<0.5
1,1-Dichloroethane	<0.4	<0.1	1,3-Dichlorobenzene	<0.6	<0.1
cis-1,2-Dichloroethene	<0.4	<0.1	1,4-Dichlorobenzene	<0.24	<0.04
Hexane	<3.5	<1	1,2,3-Trimethylbenzene	<2.5	<0.5
Chloroform	0.14	0.028	1,2-Dichlorobenzene	<0.6	<0.1
2-Butanone (MEK)	<2.9	<1	1,2,4-Trichlorobenzene	<0.74	<0.1
1,2-Dichloroethane (EDC)	0.11	0.028	Naphthalene	0.27 fb	0.052 fb
1,1,1-Trichloroethane	<0.55	<0.1	Hexachlorobutadiene	<0.21	<0.02

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 14697, F&BI 810322
Date Collected:	Not Applicable	Lab ID:	08-2400 mb
Date Analyzed:	10/19/18	Data File:	101907.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	MS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
4-Bromofluorobenzene	97	70	130

Compounds:	Concentration ug/m3	Concentration ppbv	Compounds:	Concentration ug/m3	Concentration ppbv
Chlorodifluoromethane	<0.35	<0.1	1-Butanol	<6.1	<2
Propene	<0.69	<0.4	Carbon tetrachloride	<0.63	<0.1
Dichlorodifluoromethane	<0.49	<0.1	Benzene	<0.32	<0.1
Chloromethane	<0.21	<0.1	Cyclohexane	<6.9	<2
F-114	<0.7	<0.1	2-Pentanone	<3.5	<1
Isobutene	<0.92	<0.4	3-Pentanone	<3.5	<1
Acetaldehyde	<9	<5	Pentanal	<3.5	<1
Vinyl chloride	<0.26	<0.1	1,2-Dichloropropane	<0.23	<0.05
1,3-Butadiene	<0.022	<0.01	1,4-Dioxane	<0.36	<0.1
Bromomethane	<1.6	<0.4	Bromodichloromethane	<0.067	<0.01
Chloroethane	<0.26	<0.1	Trichloroethene	<0.27	<0.05
Ethanol	<7.5	<4	cis-1,3-Dichloropropene	<0.45	<0.1
Acetonitrile	<1.7	<1	4-Methyl-2-pentanone	<4.1	<1
Acrolein	<0.92	<0.4	trans-1,3-Dichloropropene	<0.45	<0.1
Acrylonitrile	<0.22	<0.1	Toluene	<0.38	<0.1
Pentane	<3	<1	1,1,2-Trichloroethane	<0.055	<0.01
Trichlorofluoromethane	<0.56	<0.1	3-Hexanone	<4.1	<1
Acetone	<4.8	<2	2-Hexanone	<4.1	<1
2-Propanol	<8.6	<3.5	Hexanal	<4.1	<1
Isoprene	<0.28	<0.1	Tetrachloroethene	<0.68	<0.1
Iodomethane	<0.58	<0.1	Dibromochloromethane	<0.085	<0.01
1,1-Dichloroethene	<0.4	<0.1	1,2-Dibromoethane (EDB)	<0.077	<0.01
Methacrolein	<2.9	<1	Chlorobenzene	<0.46	<0.1
trans-1,2-Dichloroethene	<0.4	<0.1	Ethylbenzene	<0.43	<0.1
Cyclopentane	<0.29	<0.1	1,1,2,2-Tetrachloroethane	<0.14	<0.02
Methyl vinyl ketone	<2.9	<1	m,p-Xylene	<0.87	<0.2
Butanal	<2.9	<1	o-Xylene	<0.43	<0.1
Methylene chloride	<87	<25	Styrene	<0.85	<0.2
CFC-113	<0.77	<0.1	Bromoform	<2.1	<0.2
Carbon disulfide	<6.2	<2	Benzyl chloride	<0.052	<0.01
Methyl t-butyl ether (MTBE)	<1.8	<0.5	1,3,5-Trimethylbenzene	<2.5	<0.5
Vinyl acetate	<7	<2	1,2,4-Trimethylbenzene	<2.5	<0.5
1,1-Dichloroethane	<0.4	<0.1	1,3-Dichlorobenzene	<0.6	<0.1
cis-1,2-Dichloroethene	<0.4	<0.1	1,4-Dichlorobenzene	<0.24	<0.04
Hexane	<3.5	<1	1,2,3-Trimethylbenzene	<2.5	<0.5
Chloroform	<0.049	<0.01	1,2-Dichlorobenzene	<0.6	<0.1
2-Butanone (MEK)	<2.9	<1	1,2,4-Trichlorobenzene	<0.74	<0.1
1,2-Dichloroethane (EDC)	<0.04	<0.01	Naphthalene	<0.1	<0.02
1,1,1-Trichloroethane	<0.55	<0.1	Hexachlorobutadiene	<0.21	<0.02

