



Phase II Environmental Site Assessment

# Montlake Market and Gas Station Properties

2625 East Montlake Place East and 2605 22<sup>nd</sup> Avenue East Seattle, Washington

# Prepared for Montlake LLC and Stelter Montlake LLC

January 30, 2019 19426-00





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# Montlake Market and Gas Station Properties 2625 East Montlake Place East and 2605 22<sup>nd</sup> Avenue East Seattle, Washington

#### **EXECUTIVE SUMMARY**

Washington State Department of Transportation (WSDOT) conducted a Supplemental Phase II environmental site assessment (Phase II) on three King County tax parcels (Properties) at the southwest corner of SR 520 and Montlake Blvd (Figure 1). The Supplemental Phase II on the Properties was the fourth Phase II conducted by WSDOT in the general area over an approximate 3-year period.

Operations on the north tax parcel (King County Tax Parcel No. 8805901085, the "Gas Station Parcel") include a gas station building, and three underground storage tanks (USTs) and pump islands. The south tax parcel (King County Tax Parcel No. 8805901090, the "Market Parcel") contains the Montlake Market supermarket building (Market). The small southwest triangular shaped tax parcel (King County Tax Parcel No. 88059010170, the "Triangle Parcel") is part of the parking lot for the Market. The Market Parcel and the Triangle Parcel together are referred to as the Market Properties to distinguish them from the Gas Station Parcel.

The WSDOT investigations detected subsurface soil exceeding MTCA cleanup levels for gasoline-related constituents in borings in a limited area within and immediately north of the Gas Station Parcel. Based on the soil and groundwater sampling and analysis, there is no evidence of soil contamination on the Market Properties that contain the Market and cell towers. Petroleum contaminated soil appears to be limited to the Gas Station Parcel where the gas station and associated UST system are located. This limited area of contamination is bounded by "clean" soil borings in which MTCA cleanup levels are not exceeded (see Figure 2). Current groundwater data is limited in areal extent and is very likely biased high since samples were not collected from properly constructed and developed monitoring wells. Nonetheless, the overall pattern of groundwater exceedances generally mirrors the soil results (see Figure 3).

Site-wide constituents of potential concern (COPCs), identified by comparing the highest detected concentrations with the MTCA cleanup levels, are limited to TPH-G, BTEX, naphthalenes, and EDC, which are consistent with release(s) of gasoline. The COPCs do not suggest releases of diesel or waste oil containing PCBs or significant carcinogenic PAHs (cPAHs).<sup>1</sup> Observations noted in the WSDOT boring logs and analytical result do not indicate the presence of significant free petroleum product. Taken together,

<sup>&</sup>lt;sup>1</sup> There was one exceedance of heavy oil (TPH-O) in the 5-foot soil sample from boring H-19-18. This could represent a localized release of motor oil. Alternatively, since no oil sheen was noted on the boring log at this depth, the soil material consisted of dark gray, soft silt, and the analysis did not include a silica gel cleanup step, it is also possible that this result is a false positive resulting from naturally occurring organic material.

the data indicate that the site is a simple gasoline-release site of limited extent with little or no free product present.

The existing data indicate that the property could be remediated using a combination of *in-situ* methods and monitored natural attenuation (along with some limited hot-spot soil removal, if necessary) without the need to demolish the Market building or impact its operations. Based on the data, it is also likely to address site contamination without having to close the gas station other than perhaps temporarily.

We are also providing this technical document as a notice for a release under as required by Ecology's reporting requirements in WAC 173-340-300.

### INTRODUCTION

This report summarizes the results from the recent supplemental Limited Phase II conducted on the Gas Station Parcel and Market Properties in December 2018, as well as the results from other Phase II Environmental Site Assessments conducted on adjacent and nearby rights-of-way (ROW). INNOVEX Environmental Management, Inc. (INNOVEX) conducted all of the Phase IIs for WSDOT.

Our report is organized as follows:

- Executive Summary;
- Introduction;
- Field Investigations;
- Site Background;
- Geology and Hydrogeology
- Contaminants of Potential Concern (COPCs) and Analytical Methods;
- Cleanup Levels
- Subsurface Soil and Groundwater Assessment;
- Conclusions;
- Recommendations;
- Limitations; and
- References

Tables 1 and 2 list the relevant constituents for the Site as well as several metals that were tested for by WSDOT's consultant but are not required under WAC 173-340-450.

Soil and groundwater analytical results are summarized in Tables 3 and 4, respectively. Figure 1 is a Vicinity Map showing the location of the Property. A site plan showing boring locations is presented on Figure 2. Chemical data quality review and laboratory reports are presented in Appendix A. Field exploration methods and soil boring logs are not provided in the Appendices but can be found each technical report listed under references.

### **FIELD INVESTIGATIONS**

The field investigations were conducted during four separate events by WSDOT between 2016 and 2018. The most recent investigation was conducted on the Gas Station Parcel and Market Properties while the other three previous investigations were conducted outside those property boundaries.

The general outline of the work completed was as follows:

- Twenty-one borings were advanced for environmental purposes by hollow-stem auger or sonic drill method to depths of 15 to 50 feet between 2016 and 2018.
- Six of the twenty-one borings were advanced on the Gas Station Parcel and Market Properties.
- Fifteen of the twenty-one borings were advanced outside of the Gas Station Parcel and Market Properties boundaries.
- Approximately 137 soil samples were collected and screened from twenty-one borings advanced for environmental purposes by hollow-stem auger or sonic drill method to depths of 15 to 50 feet.
- Soil samples were collected and screened from three geotechnical borings advanced in 2015 and 2016 to depths of 50 to 75 feet.
- Forty-two soil samples were submitted for chemical analysis.
- Eleven grab groundwater samples were collected from temporary wells in 11 borings and submitted for chemical analyses.

No permanent monitoring wells were installed in any of the 21 environmental borings advanced. No free product was noted in any of the borings.

# SITE BACKGROUND

### **Site Description**

The study area encompassed the Gas Station Parcel (2625 East Montlake Place East) and Market Properties (2605 22<sup>nd</sup> Avenue East) as well as the adjacent and nearby City of Seattle and WSDOT SR 520 ROWs and undeveloped land within the ROWs (Figure 1). Most of the borings were advanced between the intersection of East Montlake Place East/East Lake Washington Blvd and East Roanoke Street within an approximate 2- to 3-acre area south of SR 520, including six borings on the Gas Station Parcel and Market Properties. Residences are located south of East Roanoke Street and across East Montlake Place East to the east.

# **Site History**

The general area was undeveloped in the late 1800s and early 1900s though East Montlake Place East was visible in historical topographic maps within that timeframe. By 1930, the roads and a large percentage of the nearby residential structures to the east, south, and southwest are located as they are today. In 1930, the three properties that currently house the Gas Station and Market contain a smaller gas station structure on the north property and retail structure in the southeast corner of the south property where the Market is currently located. Also, in 1930, across West Montlake Place (current location of the on- and off-ramp to SR520) to the northwest, were a gas station, wash rack, and retail structure. The general area and roadways have remained generally the same except for the area where the structures and businesses to the northwest of West Montlake Place were located and were removed and graded during the development of the SR520 in the early 1960s. The current structure on the Gas Station Parcel was constructed in 1952 and the Market building was constructed in 1952. Several renovations have occurred to these buildings since then, but they have generally remained the same. Several blocks to the west/southwest, is City of Seattle community center and playfield.

There are three active single-wall, steel-lined USTs containing gasoline on the Gas Station Parcel. The sizes of these USTs range from 6,000 to 10,000 gallons. They were installed in 1952, 1962, and 1975 and have been upgraded throughout their use to be compliant with current UST regulations. The Washington State Department of Ecology (Ecology) has conducted several inspections on the USTs over the past 15 years. They are also regulatory tightness and system leak tested regularly in accordance with Ecology's UST regulations. A 300-gallon waste oil UST was decommissioned in-place in 2000. A UST site assessment conducted at the time of decommissioning that included samples from below this UST and surficial impacts in the shallow soil above the tank by the former fill port indicated no impacts directly below the UST. Approximately 1 ton of impacted soil from above the tank was removed and disposed of off-site at the time of decommissioning. The UST decommissioning was conducted in accordance with the Ecology UST regulations and all documentation was submitted to Ecology.

# **Geology and Hydrogeology**

The Site lies within the Puget Sound Lowland, which consists of a broad, low-lying region situated between the Cascade Range to the east and the Olympic Mountains to the west. The Lowland depression is underlain by Tertiary volcanic and sedimentary bedrock and is filled to the present-day land surface with Quaternary glacial and non-glacial sediments. The Puget Sound Lowland's present-day geomorphic features can be attributed to the last continental glacier, the Cordilleran ice sheet, which covered the region during the Fraser Glaciation. The ice sheet advanced from British Columbia 18,000 years ago to just south of Olympia and disappeared approximately 10,000 years ago (Lasmanis, 1991).

The site lies at an elevation of about 45 feet (estimated from Google Earth Pro). Topography in the vicinity of the site slopes westward toward Portage Bay, eastward toward Lake Washington, and northward toward the Montlake Cut.

Boring logs indicate that the site is underlain to a depth of at least 25 feet by fine-grained soils (including some fill) consisting generally of silty clays, sandy silts, and silty sands. Based on an initial interpretation of



boring logs, it appears that the site is underlain by overconsolidated glacial till (silty sand with some gravel) at depths of about 20+ feet; the till is overlain primarily by discontinuous layers silty clays, sandy silts, and silty sands with some lenses of cleaner sands. Saturated soils and water table conditions (likely perched) have typically been encountered around 20 to 25 feet below land surface.

Without monitoring wells, it is not possible to accurately characterize groundwater at the site, including whether a continuous water table aquifer is present or whether the groundwater encountered in previous borings represents isolated, discontinuous perched zones. In general, shallow groundwater would be expected for follow topography. However, the site itself is fairly flat and the general vicinity slopes to the west, north, and east. In addition, significant artificial cuts associated with the SR-520 on ramp further complicate the picture.

Existing subsurface data suggests that there would be very limited migration of contamination via groundwater. Shallow groundwater that has been encountered and sampled beneath the site appears to be limited to isolated perched zones overlying glacial till and occurs in fine-grained units with low hydraulic conductivity. The glacial till underlying the site would protect groundwater resources lying beneath the till.

# CONTAMINANTS OF POTENTIAL CONCERN (COPCs) AND ANALYTICAL METHODS

Based on the Site and vicinity's past history, petroleum hydrocarbons and related constituents are identified as the COPCs for the Site. The constituents and analytical methods used on submitted soil and groundwater samples for chemical analysis included:

- Hydrocarbon Identification (HCID) Northwest Total Petroleum Hydrocarbon (NWTPH)-HCID (soil and water)
- Gasoline-range petroleum hydrocarbons NWTPH Gx (soil and water)
- Diesel-range and Oil-range petroleum hydrocarbons NWTPH Dx (soil and water)
- Volatile Organic Compounds (VOCs) EPA Method 8260 (soil and water)
- Semi-volatile Organic Compounds (SVOCs) EPA Method 8270 (soil and water)
- Priority Pollutant Metals (PP-13) EPA Method 6010 (soil and water)
- Polychlorinated Biphenyls (PCBs) EPA Method 8082 (soil and water)

The laboratory reports and quality assurance/quality control (QA/QC) review for the soil and groundwater samples analyzed by WSDOT's contractor are included in the referenced data reports for each separate sampling event. Hart Crowser's laboratory reports are included in Appendix A. Tables 2 and 3 summarize the detections only of WSDOT contractor's and Hart Crowser's soil and groundwater results discussed in this report. Data validation for the Hart Crowser chemical results as well as the laboratory results are included in Appendix A.

# **CLEANUP LEVELS**

### **MTCA Cleanup Levels**

Washington's Model Toxics Control Act regulations (Chapter 173-340 WAC) provide testing requirements for soil and groundwater and lay out specific procedures for setting cleanup levels at petroleum contaminated sites.

# **Testing Requirements**

WAC 173-340-450 requires that soil and groundwater at petroleum contaminated sites be analyzed for various constituents—depending upon the type of petroleum product(s) released—on the requirements shown in MTCA Table 830-1. Tables 1 and 2 in our report list the relevant constituents for the subject site. (These tables also list several metals that were tested for by WSDOT's consultant but are not required under WAC 173-340-450.)

# **Cleanup Levels**

WAC 173-340-700(8)(b)(i) indicates that MTCA Method A cleanup levels are appropriate for assessing of total petroleum hydrocarbons (TPH) and associated hazardous substances at petroleum sites that have few hazardous substances and that that are undergoing a routine cleanup action or where numerical standards are available for all indicator hazardous substances in the media for which the Method A cleanup level is being used. The site must also qualify for exclusion from a terrestrial ecological evaluation. The subject site meets these criteria; therefore, Method A cleanup levels for soil and groundwater are appropriate. WSDOT's consultant also analyzed for several metals in soil and groundwater. Except for lead, these constituents are not generally required to be tested for at petroleum sites and some do not have Method A cleanup levels. For those constituents where Method A levels are not available, Method B cleanup levels are used as a point of comparison since Method B levels are applicable to all sites (including petroleum and non-petroleum sites), per WAC 173-340-705. Tables 1 and 2 in our report list the applicable cleanup levels and the basis for their selection for all constituents.

# SUBSURFACE SOIL AND GROUNDWATER ASSESSMENT

In 2016, analytical results from soil samples collected from three nearby geotechnical borings advanced in 2015 and 2016 within the 3-acre study area, were presented to WSDOT's environmental consultant. There were no detections of petroleum in any of the soil samples analyzed. A groundwater sample from one of the borings was also detected and it had low concentrations of gasoline and xylenes in the sample. This geotechnical boring was located near the former gas station to the northwest of the study area. All of the soil and groundwater sample results were below MTCA cleanup levels.

