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Seattle Land Use Co.
2921 Eastlake Avenue E.
Seattle, WA 98109

Attention: Mr. Michael Pollard

Subject: June-July 2018 Groundwater Monitoring Results
104-124 12th Avenue & 1209 E. Fir Street
Seattle, Washington

Dear Mr. Pollard:
As you have authorized, ***Whitman Environmental Sciences, (WES)*** has conducted additional groundwater sampling at the above referenced site in Seattle, Washington. Figure 1 shows the site location and surrounding area. This letter summarizes the sampling and results of laboratory testing on the groundwater samples taken during June and July 2018. The findings indicate that samples from two of the ten sampled wells contain the chlorinated solvent vinyl chloride and one well contained gasoline-range total petroleum hydrocarbons at concentrations that exceed current Washington State cleanup criteria under the Model Toxics Control Act (MTCA), Chapter 173-340 WAC. No other analyzed parameters exceeded MTCA cleanup criteria.

Groundwater Monitoring
A total of ten monitoring wells were purged and sampled as part of this monitoring event; existing wells MW-1, MW-2, MW-3, MW-4, MW-5 and MW-6 from previous investigations of the site conducted in 2014 by others, as well as MW-7, MW-8 and MW-9 from our own 2017 site investigation. One well installed by SoundEarth Strategies, Inc., in October 2017 near the southeastern corner of the property was also accessed and sampled. For this and future monitoring rounds, this well has been designated MW-10. Figure 2 shows the approximate locations of the wells in relation to the features of the property.

WES conducted groundwater monitoring from eight of the on-site wells on June 14th, 2018. Due to access issues from parked vehicles, two other wells were sampled at later dates. Monitoring Well MW-8 was sampled on June 28th. MW-9 was sampled on July 13th.

Groundwater Level Measurements
As part of monitoring, WES measured the depth to groundwater in the on-site monitoring wells. The measurements were obtained after the wells caps had been removed for a period of time to allow water levels to stabilize and before any of the wells were purged of standing groundwater. Table 1 summarizes the top-of-pipe elevation for each well, the depth to groundwater and the relative elevation of groundwater at each well during monitoring events from October and November 2017, as well as the current measurements. Top of pipe elevations were determined by a licensed surveyor at your direction in November 2017.

The current measurements show that groundwater was at a depth of 2.66 to 15.27 feet below the top of pipe of the monitoring wells. The depths represent groundwater elevations within a range

of 187.00 to 201.24 feet. There is a significant difference in water elevation from the highest elevations in the northwest to lowest levels in the southeast, indicating a relatively strong overall gradient of 0.06 foot/foot to the southeast across most of the site.

Figure 2 shows the inferred contour of the groundwater surface and anticipated direction of migration for the current measurements. The water levels and inferred gradient of groundwater migration are similar to that interpreted from prior measurements from October and November 2017.

Groundwater Sampling

Samples were obtained using peristaltic pumps equipped with dedicated polyethylene tubing in each well. Each well was purged of at least three times the volume of standing water prior to sampling; volumes ranging from one to 12 gallons. Field measurements of pH, temperature and conductivity were used to evaluate when stabilized conditions were reached in the pump discharge water.

Monitoring wells MW-3, MW-4, MW-5, MW-6 and MW-7 were installed using relatively small limited access drilling equipment. These wells consist of 3/4 to 1-inch diameter PVC pipe and well screens. These wells can pump dry after a limited volume and have moderate recharge rates. Each of these wells were pumped repeatedly to obtain representative samples of fresh recharge water and the total volume removed ranged from one to four gallons from each well. Other wells are constructed of 2-inch diameter PVC screen and risers and have relatively good flow characteristics.

Samples were taken following proper environmental sampling techniques and protocols. Samples were taken directly from the polyethylene pump tubing at a low flow rate and were placed in laboratory prepared bottles, sealed, chilled and held under chain of custody until delivered to the laboratory. The samples were submitted to Friedman & Bruya, Inc., a Washington State accredited laboratory, for testing.

Each sample was analyzed by Washington accepted method NWTPH-G and NWTPH-D (extended) for total petroleum hydrocarbons (TPH) in the gasoline, diesel and motor oil ranges, respectively. All samples were also analyzed for a list of 62 individual volatile organic compounds by EPA Method 8260C. The tested compounds are common solvents and/or organic compounds associated with petroleum. All laboratory testing was conducted with reporting limits suitable for comparison with regulatory criteria. All laboratory quality assurance/quality control data is included and meets the analytical requirements of this assessment.

Laboratory Analytical Results

The results of laboratory testing and Washington State cleanup criteria are summarized in Table 2 and illustrated in Figure 3. The laboratory reports of the analytical results are attached. The groundwater samples from monitoring wells MW-2, MW-4 and MW-7 contained no detectable concentrations of any of the analyzed parameters. A sample from one additional well (MW-3) contained only a slightly elevated concentration of diesel range petroleum hydrocarbons. This detection was flagged by the laboratory as not matching their laboratory standard for diesel. This typically indicates the detected hydrocarbons represent non-petroleum organic material than may be naturally occurring.

Samples from monitoring wells MW-1 and MW-5 contained concentrations of vinyl chloride at reported concentrations of 0.27 and 0.25 ug/l (units equivalent to parts per billion (ppb)). Vinyl chloride is most commonly encountered as a daughter product from the breakdown of tetrachloroethene in the environment. Because of its carcinogenic properties, vinyl chloride has a very low MTCA Method A cleanup level of 0.20 ug/l under Washington regulations. The reported concentrations found on site only slightly exceed the MTCA groundwater cleanup level. Both of these wells are along the north side of the paved parking lot to the east of the 104 12th Avenue building.

A sample from monitoring well MW-8, in the northwestern part of the property where a former gas station had operated, found gasoline-range total petroleum hydrocarbons (TPH) at a reported concentration of 2,400 ug/l, which exceeds the MTCA Method A cleanup level of 800 ug/l. That sample also contained concentrations of diesel-range TPH (160 ug/l), benzene (2.9 ug/l), ethylbenzene (85 ug/l), xylenes (432 ug/l), naphthalene (1.6 ug/l) and other volatile organic compounds. None of these other detections exceed MTCA Method A or B groundwater cleanup levels.

Three of the tested samples contained low but detectable concentrations of other chlorinated solvents. These included tetrachloroethylene (MW-5 at 1.9 ug/l, MW-6 at 1.3 ug/l), trichloroethylene (MW-5 at 5.0 ug/l), cis-1,2 dichloroethene (MW-5 at 8.3 ug/l, MW-6 at 9.6 ug/l and MW-10 at 1.2 ug/l) and chloroform (MW-6 at 1.1 ug/l). None of these detections exceed MTCA Method A or B groundwater cleanup levels.

Comparison to Prior Sampling

The reported detections are relatively similar to previous groundwater sampling conducted during our 2017 site investigations. Table 3 summarizes the groundwater sample analytical results from our prior monitoring events along with the current data. Notable differences between the current testing and prior rounds include MW-3, which in initial April 2017 testing contained low but detectable concentrations of acetone, naphthalene, vinyl chloride, 1,2,4-trimethylbenzene and 1,3,5-trimethylbenzene. Samples taken in November 2017 and the current round of testing found no detectable concentrations of any of these analyzed parameters.

In initial April 2017 testing, monitoring well MW-5 was found to contain only a low concentration of acetone, which has not been found in subsequent sampling. However, samples taken in November 2017 and June 2018 found concentrations of tetrachloroethylene, trichloroethylene, cis-1,2 dichloroethene and vinyl chloride. Vinyl chloride concentrations have slightly exceeded the MTCA 0.2 ug/l cleanup level in both samples. Trichloroethene concentrations have been at or above the 5.0 ug/l MTCA Method A cleanup level in these two sampling events.

Recommendations

Groundwater sampling and analysis are important parts of compliance monitoring for this site. Additional semi-annual or quarterly monitoring may be appropriate to evaluate which areas of the site have groundwater that consistently exceeds MTCA cleanup criteria. This will assist in preparing cleanup action alternatives that may be needed, depending on the overall redevelopment design for the property. Current design concepts call for excavation of much of the site to a depth that would remove most shallow perched groundwater zones.

Closure

Thank you for the opportunity to be of service to you in this matter. If you have any questions regarding this letter, or if I may be of any further assistance, please feel free to contact me.

Respectfully submitted,
Whitman Environmental Sciences

Daniel S. Whitman
Principal

Attachments:

Table 1 - Summary of Groundwater Level Measurements
Table 2 - Summary of June-July 2018 Groundwater Sample Analytical Results
Table 3 - Summary of 2017-2018 Groundwater Sample Analytical Results

Figure 1 - Site Location Map
Figure 2 - Monitoring Well Location Plan and Inferred Groundwater Contours
Figure 3 - Groundwater Analytical Results

Laboratory Analytical Reports - Friedman & Bruya, Inc.