Date of Report: 10/26/18
Date Received: 10/16/18
Project: Kelly Moore 14697, F&BI 810322

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
Chlorodifluoromethane	ppbv	5	113	70-130
Propene	ppbv	5	98	70-130
Dichlorodifluoromethane	ppbv	5	99	70-130
Chloromethane	ppbv	5	109	70-130
F-114	ppbv	5	108	70-130
Isobutene	ppbv	5	113	70-130
Acetaldehyde	ppbv	5	126	70-130
Vinyl chloride	ppbv	5	108	70-130
1,3-Butadiene	ppbv	5	120	70-130
Bromomethane	ppbv	5	111	70-130
Chloroethane	ppbv	5	107	70-130
Ethanol	ppbv	5	115	70-130
Acetonitrile	ppbv	5	115	70-130
Acrolein	ppbv	5	116	70-130
Acrylonitrile	ppbv	5	109	70-130
Pentane	ppbv	5	114	70-130
Trichlorofluoromethane	ppbv	5	103	70-130
Acetone	ppbv	5	104	70-130
2-Propanol	ppbv	5	113	70-130
Isoprene	ppbv	5	108	70-130
Iodomethane	ppbv	5	95	70-130
1,1-Dichloroethene	ppbv	5	98	70-130
Methacrolein	ppbv	5	106	70-130
trans-1,2-Dichloroethene	ppbv	5	99	70-130
Cyclopentane	ppbv	5	118	70-130
Methyl vinyl ketone	ppbv	5	117	70-130
Butanal	ppbv	5	99	70-130
Methylene chloride	ppbv	5	93	70-130
CFC-113	ppbv	5	100	70-130
Carbon disulfide	ppbv	5	98	70-130
Methyl t-butyl ether (MTBE)	ppbv	5	103	70-130
Vinyl acetate	ppbv	5	109	70-130
1,1-Dichloroethane	ppbv	5	107	70-130
cis-1,2-Dichloroethene	ppbv	5	95	70-130
Hexane	ppbv	5	113	70-130
Chloroform	ppbv	5	105	70-130
2-Butanone (MEK)	ppbv	5	104	70-130
1,2-Dichloroethane (EDC)	ppbv	5	106	70-130
1,1,1-Trichloroethane	ppbv	5	105	70-130

Date of Report: 10/26/18
Date Received: 10/16/18
Project: Kelly Moore 14697, F&BI 810322

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES FOR VOLATILES BY METHOD TO-15

Laboratory Code: Laboratory Control Sample (continued)