WSDOT's contractor advanced five environmental borings (H-1-16 through H-5-16) in October 2016 to depths of 17.4 to 50 feet along the outer west/north/east boundaries (within 10-20 feet) of the Gas Station Parcel and Market Properties. A total of 40 soil samples were collected and screened and 20 soil samples were selected for chemical analysis (TPH, VOCs, SVOCs, PCBs, Metals). Odors were noted in 4 of

the borings though only one boring had a soil sample (out of three analyzed) with an exceedance above MTCA cleanup levels for benzene. A grab groundwater sample from a temporary well in the boring also had an exceedance of benzene. None of the other 19 soil samples analyzed had detections above MTCA cleanup levels. All of the soil and groundwater sample results were below MTCA cleanup levels.

In October 2017, five additional environmental borings (H-6-17 through H-10-17) were advanced by WSDOT's contractor to depths of 30 to 50 feet further northwest/north/northeast/east of the previous 2016 borings. They are approximately 80 to 100 feet from the Gas Station Parcel and Market Properties boundaries. Forty-one soil samples were collected and screened and six soil samples were submitted for chemical analysis ((TPH, VOCs, SVOCs, PCBs, Metals). No odors or elevated PID readings were noted except PID readings in H-7-17. All of the soil samples were non-detect (below the laboratory detection limits) except for the soil sample from H-7-17) that had low concentrations petroleum-related VOCs and SVOCs and below MTCA cleanup levels. No groundwater samples were collected from any of the borings. All of the soil sample results were below MTCA cleanup levels.

Five more environmental borings (H-11-18 through H-15-18) were advanced in May 2018 by WSDOT's contractor to depths of 20 to 30 feet. The borings were located along the outer east/southeast/south boundaries (within 10-20 feet) of the Gas Station Parcel and Market Properties. A total of 27 soil samples were collected and screened and 6 soil samples were selected for chemical analysis (TPH, VOCs, SVOCs, PCBs, Metals). No odors or elevated PID readings were noted in any of the soil samples. Three grab groundwater samples were collected from temporary wells at depths of 23 to 28 feet. Analytical results indicated low detections of petroleum in the lube oil range, SVOCs, and metals in two of the three groundwater samples and only low concentrations of SVOCs and metals in the third groundwater sample. All of the soil and groundwater sample results were below MTCA cleanup levels.

In December 2018, six environmental borings were advanced by WSDOT's contractor within the property boundaries of the Gas Station Parcel and Market Properties. Hart Crowser personnel were also on site during the drilling and sampling. Hart Crowser collected and screened split soil samples when sufficient soil volume was available. Soil samples were also collected from the drill cuttings when sufficient soil volume was not available from the split-spoon to split. The six borings were advanced to depths of 20 to 26 feet. Groundwater was noted in the six borings at depths of 15 to 20 feet. A total of 29 soil samples were collected and screened from the six borings. Elevated PID readings were noted in four (H-16-18, H-17-18, H-19-18, and H-20-18) of the six borings. No PID readings were noted in H-18-18 or H-21-18. One soil sample and one grab groundwater sample (from temporary wells) from each boring were submitted for chemical analysis (TPH-G, TPH-D, VOCs, SVOCs, Metals) by WSDOT's contractor. Two additional soil samples from H-16-18 and H-19-18 were submitted for chemical analysis. Hart Crowser also submitted 16 soil samples from the split and drill cutting soil samples from all 6 soil borings and one grab groundwater sample from H-16-18.

The highest Photoionization detector (PID) soil field screening readings by Hart Crowser were of the soil samples from boring H-16-18, which was located closest to the USTs in the Gas Station Parcel. All of the soil samples (5) analyzed in this boring (to a maximum depth of 26 feet) exceeded the MTCA Method A unrestricted cleanup levels for TPH-G and/or benzene.

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The second highest PID soil field screening readings on soil samples collected were from boring H-19-18, which is also in the Gas Station Parcel near the gasoline pumps in the northeast area of the Property. However, none of the three soil samples Hart Crowser analyzed had concentrations of TPH-G or benzene exceeding MTCA Method A unrestricted cleanup levels though WSDOT contractor's results indicated two of three soil samples analyzed had exceedances of TPH-G and benzene exceeding MTCA Method A unrestricted cleanup levels.

Boring H-17-18, also located in the north end of the Gas Station Parcel and near the gas station USTs, had lower PID readings though 2 of the 5 soil samples analyzed and had exceedances above MTCA Method A unrestricted cleanup levels for TPH-G and benzene in both Hart Crowser and WSDOT contractor's results.

The soil samples from boring H-18-18, located on the southerly side of the Gas Station Parcel adjacent of the Market, had no indications of petroleum impacts (e.g. no odors, no PID readings) during sampling. The one soil sample submitted for chemical analyses by Hart Crowser did not contain any detections of petroleum-related constituents above the laboratory limits and WSDOT's contractor indicated no exceedances of MTCA cleanup levels.

Two other borings (H-20-18 and H-21-18) were advanced southwest of the gas station USTs and west of the Market. Only one soil sample analyzed by Hart Crowser from these two borings had petroleum-related constituents above MTCA Method A unrestricted cleanup levels; HC-20-18 at a depth of approximately 10 feet had an exceedance of benzene. WSDOT's contractor also indicated an exceedance of MTCA cleanup levels for a soil sample at this depth. One grab groundwater sample that was collected and analyzed by Hart Crowser was from H-21-18. Low TPH-G and benzene concentrations were detected, but below MTCA Method A cleanup levels. WSDOT contractor's grab groundwater samples from all six borings indicated exceedances of TPH or benzene (or both) above MTCA Method cleanup levels.

### CONCLUSIONS

Based on the available data, soil contamination appears to be limited to the Gas Station Parcel, is not a significant threat to the Market on the Market Properties or surrounding area. It appears to be simple gasoline site with residual petroleum contamination in soil but limited or no free product. In addition, there is no evidence of soil contamination on the Market Properties that contains the Market and cell towers. The site can be remediated without demolishing or impacting the Market building or its operations. And, given the current data, a remediation plan under MTCA could also be conducted on the site without having to close the gas station. In addition, the adjacent and nearby parcels have been minimally affected and limited to areas north of the Gas Station Parcel. Based on the existing data, there has been no soil impacts to the residential areas to the northeast, east, south, and southwest or the Montlake community center and playfield to the southwest and groundwater impacts in these areas are extremely unlikely.

### RECOMMENDATIONS

We recommend installing permanent groundwater monitoring wells on the site to further characterize and monitor groundwater quality; conduct a vapor intrusion analysis per Ecology's current guidance; and evaluate preliminary MTCA-compliant remediation alternatives. Th preliminary remediation evaluation may also include additional soil and groundwater characterization to confirm the current data.

### LIMITATIONS

Work for this project was performed, and this report prepared, in accordance with generally accepted professional practices for the nature and conditions of the work completed in the same or similar localities, at the time the work was performed. It is intended for the exclusive use of Montlake LLC and Stelter Montlake LLC for specific application to the referenced property. This report is not meant to represent a legal opinion. No other warranty, express or implied, is made.

The MTCA cleanup levels included in this report are provided for comparison purposes only and are based on our understanding of cleanup levels required by Ecology for similar projects. They do not represent MTCA interpretations.

Please call if you have any questions regarding our work and this report, the presentation of the information, or the interpretation of the data.

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#### Table 1 - Identification of Soil Constituents of Potential Concern

Constituent	Max. detected conc.	MTCA Cleanup Level	Cleanup Level	Notos	Constituent of
Petroleum Hydrocarbons	(iiig/kg)	(iiig/kg)	Dasis	notes	Potential Concerns
	5600	20	Mathad A		Voc
		2000	Method A		No
TPH-Hoovy Oil	6000	2000	Method A		Vos
Aromatic Compounds	0000	2000	Method A		163
Benzene	1 /	0.03	Method A		Ves
Toluene	73	7	Method A		Ves
Ethylbenzne	17	6	Method A		Ves
Xylenes	80	9	Method A		Ves
Fuel Additives/Blending Comp	ounds (halgenated VOC	<u> </u>	Method A		163
1 2-Dichoroethane (EDC)		11/0.023	Method B/GWP		No
1.2-Dibromomethane (EDB)	ND	0.005	Method A		No
Nanhthalenes		0.000	Method //		
Naphthalene	11				
1-Methylnaphthalene	1.4			Cleanup level based on total of	
2-Methylnaphthalene	27	5	Method A	naphthalene and 1- and 2-	Yes
Total naphthalenes (calc'd)	15.1			methylnaphthalene	
Carcinogenic Polyaromatic Hy	drocarbons (cPAHs)	I			
Benzo(a)pyrene	0.02				Νο
Chrysene	0.29				No
Dibenzo(a.h)anthracene	ND			Cleanup level based on calculated toxicity equivalency factor (TEF) for	No
Indeno(1.2.3-cd)pyrene	0.013	0.1	Method A		No
Benzo(k)fluoranthene	ND			cPAHs (MTCA Table 708-2)	No
Benzo(a)anthracene	0.017			, , , , , , , , , , , , , , , , , , ,	No
Benzo(b)fluoranthene	0.02				No
Total cPAH (TEF) (calc'd)	0.0279				
Polychlorinated Biphenyls (PC	Bs)	L			
PCBs	ND	1	Method A	Cleanup level based on total PCBs	No
Metals					
Arsenic	ND	20	Method A		No
Barium	200	1600/1650	Method B/GWP		No
Cadmium	ND	2	Method A		No
Chromium	140	2000	Method A	Cleanup level based on trivalent Cr	No
Copper	46	3200/284	Method B/GWP		No
Lead	8.5	250	Method A		No
Mercury	ND	2	Method A		No
Nickel	69	1600/130	Method B/GWP		No
Selenium	ND	400/5.2	Method B/GWP		No
Silver	ND	400/13.6	Method B/GWP		No

Notes:

#### Shading indicates constituent of potential concern

ND = not detected

Constituents shown include those listed in MTCA Table 830-1 (Required Testing for Petroleum Releases) for which results are available.

Method A soil cleanup levels for unrestricted land uses shown where available; these are appropriate for sites undergoing routine cleanup actions or for sites with relatively few hazardous substances and site qualifies under MTCA for exclusion from simplified or site-specific terrestrial ecological evaluation. Subject site meets these criteria.

Method B cleaup levels (based on direct contact/ingestion and groundwater protection [GWP]) are shown where Method A level is unavailable. Method B levels are appropriate for all cleanup sites.

PCB results reflect analysis of individual Aroclors 1016, 1212 1232, 1242, 1248, 1254, 1260.

Data sources:

Phase II Environmental Site Assessment, State Route (SR) 520 Eastbound Off-Ramp to Montlake Vicinity, Seattle, Washington, December 8, 2016, Innovex Environmental Management.

Supplemental Limited Phase II Environmental Site Assessment, State Route (SR) 520 Eastbound Ramps to Montlake Vicinity, Seattle, Washington, February 28, 2018, Innovex Environmental Management.

Second Supplemental Limited Phase II Environmental Site Assessment, State Route 520 and East Montlake Place East Vicinity Properties, Seattle, Washington June 15, 2018, Innovex Environmental Management.

Third Supplemental Limited Phase II Environmental Site Assessment, 2625 East Montlake Place East, Seattle, Washington, January 16, 2019, Innovex Environmental Management.

#### Table 2 - Identification of Groundwater Constituents of Potential Concern

		MTCA			
	Max. detected conc.	Cleanup	Cleanup Level		Constituent of
Constituent	(ug/L)	Level	Basis	Notes	Potential Concern?
Petroleum Hydrocarbons					
TPH-Gasoline	110000	800	Method A		Possible (results suspect: high turbidity)
					Unlikely (not a soil CPOC and groundwater results
TPH-Diesel	690	500	Method A		suspect: high turbidity)
TPH-Heavy Oil	380	500	Method A		No
Aromatic Compounds					
Benzene	5300	5	Method A		Possible (results suspect: high turbidity)
Toluene	2000	1000	Method A		Possible (results suspect: high turbidity)
Ethylbenzne	4600	700	Method A		Possible (results suspect: high turbidity)
Xylenes	18600	1000	Method A		Possible (results suspect: high turbidity)
Fuel Additives/Blending Comp	ounds (halgenated VO	Cs)			
1,2-Dichoroethane (EDC)	19	5	Method A		Possible (results suspect: high turbidity)
1,2-Dibromomethane (EDB)	ND	0.01	Method A		No
Naphthalenes					
Naphthalene	970				
1-Methylnaphthalene	72	160	Method A	Cleanup level based on total of	Possible (results suspect: high turbidity)
2-Methylnaphthalene	150	100	Method A	naphthalene and 1- and 2-	r ossible (results suspect. high turblaity)
Total naphthalenes (calc'd)	1192			methylnaphthalene	
Carcinogenic Polyaromatic Hy	drocarbons (cPAHs)				
Benzo(a)pyrene	0.02				No
Chrysene	0.035				No
Dibenzo(a,h)anthracene	ND			Cleanup level based on	No
Indeno(1,2,3-cd)pyrene	0.017	0.1	Method A	calculated toxicity equivalency	No
Benzo(k)fluoranthene	ND	0.1	Mothod / (	factor (TEF) for cPAHs (MTCA	No
Benzo(a)anthracene	0.027			Table 708-2)	No
Benzo(b)fluoranthene	0.029				No
Total cPAH (TEF) (calc'd)	0.02765				
Polychlorinated Biphenyls (PC	Bs)				
PCBs	ND	1	Method A	Based on total PCBs	No
Metals (dissolved [lab filtered]	)				
Arsenic	32	5	Method A		No
Barium	150	3200	Method B		No
Cadmium	ND	5	Method A		No
Chromium	ND	50	Method A	Based on total Cr	No
Lead	1.7	15	Method A		No
Mercury	ND	2	Method A		No
Selenium	ND	80	Method B		No
Silver	ND	80	Method B		No

Notes:

Shading indicates possible constituent of potential concern

ND = not detected

NA = not analyzed

Constituents shown include those listed in MTCA Table 830-1 (Required Testing for Petroleum Releases) for which results are available.