Table 1
Summary of Groundwater Level Measurements
104 - 124 12th Avenue & 1209 E. Fir Street
Seattle, Washington

Monitoring Well	*Date*	*Top of Pipe Elevation*	*Water Level Below T.O.P.*	*Water Elevation*	*Comments*
MW-1	10/30/2017	200.26	-6.68	193.58	2" Well, 29' deep
	11/7/2017		-6.37	193.89	
	6/14/2018		-6.28	193.98	
MW-2	10/30/2017	201.08	-5.94	195.14	2" Well, 29' deep
	11/7/2017		-5.78	195.30	
	6/14/2018		-5.83	195.25	
MW-3	10/30/2017	199.98	-4.81	195.17	3/4" Well, 10.6' deep
	11/7/2017		-5.09	194.89	
	6/14/2018		-4.80	195.18	
MW-4	10/30/2017	199.36	-8.65	190.71	2" Well, 29' deep
	11/7/2017		-8.45	190.91	
	6/14/2018		-8.32	191.04	
MW-5	10/30/2017	200.99	-6.53	194.46	3/4" Well, 12' deep
	11/7/2017		-6.22	194.77	
	6/14/2018		-6.10	194.89	

Table 1
Summary of Groundwater Level Measurements
104 - 124 12th Avenue & 1209 E. Fir Street
Seattle, Washington

MW-6	10/30/2017	200.27	-2.75	197.52	3/4" Well, 12' deep
	11/7/2017		-2.10	198.17	
	6/14/2018		-2.82	197.45	
MW-7	10/30/2017	199.56	-2.41	197.15	1" Well, 11.5' deep
	11/7/2017		-1.70	197.86	
	6/14/2018		-2.66	196.90	
MW-8 (Formerly BN-7)	10/30/2017	216.51	NM	--	2" Well, 22' deep
	11/7/2017		-15.16	201.35	
	6/28/2018		-15.27	201.24	
MW-9 (Formerly BN-10)	10/30/2017	214.25	NM	--	2" Well, 25' deep
	11/7/2017		-13.14	201.11	
	7/13/2018		-13.99	200.26	
MW-10 (Formerly SEMW-1)	10/30/2017	196.88	Not installed yet		
	11/7/2017		-10.21	186.67	2" Well, 15' deep
	6/14/2018		-9.88	187.00	

Table XXX Notes:
NM - Not measured due to obstruction over well.
Top of Pipe elevations determined by site survey Terrane, Inc., November 2017

Table 2
Summary of June-July 2018 Groundwater Sample Analytical Results
104 - 124 12th Avenue & 1209 E. Fir Street, Seattle, Washington

Monitoring Well Sample I.D.	***Sample Date***	***Laboratory Analytical Results (ug/l)***		
		Total Petroleum Hydrocarbons ***(by Methods NWTPH-G & NWTPH-D(X))***	***Benzene*** ***Toluene*** ***Ethyl benzene*** ***Xylenes*** ***(by EPA Method 8260C)***	***Other Volatile Organic Compounds*** ***(by EPA Method 8260C)*** ***List of 58 Additional Compounds Detectable by the Laboratory Method.***
Pre-existing Monitoring Wells on 104 12th Avenue Property				
MW-1-GW	6/14/2018	Gasoline Range: ND (<100) Diesel: ND (<50) Motor Oil: ND (<250)	Benzene: ND (<0.35) Toluene: ND (<1) Ethylbenzene: ND (<1) Xylenes: ND (<3)	***Vinyl Chloride:*** ***0.27*** ND (all other)
MW-2-GW	6/14/2018	Gasoline Range: ND (<100) Diesel: ND (<50) Motor Oil: ND (<250)	Benzene: ND (<0.35) Toluene: ND (<1) Ethylbenzene: ND (<1) Xylenes: ND (<3)	ND (all)
MW-3-GW	6/14/2018	Gasoline Range: ND (<100) Diesel: 210[x] Motor Oil: ND (<250)	Benzene: ND (<0.35) Toluene: ND (<1) Ethylbenzene: ND (<1) Xylenes: ND (<3)	ND (all)
MW-4-GW	6/14/2018	Gasoline Range: ND (<100) Diesel: ND (<50) Motor Oil: ND (<250)	Benzene: ND (<0.35) Toluene: ND (<1) Ethylbenzene: ND (<1) Xylenes: ND (<3)	ND (all)
MW-5-GW	6/14/2018	Gasoline Range: ND (<100) Diesel: ND (<50) Motor Oil: ND (<250)	Benzene: ND (<0.35) Toluene: ND (<1) Ethylbenzene: ND (<1) Xylenes: ND (<3)	***Vinyl Chloride:*** ***0.25*** cis-1,2-Dichloroethene: 8.3 Tetrachloroethene: 1.3 Trichloroethene: 5.0 ND (all other)

Table 2
Summary of June-July 2018 Groundwater Sample Analytical Results
104 - 124 12th Avenue & 1209 E. Fir Street, Seattle, Washington

Monitoring Well Sample I.D.	***Sample Date***	***Laboratory Analytical Results (ug/l)***		
		Total Petroleum Hydrocarbons ***(by Methods NWTPH-G & NWTPH-D(X))***	***Benzene*** ***Toluene*** ***Ethyl benzene*** ***Xylenes*** ***(by EPA Method 8260C)***	***Other Volatile Organic Compounds*** ***(by EPA Method 8260C)*** ***List of 58 Additional Compounds Detectable by the Laboratory Method.***
Monitoring Wells installed in 2017				
MW-6-GW	6/14/2018	Gasoline Range: ND (<100) Diesel: ND (<50) Motor Oil: ND (<250)	Benzene: ND (<0.35) Toluene: 1.2 Ethylbenzene: ND (<1) Xylenes: 5.5	cis-1,2-Dichloroethene: 9.6 Chloroform 1.1 Tetrachloroethene 1.2 ND (all other)
MW-7 (Originally Boring WES-8)	6/14/2018	Gasoline Range: ND (<100) Diesel: ND (<50) Motor Oil: ND (<250)	Benzene: ND (<0.35) Toluene: ND (<1) Ethylbenzene: ND (<1) Xylenes: ND (<3)	ND (all)
MW-8 (Originally Boring WES-9)	6/28/2018	***Gasoline Range: 2,400*** Diesel: 160[x] Motor Oil: ND (<250)	Benzene: 2.9 Toluene: ND (<1) Ethylbenzene: 85 Xylenes: 432	Isopropylbenzene: 14 n-Propylbenzene: 33 Naphthalene: 1.6 p-Isopropyltoluene: 1.1 sec-Butylbenzene: 1.9 1,2,4-Trimethylbenzene: 150 1,3,5-Trimethylbenzene: 54 ND (all other)
MW-9 (Originally Boring BN-10)	7/13/2018	Gasoline Range: 470 Diesel: 180[x] Motor Oil: ND (<250)	Benzene: 5.0 Toluene: ND (<1) Ethylbenzene: 8.5 Xylenes: 3.2	n-Propylbenzene: 23 sec-Butylbenzene: 1.9 1,2,4-Trimethylbenzene: 1.1 ND (all other)

Table 2
Summary of June-July 2018 Groundwater Sample Analytical Results
104 - 124 12th Avenue & 1209 E. Fir Street, Seattle, Washington

Monitoring Well Sample I.D.	***Sample Date***	***Laboratory Analytical Results (ug/l)***		
		Total Petroleum Hydrocarbons ***(by Methods NWTPH-G & NWTPH-D(X))***	***Benzene*** ***Toluene*** ***Ethyl benzene*** ***Xylenes*** ***(by EPA Method 8260C)***	***Other Volatile Organic Compounds*** ***(by EPA Method 8260C)*** ***List of 58 Additional Compounds Detectable by the Laboratory Method.***
MW-10 (Originally Boring SES-1)	6/14/2018	Gasoline Range: ND (<100) Diesel: 66[x] Motor Oil: ND (<250)	Benzene: ND (<0.35) Toluene: ND (<1) Ethylbenzene: ND (<1) Xylenes: ND (<1)	cis-1,2-Dichloroethene: 1.2 ND (all other)
Washington State MTCA Groundwater Cleanup Criteria (ug/l)		***Gasoline: 800 (Benzene is present)*** ***Diesel or Motor Oil: 500 (combined)***	***Benzene: 5*** ***Toluene: 1,000*** ***Ethylbenzene: 700*** ***Xylenes: 1,000***	***Vinyl chloride: 0.2*** ***cis-1,2-Dichloroethene: 16*** ***Isopropylbenzene: 800*** ***n-Propylbenzene: 800*** ***Naphthalene: 160*** ***p-Isopropyltoluene: NV*** ***sec-Butylbenzene: NV*** ***Tetrachloroethene: 5*** ***Trichloroethene: 5*** ***1,2,4-Trimethylbenzene: NV*** ***1,3,5-Trimethylbenzene: 80***

Table 2
Summary of June-July 2018 Groundwater Sample Analytical Results
104 - 124 12th Avenue & 1209 E. Fir Street, Seattle, Washington

Table 3 Notes:
ND (<XXX) - Parameter not detected at concentrations at or above the noted reporting limit.
NA - Sample not analyzed for the listed parameter.
Gasoline Range Total Petroleum Hydrocarbons by Method NWTPH-G.
Diesel and Motor Oil Range Total Petroleum Hydrocarbons by Method NWTPH-D(x).
[x] - Indicates sample chromatogram does not resemble fuel standard used for analysis. Most likely carry over from gasoline range hydrocarbons.
BTEX compounds and other volatile organic compounds by EPA Method 8260C. All detected compounds summarized here. See laboratory report for full list of analyzed parameters.

MTCA Groundwater cleanup criteria per Chapter 173-340-720 WAC. Method A criteria presented where available. Method B standard formula values shown where no Method A criteria available. Method B standard formula values from Dept. of Ecology Cleanup Levels and Risk Calculation (CLARC) database. NV indicates no value available from CLARC.

Sample results exceeding applicable cleanup criteria are noted in ***Bold Italic***.

Table 3
Summary of 2017-2018 Groundwater Sample Analytical Results
104 - 124 12th Avenue & 1209 E. Fir Street, Seattle, Washington

Boring/ Sample I.D.	***Sample Date***	***Laboratory Analytical Results (ug/l)***		
		Total Petroleum Hydrocarbons ***(by Methods NWTPH-G & NWTPH-D(X))***	***Benzene*** ***Toluene*** ***Ethyl benzene*** ***Xylenes*** ***(by EPA Method 8260C)***	***Other Volatile Organic Compounds*** ***(by EPA Method 8260C)*** ***List of 58 Additional Compounds Detectable by the Laboratory Method.***
MW-1-GW	6/30/2017	Gasoline Range: ND (<100) Diesel: ND (<50) Motor Oil: ND (<250)	Benzene: ND (<0.35) Toluene: ND (<1) Ethylbenzene: ND (<1) Xylenes: ND (<1)	Vinyl Chloride: 0.20 ND (all other)
	10/30/2017	Gasoline Range: NA Diesel: NA Motor Oil: NA	Benzene: ND (<0.35) Toluene: ND (<1) Ethylbenzene: ND (<1) Xylenes: ND (<3)	ND (all)
	6/14/2018	Gasoline Range: ND (<100) Diesel: ND (<50) Motor Oil: ND (<250)	Benzene: ND (<0.35) Toluene: ND (<1) Ethylbenzene: ND (<1) Xylenes: ND (<3)	***Vinyl Chloride: 0.27*** ND (all other)
MW-2-GW	4/4/2017	Gasoline Range: NA Diesel: ND (<50) Motor Oil: ND (<250)	Benzene: ND (<0.35) Toluene: ND (<1) Ethylbenzene: ND (<1) Xylenes: ND (<1)	ND (all)
	10/30/2017	Gasoline Range: NA Diesel: NA Motor Oil: NA	Benzene: ND (<0.35) Toluene: ND (<1) Ethylbenzene: ND (<1) Xylenes: ND (<1)	ND (all)
	6/14/2018	Gasoline Range: ND (<100) Diesel: ND (<50) Motor Oil: ND (<250)	Benzene: ND (<0.35) Toluene: ND (<1) Ethylbenzene: ND (<1) Xylenes: ND (<3)	ND (all)