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
1-Butanol	ppbv	5	101	70-130
Carbon tetrachloride	ppbv	5	100	70-130
Benzene	ppbv	5	105	70-130
Cyclohexane	ppbv	5	104	70-130
2-Pentanone	ppbv	5	120	70-130
3-Pentanone	ppbv	5	120	70-130
Pentanal	ppbv	5	108	70-130
1,2-Dichloropropane	ppbv	5	105	70-130
1,4-Dioxane	ppbv	5	110	70-130
Bromodichloromethane	ppbv	5	107	70-130
Trichloroethene	ppbv	5	98	70-130
cis-1,3-Dichloropropene	ppbv	5	92	70-130
4-Methyl-2-pentanone	ppbv	5	104	70-130
trans-1,3-Dichloropropene	ppbv	5	100	70-130
Toluene	ppbv	5	96	70-130
1,1,2-Trichloroethane	ppbv	5	103	70-130
3-Hexanone	ppbv	5	108	70-130
2-Hexanone	ppbv	5	118	70-130
Hexanal	ppbv	5	111	70-130
Tetrachloroethene	ppbv	5	96	70-130
Dibromochloromethane	ppbv	5	114	70-130
1,2-Dibromoethane (EDB)	ppbv	5	109	70-130
Chlorobenzene	ppbv	5	99	70-130
Ethylbenzene	ppbv	5	88	70-130
1,1,2,2,-Tetrachloroethane	ppbv	5	104	70-130
m,p-Xylene	ppbv	10	95	70-130
o-Xylene	ppbv	5	103	70-130
Styrene	ppbv	5	91	70-130
Bromoform	ppbv	5	97	70-130
Benzyl chloride	ppbv	5	112	70-130
1,3,5-Trimethylbenzene	ppbv	5	88	70-130
1,2,4-Trimethylbenzene	ppbv	5	88	70-130
1,3-Dichlorobenzene	ppbv	5	94	70-130
1,4-Dichlorobenzene	ppbv	5	103	70-130
1,2,3-Trimethylbenzene	ppbv	5	95	70-130
1,2-Dichlorobenzene	ppbv	5	99	70-130
1,2,4-Trichlorobenzene	ppbv	5	84	70-130
Naphthalene	ppbv	5	89	70-130
Hexachloro-1,3-butadiene	ppbv	5	91	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 compound 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. Compounds in the sample matrix interfered with the quantitation of the analyte.

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.

810322

SAMPLE CHAIN OF CUSTODY

ME 10/16/18

Page # 1 of 1

Report To Crystal Thimgan

Company Word

Address 600 University St #600

City, State, ZIP Seattle WA 98101

Phone 781-724-1019 Email Crystal.Thimgan@word.com

SAMPLERS (*signature*)

PROJECT NAME: Kirby MO

PO # 146017

REPORTING LEVEL: ☐ Indoor Air ☐ Deep Soil Gas ☐ Sub Slab/Soil Gas ☐ SVE/Grab

INVOICE TO

TURNAROUND TIME: ☒ Standard ☐ RUSH

Rush charges authorized by:

SAMPLE DISPOSAL: ☒ Dispose after 30 days ☐ Archive Samples ☐ Other

Sample Name	Lab ID	Canister ID	Flow Contr. ID	Date Sampled	Field Initial Press. (Hg)	Field Initial Time	Field Final Press. (Hg)	Field Final Time	ANALYSIS REQUESTED: TO-15 Full Scan	TO-15 BTEXN	TO-15 cVOCs		Notes
KM-AS-1-101618	01	21493	07851	10/16	29.0	0856	7.0	1658	X				
KM-AS-2-101618	02	18579	07845	10/16	29.5	0903	3.0	1703	X				
KM-AS-3-101618	03	18563	07852	10/16	29.1	0910	6.8	1710	X				
													Samples received at 20 °C

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	William Young	Word	10/16	1741
Received by:	Jon Shimazu	FBI	10/16/18	17:41
Relinquished by:				
Received by:				

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
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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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www.friedmanandbruya.com

June 18, 2019

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

Dear Ms Thimsen:

Included are the results from the testing of material submitted on June 7, 2019 from the Kelly Moore, F&BI 906142 project. There are 8 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
WEI0618R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on June 7, 2019 by Friedman & Bruya, Inc. from the Wood Environment & Infrastructure Solutions Kelly Moore, F&BI 906142 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Wood Environment & Infrastructure Solutions
906142 -01	AS1-060519
906142 -02	AS2-060519
906142 -03	AS3-060519

The TO-15 calibration standard failed the acceptance criteria for bromomethane. In addition, the ethanol concentration for all samples exceeded the calibration range. The data were flagged accordingly.

All other quality control requirements were acceptable.