Method A groundwater cleanup levels shown where available; these are appropriate for sites undergoing routine cleanup actions or for sites with relatively few hazardous substances and site qualifies under MTCA for exclusion from simplified or site-specific terrestrial ecological evaluation. Subject site meets these criteria.

Method B cleaup levels are shown where Method A level is unavailable. Method B levels are appropriate for all cleanup sites.

PCB results reflect analysis of individual Aroclors 1016, 1212 1232, 1242, 1248, 1254, 1260.

Groundwater samples were collected using pumps and bailers from undeveloped temporary well screens placed in sonic borings. Given fine-grained soil materials and in light of highly discordant filtered/unfiltered metals results we conclude samples were likely highly turbid and unfiltered metals are unsuitable for comparison to cleanup levels. Unfiltered TPH/organic results are also likely biased high and suitable only for "one-sided" comparison to cleanup levels.

Data sources:

Phase II Environmental Site Assessment, State Route (SR) 520 Eastbound Off-Ramp to Montlake Vicinity, Seattle, Washington, December 8, 2016, Innovex Environmental Management.

Supplemental Limited Phase II Environmental Site Assessment, State Route (SR) 520 Eastbound Ramps to Montlake Vicinity, Seattle, Washington, February 28, 2018, Innovex Environmental Management.

Second Supplemental Limited Phase II Environmental Site Assessment, State Route 520 and East Montlake Place East Vicinity Properties, Seattle, Washington June 15, 2018, Innovex Environmental Management.

Third Supplemental Limited Phase II Environmental Site Assessment, 2625 East Montlake Place East, Seattle, Washington, January 16, 2019, Innovex Environmental Management.

SS-1

HC-16-18 HC-16-18 HC-16-18 HC-16-18

SS-3

SS-2

MTCA

Method A

Sample ID

Sampling Date 12/3/2018 12/3/2018 12/3/2018 12/3/2018 12/3/2018 12/4/2018 12/4/2018 12/4/2018 12/6/2018 12/6/2018 Cleanup Level <sup>a</sup> Depth in Feet 5-6.5 11.5-13 15-16.5 20 25-26.5 10-11.5 15-16.5 20-21.5 24.5 15-16.5 TPH in ma/ka Diesel/Fuel oil 2000 ND ND ND ND ND ND ND ND 2000 ND ND ND ND ND ND ND ND Heavy oil 30/100<sup>c</sup> Gasoline 11 900 58 1600 41 44 9.3 ND 23 BTEX in mg/kg 0.096 Benzene 0.03 0.15 ND Toluene 7 ND ND ND Ethylbenzene 6 ND 0.49 ND **Xvlenes** 9 ND 0.82 ND Metals in mg/kg Arsenic (As) 20 1600<sup>b</sup> Barium (Ba) Cadmium (Cd) 2 19/2000<sup>d</sup> Chromium (Cr) 3200<sup>b</sup> Copper (Cu) Lead (Pb) 250 Mercury (Hg) 2 1600<sup>b</sup> Nickel (Ni) 400<sup>b</sup> Selenium (Se) 400<sup>b</sup> Silver (Ag) Zinc (Zn) Volatiles in mg/kg 1,2,4-Trimethylbenzene 2.3 2.1 31 1.6 0.46 0.86 1.3.5-Trimethylbenzene 2 0.48 11 0.43 0.13 0.26 Benzene 0.03 5 0.98 1.2 0.094 0.33 ND Ethylbenzene 6 34 2.8 15 0.65 0.17 0.19 Isopropylbenzene 5.1 0.25 1.5 0.059 0.061 ND Isopropyltoluene 1.1 0.053 0.57 0.17 ND ND Naphthalene 5 2.3 0.21 n-Butylbenzene 6.8 0.44 0.16 0.12 7.6 1.2 0.3 0.22 0.13 n-Propylbenzene 20 sec-Butylbenzene 2.4 0.14 0.79 ND ND ND Toluene 7 0.48 0.081 0.53 ND ND ND **Xvlenes** 9 51 2.2 0.36 0.78 1.8 2 Semivolatiles in mg/kg 1-Methylnaphthalene 0.63 ND ND 1.1 2-Methylnaphthalene 2.4 ND ND 1 Naphthalene 0.16 4.6 ND ND 5

SC-1

HC-16-18

SS-4

HC-17-18

SS-1

HC-17-18

SS-2

HC-17-18

SS-3

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HC-19-18

SS2

HC-18-18

SC3

Sample ID	MTCA	HC-19-18	HC-19-18	HC-20-18	HC-20-18	HC-21-18	HC-21-18	Innovex	Innovex	Innovex	Innovex
	Method A	SS3	SC1	SS1	SS3	SS1	SC3	H-11-18	H-12-18	H-13-18	H-14-18
Sampling Date	Cleanup	12/6/2018	12/6/2018	12/6/2018	12/6/2018	12/6/2018	12/6/2018	5/25/2018	5/17/2018	5/17/2018	5/26/2018
Depth in Feet	Level <sup>a</sup>	20-21.5	19.5	10-11.5	20-21.5	10-11.5	16.5	10	20	15	10
TDH in ma/ka						[					
	2000						ND				
	2000										
Heavy on	2000		ND	ND	ND	ND	ND		ND	ND	
Gasoline	30/100*	16	6.8	8.8	ND	ND		ND	ND	ND	ND
BTEX in mg/kg											
Benzene	0.03					ND					
loluene	7					ND					
Ethylbenzene	6					ND					
Xylenes	9					ND					
Metals in mg/kg											
Arsenic (As)	20							ND	ND	ND	ND
Barium (Ba)	1600 <sup>b</sup>							46	73	58	110
Cadmium (Cd)	2							ND	ND	ND	ND
Chromium (Cr)	19/2000 <sup>d</sup>							48	140	43	68
Copper (Cu)	3200 <sup>b</sup>										
Lead (Pb)	250							ND	ND	ND	ND
Mercury (Hg)	2							ND	ND	ND	ND
Nickel (Ni)	1600 <sup>b</sup>										
Selenium (Se)	400 <sup>b</sup>							ND	ND	ND	ND
Silver (Ag)	400 <sup>b</sup>							ND	ND	ND	ND
Zinc (Zn)											
Volatiles in mg/kg											
1,2,4-Trimethylbenzene		0.53	0.19	0.14	ND		ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene		0.21	0.17	0.14	ND		ND	ND	ND	ND	ND
Benzene	0.03	ND	ND	1.1	ND		ND	ND	ND	ND	ND
Ethylbenzene	6	0.15	0.068	0.34	ND		ND	ND	ND	ND	ND
Isopropylbenzene		0.064	0.057	0.059	ND			ND	ND	ND	ND
Isopropyltoluene								ND	ND	ND	ND
Naphthalene	5							ND	ND	ND	ND
n-Butylbenzene		0.23	0.18	0.18	ND		ND	ND	ND	ND	ND
n-Propylbenzene		0.14	0.11	0.25	ND		ND	ND	ND	ND	ND
sec-Butylbenzene								ND	ND	ND	ND
Toluene	7	ND	ND	1.1	ND		ND	ND	ND	ND	ND
Xylenes	9	0.65	0.21	0.15	ND		ND	ND	ND	ND	ND
Semivolatiles in mg/kg											
1-Methylnaphthalene								ND	ND	ND	ND
2-Methylnaphthalene								ND	ND	ND	ND
Naphthalene	5							ND	ND	ND	ND

Sample ID	MTCA	Innovex									
	Method A	H-15-18	H-15-18	H-16-18	H-16-18	H-16-18	H-17-18	H-18-18	H-19-18	H-19-18	H-19-18
Sampling Date	Cleanup	5/26/2018	5/26/2018	12/3/2018	12/3/2018	12/4/2018	12/4/2018	12/5/2018	12/6/2018	12/6/2018	12/6/2018
Depth in Feet	Level <sup>a</sup>	15	25	10	15	25	10	25	5	15	25
TPH in mg/kg											
Diesel/Fuel oil	2000	ND									
Heavy oil	2000	ND	ND	ND	ND	ND	ND	59	6000	82	ND
Gasoline	30/100 <sup>c</sup>	ND	ND	15	130	17	180	ND	3100	5600	ND
BTEX in mg/kg											
Benzene	0.03										
Toluene	7										
Ethylbenzene	6										
Xylenes	9										
Metals in mg/kg											
Arsenic (As)	20	ND									
Barium (Ba)	1600 <sup>b</sup>	50	35	200	92	48	110	56	100	76	57
Cadmium (Cd)	2	ND									
Chromium (Cr)	19/2000 <sup>d</sup>	37	25	81	63	35	66	120	35	53	49
Copper (Cu)	3200 <sup>b</sup>										
Lead (Pb)	250	ND	ND	8.5	ND	ND	ND	ND	13	8.2	6
Mercury (Hg)	2	ND									
Nickel (Ni)	1600 <sup>b</sup>										
Selenium (Se)	400 <sup>b</sup>	ND									
Silver (Ag)	400 <sup>b</sup>	ND									
Zinc (Zn)											
Volatiles in mg/kg											
1,2,4-Trimethylbenzene		ND	ND								
1,3,5-Trimethylbenzene		ND	ND								
Benzene	0.03	ND	ND	1.4	0.5	0.17	0.098	ND	0.27	1.3	0.005
Ethylbenzene	6	ND	ND	1.8	2.6	0.91	0.33	ND	2.7	17	0.023
Isopropylbenzene		ND	ND								
Isopropyltoluene		ND	ND								
Naphthalene	5	ND	ND	0.099	1.8	0.45	0.32	ND	4.4	11	0.0063
n-Butylbenzene		ND	ND								
n-Propylbenzene		ND	ND								
sec-Butylbenzene		ND	ND								
loluene	7	ND	7.3	0.017							
Xylenes	9	ND	ND	ND	3.6	2.34	ND	ND	23.8	80	0.123
Semivolatiles in mg/kg			ND								
	F			4 4	0.4	0.44	0.000		6.7	0.7	0.40
ivaphthalene	5	ND	ND	1.1	2.4	0.41	0.023	ND	6.7	3.7	0.46

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Sheet 4 of 7

Sample ID	MTCA	Innovex	Innovex	Innovex	Innovex	Innovex	Innovex	Innovex	Innovex	Innovex	Innovex
	Method A	H-20-18	H-21-18	H-21-18	H-1-16	H-2-16	H-3-16	H-3-16	H-3-16	H-4-16	H-4-16
Sampling Date	Cleanup	12/6/2018	12/6/2018	12/6/2018	10/6/2016	10/7/2016	10/7/2016	10/7/2016	10/7/2016	10/8/2016	10/8/2016
Depth in Feet	Level <sup>a</sup>	10	20	20	10	13.5	3	6	8.5	3	6
			Du	p of H-21-18	-20						
TPH in mg/kg											
Diesel/Fuel oil	2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Heavy oil	2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Gasoline	30/100 <sup>c</sup>	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BTEX in mg/kg											
Benzene	0.03										
Toluene	7										
Ethylbenzene	6										
Xylenes	9										
Metals in mg/kg											
Arsenic (As)	20	ND	ND	ND							
Barium (Ba)	1600 <sup>b</sup>	130	52	55							
Cadmium (Cd)	2	ND	ND	ND							
Chromium (Cr)	19/2000 <sup>d</sup>	58	52	52	36	37	28	27	29		
Copper (Cu)	3200 <sup>b</sup>				8.4	24	13	11	8.6		
Lead (Pb)	250	ND	ND	ND	ND	11	ND	ND	ND		
Mercury (Hg)	2	ND	ND	ND							
Nickel (Ni)	1600 <sup>b</sup>				27	36	33	30	24		
Selenium (Se)	400 <sup>b</sup>	ND	ND	ND							
Silver (Ag)	400 <sup>b</sup>	ND	ND	ND							
Zinc (Zn)					20	56	26	24	26		
Volatiles in mg/kg											
1,2,4-Trimethylbenzene											
1,3,5-Trimethylbenzene											
Benzene	0.03	0.93	ND	ND	ND	0.0053	0.0053	ND	0.038	ND	0.024
Ethylbenzene	6	0.034	ND	ND	ND	ND	ND	ND	0.005	ND	ND
Isopropylbenzene											
Isopropyltoluene											
Naphthalene	5	ND	ND	ND	ND	ND	ND	ND	ND		
n-Butylbenzene											
n-Propylbenzene											
sec-Butylbenzene											
Toluene	7	0.028	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes	9	0.0261	ND	ND	ND	ND	ND	ND	0.016	ND	ND
Semivolatiles in mg/kg											
1-Methylnaphthalene					ND	ND			0.013		
2-Methylnaphthalene					ND	ND			0.018		
Naphthalene	5	ND	ND	ND	ND	0.0096			ND		