Boring/ Sample I.D.	***Sample Date***	***Laboratory Analytical Results (ug/l)***		
		Total Petroleum Hydrocarbons ***(by Methods NWTPH-G & NWTPH-D(X))***	***Benzene*** ***Toluene*** ***Ethyl benzene*** ***Xylenes*** ***(by EPA Method 8260C)***	***Other Volatile Organic Compounds*** ***(by EPA Method 8260C)*** ***List of 58 Additional Compounds Detectable by the Laboratory Method.***
MW-3-GW	4/3/2017	Gasoline Range: 110 Diesel: 400[x] Motor Oil: ND (<250)	Benzene: ND (<0.35) Toluene: 2.5 Ethylbenzene: ND (<1) Xylenes: 7.9	Acetone: 11 Naphthalene: 4.7 ***Vinyl Chloride:*** ***0.34*** 1,2,4-Trimethylbenzene: 4.9 1,3,5-Trimethylbenzene: 1.1 ND (all other)
	10/30/2017	Gasoline Range: NA Diesel: NA Motor Oil: NA	Benzene: ND (<0.35) Toluene: ND (<1) Ethylbenzene: ND (<1) Xylenes: ND (<1)	ND (all)
	6/14/2018	Gasoline Range: ND (<100) Diesel: 210[x] Motor Oil: ND (<250)	Benzene: ND (<0.35) Toluene: ND (<1) Ethylbenzene: ND (<1) Xylenes: ND (<3)	ND (all)
MW-4-GW	4/5/2017	Gasoline Range: NA Diesel: 67[x] Motor Oil: ND (<250)	Benzene: ND (<0.35) Toluene: ND (<1) Ethylbenzene: ND (<1) Xylenes: ND (<1)	ND (all)
	10/30/2017	Gasoline Range: NA Diesel: NA Motor Oil: NA	Benzene: ND (<0.35) Toluene: ND (<1) Ethylbenzene: ND (<1) Xylenes: ND (<1)	ND (all)
	6/14/2018	Gasoline Range: ND (<100) Diesel: ND (<50) Motor Oil: ND (<250)	Benzene: ND (<0.35) Toluene: ND (<1) Ethylbenzene: ND (<1) Xylenes: ND (<3)	ND (all)

Boring/ Sample I.D.	***Sample Date***	***Laboratory Analytical Results (ug/l)***		
		Total Petroleum Hydrocarbons ***(by Methods NWTPH-G & NWTPH-D(X))***	***Benzene Toluene Ethyl benzene Xylenes*** ***(by EPA Method 8260C)***	***Other Volatile Organic Compounds*** ***(by EPA Method 8260C)*** ***List of 58 Additional Compounds Detectable by the Laboratory Method.***
MW-5-GW	4/5/2017	Gasoline Range: NA Diesel: ND (<50) Motor Oil: ND (<250)	Benzene: ND (<0.35) Toluene: ND (<1) Ethylbenzene: ND (<1) Xylenes: ND (<1)	Acetone: 12 ND (all other)
	10/30/2017	Gasoline Range: NA Diesel: NA Motor Oil: NA	Benzene: ND (<0.35) Toluene: ND (<1) Ethylbenzene: ND (<1) Xylenes: ND (<3)	***Vinyl Chloride: 0.29*** cis-1,2-Dichloroethene: 10 Tetrachloroethene: 1.4 ***Trichloroethene: 9.1*** ND (all other)
	6/14/2018	Gasoline Range: ND (<100) Diesel: ND (<50) Motor Oil: ND (<250)	Benzene: ND (<0.35) Toluene: ND (<1) Ethylbenzene: ND (<1) Xylenes: ND (<3)	***Vinyl Chloride: 0.25*** cis-1,2-Dichloroethene: 8.3 Tetrachloroethene: 1.3 Trichloroethene: 5.0 ND (all other)
MW-6-GW	4/4/2017	Gasoline Range: NA Diesel: ND (<50) Motor Oil: ND (<250)	Benzene: ND (<0.35) Toluene: 1.2 Ethylbenzene: ND (<1) Xylenes: 5.5	cis-1,2-Dichloroethene: 1.3 1,2,4-Trimethylbenzene: 3.4 ND (all other)
	6/14/2018	Gasoline Range: ND (<100) Diesel: ND (<50) Motor Oil: ND (<250)	Benzene: ND (<0.35) Toluene: ND (<1) Ethylbenzene: ND (<1) Xylenes: ND (<3)	cis-1,2-Dichloroethene: 9.6 Chloroform 1.1 Tetrachloroethene 1.2 ND (all other)

Boring/ Sample I.D.	***Sample Date***	***Laboratory Analytical Results (ug/l)***		
		Total Petroleum Hydrocarbons ***(by Methods NWTPH-G & NWTPH-D(X))***	***Benzene*** ***Toluene*** ***Ethyl benzene*** ***Xylenes*** ***(by EPA Method 8260C)***	***Other Volatile Organic Compounds*** ***(by EPA Method 8260C)*** ***List of 58 Additional Compounds Detectable by the Laboratory Method.***
MW-7 (Originally Boring WES-8)	6/30/2017	Gasoline Range: ND (<100) Diesel: ND (<50) Motor Oil: ND (<250)	Benzene: ND (<0.35) Toluene: ND (<1) Ethylbenzene: ND (<1) Xylenes: ND (<3)	ND (all)
	6/14/2018	Gasoline Range: ND (<100) Diesel: ND (<50) Motor Oil: ND (<250)	Benzene: ND (<0.35) Toluene: ND (<1) Ethylbenzene: ND (<1) Xylenes: ND (<3)	ND (all)
MW-8 (Originally Boring BN-7)	8/3/2017	***Gasoline Range: 3,200*** ***Diesel: 790[x]*** Motor Oil: ND (<250)	***Benzene: 11*** Toluene: ND (<1) Ethylbenzene: 71 Xylenes: 419	Isopropylbenzene: 12 n-Propylbenzene: 24 Naphthalene: 8.9 p-Isopropyltoluene: 1.1 sec-Butylbenzene: 1.8 1,2,4-Trimethylbenzene: 180 1,3,5-Trimethylbenzene: 59 ND (all other)
	6/28/2018	***Gasoline Range: 2,400*** ***Diesel: 160[x]*** Motor Oil: ND (<250)	Benzene: 2.9 Toluene: ND (<1) Ethylbenzene: 85 Xylenes: 432	Isopropylbenzene: 14 n-Propylbenzene: 33 Naphthalene: 1.6 p-Isopropyltoluene: 1.1 sec-Butylbenzene: 1.9 1,2,4-Trimethylbenzene: 150 1,3,5-Trimethylbenzene: 54 ND (all other)

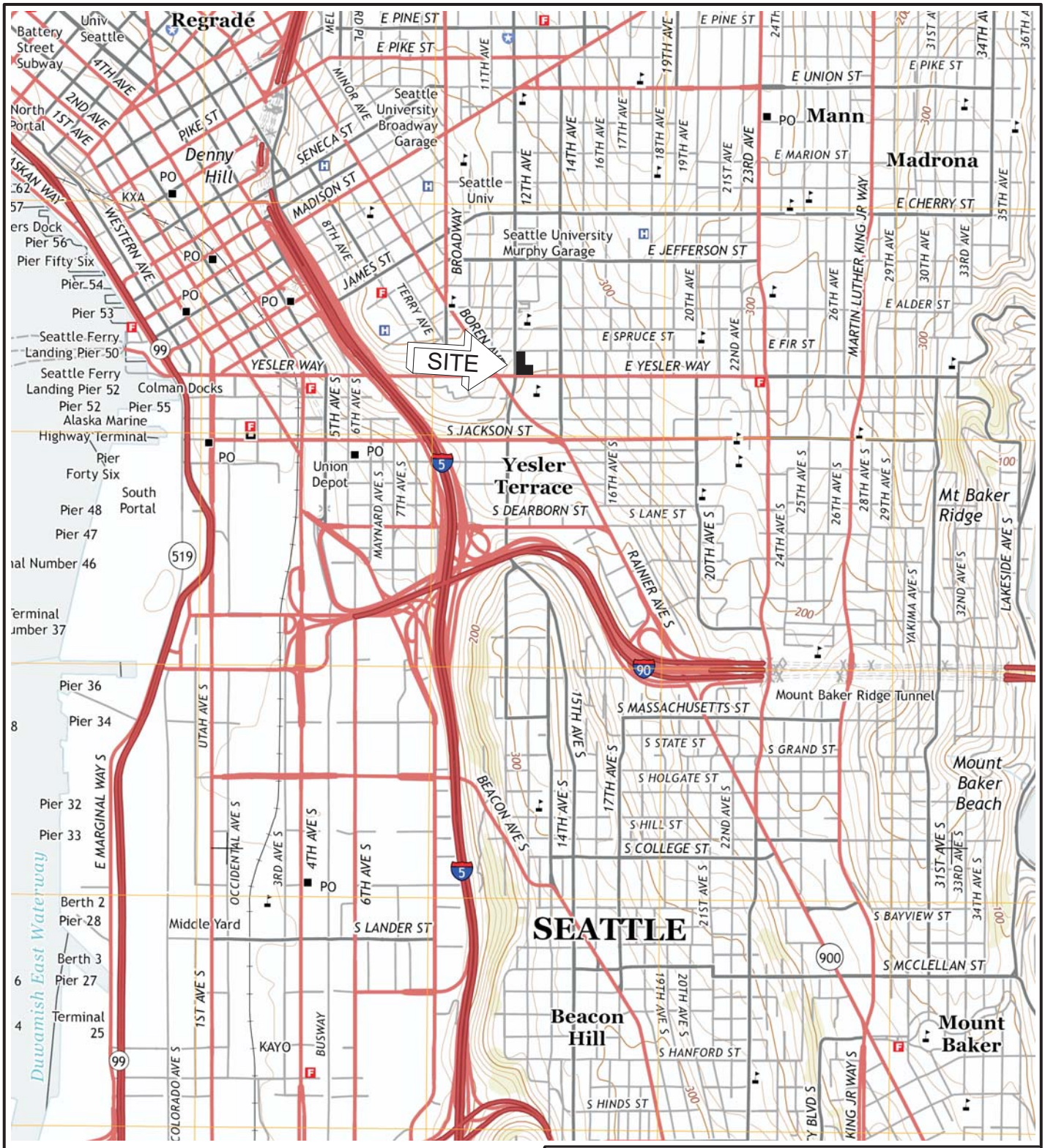
Boring/ Sample I.D.	***Sample Date***	***Laboratory Analytical Results (ug/l)***		
		Total Petroleum Hydrocarbons ***(by Methods NWTPH-G & NWTPH-D(X))***	***Benzene*** ***Toluene*** ***Ethyl benzene*** ***Xylenes*** ***(by EPA Method 8260C)***	***Other Volatile Organic Compounds*** ***(by EPA Method 8260C)*** ***List of 58 Additional Compounds Detectable by the Laboratory Method.***
MW-9 (Originally Boring BN-10)	8/3/2017	Gasoline Range: 500 Diesel: 270[x] Motor Oil: ND (<250)	***Benzene: 6.8*** Toluene: 1.3 Ethylbenzene: 6.3 Xylenes: 4.3	Hexane: 4.3 Isopropylbenzene: 7.2 n-Propylbenzene: 17 sec-Butylbenzene: 1.5 1,2,4-Trimethylbenzene: 1.3 1,3,5-Trimethylbenzene: 1.4 ND (all other)
	7/13/2018	Gasoline Range: 470 Diesel: 180[x] Motor Oil: ND (<250)	Benzene: 5.0 Toluene: ND (<1) Ethylbenzene: 8.5 Xylenes: 3.2	n-Propylbenzene: 23 sec-Butylbenzene: 1.9 1,2,4-Trimethylbenzene: 1.1 ND (all other)
MW-10 (Originally Boring SES-1)	10/30/2017	Gasoline Range: ND (<100) Diesel: 460[x] Motor Oil: ND (<250)	Benzene: ND (<0.35) Toluene: ND (<1) Ethylbenzene: ND (<1) Xylenes: ND (<1)	ND (all)
	6/14/2018	Gasoline Range: ND (<100) Diesel: 66[x] Motor Oil: ND (<250)	Benzene: ND (<0.35) Toluene: ND (<1) Ethylbenzene: ND (<1) Xylenes: ND (<1)	cis-1,2-Dichloroethene: 1.2 ND (all other)