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	AS1-060519	Client:	Wood Environment & Infrastructure
Date Received:	06/07/19	Project:	Kelly Moore, F&BI 906142
Date Collected:	06/05/30	Lab ID:	906142-01
Date Analyzed:	06/10/19	Data File:	061020.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	MS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
4-Bromofluorobenzene	88	70	130

Compounds:	Concentration ug/m3	Concentration ppbv	Compounds:	Concentration ug/m3	Concentration ppbv
Propene	<0.69	<0.4	1,2-Dichloropropane	<0.23	<0.05
Dichlorodifluoromethane	2.2	0.44	1,4-Dioxane	<0.36	<0.1
Chloromethane	<2.1	<1	2,2,4-Trimethylpentane	<4.7	<1
F-114	<0.7	<0.1	Methyl methacrylate	<4.1	<1
Vinyl chloride	<0.26	<0.1	Heptane	<4.1	<1
1,3-Butadiene	<0.022	<0.01	Bromodichloromethane	<0.067	<0.01
Butane	<2.4	<1	Trichloroethene	<0.27	<0.05
Bromomethane	<1.6 ca	<0.4 ca	cis-1,3-Dichloropropene	<0.45	<0.1
Chloroethane	<2.6	<1	4-Methyl-2-pentanone	<4.1	<1
Vinyl bromide	<0.44	<0.1	trans-1,3-Dichloropropene	<0.45	<0.1
Ethanol	1,500 ve	770 ve	Toluene	2.3	0.62
Acrolein	1.1	0.49	1,1,2-Trichloroethane	<0.11	<0.02
Pentane	<3	<1	2-Hexanone	<4.1	<1
Trichlorofluoromethane	<2.2	<0.4	Tetrachloroethene	<6.8	<1
Acetone	18	7.7	Dibromochloromethane	<0.085	<0.01
2-Propanol	<8.6	<3.5	1,2-Dibromoethane (EDB)	<0.077	<0.01
1,1-Dichloroethene	<0.4	<0.1	Chlorobenzene	<0.46	<0.1
trans-1,2-Dichloroethene	<0.4	<0.1	Ethylbenzene	<0.43	<0.1
Methylene chloride	<87	<25	1,1,2,2-Tetrachloroethane	<0.14	<0.02
t-Butyl alcohol (TBA)	<12	<4	Nonane	<5.2	<1
3-Chloropropene	<1.3	<0.4	Isopropylbenzene	<2.5	<0.5
CFC-113	<0.77	<0.1	2-Chlorotoluene	<5.2	<1
Carbon disulfide	<6.2	<2	Propylbenzene	<2.5	<0.5
Methyl t-butyl ether (MTBE)	<1.8	<0.5	4-Ethyltoluene	<2.5	<0.5
Vinyl acetate	<7	<2	m,p-Xylene	1.2	0.27
1,1-Dichloroethane	<0.4	<0.1	o-Xylene	0.44	0.10
cis-1,2-Dichloroethene	<0.4	<0.1	Styrene	<0.85	<0.2
Hexane	<3.5	<1	Bromoform	<2.1	<0.2
Chloroform	0.24	0.049	Benzyl chloride	<0.052	<0.01
Ethyl acetate	14	3.8	1,3,5-Trimethylbenzene	<2.5	<0.5
Tetrahydrofuran	2.4	0.80	1,2,4-Trimethylbenzene	<2.5	<0.5
2-Butanone (MEK)	17	5.8	1,3-Dichlorobenzene	<0.6	<0.1
1,2-Dichloroethane (EDC)	0.11	0.026	1,4-Dichlorobenzene	<0.24	<0.04
1,1,1-Trichloroethane	<0.55	<0.1	1,2-Dichlorobenzene	<0.6	<0.1
Carbon tetrachloride	<0.63	<0.1	1,2,4-Trichlorobenzene	<0.74	<0.1
Benzene	<0.32	<0.1	Naphthalene	0.14	0.026
Cyclohexane	<6.9	<2	Hexachlorobutadiene	<0.21	<0.02

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	AS2-060519	Client:	Wood Environment & Infrastructure
Date Received:	06/07/19	Project:	Kelly Moore, F&BI 906142
Date Collected:	06/05/30	Lab ID:	906142-02
Date Analyzed:	06/11/19	Data File:	061021.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	MS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
4-Bromofluorobenzene	100	70	130