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Sample ID	MTCA	Innovex									
	Method A	H-4-16	H-4-16	H-4-16	H-4-16	H-4-16	H-4-16	H-5-16	H-5-16	H-5-16	H-5-16
Sampling Date	Cleanup	10/8/2016	10/8/2016	10/8/2016	10/8/2016	10/8/2016	10/8/2016	10/8/2016	10/8/2016	10/8/2016	10/8/2016
Depth in Feet	Level <sup>a</sup>	8.5	11	16	18.5	19.9	25.4	3	6	8.5	11
TPH in mg/kg											
Diesel/Fuel oil	2000	ND									
Heavy oil	2000	ND									
Gasoline	30/100 <sup>c</sup>	ND	ND	69	30	99	ND	ND	ND	ND	ND
BTEX in mg/kg											
Benzene	0.03										
Toluene	7										
Ethylbenzene	6										
Xylenes	9										
Metals in mg/kg											
Arsenic (As)	20										
Barium (Ba)	1600 <sup>b</sup>										
Cadmium (Cd)	2										
Chromium (Cr)	19/2000 <sup>d</sup>			28							
Copper (Cu)	3200 <sup>b</sup>			11							
Lead (Pb)	250			ND							
Mercury (Hg)	2										
Nickel (Ni)	1600 <sup>b</sup>			30							
Selenium (Se)	400 <sup>b</sup>										
Silver (Ag)	400 <sup>b</sup>										
Zinc (Zn)				24							
Volatiles in mg/kg											
1,2,4-Trimethylbenzene											
1,3,5-Trimethylbenzene											
Benzene	0.03	0.045	0.026	ND	0.13	0.35	0.092				
Ethylbenzene	6	ND	ND	0.55	0.76	1.4	ND				
Isopropylbenzene											
Isopropyltoluene											
Naphthalene	5			ND							
n-Butylbenzene											
n-Propylbenzene											
sec-Butylbenzene											
Toluene	7	ND	ND	ND	0.074	0.09	0.064				
Xylenes	9	ND	ND	1.89	2.28	2.79	0.088				
Semivolatiles in mg/kg											
1-Methylnaphthalene				0.37							
2-Methylnaphthalene				0.74							
Naphthalene	5			0.59							

Sample ID	MTCA	Innovex	Innovex	Innovex	Innovex	Innovex	Innovex	Innovex	Innovex	Innovex
	Method A	H-5-16	H-5-16	H-5-16	H-6-17	H-9-17	H-10-17	H-8-17	H-7-17	H-7-17
Sampling Date	Cleanup	10/8/2016	10/8/2016	10/8/2016	10/22/2017	10/21/2017	10/22/2017	10/24/2017	10/23/2017	10/23/2017
Depth in Feet	Level <sup>a</sup>	13.5	16	18.5	15	15	10	5	10	20
TPH in mg/kg										
Diesel/Fuel oil	2000	ND	ND	ND	ND	ND	ND	ND	ND	ND
Heavy oil	2000	ND	ND	ND	ND	ND	ND	ND	ND	ND
Gasoline	30/100 <sup>c</sup>	ND	ND	ND	ND	ND	ND	ND	ND	ND
BTEX in mg/kg										
Benzene	0.03									
Toluene	7									
Ethylbenzene	6									
Xylenes	9									
Metals in mg/kg										
Arsenic (As)	20				ND	ND	ND	ND	ND	ND
Barium (Ba)	1600 <sup>b</sup>				47	63	35	69	59	42
Cadmium (Cd)	2				ND	ND	ND	ND	ND	ND
Chromium (Cr)	19/2000 <sup>d</sup>	64			33	37	27	35	37	35
Copper (Cu)	3200 <sup>b</sup>	46								
Lead (Pb)	250	ND			ND	ND	ND	ND	6	ND
Mercury (Hg)	2				ND	ND	ND	ND	ND	ND
Nickel (Ni)	1600 <sup>b</sup>	69								
Selenium (Se)	400 <sup>b</sup>				ND	ND	ND	ND	ND	ND
Silver (Ag)	400 <sup>b</sup>				ND	ND	ND	ND	ND	ND
Zinc (Zn)		69								
Volatiles in mg/kg										
1,2,4-Trimethylbenzene					ND	ND	ND	ND	ND	0.0015
1,3,5-Trimethylbenzene					ND	ND	ND	ND	ND	ND
Benzene	0.03	ND			ND	ND	ND	ND	ND	0.0096
Ethylbenzene	6	0.089			ND	ND	ND	ND	ND	0.0022
Isopropylbenzene					ND	ND	ND	ND	ND	0.0012
Isopropyltoluene					ND	ND	ND	ND	ND	ND
Naphthalene	5	0.64			ND	ND	ND	ND	ND	0.0027
n-Butylbenzene					ND	ND	ND	ND	ND	ND
n-Propylbenzene					ND	ND	ND	ND	ND	0.0035
sec-Butylbenzene					ND	ND	ND	ND	ND	ND
Toluene	7	ND			ND	ND	ND	ND	ND	ND
Xylenes	9	ND			ND	ND	ND	ND	ND	0.0024
Semivolatiles in mg/kg										
1-Methylnaphthalene		0.037								
2-Methylnaphthalene		0.35								
Naphthalene	5	0.039								

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Sample ID	MTCA
	Method A
Sampling Date	Cleanup
Depth in Feet	Level <sup>a</sup>
TPH in mg/kg	
Diesel/Fuel oil	2000
Heavy oil	2000
Gasoline	30/100 <sup>c</sup>
BTEX in mg/kg	
Benzene	0.03
Toluene	7
Ethylbenzene	6
Xylenes	9
Metals in mg/kg	
Arsenic (As)	20
Barium (Ba)	1600 <sup>b</sup>
Cadmium (Cd)	2
Chromium (Cr)	19/2000 <sup>d</sup>
Copper (Cu)	3200 <sup>b</sup>
Lead (Pb)	250
Mercury (Hg)	2
Nickel (Ni)	1600 <sup>b</sup>
Selenium (Se)	400 <sup>b</sup>
Silver (Ag)	400 <sup>b</sup>
Zinc (Zn)	
Volatiles in mg/kg	
1,2,4-Trimethylbenzene	
1,3,5-Trimethylbenzene	
Benzene	0.03
Ethylbenzene	6
Isopropylbenzene	
Isopropyltoluene	
Naphthalene	5
n-Butylbenzene	
Sec-Bulyidenzerie	7
Yulopos	/
Semivolatiles in ma/ka	9
1-Methylnanhthalene	
2-Methylnaphthalene	
Naphthalene	5
	<u> </u>

U = Not detected at reporting limit indicated.

ND = Not detected.

a. Method A soil cleanup level for unrestricted land use.

b. Method B Cleanup Level.

c. 30 mg/kg if benzene is present, otherwise, 100 mg/kg.

d. 19 mg/kg as Chromium VI/2000 mg/kg as Chromium III.

#### Table 4 - Analytical Results for Groundwater Samples - Detects Only

Source	MTCA	Hart Crowser	Innovex	Innovex	Innovex	Innovex	Innovex	Innovex	Innovex	Innovex
Sample ID	Method A	H-21-18	H-16-18-GW	H-17-18-GW	H-18-18-GW	H-19-18-GW	H-20-18-GW	H-21-18-GW	H-22-18-GW	H-3-16
Sampling Date	Cleanup Level	12/6/2018	12/4/2018	12/4/2018	12/5/2018	12/6/2018	12/6/2018	12/6/2018 Du	12/6/2018 p of H-21-18-0	10/7/2016 W
Total Susp. Solids in mg/L		19000								
TPH in mg/L										
Diesel/Fuel oil	0.5	ND	ND	ND	ND	ND	0.69	ND		
Heavy oil	0.5	ND	0.00084	ND	ND	0.38	ND	ND		
Gasoline	0.8/1.0 <sup>a</sup>	0.59	76	8.7	1.3	110	0.59	1.7	1.8	
Dissolved Metals in mg/L										
Arsenic (As)	0.005	1.05	0.032	0.012	ND	0.0039	0.032	ND		3
Barium (Ba)	3.2 <sup>b</sup>	1.04	0.15	0.066	ND	0.037	0.079	ND		
Cadmium (Cd)	0.005	0.969	ND	ND	ND	ND	ND	ND		
Chromium (Cr)	0.05	0.9941	ND	ND	ND	ND	ND	ND		
Lead (Pb)	0.015	0.92	0.0017	ND	ND	0.0012	ND	ND		2.5
Mercury (Hg) (7470A)	0.002	0.00006	ND	ND	ND	ND	ND	ND		
Selenium (Se)	0.008 <sup>b</sup>	1.06	ND	ND	ND	ND	ND	ND		
Silver (Ag)	0.008 <sup>b</sup>	0.842	ND	ND	ND	ND	ND	ND		
Total Metals in mg/L										
Arsenic (As)	0.005		0.12	0.18	0.17	0.57	0.58	0.052		
Barium (Ba)	3.2 <sup>b</sup>		1.3	4.1	3.6	9.8	11	0.82		
Cadmium (Cd)	0.005		ND	0.0079	0.0059	0.012	0.0082	ND		
Chromium (Cr)	0.05		0.43	2.5	2.1	4.8	4.5	0.42		
Lead (Pb)	0.015		0.11	0.17	0.15	0.8	0.45	0.034		
Mercury (Hg) (7470A)	0.002		0.00053	0.0022	0.0018	0.0018	0.0006	ND		
Selenium (Se)	0.008 <sup>b</sup>		ND	0.059	0.016	0.076	0.046	ND		
Silver (Ag)	0.008 <sup>b</sup>		ND	ND	ND	ND	ND	ND		
Volatiles in µg/L										
1,2,4-Trichlorobenzene		6.9	ND	ND	ND	ND	ND	ND	ND	
1,2,4-Trimethylbenzene		17	3300	370	63	7000	4.5	100	93	
1,2-Dichloroethane (EDC)	5	ND	ND	ND	ND	ND	19	ND	ND	
1,3,5-Trimethylbenzene		4.6	910	100	16	2100	1.8	23	21	
Benzene	5	4.3	5300	2400	32	760	450	30	28	7.4
cis-1,3-Dichloropropene		7.3	ND	ND	ND	ND	ND	ND	ND	
Ethylbenzene	700	11	4600	520	84	2200	6.2	81	78	
Isopropylbenzene		1.1	170	43	4	420	15	7.7	7	
n-Butylbenzene			87	17	1.2	520	2.1	ND	ND	
n-Propylbenzene		2.2	540	110	9.9	830	30	15	14	
Toluene	1000		510	70	10	2000	7.5	26	24	
Xylenes	1000	45	18600	1/10	321	12000	16.6	297	284	
Semivolatiles in µg/L		0.10	70	10			1.0	4 -		
		0.12	/2	16	4	21	1.8	1.5		
		0.1	150	27	6./	48 ND	2.5	2.4		
	160	ND 0.52	570					24		
марнинанне	100	0.02	570	30	33	200	1.1	0.0	H	art Crowser

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#### Table 4 - Analytical Results for Groundwater Samples - Detects Only

Source	MICA	Innovex	Innovex	Innovex
Sample ID	Method A	H-11-18	H-14-18	H-15-18
Sampling Date	Cleanup Level	5/26/2017	5/26/2017	5/26/2017
Total Susp. Solids in mg/L				
TPH in mg/L				
Diesel/Fuel oil	0.5	ND	ND	ND
Heavy oil	0.5	0.00056	0.00098	ND
Gasoline	0.8/1.0 <sup>a</sup>	ND	ND	ND
Dissolved Metals in mg/L				
Arsenic (As)	0.005			
Barium (Ba)	3.2 <sup>b</sup>			
Cadmium (Cd)	0.005			
Chromium (Cr)	0.05			
Lead (Pb)	0.015			
Mercury (Hg) (7470A)	0.002			
Selenium (Se)	0.008 <sup>b</sup>			
Silver (Ag)	0.008 <sup>b</sup>			
Total Metals in mg/L				
Arsenic (As)	0.005	0.48	0.23	0.16
Barium (Ba)	3.2 <sup>b</sup>	14	8.8	4.6
Cadmium (Cd)	0.005	0.013	ND	ND
Chromium (Cr)	0.05	5.9	2.4	1.8
Lead (Pb)	0.015	0.51	0.22	0.18
Mercury (Hg) (7470A)	0.002	ND	ND	ND
Selenium (Se)	0.008 <sup>b</sup>	0.023	0.012	0.013
Silver (Ag)	0.008 <sup>b</sup>	ND	ND	ND
Volatiles in µg/L				
1,2,4-Trichlorobenzene		ND	ND	ND
1,2,4-Trimethylbenzene		ND	ND	ND
1,2-Dichloroethane (EDC)	5	ND	ND	ND
1,3,5-Trimethylbenzene		ND	ND	ND
Benzene	5	ND	ND	ND
cis-1,3-Dichloropropene		ND	ND	ND
Ethylbenzene	700	ND	ND	ND
Isopropylbenzene		ND	ND	ND
n-Butylbenzene		ND	ND	ND
n-Propylbenzene		ND	ND	ND
Toluene	1000	ND	ND	ND
Xylenes	1000	ND	ND	ND
Semivolatiles in µg/L			ND	ND
1-Methylnaphthalene			ND	ND
	160	2.7		
ivapnthalene	160	ND	ND	ND

U = Not detected at reporting limit indicated.

ND = Not detected.

a. 0.8 mg/L when benzene is present; 1.0 when benzene is not detected.

b. Method B Cleanup Level.