Boring/ Sample I.D.	Sample Date	Laboratory Analytical Results (ug/l)		
		Total Petroleum Hydrocarbons (by Methods NWTPH-G & NWTPH-D(X))	**Benzene, Toluene, Ethyl benzene, Xylenes** (by EPA Method 8260C)	**Other Volatile Organic Compounds** (by EPA Method 8260C) List of 58 Additional Compounds Detectable by the Laboratory Method.
Washington State MTCA Groundwater Cleanup Criteria (ug/l)		**Gasoline:** 800 (Benzene is present) **Diesel or Motor Oil:** 500 (combined)	**Benzene:** 5 **Toluene:** 1,000 **Ethylbenzene:** 700 **Xylenes:** 1,000	**Acetone:** 7,200 **cis-1,2-Dichloroethene:** 16 **Hexane:** 480 **Isopropylbenzene:** 800 **n-Propylbenzene:** 800 **Naphthalene:** 160 **p-Isopropyltoluene:** NV **sec-Butylbenzene:** NV **tert-Butylbenzene:** NV **Tetrachloroethene:** 5 **Trichloroethene:** 5 **Vinyl chloride:** 0.2 **1,2,4-Trimethylbenzene:** NV **1,3,5-Trimethylbenzene:** 80

Table 3 Notes:
ND (<XXX) - Parameter not detected at concentrations at or above the noted reporting limit.
NA - Sample not analyzed for the listed parameter.
Gasoline Range Total Petroleum Hydrocarbons by Method NWTPH-G.
Diesel and Motor Oil Range Total Petroleum Hydrocarbons by Method NWTPH-D(x).
[x] - Indicates sample chromatogram does not resemble fuel standard used for analysis. Most likely carry over from gasoline range hydrocarbons.
BTEX compounds and other volatile organic compounds by EPA Method 8260C. All detected compounds summarized here. See laboratory report for full list of analyzed parameters.

MTCA Groundwater cleanup criteria per Chapter 173-340-720 WAC. Method A criteria presented where available. Method B standard formula values shown where no Method A criteria available. Method B standard formula values from Dept. of Ecology Cleanup Levels and Risk Calculation (CLARC) database. NV indicates no value available from CLARC.

Sample results exceeding applicable cleanup criteria are noted in ***Bold Italic***.



North

0 2000’

Scale 1 : 24,000

From USGS

Figure 1 - Site Map

104-124 12th Avenue & 1209 E. Fir Street
Seattle, Washington 98122

Project No.	WES - 1591
Date	June 11, 2017
File ID.	1591F1

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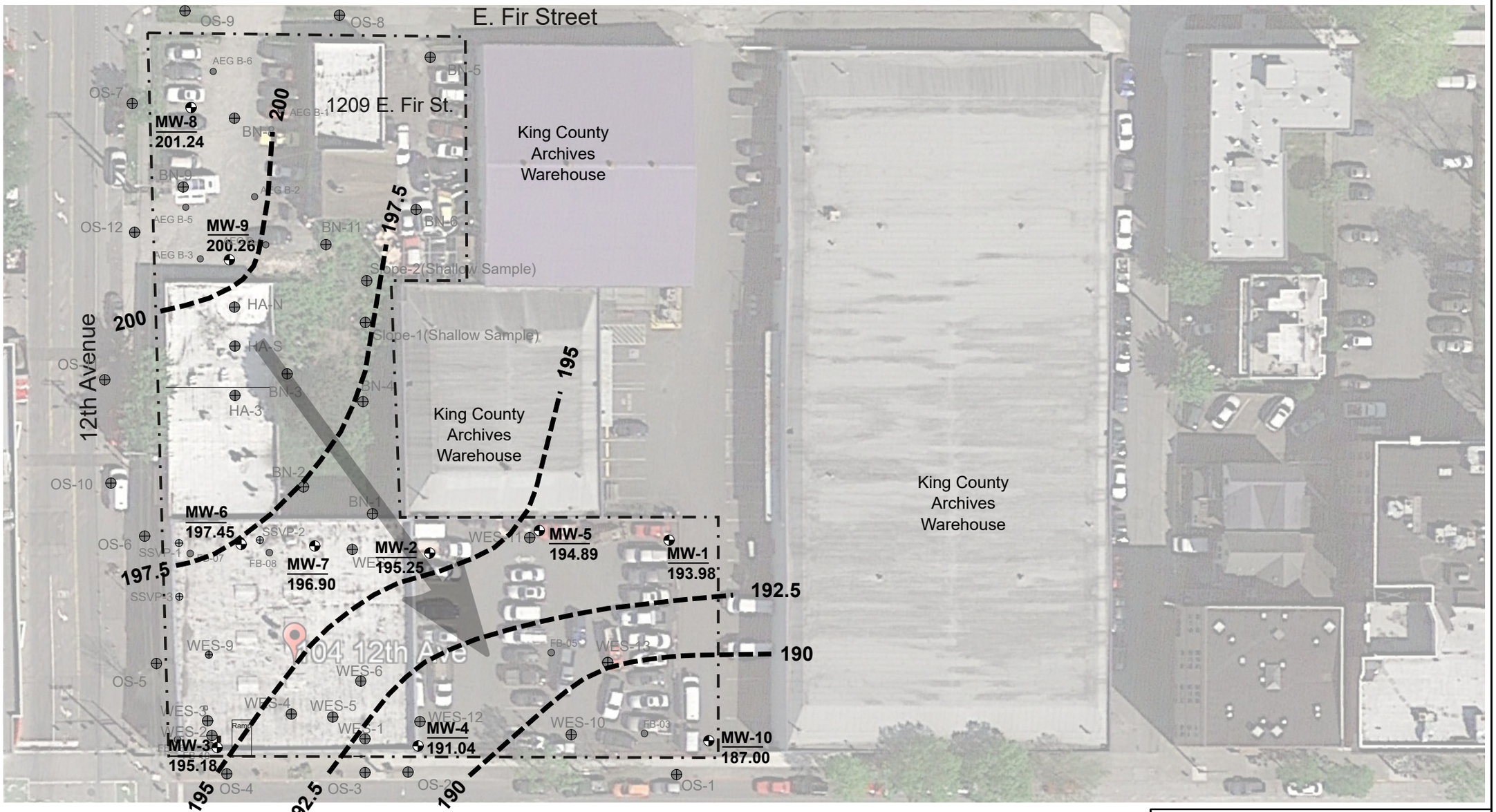
Environmental Sciences



Legend

- Approximate Location of Monitoring Well
- MW-1 / XXX.XX — Well I.D. and Groundwater Elevation
- Approximate Location of Soil Borings (2014-17)
- General Direction of Groundwater Migration
- Approximate Property Boundary