Compounds:	Concentration ug/m3	Concentration ppbv	Compounds:	Concentration ug/m3	Concentration ppbv
Propene	<0.69	<0.4	1,2-Dichloropropane	<0.23	<0.05
Dichlorodifluoromethane	2.3	0.46	1,4-Dioxane	<0.36	<0.1
Chloromethane	<2.1	<1	2,2,4-Trimethylpentane	<4.7	<1
F-114	<0.7	<0.1	Methyl methacrylate	<4.1	<1
Vinyl chloride	<0.26	<0.1	Heptane	<4.1	<1
1,3-Butadiene	<0.022	<0.01	Bromodichloromethane	<0.067	<0.01
Butane	<2.4	<1	Trichloroethene	<0.27	<0.05
Bromomethane	<1.6 ca	<0.4 ca	cis-1,3-Dichloropropene	0.51	0.11
Chloroethane	<2.6	<1	4-Methyl-2-pentanone	<4.1	<1
Vinyl bromide	<0.44	<0.1	trans-1,3-Dichloropropene	<0.45	<0.1
Ethanol	1,400 ve	750 ve	Toluene	2.1	0.57
Acrolein	<0.92	<0.4	1,1,2-Trichloroethane	<0.11	<0.02
Pentane	<3	<1	2-Hexanone	<4.1	<1
Trichlorofluoromethane	<2.2	<0.4	Tetrachloroethene	<6.8	<1
Acetone	16	6.8	Dibromochloromethane	<0.085	<0.01
2-Propanol	<8.6	<3.5	1,2-Dibromoethane (EDB)	<0.077	<0.01
1,1-Dichloroethene	<0.4	<0.1	Chlorobenzene	<0.46	<0.1
trans-1,2-Dichloroethene	<0.4	<0.1	Ethylbenzene	<0.43	<0.1
Methylene chloride	<87	<25	1,1,2,2-Tetrachloroethane	<0.14	<0.02
t-Butyl alcohol (TBA)	<12	<4	Nonane	<5.2	<1
3-Chloropropene	<1.3	<0.4	Isopropylbenzene	<2.5	<0.5
CFC-113	<0.77	<0.1	2-Chlorotoluene	<5.2	<1
Carbon disulfide	<6.2	<2	Propylbenzene	<2.5	<0.5
Methyl t-butyl ether (MTBE)	<1.8	<0.5	4-Ethyltoluene	<2.5	<0.5
Vinyl acetate	<7	<2	m,p-Xylene	1.3	0.29
1,1-Dichloroethane	<0.4	<0.1	o-Xylene	0.46	0.11
cis-1,2-Dichloroethene	<0.4	<0.1	Styrene	<0.85	<0.2
Hexane	<3.5	<1	Bromoform	<2.1	<0.2
Chloroform	0.24	0.049	Benzyl chloride	<0.052	<0.01
Ethyl acetate	13	3.5	1,3,5-Trimethylbenzene	<2.5	<0.5
Tetrahydrofuran	2.2	0.75	1,2,4-Trimethylbenzene	<2.5	<0.5
2-Butanone (MEK)	17	5.8	1,3-Dichlorobenzene	<0.6	<0.1
1,2-Dichloroethane (EDC)	0.11	0.026	1,4-Dichlorobenzene	<0.24	<0.04
1,1,1-Trichloroethane	<0.55	<0.1	1,2-Dichlorobenzene	<0.6	<0.1
Carbon tetrachloride	<0.63	<0.1	1,2,4-Trichlorobenzene	<0.74	<0.1
Benzene	<0.32	<0.1	Naphthalene	0.14	0.027
Cyclohexane	<6.9	<2	Hexachlorobutadiene	<0.21	<0.02

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	AS3-060519	Client:	Wood Environment & Infrastructure
Date Received:	06/07/19	Project:	Kelly Moore, F&BI 906142
Date Collected:	06/05/30	Lab ID:	906142-03
Date Analyzed:	06/11/19	Data File:	061022.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	MS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
4-Bromofluorobenzene	96	70	130