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HARTCROWSER

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# **APPENDIX A**

Chemical Data Quality Review and Laboratory Report: Advanced Analytical, Inc. December 2018

# APPENDIX A CHEMICAL DATA QUALITY REVIEW AND LABORATORY REPORTS

### **Chemical Data Quality Review**

Between December 3 and 6, 2018, 28 soil samples were collected, and on December 7, 2018, one groundwater sample was collected. The samples were submitted to Advanced Analytical Laboratory (AAL), in Redmond, Washington, for chemical analysis. The laboratory reported results as Job No. C81207-2. AAL subcontracted the water sample to AmTest Laboratories (AmTest) in Kirkland, Washington for dissolved metals analysis. AmTest reported results as 18-A021764.

Selected soil samples were analyzed for one or more of the following:

- Total petroleum hydrocarbons as diesel- and heavy-oil-range organics (TPH-D and TPD-O) by Washington State Department of Ecology (Ecology) method NWTPH-Dx;
- Total petroleum hydrocarbons as gasoline-range organics (TPH-G) by Ecology method NWTPH-Gx;
- Benzene, toluene, ethylbenzene, and total xylenes (BTEX) by EPA Method 8021B;
- Semivolatile organic compounds (SVOCs) by EPA Method 8270C;
- Volatile organic compounds (VOCs) by EPA Method 8260B; and
- Percent moisture by Standard Method (SM) 2540B.

The water sample was analyzed for the following:

- VOCs by EPA Method 8260B;
- TPH-D and TPH-O by Ecology method NWTPH-Dx;
- TPH-G by Ecology method NWTPH-Gx;
- SVOCs by EPA Method 8270;
- Total Suspended Solids (TSS) by EPA Method 160.2;
- Dissolved metals (arsenic, barium, cadmium, chromium, lead, selenium, and silver) by EPA Method 200.7; and
- Dissolved mercury by EPA Method 245.1.

The laboratories performed ongoing quality assurance/quality control (QA/QC) reviews. Hart Crowser reviewed summary reports to check that they met data quality objectives for the project.

The following criteria were evaluated during the standard data quality review process:

- Holding times;
- Reporting limits;
- Method blanks;
- Surrogate recoveries;
- Laboratory duplicate relative percent differences (RPDs);
- Laboratory Control Samples (LCS) recoveries;



- Standard Reference Material (SRM) recoveries; and
- Matrix spike/matrix spike duplicate (MS/MSD) recoveries and RPDs.

The data were determined to be acceptable for use without qualification; the complete laboratory report is presented at the end of this appendix. The data review is summarized below.

# **Sample Receiving Notes**

**C81207-2.** Samples H-17-18,SS2, H-17-18,SC1, H-17-18,SC2, H-18-18,SS1, H-18-18,SC1, H-18-18,SS2, H-18-18,SC2, H-19-18,SS1, H-20-18,SC1, H-20-18,SS2, H-20-18,SC2, H-21-18,SC1, and H-21-18,SC2 were placed on hold and not analyzed. Sample H-18-18,SC3 was marked for TPH-G and TPH-G/BTEX on the chain-of-custody (COC). The sample was analyzed and reported for TPH-G/BTEX.

18-A021764. The sample was filtered at the laboratory for dissolved metals analysis.

### **Soil Results**

#### TPH-D and TPH-O by NWTPH-Dx

Holding times and reporting limits were acceptable. No method blank contamination was detected. Surrogate recoveries were within laboratory control limits. The laboratory duplicate RPDs were not applicable as the sample and duplicate results were below the reporting limit.

#### TPH-G and BTEX by NWTPH-Gx/EPA 8021B

Holding times and reporting limits were acceptable. No method blank contamination was detected. LCS recoveries were within laboratory control limits. MS/MSD recoveries and RPDs were within laboratory control limits. The laboratory duplicate RPDs were not applicable, as the sample and duplicate results were below the reporting limit.

Surrogate recoveries were within laboratory control limits with the following exceptions:

H-16-18,SS2 and H-16-18,SC1: The surrogates were not reported due to coelution with sample peaks.
 High concentrations of TPH-G were present in the samples, and sample results were not qualified.

#### VOCs by EPA 8260B

Holding times and reporting limits were acceptable. No method blank contamination was detected. LCS and surrogate recoveries were within laboratory control limits. MS/MSD recoveries and RPDs were within laboratory control limits.

#### SVOCs by EPA 8270

Holding times and reporting limits were acceptable. No method blank contamination was detected. LCS recoveries were within laboratory control limits. MS/MSD recoveries and RPDs were within laboratory control limits.

Surrogate recoveries were within laboratory control limits with the following exceptions:

H-16-18,SS2 and H-16-18,SC1: The recoveries for the surrogate Nitrobenzene-d5 were not reported due to matrix interferences. The recoveries for the remaining surrogates were within control, and sample results were not qualified.

#### **Percent Moisture**

Holding times and reporting limits were acceptable.

### Water Results

#### TPH-G by NWTPH-Gx

Holding times and reporting limits were acceptable. No method blank contamination was detected. Surrogate recoveries were within laboratory control limits. The laboratory duplicate RPDs were within control limits.

#### TPH-D and TPH-O by NWTPH-Dx

Holding times and reporting limits were acceptable. No method blank contamination was detected. Surrogate recoveries were within laboratory control limits. The laboratory duplicate RPDs were not applicable, as the sample and duplicate results were below the reporting limit.

#### SVOCs by EPA 8270

Holding times and reporting limits were acceptable. No method blank contamination was detected. LCS and surrogate recoveries were within laboratory control limits. MS/MSD recoveries and RPDs were within laboratory control limits.

#### Dissolved Metals by EPA 200.7

Holding times and reporting limits were acceptable. SRM recoveries were within control limits. MS/MSD recoveries and RPDs were within method control limits.

The method blank contained detections for dissolved silver, barium, cadmium, and chromium above the detection limits. The results for those metals in the associated sample, H-21-18,H1 were greater than ten times the amount in the method blank, and no results were qualified.

#### Dissolved Mercury by EPA 245.1

Holding times and reporting limits were acceptable. No method blank contamination was detected. SRM and MS recoveries were within control limits. The laboratory duplicate RPDs were within control limits.

#### VOCs by EPA 8260

Holding times and reporting limits were acceptable. No method blank contamination was detected. LCS and surrogate recoveries were within laboratory control limits. MS/MSD recoveries and RPDs were within laboratory control limits.

#### TSS by EPA 160.2

Holding times and reporting limits were acceptable.

Laboratory Report



Environmental Testing Laboratory

December 26, 2018

Julie Wukelic Hart Crowser, Inc. 3131 Elliott Avenue, Suite 600 Seattle, WA 98121

Dear Ms. Wukelic:

Please find enclosed the analytical data report for the *Montlake (WSDOT)* 19426-00 (C81207-2) Project.

Samples were received on *December 07, 2018*. The results of the analyses are presented in the attached tables. Applicable reporting limits, QA/QC data and data qualifiers are included. A copy of the chain-of-custody and an invoice for the work is also enclosed.

ADVANCED ANALYTICAL LABORATORY appreciates the opportunity to provide analytical services for this project. Should there be any questions regarding this report, please contact me at (425) 702-8571.

It was a pleasure working with you, and we are looking forward to the next opportunity to work together.

Sincerely,

. Ivanov

Val G. Ivanov, Ph.D. Laboratory Manager

4078 148 Ave NE ■ Redmond, WA 98052 425.702-8571 *E-mail: aachemlab@yahoo.com* 

This report is issued solely for the use of the person or company to whom it is addressed. Any use, copying or disclosure other than by the intended recipient is unauthorized.
AAL Job Number: Client: Project Manager: Client Project Name: Client Project Number: Date received: C81207-2 Hart Crowser, Inc. Julie Wukelic Montlake (WSDOT) 19426-00 12/07/18

AAL Job Number:	C81207-2
Client:	Hart Crowser, Inc.
Project Manager:	Julie Wukelic
Client Project Name:	Montlake (WSDOT)
Client Project Number:	19426-00
Date received:	12/07/18

8260B, μg/kg		MTH BLK	LCS	H-16-18,SS2	H-16-18,SS3
Matrix	Soil	Soil	Soil	Soil	Soil
Date extracted	Reporting	12/08/18	12/08/18	12/08/18	12/08/18
Date analyzed	Limits	12/08/18	12/08/18	12/08/18	12/08/18
MTBE	100	nd		nd	nd
Dichlorodifluoromethane	50	nd		nd	nd
Chloromethane	50	nd		nd	nd
Vinyl chloride	50	nd		nd	nd
Bromomethane	50	nd		nd	nd
Chloroethane	50	nd		nd	nd
Trichlorofluoromethane	50	nd		nd	nd
1,1-Dichloroethene	50	nd		nd	nd
Methylene chloride	20	nd		nd	nd
trans-1.2-Dichloroethene	50	nd		nd	nd
1.1-Dichloroethane	50	nd		nd	nd
2.2-Dichloropropane	50	nd		nd	nd
cis-1.2-Dichloroethene	50	nd		nd	nd
Chloroform	50	nd		nd	nd
1 1 1-Trichloroethane	50	nd		nd	nd
Carbontetrachloride	50	nd		nd	nd
1 1-Dichloropropene	50	nd		nd	nd
Benzene	20	nd	120%	5 000	980
1 2-Dichloroethane(EDC)	20	nd	12070	nd	nd
Trichloroethene	20	nd	80%	nd	nd
1 2-Dichloropropane	50	nd	0070	nd	nd
Dibromomethane	50	nd		nd	nd
Bromodichloromethane	50	nd		nd	nd
cis_1 3-Dichloropropene	50	nd		nd	nd
Toluene	50	nd	01%	/80	81
trans 1.3 Dichloropropopo	50	nd	5170	00+ ba	10 ba
1 1 2 Trichloroothano	50	nu		nu	nu
Totrachloroothono	50	nd		nu	nu
1 2 Dichloropropapa	50	nu		nu	nu
Dibromochloromothono	30	nu		nu	nu
1 2 Dibromochioromethane	20	nu		nu	nu
Chlorobonzono	5	nu	050/	nu	nu
	50	nu	95%	nu	nu
	50	nu		11U 24.000	2 200
Ethylbenzene	50	na		34,000	2,800
Aylenes Sture e s	50	na		1,800	2,000
Styrene	50	na		na	na
Bromotorm	50	na		na F 100	na
Isopropylbenzene	50	nd		5,100	250
1,2,3-Trichloropropane	50	nd		nd	nd
Bromobenzene	50	nd		nd	nd
1,1,2,2-Tetrachloroethane	50	nd		nd	nd
n-Propylbenzene	50	nd		20,000	1,200
2-Chlorotoluene	50	nd		nd	nd
4-Chlorotoluene	50	nd		nd	nd
1,3,5-Trimethylbenzene	50	nd		2,000	480
tert-Butylbenzene	50	nd		nd	nd

AAL Job Number:	C81207-2
Client:	Hart Crowser, Inc.
Project Manager:	Julie Wukelic
Client Project Name:	Montlake (WSDOT)
Client Project Number:	19426-00
Date received:	12/07/18

8260B, μg/kg		MTH BLK	LCS	H-16-18,SS2	H-16-18,SS3
Matrix	Soil	Soil	Soil	Soil	Soil
Date extracted	Reporting	12/08/18	12/08/18	12/08/18	12/08/18
Date analyzed	Limits	12/08/18	12/08/18	12/08/18	12/08/18
1,2,4-Trimethylbenzene	50	nd		2,300	2,100
sec-Butylbenzene	50	nd		2,400	140
1,3-Dichlorobenzene	50	nd		nd	nd
Isopropyltoluene	50	nd		1,100	53
1,4-Dichlorobenzene	50	nd		nd	nd
1,2-Dichlorobenzene	50	nd		nd	nd
n-Butylbenzene	50	nd		6,800	440
1,2-Dibromo-3-Chloropropane	50	nd		nd	nd
1,2,4-Trichlorobenzene	50	nd		nd	nd
Hexachloro-1,3-butadiene	50	nd		nd	nd
1,2,3-Trichlorobenzene	50	nd		nd	nd
*-instrument detection limits					
Surrogate recoveries					

Carrogate recoveries				
Dibromofluoromethane	86%	95%	84%	81%
Toluene-d8	92%	78%	104%	82%
1,2-Dichloroethane-d4	104%	103%	113%	101%
4-Bromofluorobenzene	96%	101%	126%	99%

Data Qualifiers and Analytical Comments nd - not detected at listed reporting limits M-matrix interference C - coelution with sample peaks Acceptable Recovery limits: 70% TO 130% Acceptable RPD limit: 30%

AAL Job Number:	C81207-2
Client:	Hart Crowser, Inc.
Project Manager:	Julie Wukelic
Client Project Name:	Montlake (WSDOT)
Client Project Number:	19426-00
Date received:	12/07/18