Scale 1" = Approx. 40 feet

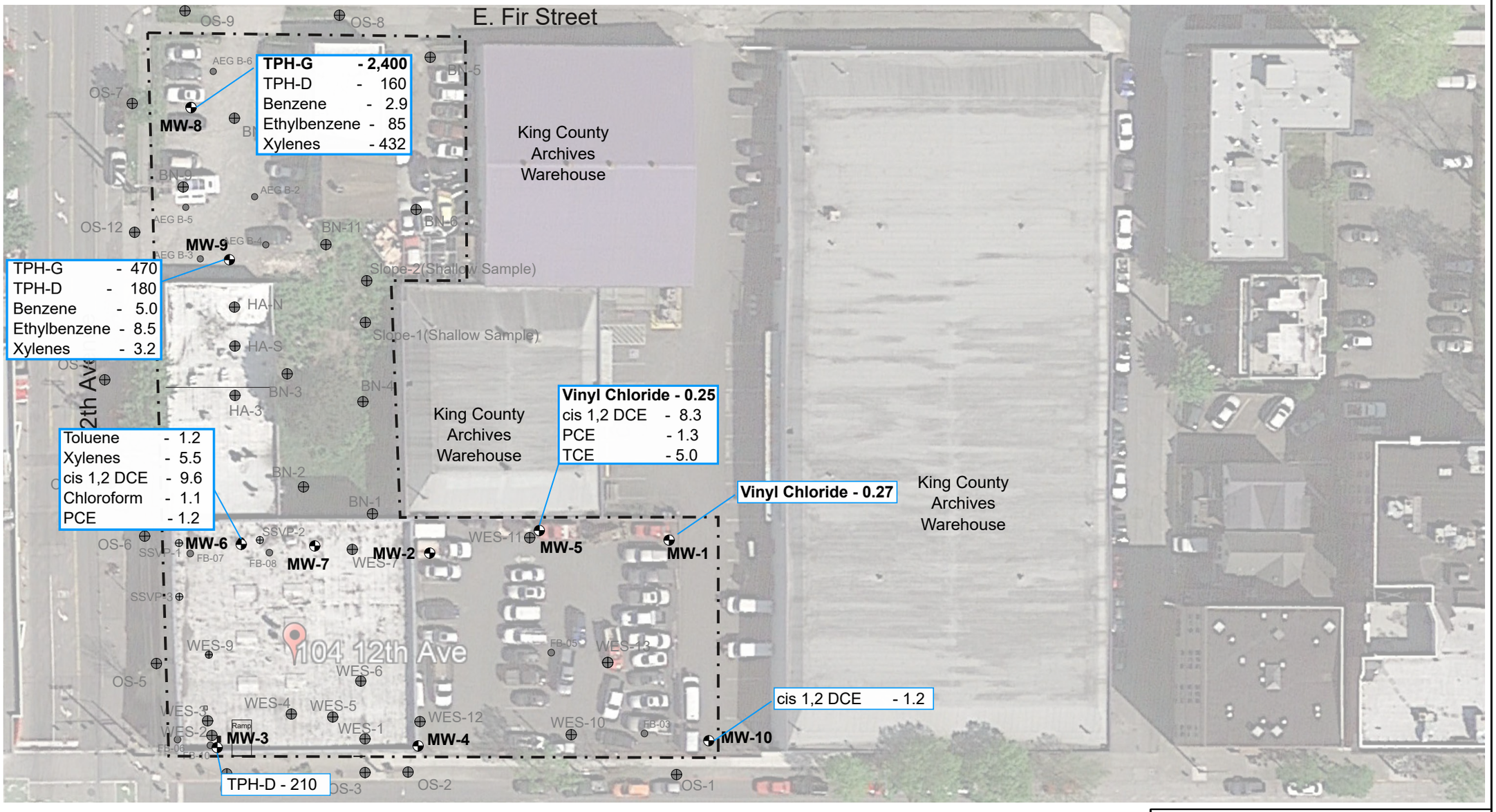
North

Figure 2 - Monitoring Well Location Plan and Groundwater Elevation Contours

Proposed Redevelopment Property
104-124 12th Avenue & 1209 E. Fir Street
Seattle, WA

Project No.	WES - 1591
Date	July 25, 2018
File ID.	1591F3

WHITMAN Environmental Sciences



Legend

- Approximate Location of Monitoring Well
- TPH-D - XXX — Laboratory Analytical Result on Current Groundwater Sample
  Bold indicates Result Exceeds MTCA Cleanup Level
- Approximate Property Boundary

Scale 1" = Approx. 40 feet

North

Figure 3 - Groundwater Analytical Results

Proposed Redevelopment Property
104-124 12th Avenue & 1209 E. Fir Street
Seattle, WA

Project No.	WES - 1591
Date	July 25, 2018
File ID.	1591F3

WHITMAN Environmental Sciences

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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

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

June 22, 2018

Dan Whitman, Project Manager
Whitman Environmental Sciences
6812 16th Ave NE
Seattle, WA 98115

Dear Mr Whitman:

Included are the results from the testing of material submitted on June 14, 2018 from the 12th and Yesler WES 1591, F&BI 806263 project. There are 16 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
WES0622R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on June 14, 2018 by Friedman & Bruya, Inc. from the Whitman Environmental Sciences 12th and Yesler WES 1591, F&BI 806263 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Whitman Environmental Sciences
806263 -01	MW-1
806263 -02	MW-2
806263 -03	MW-3
806263 -04	MW-4
806263 -05	MW-5
806263 -06	MW-6
806263 -07	MW-7
806263 -08	MW-10

All quality control requirements were acceptable.

Date of Report: 06/22/18
Date Received: 06/14/18
Project: 12th and Yesler WES 1591, F&BI 806263
Date Extracted: 06/15/18
Date Analyzed: 06/15/18

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 50-150)
MW-1 806263-01	<100	89
MW-2 806263-02	<100	85
MW-3 806263-03	<100	85
MW-4 806263-04	<100	87
MW-5 806263-05	<100	87
MW-6 806263-06	<100	89
MW-7 806263-07	<100	87
MW-10 806263-08	<100	87
Method Blank 08-1301 MB	<100	91

Date of Report: 06/22/18
Date Received: 06/14/18
Project: 12th and Yesler WES 1591, F&BI 806263
Date Extracted: 06/18/18
Date Analyzed: 06/18/18

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)
MW-1 806263-01	<50	<250	87
MW-2 806263-02	<50	<250	85
MW-3 806263-03	210 x	<250	88
MW-4 806263-04	<50	<250	84
MW-5 806263-05	<50	<250	89
MW-6 806263-06	<50	<250	85
MW-7 806263-07	<50	<250	85
MW-10 806263-08	66 x	<250	92
Method Blank 08-1304 MB	<50	<250	87

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-1	Client:	Whitman Environmental Sciences
Date Received:	06/14/18	Project:	12th and Yesler WES 1591
Date Extracted:	06/15/18	Lab ID:	806263-01
Date Analyzed:	06/15/18	Data File:	061543.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	57	121
Toluene-d8	99	63	127
4-Bromofluorobenzene	104	60	133

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	0.27	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:	MW-2	Client:	Whitman Environmental Sciences
Date Received:	06/14/18	Project:	12th and Yesler WES 1591
Date Extracted:	06/15/18	Lab ID:	806263-02
Date Analyzed:	06/15/18	Data File:	061544.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	99	63	127
4-Bromofluorobenzene	102	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:	MW-3	Client:	Whitman Environmental Sciences
Date Received:	06/14/18	Project:	12th and Yesler WES 1591
Date Extracted:	06/15/18	Lab ID:	806263-03
Date Analyzed:	06/15/18	Data File:	061545.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	57	121
Toluene-d8	99	63	127
4-Bromofluorobenzene	102	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:	MW-4	Client:	Whitman Environmental Sciences
Date Received:	06/14/18	Project:	12th and Yesler WES 1591
Date Extracted:	06/15/18	Lab ID:	806263-04
Date Analyzed:	06/16/18	Data File:	061546.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	101	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		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-5	Client:	Whitman Environmental Sciences
Date Received:	06/14/18	Project:	12th and Yesler WES 1591
Date Extracted:	06/15/18	Lab ID:	806263-05
Date Analyzed:	06/16/18	Data File:	061547.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	101	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	1.3
Vinyl chloride	0.25	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	8.3	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	5.0	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:	MW-6	Client:	Whitman Environmental Sciences
Date Received:	06/14/18	Project:	12th and Yesler WES 1591
Date Extracted:	06/15/18	Lab ID:	806263-06
Date Analyzed:	06/16/18	Data File:	061548.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	57	121
Toluene-d8	100	63	127
4-Bromofluorobenzene	102	60	133

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	1.2
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	9.6	1,3,5-Trimethylbenzene	<1
Chloroform	1.1	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:	MW-7	Client:	Whitman Environmental Sciences
Date Received:	06/14/18	Project:	12th and Yesler WES 1591
Date Extracted:	06/15/18	Lab ID:	806263-07
Date Analyzed:	06/16/18	Data File:	061549.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	101	63	127
4-Bromofluorobenzene	102	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:	MW-10	Client:	Whitman Environmental Sciences
Date Received:	06/14/18	Project:	12th and Yesler WES 1591
Date Extracted:	06/15/18	Lab ID:	806263-08
Date Analyzed:	06/16/18	Data File:	061550.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	97	57	121
Toluene-d8	99	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	1.2	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:	Whitman Environmental Sciences
Date Received:	Not Applicable	Project:	12th and Yesler WES 1591
Date Extracted:	06/15/18	Lab ID:	08-1306 mb
Date Analyzed:	06/15/18	Data File:	061529.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	100	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	<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: 06/22/18
Date Received: 06/14/18
Project: 12th and Yesler WES 1591, F&BI 806263

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

Laboratory Code: 806257-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Gasoline	ug/L (ppb)	1,000	93	70-119

Date of Report: 06/22/18
Date Received: 06/14/18
Project: 12th and Yesler WES 1591, F&BI 806263

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

Laboratory Code: 806286-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	290	120	110	50-150	9

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	84	81	63-142	4

Date of Report: 06/22/18
Date Received: 06/14/18
Project: 12th and Yesler WES 1591, F&BI 806263