Compounds:	Concentration ug/m3	Concentration ppbv	Compounds:	Concentration ug/m3	Concentration ppbv
Propene	<0.69	<0.4	1,2-Dichloropropane	<0.23	<0.05
Dichlorodifluoromethane	2.3	0.46	1,4-Dioxane	<0.36	<0.1
Chloromethane	<2.1	<1	2,2,4-Trimethylpentane	<4.7	<1
F-114	<0.7	<0.1	Methyl methacrylate	<4.1	<1
Vinyl chloride	<0.26	<0.1	Heptane	<4.1	<1
1,3-Butadiene	<0.022	<0.01	Bromodichloromethane	<0.067	<0.01
Butane	<2.4	<1	Trichloroethene	<0.27	<0.05
Bromomethane	<1.6 ca	<0.4 ca	cis-1,3-Dichloropropene	<0.45	<0.1
Chloroethane	<2.6	<1	4-Methyl-2-pentanone	<4.1	<1
Vinyl bromide	<0.44	<0.1	trans-1,3-Dichloropropene	<0.45	<0.1
Ethanol	150 ve	82 ve	Toluene	1.5	0.41
Acrolein	<0.92	<0.4	1,1,2-Trichloroethane	<0.11	<0.02
Pentane	<3	<1	2-Hexanone	<4.1	<1
Trichlorofluoromethane	<2.2	<0.4	Tetrachloroethene	<6.8	<1
Acetone	7.5	3.2	Dibromochloromethane	<0.085	<0.01
2-Propanol	<8.6	<3.5	1,2-Dibromoethane (EDB)	<0.077	<0.01
1,1-Dichloroethene	<0.4	<0.1	Chlorobenzene	<0.46	<0.1
trans-1,2-Dichloroethene	<0.4	<0.1	Ethylbenzene	<0.43	<0.1
Methylene chloride	<87	<25	1,1,2,2-Tetrachloroethane	<0.14	<0.02
t-Butyl alcohol (TBA)	<12	<4	Nonane	<5.2	<1
3-Chloropropene	<1.3	<0.4	Isopropylbenzene	<2.5	<0.5
CFC-113	<0.77	<0.1	2-Chlorotoluene	<5.2	<1
Carbon disulfide	<6.2	<2	Propylbenzene	<2.5	<0.5
Methyl t-butyl ether (MTBE)	<1.8	<0.5	4-Ethyltoluene	<2.5	<0.5
Vinyl acetate	<7	<2	m,p-Xylene	1.1	0.24
1,1-Dichloroethane	<0.4	<0.1	o-Xylene	<0.43	<0.1
cis-1,2-Dichloroethene	<0.4	<0.1	Styrene	<0.85	<0.2
Hexane	<3.5	<1	Bromoform	<2.1	<0.2
Chloroform	0.083	0.017	Benzyl chloride	<0.052	<0.01
Ethyl acetate	<7.2	<2	1,3,5-Trimethylbenzene	<2.5	<0.5
Tetrahydrofuran	<0.29	<0.1	1,2,4-Trimethylbenzene	<2.5	<0.5
2-Butanone (MEK)	<2.9	<1	1,3-Dichlorobenzene	<0.6	<0.1
1,2-Dichloroethane (EDC)	0.077	0.019	1,4-Dichlorobenzene	<0.24	<0.04
1,1,1-Trichloroethane	<0.55	<0.1	1,2-Dichlorobenzene	<0.6	<0.1
Carbon tetrachloride	<0.63	<0.1	1,2,4-Trichlorobenzene	<0.74	<0.1
Benzene	<0.32	<0.1	Naphthalene	<0.079	<0.015
Cyclohexane	<6.9	<2	Hexachlorobutadiene	<0.21	<0.02

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 906142
Date Collected:	Not Applicable	Lab ID:	09-1324 mb
Date Analyzed:	06/10/19	Data File:	061013.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	MS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
4-Bromofluorobenzene	89	70	130