8260B, μg/kg		H-16-18,SC1	H-17-18,SS1	H-17-18,SS3	H-19-18,SS2
Matrix	Soil	Soil	Soil	Soil	Soil
Date extracted	Reporting	12/08/18	12/08/18	12/08/18	12/08/18
Date analyzed	Limits	12/08/18	12/08/18	12/08/18	12/08/18
¥					
MTBE	100	nd	nd	nd	nd
Dichlorodifluoromethane	50	nd	nd	nd	nd
Chloromethane	50	nd	nd	nd	nd
Vinyl chloride	50	nd	nd	nd	nd
Bromomethane	50	nd	nd	nd	nd
Chloroethane	50	nd	nd	nd	nd
Trichlorofluoromethane	50	nd	nd	nd	nd
1.1-Dichloroethene	50	nd	nd	nd	nd
Methylene chloride	20	nd	nd	nd	nd
trans-1 2-Dichloroethene	50	nd	nd	nd	nd
1 1-Dichloroethane	50	nd	nd	nd	nd
2 2-Dichloropropage	50	nd	nd	nd	nd
cis-1 2-Dichloroethene	50	nd	nd	nd	nd
Chloroform	50	nd	nd	nd	nd
1 1 1-Trichloroethane	50	nd	nd	nd	nd
Carbontetrachloride	50	nd	nd	nd	nd
	50	nd	nd	nd	nd
Ronzono	20	1 200	04	220	nd
1.2 Dichloroothano(EDC)	20	1,200 nd	94 nd	550 nd	nu
Trichlereethene	20	nu	nu	nu	nu
	20	nu nd	nu	nu	nu
Dibromono athono	50	nu nd	nu nd	nu nd	nu ad
Dibromomethane	50	na	na	na	na
Bromodicnioromethane	50	nd	na	na	nd
cis-1,3-Dicnioropropene	50	na	na	nd	nd
loiuene	50	530	na	nd	nd
trans-1,3-Dichloropropene	50	na	nd	nd	na
1,1,2-Irichloroethane	50	nd	nd	nd	nd
letrachloroethene	50	nd	nd	nd	nd
1,3-Dichloropropane	50	nd	nd	nd	nd
Dibromochloromethane	20	nd	nd	nd	nd
1,2-Dibromoethane (EDB)*	5	nd	nd	nd	nd
Chlorobenzene	50	nd	nd	nd	nd
1,1,1,2-Tetrachloroethane	50	nd	nd	nd	nd
Ethylbenzene	50	15,000	650	170	190
Xylenes	50	51,000	2,200	360	780
Styrene	50	nd	nd	nd	nd
Bromoform	50	nd	nd	nd	nd
Isopropylbenzene	50	1,500	59	61	nd
1,2,3-Trichloropropane	50	nd	nd	nd	nd
Bromobenzene	50	nd	nd	nd	nd
1,1,2,2-Tetrachloroethane	50	nd	nd	nd	nd
n-Propylbenzene	50	7,600	300	220	130
2-Chlorotoluene	50	nd	nd	nd	nd
4-Chlorotoluene	50	nd	nd	nd	nd
1,3,5-Trimethylbenzene	50	11,000	430	130	260
tert-Butylbenzene	50	nd	nd	nd	nd

AAL Job Number:	C81207-2
Client:	Hart Crowser, Inc.
Project Manager:	Julie Wukelic
Client Project Name:	Montlake (WSDOT)
Client Project Number:	19426-00
Date received:	12/07/18

8260B, µg/kg		H-16-18,SC1	H-17-18,SS1	H-17-18,SS3	H-19-18,SS2
Matrix	Soil	Soil	Soil	Soil	Soil
Date extracted	Reporting	12/08/18	12/08/18	12/08/18	12/08/18
Date analyzed	Limits	12/08/18	12/08/18	12/08/18	12/08/18
1,2,4-Trimethylbenzene	50	31,000	1,600	460	860
sec-Butylbenzene	50	790	nd	nd	nd
1,3-Dichlorobenzene	50	nd	nd	nd	nd
Isopropyltoluene	50	570	170	nd	nd
1,4-Dichlorobenzene	50	nd	nd	nd	nd
1,2-Dichlorobenzene	50	nd	nd	nd	nd
n-Butylbenzene	50	2,300	210	160	120
1,2-Dibromo-3-Chloropropane	50	nd	nd	nd	nd
1,2,4-Trichlorobenzene	50	nd	nd	nd	nd
Hexachloro-1,3-butadiene	50	nd	nd	nd	nd
1,2,3-Trichlorobenzene	50	nd	nd	nd	nd
*-instrument detection limits					
Surrogate recoveries					
Dibromofluoromethane		82%	81%	85%	82%
Toluene-d8		89%	86%	85%	83%
1,2-Dichloroethane-d4		103%	106%	109%	105%
4-Bromofluorobenzene		122%	97%	104%	104%

Data Qualifiers and Analytical Comments nd - not detected at listed reporting limits M-matrix interference C - coelution with sample peaks Acceptable Recovery limits: 70% TO 130% Acceptable RPD limit: 30%

AAL Job Number:	C81207-2
Client:	Hart Crowser, Inc.
Project Manager:	Julie Wukelic
Client Project Name:	Montlake (WSDOT)
Client Project Number:	19426-00
Date received:	12/07/18

8260B, μg/kg		H-19-18,SS3	H-19-18,SC1	H-20-18,SS1	H-20-18,SS3
Matrix	Soil	Soil	Soil	Soil	Soil
Date extracted	Reporting	12/08/18	12/08/18	12/08/18	12/08/18
Date analyzed	Limits	12/08/18	12/08/18	12/08/18	12/08/18
ē					
MTBE	100	nd	nd	nd	nd
Dichlorodifluoromethane	50	nd	nd	nd	nd
Chloromethane	50	nd	nd	nd	nd
Vinyl chloride	50	nd	nd	nd	nd
Bromomethane	50	nd	nd	nd	nd
Chloroethane	50	nd	nd	nd	nd
Trichlorofluoromethane	50	nd	nd	nd	nd
1.1-Dichloroethene	50	nd	nd	nd	nd
Methylene chloride	20	nd	nd	nd	nd
trans-1.2-Dichloroethene	50	nd	nd	nd	nd
1.1-Dichloroethane	50	nd	nd	nd	nd
2 2-Dichloropropane	50	nd	nd	nd	nd
cis-1 2-Dichloroethene	50	nd	nd	nd	nd
Chloroform	50	nd	nd	nd	nd
1 1 1-Trichloroethane	50	nd	nd	nd	nd
Carbontetrachloride	50	nd	nd	nd	nd
1 1-Dichloropropene	50	nd	nd	nd	nd
Benzene	20	nd	nd	1 100	nd
1 2-Dichloroethane(EDC)	20	nd	nd	1,100 nd	nd
Trichloroethene	20	nd	nd	nd	nd
1 2-Dichloropropane	50	nd	nd	nd	nd
Dibromomethane	50	nd	nd	nd	nd
Bromodichloromethane	50	nd	nd	nd	nd
	50	nd	nd	nd	nd
Toluono	50	nu	nu	110	nu
trana 1.2 Diablarantanana	50	nu	nu	00 nd	nu
1 1 2 Trichloroothono	50	nu	nu	nu	nu
Totrachloroothono	50	nu	nu	nu	nu
	50	nu	nu	nu	nu
Dibromochloromothono	50	nu	nu	nu	nu
1.2 Dibromosthone (EDB)*	20	nu	nu	nu	nu
	5	nu	nu	nu	nu ad
	50	nu	nu	nu	nu
T, T, T, Z-Tetrachioroethane	50	10	nu	10 240	nu ad
Ethylbenzene	50	150	00	340	na
Aylenes	50	000	210	150	na
Stylene	50	nu	nu	nu	nu ad
Bromotorm	50	na	na	nd	nd
Isopropyibenzene	50	64	57	59	nd
I,2,3-I richloropropane	50	nd	nd	nd	nd
Bromobenzene	50	nd	na	nd	nd
1,1,2,2-I etrachloroethane	50	nd	nd	nd	nd
n-Propylbenzene	50	140	110	250	nd
2-Chlorotoluene	50	nd	nd	nd	nd
4-Chlorotoluene	50	nd	nd	nd	nd
1,3,5-Trimethylbenzene	50	210	170	140	nd
tert-Butylbenzene	50	nd	nd	nd	nd

106%

97%

AAL Job Number:	C81207-2
Client:	Hart Crowser, Inc.
Project Manager:	Julie Wukelic
Client Project Name:	Montlake (WSDOT)
Client Project Number:	19426-00
Date received:	12/07/18

#### Analytical Results

8260B, µg/kg		H-19-18,SS3	H-19-18,SC1	H-20-18,SS1	H-20-18,SS3
Matrix	Soil	Soil	Soil	Soil	Soil
Date extracted	Reporting	12/08/18	12/08/18	12/08/18	12/08/18
Date analyzed	Limits	12/08/18	12/08/18	12/08/18	12/08/18
1,2,4-Trimethylbenzene	50	530	190	140	nd
sec-Butylbenzene	50	nd	nd	nd	nd
1,3-Dichlorobenzene	50	nd	nd	nd	nd
Isopropyltoluene	50	nd	nd	nd	nd
1,4-Dichlorobenzene	50	nd	nd	nd	nd
1,2-Dichlorobenzene	50	nd	nd	nd	nd
n-Butylbenzene	50	230	180	180	nd
1,2-Dibromo-3-Chloropropane	50	nd	nd	nd	nd
1,2,4-Trichlorobenzene	50	nd	nd	nd	nd
Hexachloro-1,3-butadiene	50	nd	nd	nd	nd
1,2,3-Trichlorobenzene	50	nd	nd	nd	nd
*-instrument detection limits					
Surrogate recoveries					
Dibromofluoromethane		84%	82%	83%	85%
Toluene-d8		84%	84%	87%	71%
1,2-Dichloroethane-d4		102%	106%	103%	94%

113%

96%

Data Qualifiers and Analytical Comments nd - not detected at listed reporting limits M-matrix interference C - coelution with sample peaks Acceptable Recovery limits: 70% TO 130% Acceptable RPD limit: 30%

4-Bromofluorobenzene

AAL Job Number:	C81207-2
Client:	Hart Crowser, Inc.
Project Manager:	Julie Wukelic
Client Project Name:	Montlake (WSDOT)
Client Project Number:	19426-00
Date received:	12/07/18

Analytical Results			MS	MSD	RPD
8260B, µg/kg		H-21-18,SC3	H-21-18,SC3	H-21-18,SC3	H-21-18,SC3
Matrix	Soil	Soil	Soil	Soil	Soil
Date extracted	Reporting	12/08/18	12/08/18	12/08/18	12/08/18
Date analyzed	Limits	12/08/18	12/08/18	12/08/18	12/08/18
MTBE	100	nd			
Dichlorodifluoromethane	50	nd			
Chloromethane	50	nd			
Vinyl chloride	50	nd			
Bromomethane	50	nd			
Chloroethane	50	nd			
Trichlorofluoromethane	50	nd			
1,1-Dichloroethene	50	nd			
Methylene chloride	20	nd			
trans-1,2-Dichloroethene	50	nd			
1,1-Dichloroethane	50	nd			
2,2-Dichloropropane	50	nd			
cis-1,2-Dichloroethene	50	nd			
Chloroform	50	nd			
1,1,1-Trichloroethane	50	nd			
Carbontetrachloride	50	nd			
1,1-Dichloropropene	50	nd			
Benzene	20	nd	112%	129%	14%
1,2-Dichloroethane(EDC)	20	nd			
Trichloroethene	20	nd	76%	97%	24%
1,2-Dichloropropane	50	nd			
Dibromomethane	50	nd			
Bromodichloromethane	50	nd			
cis-1,3-Dichloropropene	50	nd			
Toluene	50	nd	83%	103%	21%
trans-1,3-Dichloropropene	50	nd			
1,1,2-Trichloroethane	50	nd			
Tetrachloroethene	50	nd			
1,3-Dichloropropane	50	nd			
Dibromochloromethane	20	nd			
1,2-Dibromoethane (EDB)*	5	nd			
Chlorobenzene	50	nd	89%	100%	12%
1,1,1,2-Tetrachloroethane	50	nd			
Ethylbenzene	50	nd			
Xylenes	50	nd			
Styrene	50	nd			
Bromoform	50	nd			
Isopropylbenzene	50	nd			
1,2,3-Trichloropropane	50	nd			
Bromobenzene	50	nd			
1,1,2,2-Tetrachloroethane	50	nd			
n-Propylbenzene	50	nd			
2-Chlorotoluene	50	nd			
4-Chlorotoluene	50	nd			
1,3,5-Trimethylbenzene	50	nd			
tert-Butylbenzene	50	nd			

AAL Job Number:	C81207-2
Client:	Hart Crowser, Inc.
Project Manager:	Julie Wukelic
Client Project Name:	Montlake (WSDOT)
Client Project Number:	19426-00
Date received:	12/07/18

Analytical Results			MS	MSD	RPD
8260B, µg/kg		H-21-18,SC3	H-21-18,SC3	H-21-18,SC3	H-21-18,SC3
Matrix	Soil	Soil	Soil	Soil	Soil
Date extracted	Reporting	12/08/18	12/08/18	12/08/18	12/08/18
Date analyzed	Limits	12/08/18	12/08/18	12/08/18	12/08/18
1,2,4-Trimethylbenzene	50	nd			
sec-Butylbenzene	50	nd			
1,3-Dichlorobenzene	50	nd			
Isopropyltoluene	50	nd			
1,4-Dichlorobenzene	50	nd			
1,2-Dichlorobenzene	50	nd			
n-Butylbenzene	50	nd			
1,2-Dibromo-3-Chloropropane	50	nd			
1,2,4-Trichlorobenzene	50	nd			
Hexachloro-1,3-butadiene	50	nd			
1,2,3-Trichlorobenzene	50	nd			
*-instrument detection limits					
Surrogate recoveries					
Dibromofluoromethane		85%	95%	88%	
Toluene-d8		70%	71%	70%	
1.2-Dichloroethane-d4		99%	97%	96%	
4-Bromofluorobenzene		102%	101%	99%	

Data Qualifiers and Analytical Comments nd - not detected at listed reporting limits M-matrix interference C - coelution with sample peaks Acceptable Recovery limits: 70% TO 130% Acceptable RPD limit: 30%

AAL Job Number:	C81207-2
Client:	Hart Crowser, Inc.
Project Manager:	Julie Wukelic
Client Project Name:	Montlake (WSDOT)
Client Project Number:	19426-00
Date received:	12/07/18