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	109	110	25-158	1
Chloromethane	ug/L (ppb)	50	97	98	45-156	1
Vinyl chloride	ug/L (ppb)	50	101	102	50-154	1
Bromomethane	ug/L (ppb)	50	115	117	55-143	2
Chloroethane	ug/L (ppb)	50	82	83	58-146	1
Trichlorofluoromethane	ug/L (ppb)	250	95	99	50-150	4
Acetone	ug/L (ppb)	250	88	91	53-131	3
1,1-Dichloroethene	ug/L (ppb)	50	103	105	67-136	2
Hexane	ug/L (ppb)	50	97	101	57-137	4
Methylene chloride	ug/L (ppb)	50	102	105	39-148	3
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	102	104	64-147	2
trans-1,2-Dichloroethene	ug/L (ppb)	50	103	105	68-128	2
1,1-Dichloroethane	ug/L (ppb)	50	100	102	79-121	2
2,2-Dichloropropane	ug/L (ppb)	50	102	102	55-143	0
cis-1,2-Dichloroethene	ug/L (ppb)	50	100	102	80-123	2
Chloroform	ug/L (ppb)	50	98	100	80-121	2
2-Butanone (MEK)	ug/L (ppb)	250	89	93	57-149	4
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	93	97	73-132	4
1,1,1-Trichloroethane	ug/L (ppb)	50	99	101	83-130	2
1,1-Dichloropropene	ug/L (ppb)	50	99	101	77-129	2
Carbon tetrachloride	ug/L (ppb)	50	102	105	75-158	3
Benzene	ug/L (ppb)	50	97	100	69-134	3
Trichloroethene	ug/L (ppb)	50	95	98	80-120	3
1,2-Dichloropropane	ug/L (ppb)	50	101	105	77-123	4
Bromodichloromethane	ug/L (ppb)	50	102	107	81-133	5
Dibromomethane	ug/L (ppb)	50	98	100	82-125	2
4-Methyl-2-pentanone	ug/L (ppb)	250	100	106	65-138	6
cis-1,3-Dichloropropene	ug/L (ppb)	50	109	114	82-132	4
Toluene	ug/L (ppb)	50	99	103	72-122	4
trans-1,3-Dichloropropene	ug/L (ppb)	50	116	120	80-136	3
1,1,2-Trichloroethane	ug/L (ppb)	50	106	110	75-124	4
2-Hexanone	ug/L (ppb)	250	103	108	60-136	5
1,3-Dichloropropane	ug/L (ppb)	50	102	107	76-126	5
Tetrachloroethene	ug/L (ppb)	50	103	106	76-121	3
Dibromochloromethane	ug/L (ppb)	50	111	116	84-133	4
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	103	109	82-125	6
Chlorobenzene	ug/L (ppb)	50	100	104	83-114	4
Ethylbenzene	ug/L (ppb)	50	101	105	77-124	4
1,1,1,2-Tetrachloroethane	ug/L (ppb)	50	108	111	84-127	3
m,p-Xylene	ug/L (ppb)	100	101	104	83-125	3
o-Xylene	ug/L (ppb)	50	101	105	81-121	4
Styrene	ug/L (ppb)	50	103	107	84-119	4
Isopropylbenzene	ug/L (ppb)	50	102	105	85-117	3
Bromoform	ug/L (ppb)	50	117	123	74-136	5
n-Propylbenzene	ug/L (ppb)	50	105	109	74-126	4
Bromobenzene	ug/L (ppb)	50	103	108	80-121	5
1,3,5-Trimethylbenzene	ug/L (ppb)	50	105	109	78-123	4
1,1,2,2-Tetrachloroethane	ug/L (ppb)	50	105	109	66-126	4
1,2,3-Trichloropropane	ug/L (ppb)	50	101	105	67-124	4
2-Chlorotoluene	ug/L (ppb)	50	104	107	77-127	3
4-Chlorotoluene	ug/L (ppb)	50	103	107	78-128	4
tert-Butylbenzene	ug/L (ppb)	50	107	110	80-123	3
1,2,4-Trimethylbenzene	ug/L (ppb)	50	105	108	79-122	3
sec-Butylbenzene	ug/L (ppb)	50	104	108	80-125	4
p-Isopropyltoluene	ug/L (ppb)	50	104	108	81-123	4
1,3-Dichlorobenzene	ug/L (ppb)	50	100	104	85-116	4
1,4-Dichlorobenzene	ug/L (ppb)	50	97	101	84-121	4
1,2-Dichlorobenzene	ug/L (ppb)	50	100	103	85-116	3
1,2-Dibromo-3-chloropropane	ug/L (ppb)	50	109	111	57-141	2
1,2,4-Trichlorobenzene	ug/L (ppb)	50	101	104	72-130	3
Hexachlorobutadiene	ug/L (ppb)	50	99	101	53-141	2
Naphthalene	ug/L (ppb)	50	106	107	64-133	1
1,2,3-Trichlorobenzene	ug/L (ppb)	50	104	105	65-136	1

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.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
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July 10, 2018

Dan Whitman, Project Manager
Whitman Environmental Sciences
6812 16th Ave NE
Seattle, WA 98115

Dear Mr Whitman:

Included are the results from the testing of material submitted on June 29, 2018 from the 12th and Yesler WES-159, F&BI 806581 project. There are 11 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
WES0710R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on June 29, 2018 by Friedman & Bruya, Inc. from the Whitman Environmental Sciences 12th and Yesler WES-159, F&BI 806581 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Whitman Environmental Sciences
806581 -01	MW-8-GW

All quality control requirements were acceptable.

Date of Report: 07/10/18
Date Received: 06/29/18
Project: 12th and Yesler WES-159, F&BI 806581
Date Extracted: 07/03/18
Date Analyzed: 07/03/18

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)
MW-8-GW 806581-01 1/10	2,400	80
Method Blank 08-1390 MB	<100	84

Date of Report: 07/10/18
Date Received: 06/29/18
Project: 12th and Yesler WES-159, F&BI 806581
Date Extracted: 07/02/18
Date Analyzed: 07/02/18

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 47-140)
MW-8-GW 806581-01	160 x	<250	89
Method Blank 08-1444 MB	<50	<250	82

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-8-GW	Client:	Whitman Environmental Sciences
Date Received:	06/29/18	Project:	12th and Yesler WES-159, F&BI 806581
Date Extracted:	06/29/18	Lab ID:	806581-01
Date Analyzed:	06/30/18	Data File:	062944.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	102	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	85
Acetone	<50	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	360 ve
Hexane	<1	o-Xylene	72
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	33
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	<1	1,3,5-Trimethylbenzene	54
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	150
Benzene	2.9	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	1.6
1,1,2-Trichloroethane	<1	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-8-GW	Client:	Whitman Environmental Sciences
Date Received:	06/29/18	Project:	12th and Yesler WES-159, F&BI 806581
Date Extracted:	07/03/18	Lab ID:	806581-01 1/10
Date Analyzed:	07/03/18	Data File:	070328.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	97	57	121
Toluene-d8	102	63	127
4-Bromofluorobenzene	108	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	78
Acetone	<500	1,1,1,2-Tetrachloroethane	<10
1,1-Dichloroethene	<10	m,p-Xylene	320
Hexane	<10	o-Xylene	64
Methylene chloride	<50	Styrene	<10
Methyl t-butyl ether (MTBE)	<10	Isopropylbenzene	13
trans-1,2-Dichloroethene	<10	Bromoform	<10
1,1-Dichloroethane	<10	n-Propylbenzene	32
2,2-Dichloropropane	<10	Bromobenzene	<10
cis-1,2-Dichloroethene	<10	1,3,5-Trimethylbenzene	53
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	150
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:	Method Blank	Client:	Whitman Environmental Sciences
Date Received:	Not Applicable	Project:	12th and Yesler WES-159, F&BI 806581
Date Extracted:	06/29/18	Lab ID:	08-1411 mb
Date Analyzed:	06/29/18	Data File:	062917.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	103	63	127
4-Bromofluorobenzene	107	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: 07/10/18
Date Received: 06/29/18
Project: 12th and Yesler WES-159, F&BI 806581

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

Laboratory Code: 806582-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Gasoline	ug/L (ppb)	<100	<100	nm

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: 07/10/18
Date Received: 06/29/18
Project: 12th and Yesler WES-159, F&BI 806581

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

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	84	88	61-133	5

Date of Report: 07/10/18
Date Received: 06/29/18
Project: 12th and Yesler WES-159, F&BI 806581

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

Laboratory Code: 806557-02 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Dichlorodifluoromethane	ug/L (ppb)	50	<1	122	10-172
Chloromethane	ug/L (ppb)	50	<10	103	25-166
Vinyl chloride	ug/L (ppb)	50	<0.2	112	36-166
Bromomethane	ug/L (ppb)	50	<1	132	47-169
Chloroethane	ug/L (ppb)	50	<1	90	46-160
Trichlorofluoromethane	ug/L (ppb)	50	<1	83	44-165
Acetone	ug/L (ppb)	250	<50	84	10-182
1,1-Dichloroethene	ug/L (ppb)	50	<1	98	60-136
Hexane	ug/L (ppb)	50	<1	111	52-150
Methylene chloride	ug/L (ppb)	50	<5	103	67-132
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	109	74-127
trans-1,2-Dichloroethene	ug/L (ppb)	50	<1	104	72-129
1,1-Dichloroethane	ug/L (ppb)	50	<1	104	70-128
2,2-Dichloropropane	ug/L (ppb)	50	<1	102	36-154
cis-1,2-Dichloroethene	ug/L (ppb)	50	<1	103	71-127
Chloroform	ug/L (ppb)	50	<1	100	65-132
2-Butanone (MEK)	ug/L (ppb)	250	<10	95	10-129
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	101	69-133
1,1,1-Trichloroethane	ug/L (ppb)	50	<1	97	60-146
1,1-Dichloropropene	ug/L (ppb)	50	<1	105	69-133
Carbon tetrachloride	ug/L (ppb)	50	<1	105	56-152
Benzene	ug/L (ppb)	50	<0.35	103	76-125
Trichloroethene	ug/L (ppb)	50	<1	101	66-135
1,2-Dichloropropane	ug/L (ppb)	50	<1	109	78-125
Bromodichloromethane	ug/L (ppb)	50	<1	111	61-150
Dibromomethane	ug/L (ppb)	50	<1	105	66-141
4-Methyl-2-pentanone	ug/L (ppb)	250	<10	108	10-185
cis-1,3-Dichloropropene	ug/L (ppb)	50	<1	118	72-132
Toluene	ug/L (ppb)	50	<1	102	76-122
trans-1,3-Dichloropropene	ug/L (ppb)	50	<1	120	76-130
1,1,2-Trichloroethane	ug/L (ppb)	50	<1	109	68-131
2-Hexanone	ug/L (ppb)	250	<10	108	10-185
1,3-Dichloropropane	ug/L (ppb)	50	<1	108	71-128
Tetrachloroethene	ug/L (ppb)	50	<1	104	10-226
Dibromochloromethane	ug/L (ppb)	50	<1	115	70-139
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	<1	105	69-134
Chlorobenzene	ug/L (ppb)	50	<1	104	77-122
Ethylbenzene	ug/L (ppb)	50	<1	104	69-135
1,1,1,2-Tetrachloroethane	ug/L (ppb)	50	<1	109	73-137
m,p-Xylene	ug/L (ppb)	100	<2	103	69-135
o-Xylene	ug/L (ppb)	50	<1	103	60-140
Styrene	ug/L (ppb)	50	<1	106	71-133
Isopropylbenzene	ug/L (ppb)	50	<1	103	65-142
Bromoform	ug/L (ppb)	50	<1	117	65-142
n-Propylbenzene	ug/L (ppb)	50	<1	108	58-144
Bromobenzene	ug/L (ppb)	50	<1	103	75-124
1,3,5-Trimethylbenzene	ug/L (ppb)	50	<1	106	66-137
1,1,2,2-Tetrachloroethane	ug/L (ppb)	50	<1	106	51-154
1,2,3-Trichloropropane	ug/L (ppb)	50	<1	103	53-150
2-Chlorotoluene	ug/L (ppb)	50	<1	107	66-127
4-Chlorotoluene	ug/L (ppb)	50	<1	105	65-130
tert-Butylbenzene	ug/L (ppb)	50	<1	107	65-137
1,2,4-Trimethylbenzene	ug/L (ppb)	50	<1	105	59-146
sec-Butylbenzene	ug/L (ppb)	50	<1	106	64-140
p-Isopropyltoluene	ug/L (ppb)	50	<1	105	65-141
1,3-Dichlorobenzene	ug/L (ppb)	50	<1	101	72-123
1,4-Dichlorobenzene	ug/L (ppb)	50	<1	98	69-126
1,2-Dichlorobenzene	ug/L (ppb)	50	<1	99	69-128
1,2-Dibromo-3-chloropropane	ug/L (ppb)	50	<10	105	32-164
1,2,4-Trichlorobenzene	ug/L (ppb)	50	<1	98	66-136
Hexachlorobutadiene	ug/L (ppb)	50	<1	93	60-143
Naphthalene	ug/L (ppb)	50	<1	101	44-164
1,2,3-Trichlorobenzene	ug/L (ppb)	50	<1	98	69-148