Compounds:	Concentration ug/m3	Concentration ppbv	Compounds:	Concentration ug/m3	Concentration ppbv
Propene	<0.69	<0.4	1,2-Dichloropropane	<0.23	<0.05
Dichlorodifluoromethane	<0.49	<0.1	1,4-Dioxane	<0.36	<0.1
Chloromethane	<2.1	<1	2,2,4-Trimethylpentane	<4.7	<1
F-114	<0.7	<0.1	Methyl methacrylate	<4.1	<1
Vinyl chloride	<0.26	<0.1	Heptane	<4.1	<1
1,3-Butadiene	<0.022	<0.01	Bromodichloromethane	<0.067	<0.01
Butane	<2.4	<1	Trichloroethene	<0.27	<0.05
Bromomethane	<1.6 ca	<0.4 ca	cis-1,3-Dichloropropene	<0.45	<0.1
Chloroethane	<2.6	<1	4-Methyl-2-pentanone	<4.1	<1
Vinyl bromide	<0.44	<0.1	trans-1,3-Dichloropropene	<0.45	<0.1
Ethanol	<7.5	<4	Toluene	<0.38	<0.1
Acrolein	<0.92	<0.4	1,1,2-Trichloroethane	<0.11	<0.02
Pentane	<3	<1	2-Hexanone	<4.1	<1
Trichlorofluoromethane	<2.2	<0.4	Tetrachloroethene	<6.8	<1
Acetone	<4.8	<2	Dibromochloromethane	<0.085	<0.01
2-Propanol	<8.6	<3.5	1,2-Dibromoethane (EDB)	<0.077	<0.01
1,1-Dichloroethene	<0.4	<0.1	Chlorobenzene	<0.46	<0.1
trans-1,2-Dichloroethene	<0.4	<0.1	Ethylbenzene	<0.43	<0.1
Methylene chloride	<87	<25	1,1,2,2-Tetrachloroethane	<0.14	<0.02
t-Butyl alcohol (TBA)	<12	<4	Nonane	<5.2	<1
3-Chloropropene	<1.3	<0.4	Isopropylbenzene	<2.5	<0.5
CFC-113	<0.77	<0.1	2-Chlorotoluene	<5.2	<1
Carbon disulfide	<6.2	<2	Propylbenzene	<2.5	<0.5
Methyl t-butyl ether (MTBE)	<1.8	<0.5	4-Ethyltoluene	<2.5	<0.5
Vinyl acetate	<7	<2	m,p-Xylene	<0.87	<0.2
1,1-Dichloroethane	<0.4	<0.1	o-Xylene	<0.43	<0.1
cis-1,2-Dichloroethene	<0.4	<0.1	Styrene	<0.85	<0.2
Hexane	<3.5	<1	Bromoform	<2.1	<0.2
Chloroform	<0.049	<0.01	Benzyl chloride	<0.052	<0.01
Ethyl acetate	<7.2	<2	1,3,5-Trimethylbenzene	<2.5	<0.5
Tetrahydrofuran	<0.29	<0.1	1,2,4-Trimethylbenzene	<2.5	<0.5
2-Butanone (MEK)	<2.9	<1	1,3-Dichlorobenzene	<0.6	<0.1
1,2-Dichloroethane (EDC)	<0.04	<0.01	1,4-Dichlorobenzene	<0.24	<0.04
1,1,1-Trichloroethane	<0.55	<0.1	1,2-Dichlorobenzene	<0.6	<0.1
Carbon tetrachloride	<0.63	<0.1	1,2,4-Trichlorobenzene	<0.74	<0.1
Benzene	<0.32	<0.1	Naphthalene	<0.079	<0.015
Cyclohexane	<6.9	<2	Hexachlorobutadiene	<0.21	<0.02

Date of Report: 06/18/19
Date Received: 06/07/19
Project: Kelly Moore, F&BI 906142

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
Propene	ppbv	5	98	70-130
Dichlorodifluoromethane	ppbv	5	99	70-130
Chloromethane	ppbv	5	96	70-130
F-114	ppbv	5	96	70-130
Vinyl chloride	ppbv	5	97	70-130
1,3-Butadiene	ppbv	5	95	70-130
Butane	ppbv	5	98	70-130
Bromomethane	ppbv	5	69 vo	70-130
Chloroethane	ppbv	5	99	70-130
Ethanol	ppbv	5	89	70-130
Acrolein	ppbv	5	87	70-130
Pentane	ppbv	5	94	70-130
Trichlorofluoromethane	ppbv	5	102	70-130
Acetone	ppbv	5	89	70-130
2-Propanol	ppbv	5	96	70-130
1,1-Dichloroethene	ppbv	5	99	70-130
trans-1,2-Dichloroethene	ppbv	5	97	70-130
Methylene chloride	ppbv	5	78	70-130
t-Butyl alcohol (TBA)	ppbv	5	96	70-130
3-Chloropropene	ppbv	5	93	70-130
CFC-113	ppbv	5	96	70-130
Carbon disulfide	ppbv	5	92	70-130
Methyl t-butyl ether (MTBE)	ppbv	5	84	70-130
Vinyl acetate	ppbv	5	97	70-130
1,1-Dichloroethane	ppbv	5	96	70-130
cis-1,2-Dichloroethene	ppbv	5	98	70-130
Hexane	ppbv	5	95	70-130
Chloroform	ppbv	5	96	70-130
Ethyl acetate	ppbv	5	77	70-130
Tetrahydrofuran	ppbv	5	87	70-130
2-Butanone (MEK)	ppbv	5	99	70-130
1,2-Dichloroethane (EDC)	ppbv	5	99	70-130
1,1,1-Trichloroethane	ppbv	5	96	70-130
Carbon tetrachloride	ppbv	5	96	70-130
Benzene	ppbv	5	89	70-130
Cyclohexane	ppbv	5	90	70-130
1,2-Dichloropropane	ppbv	5	98	70-130
1,4-Dioxane	ppbv	5	113	70-130
2,2,4-Trimethylpentane	ppbv	5	100	70-130
Methyl methacrylate	ppbv	5	100	70-130