Analytical Results						
NWTPH-Dx, mg/kg		MTH BLK	H-16-18,SS1	H-16-18,SS2	H-16-18,SS3	H-16-18,SS4
Matrix	Soil	Soil	Soil	Soil	Soil	Soil
Date extracted	Reporting	12/09/18	12/09/18	12/09/18	12/09/18	12/09/18
Date analyzed	Limits	12/09/18	12/09/18	12/09/18	12/09/18	12/09/18
Kerosene/Jet fuel Diesel/Fuel oil Heavy oil	20 20 50	nd nd nd	nd nd nd	nd nd nd	nd nd nd	nd nd nd
Surrogate recoveries:						
Fluorobiphenyl		126%	124%	128%	129%	127%
o-Terphenyl		129%	125%	123%	126%	125%

Data Qualifiers and Analytical Comments nd - not detected at listed reporting limits C - coelution with sample peaks Results reported on dry-weight basis Acceptable Recovery limits: 70% TO 130% Acceptable RPD limit: 30%

AAL Job Number:	C81207-2
Client:	Hart Crowser, Inc.
Project Manager:	Julie Wukelic
Client Project Name:	Montlake (WSDOT)
Client Project Number:	19426-00
Date received:	12/07/18

Analytical Results						
NWTPH-Dx, mg/kg		H-16-18,SC1	H-17-18,SS1	H-17-18,SS3	H-19-18,SS2	H-19-18,SS3
Matrix	Soil	Soil	Soil	Soil	Soil	Soil
Date extracted	Reporting	12/09/18	12/09/18	12/09/18	12/09/18	12/09/18
Date analyzed	Limits	12/09/18	12/09/18	12/09/18	12/09/18	12/09/18
Kerosene/Jet fuel	20	nd	nd	nd	nd	nd
Diesel/Fuel oil	20	nd	nd	nd	nd	nd
Heavy oil	50	nd	nd	nd	nd	nd
Surrogate recoveries:						
Fluorobiphenyl o-Terphenyl		130% 121%	127% 120%	127% 127%	121% 121%	129% 128%

Data Qualifiers and Analytical Comments nd - not detected at listed reporting limits C - coelution with sample peaks Results reported on dry-weight basis Acceptable Recovery limits: 70% TO 130%

Acceptable RPD limit: 30%

AAL Job Number:	C81207-2
Client:	Hart Crowser, Inc.
Project Manager:	Julie Wukelic
Client Project Name:	Montlake (WSDOT)
Client Project Number:	19426-00
Date received:	12/07/18

Analytical Results						
NWTPH-Dx, mg/kg		H-19-18,SC1	H-20-18,SS1	H-20-18,SS3	H-21-18,SS1	H-21-18,SC3
Matrix	Soil	Soil	Soil	Soil	Soil	Soil
Date extracted	Reporting	12/09/18	12/09/18	12/09/18	12/09/18	12/09/18
Date analyzed	Limits	12/09/18	12/09/18	12/09/18	12/09/18	12/09/18
Kerosene/Jet fuel	20	nd	nd	nd	nd	nd
Diesel/Fuel oil	20	nd	nd	nd	nd	nd
Heavy oil	50	nd	nd	nd	nd	nd
Surrogate recoveries:						
Fluorobiphenyl		127% 127%	126% 126%	127% 128%	120% 124%	129% 127%
		127/0	12070	12070	12170	12770

Data Qualifiers and Analytical Comments nd - not detected at listed reporting limits C - coelution with sample peaks Results reported on dry-weight basis Acceptable Recovery limits: 70% TO 130%

Acceptable RPD limit: 30%

AAL Job Number:	C81207-2
Client:	Hart Crowser, Inc.
Project Manager:	Julie Wukelic
Client Project Name:	Montlake (WSDOT)
Client Project Number:	19426-00
Date received:	12/07/18

Analytical Results		Dupl
NWTPH-Dx, mg/kg		H-21-18,SC3
Matrix	Soil	Soil
Date extracted	Reporting	12/09/18
Date analyzed	Limits	12/09/18
Kerosene/Jet fuel	20	nd
Diesel/Fuel oil	20	nd
Heavy oil	50	nd
Surrogate recoveries:		

ourrogate recoveries.	
Fluorobiphenyl	130%
o-Terphenyl	130%

Data Qualifiers and Analytical Comments nd - not detected at listed reporting limits C - coelution with sample peaks Results reported on dry-weight basis Acceptable Recovery limits: 70% TO 130% Acceptable RPD limit: 30%

AAL Job Number:	C81207-2
Client:	Hart Crowser, Inc.
Project Manager:	Julie Wukelic
Client Project Name:	Montlake (WSDOT)
Client Project Number:	19426-00
Date received:	12/07/18

Analytical Results						
NWTPH-Gx / BTEX		MTH BLK	LCS	H-16-18,SS1	H-16-18,SS2	H-16-18,SS3
Matrix	Soil	Soil	Soil	Soil	Soil	Soil
Date extracted	Reporting	12/08/18	12/08/18	12/08/18	12/08/18	12/08/18
Date analyzed	Limits	12/08/18	12/08/18	12/08/18	12/08/18	12/08/18
NWTPH-Gx, mg/kg						
Mineral spirits/Stoddard	5.0	nd		nd	nd	nd
Gasoline	5.0	nd		11	900	58
BTEX 8021B, μg/kg						
Benzene	20	nd	78%	150		
Toluene	50	nd	78%	nd		
Ethylbenzene	50	nd		nd		
Xylenes	50	nd		nd		
Surrogate recoveries:						
Trifluorotoluene		93%	88%	76%	С	94%
Bromofluorobenzene		107%	113%	116%	C	88%

Data Qualifiers and Analytical Comments

nd - not detected at listed reporting limits

na - not analyzed

M - matrix interference

C - coelution with sample peaks Results reported on dry-weight basis

Acceptable Recovery limits: 70% TO 130% Acceptable RPD limit: 30%

AAL Job Number:	C81207-2
Client:	Hart Crowser, Inc.
Project Manager:	Julie Wukelic
Client Project Name:	Montlake (WSDOT)
Client Project Number:	19426-00
Date received:	12/07/18

Analytical Results					
NWTPH-Gx / BTEX		H-16-18,SS4	H-16-18,SC1	H-17-18,SS1	H-17-18,SS3
Matrix	Soil	Soil	Soil	Soil	Soil
Date extracted	Reporting	12/08/18	12/08/18	12/08/18	12/08/18
Date analyzed	Limits	12/08/18	12/08/18	12/08/18	12/08/18
NWTPH-Gx, mg/kg					
Mineral spirits/Stoddard	5.0	nd	nd	nd	nd
Gasoline	5.0	41	1,600	44	9.3
<u> БТЕЛ 602 ГВ, µу/ку</u>	20	00			
Benzene	20	96			
Toluene	50	nd			
Ethylbenzene	50	490			
Xylenes	50	820			
Surrogate recoveries:					
Trifluorotoluene		78%	С	75%	77%
Bromofluorobenzene		102%	С	114%	109%

Data Qualifiers and Analytical Comments

nd - not detected at listed reporting limits

na - not analyzed

M - matrix interference

C - coelution with sample peaks Results reported on dry-weight basis

Acceptable Recovery limits: 70% TO 130% Acceptable RPD limit: 30%

AAL Job Number:	C81207-2
Client:	Hart Crowser, Inc.
Project Manager:	Julie Wukelic
Client Project Name:	Montlake (WSDOT)
Client Project Number:	19426-00
Date received:	12/07/18

Analytical Results			Dupl			
NWTPH-Gx / BTEX		H-18-18,SC3	H-18-18,SC3	MTH BLK	LCS	H-19-18,SS2
Matrix	Soil	Soil	Soil	Soil	Soil	Soil
Date extracted	Reporting	12/08/18	12/08/18	12/09/18	12/09/18	12/09/18
Date analyzed	Limits	12/08/18	12/08/18	12/09/18	12/09/18	12/09/18
<u>NWTPH-Gx, mg/kg</u>						
Mineral spirits/Stoddard	5.0	nd	nd	nd		nd
Gasoline	5.0	nd	nd	nd		23
<u>ВТЕХ 8021В, µg/kg</u>	20				70%	
Benzene	20	na	na	na	/0%	
loluene	50	nd	nd	nd	/3%	
Ethylbenzene	50	nd	nd	nd		
Xylenes	50	nd	nd	nd		
Surrogate recoveries:						
Trifluorotoluene		77%	79%	85%	85%	86%
Bromofluorobenzene		109%	118%	103%	107%	117%

Data Qualifiers and Analytical Comments

nd - not detected at listed reporting limits

na - not analyzed

M - matrix interference

AAL Job Number:	C81207-2
Client:	Hart Crowser, Inc.
Project Manager:	Julie Wukelic
Client Project Name:	Montlake (WSDOT)
Client Project Number:	19426-00
Date received:	12/07/18

Analytical Results					
NWTPH-Gx / BTEX		H-19-18,SS3	H-19-18,SC1	H-20-18,SS1	H-20-18,SS3
Matrix	Soil	Soil	Soil	Soil	Soil
Date extracted	Reporting	12/09/18	12/09/18	12/09/18	12/09/18
Date analyzed	Limits	12/09/18	12/09/18	12/09/18	12/09/18
NWTPH-Gx, mg/kg					
Mineral spirits/Stoddard	5.0	nd	nd	nd	nd
Gasoline	5.0	16	0.8	8.8	na
<u>ΒΤΕΧ 8021Β, μg/kg</u>					
Benzene	20				
Toluene	50				
Ethylbenzene	50				
Xylenes	50				
Surrogate recoveries:					
Trifluorotoluene		87%	73%	77%	78%
Bromofluorobenzene		114%	104%	111%	118%
Data Qualifiers and Analyti nd - not detected at listed r na - not analyzed	cal Comments reporting limits				

M - matrix interference

AAL Job Number:	C81207-2
Client:	Hart Crowser, Inc.
Project Manager:	Julie Wukelic
Client Project Name:	Montlake (WSDOT)
Client Project Number:	19426-00
Date received:	12/07/18

Analytical Results				Dupl	MS
NWTPH-Gx / BTEX		H-21-18,SS1	H-21-18,SC3	H-21-18,SC3	H-21-18,SC3
Matrix	Soil	Soil	Soil	Soil	Soil
Date extracted	Reporting	12/09/18	12/09/18	12/09/18	12/08/18
Date analyzed	Limits	12/09/18	12/09/18	12/09/18	12/08/18
<u>NWTPH-Gx, mg/kg</u> Mineral spirits/Stoddard	5.0	nd	nd	nd	
Gasoline	5.0	nd	nd	nd	
<u>BTEX 8021B, μg/kg</u> Benzene Toluene	20 50	nd			74% 72%
Ethylbenzene Xylenes	50 50 50	nd nd			72,0
Surrogate recoveries:					
Trifluorotoluene Bromofluorobenzene		82% 116%	83% 123%	70% 106%	86% 71%
Data Qualifiers and Analyt	ical Comments				

nd - not detected at listed reporting limits

na - not analyzed

M - matrix interference

AAL Job Number:	C81207-2
Client:	Hart Crowser, Inc.
Project Manager:	Julie Wukelic
Client Project Name:	Montlake (WSDOT)
Client Project Number:	19426-00
Date received:	12/07/18

Analytical Deculta		MCD	ססס
Analytical Results		INISD	RPD
NWTPH-Gx / BTEX		H-21-18,SC3	<u>H-21-18,SC3</u>
Matrix	Soil	Soil	Soil
Date extracted	Reporting	12/08/18	12/08/18
Date analyzed	Limits	12/08/18	12/08/18
<u>NWTPH-Gx, mg/kg</u>			
Mineral spirits/Stoddard	5.0		
Gasoline	5.0		
BTEX 8021B, μg/kg			
Benzene	20	72%	2%
Toluene	50	70%	2%
Ethylbenzene	50		
Xylenes	50		
Surrogate recoveries:			
Trifluorotoluene		83%	
Bromofluorobenzene		81%	

Data Qualifiers and Analytical Comments nd - not detected at listed reporting limits

na - not analyzed

M - matrix interference

AAL Job Number:	C81207-2
Client:	Hart Crowser, Inc.
Project Manager:	Julie Wukelic
Client Project Name:	Montlake (WSDOT)
Client Project Number:	19426-00
Date received:	12/07/18