Date of Report: 07/10/18
Date Received: 06/29/18
Project: 12th and Yesler WES-159, F&BI 806581

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	121	119	25-158	2
Chloromethane	ug/L (ppb)	50	103	104	45-156	1
Vinyl chloride	ug/L (ppb)	50	110	109	50-154	1
Bromomethane	ug/L (ppb)	50	125	126	55-143	1
Chloroethane	ug/L (ppb)	50	88	87	58-146	1
Trichlorofluoromethane	ug/L (ppb)	250	97	81	50-150	18
Acetone	ug/L (ppb)	250	81	85	53-131	5
1,1-Dichloroethene	ug/L (ppb)	50	93	94	67-136	1
Hexane	ug/L (ppb)	50	112	113	57-137	1
Methylene chloride	ug/L (ppb)	50	101	104	39-148	3
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	110	107	64-147	3
trans-1,2-Dichloroethene	ug/L (ppb)	50	104	103	68-128	1
1,1-Dichloroethane	ug/L (ppb)	50	101	103	79-121	2
2,2-Dichloropropane	ug/L (ppb)	50	100	101	55-143	1
cis-1,2-Dichloroethene	ug/L (ppb)	50	103	102	80-123	1
Chloroform	ug/L (ppb)	50	100	100	80-121	0
2-Butanone (MEK)	ug/L (ppb)	250	98	97	57-149	1
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	100	100	73-132	0
1,1,1-Trichloroethane	ug/L (ppb)	50	95	96	83-130	1
1,1-Dichloropropene	ug/L (ppb)	50	105	105	77-129	0
Carbon tetrachloride	ug/L (ppb)	50	104	106	75-158	2
Benzene	ug/L (ppb)	50	104	104	69-134	0
Trichloroethene	ug/L (ppb)	50	100	101	80-120	1
1,2-Dichloropropane	ug/L (ppb)	50	108	109	77-123	1
Bromodichloromethane	ug/L (ppb)	50	111	110	81-133	1
Dibromomethane	ug/L (ppb)	50	104	103	82-125	1
4-Methyl-2-pentanone	ug/L (ppb)	250	109	111	65-138	2
cis-1,3-Dichloropropene	ug/L (ppb)	50	121	119	82-132	2
Toluene	ug/L (ppb)	50	103	103	72-122	0
trans-1,3-Dichloropropene	ug/L (ppb)	50	123	122	80-136	1
1,1,2-Trichloroethane	ug/L (ppb)	50	109	109	75-124	0
2-Hexanone	ug/L (ppb)	250	112	113	60-136	1
1,3-Dichloropropane	ug/L (ppb)	50	108	109	76-126	1
Tetrachloroethene	ug/L (ppb)	50	103	104	76-121	1
Dibromochloromethane	ug/L (ppb)	50	115	116	84-133	1
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	108	107	82-125	1
Chlorobenzene	ug/L (ppb)	50	103	103	83-114	0
Ethylbenzene	ug/L (ppb)	50	104	105	77-124	1
1,1,1,2-Tetrachloroethane	ug/L (ppb)	50	109	109	84-127	0
m,p-Xylene	ug/L (ppb)	100	103	104	83-125	1
o-Xylene	ug/L (ppb)	50	103	103	81-121	0
Styrene	ug/L (ppb)	50	105	106	84-119	1
Isopropylbenzene	ug/L (ppb)	50	102	103	85-117	1
Bromoform	ug/L (ppb)	50	122	119	74-136	2
n-Propylbenzene	ug/L (ppb)	50	108	108	74-126	0
Bromobenzene	ug/L (ppb)	50	103	104	80-121	1
1,3,5-Trimethylbenzene	ug/L (ppb)	50	106	107	78-123	1
1,1,2,2-Tetrachloroethane	ug/L (ppb)	50	107	108	66-126	1
1,2,3-Trichloropropane	ug/L (ppb)	50	105	104	67-124	1
2-Chlorotoluene	ug/L (ppb)	50	106	107	77-127	1
4-Chlorotoluene	ug/L (ppb)	50	106	106	78-128	0
tert-Butylbenzene	ug/L (ppb)	50	107	108	80-123	1
1,2,4-Trimethylbenzene	ug/L (ppb)	50	105	106	79-122	1
sec-Butylbenzene	ug/L (ppb)	50	105	106	80-125	1
p-Isopropyltoluene	ug/L (ppb)	50	104	105	81-123	1
1,3-Dichlorobenzene	ug/L (ppb)	50	100	101	85-116	1
1,4-Dichlorobenzene	ug/L (ppb)	50	98	98	84-121	0
1,2-Dichlorobenzene	ug/L (ppb)	50	99	99	85-116	0
1,2-Dibromo-3-chloropropane	ug/L (ppb)	50	108	107	57-141	1
1,2,4-Trichlorobenzene	ug/L (ppb)	50	96	97	72-130	1
Hexachlorobutadiene	ug/L (ppb)	50	92	93	53-141	1
Naphthalene	ug/L (ppb)	50	101	101	64-133	0
1,2,3-Trichlorobenzene	ug/L (ppb)	50	97	98	65-136	1

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.

806581

SAMPLE CHAIN OF CUSTODY ME 06-29-18

A03 / VW1

Page # ____ of ____

Report To: Dan Whitman

Company: Whitman Env. Sciences

Address: 6812 16th Ave NE

City, State, ZIP: Seattle, WA 98115

Phone ____ Email: whitenviro@yahoo.com

SAMPLERS (*signature*)	
PROJECT NAME: WES-1591 12th + Yesler	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					Notes
MW-8-GW	01 A-D	6-28	2:50	Water	4		X	X		X							

Samples received at 15 °C

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	[signature]		WES	6-29-18	2:00
Received by:	[signature]	DO VO	F&BI	6-29-18	14:10
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.
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www.friedmanandbruya.com

July 25, 2018

Dan Whitman, Project Manager
Whitman Environmental Sciences
6812 16th Ave NE
Seattle, WA 98115

Dear Mr Whitman:

Included are the results from the testing of material submitted on July 16, 2018 from the 12th and Yesler WES-1591, F&BI 807282 project. There are 10 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
WES0725R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on July 16, 2018 by Friedman & Bruya, Inc. from the Whitman Environmental Sciences 12th and Yesler WES-1591, F&BI 807282 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Whitman Environmental Sciences
807282 -01	MW-9-GW

Several compounds in the 8260C laboratory control sample and laboratory control sample duplicate exceeded the acceptance criteria. The affected analytes were flagged accordingly.

All other quality control requirements were acceptable.

Date of Report: 07/25/18
Date Received: 07/16/18
Project: 12th and Yesler WES-1591, F&BI 807282
Date Extracted: 07/19/18
Date Analyzed: 07/19/18

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 50-150)
MW-9-GW 807282-01	470	83
Method Blank 08-1530 MB	<100	85

Date of Report: 07/25/18
Date Received: 07/16/18
Project: 12th and Yesler WES-1591, F&BI 807282
Date Extracted: 07/17/18
Date Analyzed: 07/17/18

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)
MW-9-GW 807282-01	180 x	<250	78
Method Blank 08-1565 MB	<50	<250	80

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-9-GW	Client:	Whitman Environmental Sciences
Date Received:	07/16/18	Project:	12th and Yesler WES-1591, F&BI 807282
Date Extracted:	07/20/18	Lab ID:	807282-01
Date Analyzed:	07/20/18	Data File:	072032.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	106	62	142
Toluene-d8	104	55	145
4-Bromofluorobenzene	88	65	139

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	8.5
Acetone	<50	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	3.2
Hexane	<1	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	12
trans-1,2-Dichloroethene	<1	Bromoform	<1
1,1-Dichloroethane	<1	n-Propylbenzene	23 jl
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	1.1
Benzene	5.0	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		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Whitman Environmental Sciences
Date Received:	Not Applicable	Project:	12th and Yesler WES-1591, F&BI 807282
Date Extracted:	07/20/18	Lab ID:	08-1583 mb
Date Analyzed:	07/20/18	Data File:	072017.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	85	117
Toluene-d8	92	91	108
4-Bromofluorobenzene	97	76	126

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: 07/25/18
Date Received: 07/16/18
Project: 12th and Yesler WES-1591, F&BI 807282

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

Laboratory Code: 807310-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Gasoline	ug/L (ppb)	1,000	81	70-119

Date of Report: 07/25/18
Date Received: 07/16/18
Project: 12th and Yesler WES-1591, F&BI 807282

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

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	76	72	63-142	5

Date of Report: 07/25/18
Date Received: 07/16/18
Project: 12th and Yesler WES-1591, F&BI 807282