Date of Report: 06/18/19
Date Received: 06/07/19
Project: Kelly Moore, F&BI 906142

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
Heptane	ppbv	5	98	70-130
Bromodichloromethane	ppbv	5	103	70-130
Trichloroethene	ppbv	5	97	70-130
cis-1,3-Dichloropropene	ppbv	5	99	70-130
4-Methyl-2-pentanone	ppbv	5	107	70-130
trans-1,3-Dichloropropene	ppbv	5	101	70-130
Toluene	ppbv	5	90	70-130
1,1,2-Trichloroethane	ppbv	5	100	70-130
2-Hexanone	ppbv	5	104	70-130
Tetrachloroethene	ppbv	5	95	70-130
Dibromochloromethane	ppbv	5	101	70-130
1,2-Dibromoethane (EDB)	ppbv	5	99	70-130
Chlorobenzene	ppbv	5	100	70-130
Ethylbenzene	ppbv	5	94	70-130
1,1,2,2-Tetrachloroethane	ppbv	5	89	70-130
Nonane	ppbv	5	76	70-130
Isopropylbenzene	ppbv	5	96	70-130
2-Chlorotoluene	ppbv	5	92	70-130
Propylbenzene	ppbv	5	89	70-130
4-Ethyltoluene	ppbv	5	89	70-130
m,p-Xylene	ppbv	10	93	70-130
o-Xylene	ppbv	5	95	70-130
Styrene	ppbv	5	94	70-130
Bromoform	ppbv	5	91	70-130
Benzyl chloride	ppbv	5	102	70-130
1,3,5-Trimethylbenzene	ppbv	5	90	70-130
1,2,4-Trimethylbenzene	ppbv	5	81	70-130
1,3-Dichlorobenzene	ppbv	5	90	70-130
1,4-Dichlorobenzene	ppbv	5	92	70-130
1,2-Dichlorobenzene	ppbv	5	87	70-130
1,2,4-Trichlorobenzene	ppbv	5	92	70-130
Naphthalene	ppbv	5	76	70-130
Hexachlorobutadiene	ppbv	5	86	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.

906142

SAMPLE CHAIN OF CUSTODY ME 06-07-19

Page # 1 of 1

Report To Crystal Thimsen

Company WOOD E+I

Address 600 University ST STE: 600

City, State, ZIP Seattle, WA 98101

Phone 206 838-8469 Email Crystal.Thimsen@WOODPLC.COM

SAMPLERS (*signature*) George Hagan

PROJECT NAME: Kelly Moore

PO #:

REMARKS:

INVOICE TO:

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	TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM	TO-15				Notes
						ANALYSES REQUESTED											
AS1 - 060519	01	06-05-19	START 0718-HRS	6-LITER Summa	1								X				SN. 18578 FIN. 1518-Hrs. 4" Hg
AS2 - 060519	02	06-05-19	START 0715-HRS	" "	1								X				SN. 20555 FIN. 1517-Hrs. 8" Hg
AS3 - 060519	03	06-05-19	START 0710-Hrs	" "	1								X				SN. 18574 FIN. 1510 Hrs 6" Hg
													Samples received at 23 °C				

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: George Hagan	George Hagan	JHA - ENV	6-5-19	1513
Received by: Melissa Merrell	Melissa Merrell	Wood E+I S	6/5/19	3:45pm
Relinquished by:				
Received by:	DO VO	FBI	6-7-19	12:20

Samples received at _____ °C

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