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

Laboratory Code: 807371-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Dichlorodifluoromethane	ug/L (ppb)	50	<1	126	55-137
Chloromethane	ug/L (ppb)	50	<10	114	61-120
Vinyl chloride	ug/L (ppb)	50	<0.2	113	61-139
Bromomethane	ug/L (ppb)	50	<1	115	20-265
Chloroethane	ug/L (ppb)	50	<1	108	55-149
Trichlorofluoromethane	ug/L (ppb)	50	<1	113	71-128
Acetone	ug/L (ppb)	250	<50	92	48-149
1,1-Dichloroethene	ug/L (ppb)	50	<1	112	71-123
Hexane	ug/L (ppb)	50	<1	101	44-139
Methylene chloride	ug/L (ppb)	50	<5	107	61-126
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	104	68-125
trans-1,2-Dichloroethene	ug/L (ppb)	50	<1	106	72-122
1,1-Dichloroethane	ug/L (ppb)	50	<1	103	79-113
2,2-Dichloropropane	ug/L (ppb)	50	<1	119	48-157
cis-1,2-Dichloroethene	ug/L (ppb)	50	<1	102	63-126
Chloroform	ug/L (ppb)	50	<1	97	77-117
2-Butanone (MEK)	ug/L (ppb)	250	<10	104	70-135
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	98	70-119
1,1,1-Trichloroethane	ug/L (ppb)	50	<1	111	75-121
1,1-Dichloropropene	ug/L (ppb)	50	<1	107	67-121
Carbon tetrachloride	ug/L (ppb)	50	<1	118	70-132
Benzene	ug/L (ppb)	50	<0.35	102	75-114
Trichloroethene	ug/L (ppb)	50	<1	102	73-122
1,2-Dichloropropane	ug/L (ppb)	50	<1	103	80-111
Bromodichloromethane	ug/L (ppb)	50	<1	116	78-117
Dibromomethane	ug/L (ppb)	50	<1	99	73-125
4-Methyl-2-pentanone	ug/L (ppb)	250	<10	108	79-140
cis-1,3-Dichloropropene	ug/L (ppb)	50	<1	112	76-120
Toluene	ug/L (ppb)	50	<1	101	73-117
trans-1,3-Dichloropropene	ug/L (ppb)	50	<1	120	75-122
1,1,2-Trichloroethane	ug/L (ppb)	50	<1	101	81-116
2-Hexanone	ug/L (ppb)	250	<10	99	74-127
1,3-Dichloropropane	ug/L (ppb)	50	<1	106	80-113
Tetrachloroethene	ug/L (ppb)	50	<1	99	72-113
Dibromochloromethane	ug/L (ppb)	50	<1	120	69-129
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	<1	103	79-120
Chlorobenzene	ug/L (ppb)	50	<1	99	75-115
Ethylbenzene	ug/L (ppb)	50	<1	100	66-124
1,1,1,2-Tetrachloroethane	ug/L (ppb)	50	<1	117	76-130
m,p-Xylene	ug/L (ppb)	100	<2	99	63-128
o-Xylene	ug/L (ppb)	50	<1	99	64-129
Styrene	ug/L (ppb)	50	<1	97	56-142
Isopropylbenzene	ug/L (ppb)	50	<1	103	74-122
Bromoform	ug/L (ppb)	50	<1	120	49-138
n-Propylbenzene	ug/L (ppb)	50	<1	116	65-129
Bromobenzene	ug/L (ppb)	50	<1	111	70-121
1,3,5-Trimethylbenzene	ug/L (ppb)	50	<1	111	60-138
1,1,2,2-Tetrachloroethane	ug/L (ppb)	50	<1	116	79-120
1,2,3-Trichloropropane	ug/L (ppb)	50	<1	113	62-125
2-Chlorotoluene	ug/L (ppb)	50	<1	111	40-159
4-Chlorotoluene	ug/L (ppb)	50	<1	106	76-122
tert-Butylbenzene	ug/L (ppb)	50	<1	114	74-125
1,2,4-Trimethylbenzene	ug/L (ppb)	50	<1	111	59-136
sec-Butylbenzene	ug/L (ppb)	50	<1	113	69-127
p-Isopropyltoluene	ug/L (ppb)	50	<1	112	64-132
1,3-Dichlorobenzene	ug/L (ppb)	50	<1	99	77-113
1,4-Dichlorobenzene	ug/L (ppb)	50	<1	97	75-110
1,2-Dichlorobenzene	ug/L (ppb)	50	<1	108	70-120
1,2-Dibromo-3-chloropropane	ug/L (ppb)	50	<10	121	69-129
1,2,4-Trichlorobenzene	ug/L (ppb)	50	<1	105	66-123
Hexachlorobutadiene	ug/L (ppb)	50	<1	114	53-136
Naphthalene	ug/L (ppb)	50	<1	102	60-145
1,2,3-Trichlorobenzene	ug/L (ppb)	50	<1	102	59-130

Date of Report: 07/25/18
Date Received: 07/16/18
Project: 12th and Yesler WES-1591, F&BI 807282

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	148	126	50-157	16
Chloromethane	ug/L (ppb)	50	129	112	62-130	14
Vinyl chloride	ug/L (ppb)	50	131 vo	112	70-128	16
Bromomethane	ug/L (ppb)	50	130	112	62-188	15
Chloroethane	ug/L (ppb)	50	124	107	66-149	15
Trichlorofluoromethane	ug/L (ppb)	50	124	112	70-132	10
Acetone	ug/L (ppb)	250	110	88	44-145	22 vo
1,1-Dichloroethene	ug/L (ppb)	50	114	109	75-119	4
Hexane	ug/L (ppb)	50	98	101	51-153	3
Methylene chloride	ug/L (ppb)	50	114	107	63-132	6
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	106	103	70-122	3
trans-1,2-Dichloroethene	ug/L (ppb)	50	103	105	76-118	2
1,1-Dichloroethane	ug/L (ppb)	50	103	102	77-119	1
2,2-Dichloropropane	ug/L (ppb)	50	120	111	62-141	8
cis-1,2-Dichloroethene	ug/L (ppb)	50	102	100	76-119	2
Chloroform	ug/L (ppb)	50	98	96	78-117	2
2-Butanone (MEK)	ug/L (ppb)	250	110	100	49-147	10
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	96	97	78-114	1
1,1,1-Trichloroethane	ug/L (ppb)	50	117 vo	109	80-116	7
1,1-Dichloropropene	ug/L (ppb)	50	104	106	78-119	2
Carbon tetrachloride	ug/L (ppb)	50	127	118	72-128	7
Benzene	ug/L (ppb)	50	101	101	75-116	0
Trichloroethene	ug/L (ppb)	50	97	101	72-119	4
1,2-Dichloropropane	ug/L (ppb)	50	101	102	79-121	1
Bromodichloromethane	ug/L (ppb)	50	112	114	76-120	2
Dibromomethane	ug/L (ppb)	50	95	96	79-121	1
4-Methyl-2-pentanone	ug/L (ppb)	250	108	105	54-153	3
cis-1,3-Dichloropropene	ug/L (ppb)	50	102	108	76-128	6
Toluene	ug/L (ppb)	50	102	100	79-115	2
trans-1,3-Dichloropropene	ug/L (ppb)	50	113	115	76-128	2
1,1,2-Trichloroethane	ug/L (ppb)	50	103	102	78-120	1
2-Hexanone	ug/L (ppb)	250	99	95	49-147	4
1,3-Dichloropropane	ug/L (ppb)	50	106	105	81-115	1
Tetrachloroethene	ug/L (ppb)	50	100	99	78-109	1
Dibromochloromethane	ug/L (ppb)	50	121	119	63-140	2
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	104	102	82-118	2
Chlorobenzene	ug/L (ppb)	50	98	97	80-113	1
Ethylbenzene	ug/L (ppb)	50	99	99	83-111	0
1,1,1,2-Tetrachloroethane	ug/L (ppb)	50	127 vo	115	76-125	10
m,p-Xylene	ug/L (ppb)	100	99	98	84-112	1
o-Xylene	ug/L (ppb)	50	106	100	81-117	6
Styrene	ug/L (ppb)	50	95	96	83-121	1
Isopropylbenzene	ug/L (ppb)	50	111	104	81-122	7
Bromoform	ug/L (ppb)	50	120	117	40-161	3
n-Propylbenzene	ug/L (ppb)	50	117 vo	116 vo	81-115	1
Bromobenzene	ug/L (ppb)	50	110	111	80-113	1
1,3,5-Trimethylbenzene	ug/L (ppb)	50	118 vo	112	83-117	5
1,1,2,2-Tetrachloroethane	ug/L (ppb)	50	116	114	79-118	2
1,2,3-Trichloropropane	ug/L (ppb)	50	113	113	74-116	0
2-Chlorotoluene	ug/L (ppb)	50	114 vo	111	79-112	3
4-Chlorotoluene	ug/L (ppb)	50	105	107	80-116	2
tert-Butylbenzene	ug/L (ppb)	50	122 vo	115	81-119	6
1,2,4-Trimethylbenzene	ug/L (ppb)	50	116	112	81-121	4
sec-Butylbenzene	ug/L (ppb)	50	121	114	83-123	6
p-Isopropyltoluene	ug/L (ppb)	50	117	112	81-122	4
1,3-Dichlorobenzene	ug/L (ppb)	50	98	101	80-115	3
1,4-Dichlorobenzene	ug/L (ppb)	50	98	96	77-112	2
1,2-Dichlorobenzene	ug/L (ppb)	50	108	107	79-115	1
1,2-Dibromo-3-chloropropane	ug/L (ppb)	50	125	118	62-133	6
1,2,4-Trichlorobenzene	ug/L (ppb)	50	110	104	75-119	6
Hexachlorobutadiene	ug/L (ppb)	50	119 vo	114	70-116	4
Naphthalene	ug/L (ppb)	50	110	102	72-131	8
1,2,3-Trichlorobenzene	ug/L (ppb)	50	111	103	74-122	7

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.

807282

SAMPLE CHAIN OF CUSTODY ME 7/16/18

VN1/C02

Page # _____ of _____

Report To [illegible]

Company [illegible]

Address [illegible]

City, State, ZIP [illegible]

Phone [illegible] Email _____

SAMPLERS (*signature*)

PROJECT NAME: 15TH + YESLER

PO #: 025-1596

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					Notes
MW-9-GW	01A-D	7-13-18	[illegible]	[illegible]	4		X	X	X	X							
									NO								
																	Samples received at 6 °C

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: [illegible]		[illegible]	7-16-18	1:30
Received by: [illegible]	Liza Radford	FBI	7/16/18	1:30
Relinquished by:				
Received by:				

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