8270C, mg/kg		MTH BLK	LCS	H-16-18,SS2	H-16-18,SC1	H-17-18,SS1
Matrix	Soil	Soil	Soil	Soil	Soil	Soil
Date extracted	Reporting	12/08/18 1	2/08/18	12/08/18	12/08/18	12/08/18
Date analyzed	Limits	12/08/18 1	2/08/18	12/08/18	12/08/18	12/08/18
Phenol	0.50	nd		nd	nd	nd
2-Chlorophenol	0.50	nd	97%	nd	nd	nd
1,3-Dichlorobenzene	0.10	nd		nd	nd	nd
1,4-Dichlorobenzene	0.10	nd	95%	nd	nd	nd
1,2-Dichlorobenzene	0.10	nd		nd	nd	nd
2-Methylphenol (o-cresol)	0.10	nd		nd	nd	nd
3,4-Methylphenol (m,p-cresol)	0.10	nd		nd	nd	nd
Hexachloroethane	0.10	nd		nd	nd	nd
2-Nitrophenol	0.50	nd		nd	nd	nd
2,4-Dimethylphenol	0.50	nd		nd	nd	nd
Bis (2-chloroethoxy) methane	0.10	nd		nd	nd	nd
2,4-Dichlorophenol	0.50	nd		nd	nd	nd
1,2,4-Trichlorobenzene	0.10	nd	119%	nd	nd	nd
1-MethylNaphthalene	0.10	nd		0.63	1.1	nd
2-MethylNaphthalene	0.10	nd		1.0	2.4	nd
Naphthalene	0.10	nd		0.16	4.6	nd
Hexachlorobutadiene	0.50	nd		nd	nd	nd
4-Chloro-3-methylphenol	0.50	nd	102%	nd	nd	nd
Hexachlorocvclopentadiene	0.10	nd		nd	nd	nd
2.4.6-Trichlorophenol	0.50	nd		nd	nd	nd
2.4.5-Trichlorophenol	0.50	nd		nd	nd	nd
2-Chloronaphthalene	0.10	nd		nd	nd	nd
Dimethylphthalate	0.10	nd		nd	nd	nd
Acenaphthylene	0.10	nd		nd	nd	nd
Acenaphthene	0.10	nd	103%	nd	nd	nd
2.4-Dinitrophenol	0.50	nd		nd	nd	nd
4-Nitrophenol	0.50	nd		nd	nd	nd
2.3.4.6-Tetrachlorophenol	0.10	nd		nd	nd	nd
Diethylphthalate	0.10	nd		nd	nd	nd
4-Chlorophenvlphenvlether	0.50	nd		nd	nd	nd
Fluorene	0.10	nd		nd	nd	nd
N-Nitrosodiphenvlamine	0.10	nd		nd	nd	nd
2.4.6-Tribromophenol	0.50	nd		nd	nd	nd
4-Bromophenvlphenvlether	0.10	nd		nd	nd	nd
Hexachlorobenzene	0.10	nd		nd	nd	nd
Pentachlorophenol	0.50	nd		nd	nd	nd
Phenanthrene	0.10	nd		nd	nd	nd
Anthracene	0.10	nd		nd	nd	nd
Di-n-butylphthalate	0.10	nd		nd	nd	nd
Fluoranthene	0.10	nd		nd	nd	nd
Pyrene	0.10	nd	108%	nd	nd	nd
Butylbenzylphthalate	0.50	nd	10070	nd	nd	nd
Benzo(a)anthracene	0.00	nd		nd	nd	nd
Chrysene	0.10	nd		nd	nd	nd
Bis (2-ethylhexyl) ether	0.10	nd		nd	nd	nd
Di-n-octylphthalate	0.50	nd		nd	nd	nd
Benzo(b)fluoranthene	0.10	nd		nd	nd	nd
1,2,4-Trichlorobenzene 1-MethylNaphthalene 2-MethylNaphthalene Naphthalene Hexachlorobutadiene 4-Chloro-3-methylphenol Hexachlorocyclopentadiene 2,4,6-Trichlorophenol 2,4,5-Trichlorophenol 2-Chloronaphthalene Dimethylphthalate Acenaphthene 2,4-Dinitrophenol 4-Nitrophenol 2,3,4,6-Tetrachlorophenol Diethylphthalate 4-Chlorophenylphenylether Fluorene N-Nitrosodiphenylamine 2,4,6-Tribromophenol 4-Bromophenylphenylether Hexachlorobenzene Pentachlorophenol Phenanthrene Anthracene Di-n-butylphthalate Fluoranthene Pyrene Butylbenzylphthalate Benzo(a)anthracene Chrysene Bis (2-ethylhexyl) ether Di-n-octylphthalate Benzo(b)fluoranthene	0.10 0.10 0.10 0.50 0.50 0.50 0.50 0.10 0.50 0.10 0.10 0.10 0.10 0.50 0.10 0.50 0.10 0.10 0.50 0.10 0.10 0.50 0.10 0.10 0.50 0.10 0.10 0.50 0.10 0.10 0.50 0.10 0.10 0.50 0.10 0.10 0.50 0.10 0.10 0.50 0.10 0.10 0.50 0.10 0.10 0.50 0.10 0.10 0.50 0.10 0.10 0.50 0.10 0.10 0.50 0.10 0.10 0.50 0.10 0.10 0.50 0.10 0.10 0.50 0.10 0.10 0.10 0.10 0.50 0.10	nd nd nd nd nd nd nd nd nd nd nd nd nd n	119% 102% 103%	nd 0.63 1.0 0.16 nd nd nd nd nd nd nd nd nd nd nd nd nd	nd 1.1 2.4 4.6 nd nd nd nd nd nd nd nd nd nd nd nd nd	nd nd nd nd nd nd nd nd nd nd nd nd nd n

AAL Job Number:	C81207-2
Client:	Hart Crowser, Inc.
Project Manager:	Julie Wukelic
Client Project Name:	Montlake (WSDOT)
Client Project Number:	19426-00
Date received:	12/07/18

8270C, mg/kg		MTH BLK	LCS	H-16-18,SS2	H-16-18,SC1	H-17-18,SS1
Matrix	Soil	Soil	Soil	Soil	Soil	Soil
Date extracted	Reporting	12/08/18	12/08/18	12/08/18	12/08/18	12/08/18
Date analyzed	Limits	12/08/18	12/08/18	12/08/18	12/08/18	12/08/18
Benzo(k)fluoranthene	0.10	nd		nd	nd	nd
Benzo(a)pyrene	0.10	nd		nd	nd	nd
Indeno(1,2,3-cd)pyrene	0.10	nd		nd	nd	nd
Dibenzo(a,h)anthracene	0.10	nd		nd	nd	nd
Benzo(ghi)perylene	0.10	nd		nd	nd	nd
Surrogate recoveries						
Phenol-d6		82%	68%	84%	52%	94%
Nitrobenzene-d5		83%	74%	М	М	89%
2-Fluorobiphenyl		119%	138%	135%	122%	137%
2,4,6-Tribromophenol		96%	105%	97%	97%	107%
4-Terphenyl-d14		110%	112%	119%	117%	119%

Data Qualifiers and Analytical Comments nd - not detected at listed reporting limits M - matrix interference Results reported on dry-weight basis Acceptable Recovery limits: 50% TO 150% Acceptable RPD limit: 30%

AAL Job Number:	C81207-2
Client:	Hart Crowser, Inc.
Project Manager:	Julie Wukelic
Client Project Name:	Montlake (WSDOT)
Client Project Number:	19426-00
Date received:	12/07/18

Analytical Results			MS	MSD	RPD
8270C, mg/kg		H-17-18,SS3	H-17-18,SS3	H-17-18,SS3	H-17-18,SS3
Matrix	Soil	Soil	Soil	Soil	Soil
Date extracted	Reporting	12/08/18	12/08/18	12/08/18	12/08/18
Date analyzed	Limits	12/08/18	12/08/18	12/08/18	12/08/18
Phenol	0.50	nd			
2-Chlorophenol	0.50	nd	98%	99%	1%
1,3-Dichlorobenzene	0.10	nd			
1,4-Dichlorobenzene	0.10	nd	99%	96%	3%
1,2-Dichlorobenzene	0.10	nd			
2-Methylphenol (o-cresol)	0.10	nd			
3,4-Methylphenol (m,p-cresol)	0.10	nd			
Hexachloroethane	0.10	nd			
2-Nitrophenol	0.50	nd			
2.4-Dimethylphenol	0.50	nd			
Bis (2-chloroethoxy) methane	0.10	nd			
2.4-Dichlorophenol	0.50	nd			
1.2.4-Trichlorobenzene	0.10	nd	112%	110%	2%
1-MethylNaphthalene	0.10	nd			<b>_</b> /0
2-MethylNaphthalene	0.10	nd			
Naphthalene	0.10	nd			
Hexachlorobutadiene	0.50	nd			
4-Chloro-3-methylphenol	0.50	nd	102%	98%	3%
Hexachlorocyclopentadiene	0.00	nd	10270	5070	070
	0.10	nd			
2,4,0-Trichlorophenol	0.50	nd			
2,4,5-Inchiorophenoi	0.50	nu			
2-Chioronaphiliaene	0.10	nu			
	0.10	nu			
Acenaphthana	0.10	nu	1020/	1020/	10/
Acenaphtnene	0.10	na	102%	103%	1 %
2,4-Dinitrophenoi	0.50	na			
4-INITrophenol	0.50	na			
2,3,4,6-1 etrachiorophenol	0.10	na			
Dietnyiphthalate	0.10	nd			
4-Chiorophenylphenylether	0.50	nd			
Fluorene	0.10	nd			
N-Nitrosodiphenylamine	0.10	nd			
2,4,6-1ribromophenol	0.50	nd			
4-Bromophenylphenylether	0.10	nd			
Hexachlorobenzene	0.10	nd			
Pentachlorophenol	0.50	nd			
Phenanthrene	0.10	nd			
Anthracene	0.10	nd			
Di-n-butylphthalate	0.10	nd			
Fluoranthene	0.10	nd			
Pyrene	0.10	nd	106%	101%	4%
Butylbenzylphthalate	0.50	nd			
Benzo(a)anthracene	0.10	nd			
Chrysene	0.10	nd			
Bis (2-ethylhexyl) ether	0.10	nd			
Di-n-octylphthalate	0.50	nd			
Benzo(b)fluoranthene	0.10	nd			

AAL Job Number:	C81207-2
Client:	Hart Crowser, Inc.
Project Manager:	Julie Wukelic
Client Project Name:	Montlake (WSDOT)
Client Project Number:	19426-00
Date received:	12/07/18

Analytical Results			MS	MSD	RPD
8270C, mg/kg		H-17-18,SS3	H-17-18,SS3	H-17-18,SS3	H-17-18,SS3
Matrix	Soil	Soil	Soil	Soil	Soil
Date extracted	Reporting	12/08/18	12/08/18	12/08/18	12/08/18
Date analyzed	Limits	12/08/18	12/08/18	12/08/18	12/08/18
Benzo(k)fluoranthene	0.10	nd			
Benzo(a)pyrene	0.10	nd			
Indeno(1,2,3-cd)pyrene	0.10	nd			
Dibenzo(a,h)anthracene	0.10	nd			
Benzo(ghi)perylene	0.10	nd			
Surragata racovarias					
Surroyate recoveries		010/	700/	C 40/	
		81% 70%	72%	04% 70%	
Nitrobenzene-d5		/9%	84%	/2%	
2-Fluorobiphenyl		124%	150%	140%	
2,4,6-Tribromophenol		93%	102%	105%	
4-Terphenyl-d14		107%	111%	116%	

Data Qualifiers and Analytical Comments nd - not detected at listed reporting limits M - matrix interference Results reported on dry-weight basis Acceptable Recovery limits: 50% TO 150% Acceptable RPD limit: 30%

17%

AAL Job Number:	C81207-2
Client:	Hart Crowser, Inc.
Project Manager:	Julie Wukelic
Client Project Name:	Montlake (WSDOT)
Client Project Number:	19426-00
Date received:	12/07/18

Analytical Results				
Moisture, SM2540B	H-16-18,SS1	H-16-18,SS2	H-16-18,SS3	H-16-18,SS4
Matrix	Soil	Soil	Soil	Soil
Date analyzed	12/10/18	12/10/18	12/10/18	12/10/18
Moisture, %	16%	16%	13%	17%

AAL Job Number:	C81207-2
Client:	Hart Crowser, Inc.
Project Manager:	Julie Wukelic
Client Project Name:	Montlake (WSDOT)
Client Project Number:	19426-00
Date received:	12/07/18

Moisture	SM2540B
Analytical	Results

Moisture SM2540B	H-16-18 SC1	H-17-18 SS1	H-17-18 SS3	H-17-18 SC3
Matrix	Soil	Soil	Soil	Soil
Date analyzed	12/10/18	12/10/18	12/10/18	12/10/18
Moisture, %	18%	15%	14%	16%

AAL Job Number:	C81207-2
Client:	Hart Crowser, Inc.
Project Manager:	Julie Wukelic
Client Project Name:	Montlake (WSDOT)
Client Project Number:	19426-00
Date received:	12/07/18

Analytical Results				
Moisture, SM2540B	H-19-18,SS2	H-19-18,SS3	H-19-18,SC1	H-20-18,SS1
Matrix	Soil	Soil	Soil	Soil
Date analyzed	12/10/18	12/10/18	12/10/18	12/10/18
Moisture, %	13%	14%	12%	15%

AAL Job Number:	C81207-2
Client:	Hart Crowser, Inc.
Project Manager:	Julie Wukelic
Client Project Name:	Montlake (WSDOT)
Client Project Number:	19426-00
Date received:	12/07/18

Analytical Results			
Moisture, SM2540B	H-20-18,SS3	H-21-18,SS1	H-21-18,SC3
Matrix	Soil	Soil	Soil
Date analyzed	12/10/18	12/10/18	12/10/18
Moisture, %	12%	15%	12%

AAL Job Number:
Client:
Project Manager:
Client Project Name:
Client Project Number:
Date received:

C81207-2 Hart Crowser, Inc. Julie Wukelic Montlake (WSDOT) 19426-00 12/07/18

Analytical Results				
8260B, μg/L		MTH BLK	LCS	H-21-18, H1
Matrix	Water	Water	Water	Water
Date analyzed	Reporting Limits	12/08/18	12/08/18	12/08/18
MTBE	5.0	nd		nd
Chloromethane	1.0	nd		nd
Vinyl chloride(*)	0.2	nd		nd
Bromomethane	1.0	nd		nd
Chloroethane	1.0	nd		nd
Trichlorofluoromethane	1.0	nd		nd
1,1-Dichloroethene	1.0	nd		nd
Methylene chloride	1.0	nd		nd
trans-1,2-Dichloroethene	1.0	nd		nd
1,1-Dichloroethane	1.0	nd		nd
2,2-Dichloropropane	1.0	nd		nd
cis-1,2-Dichloroethene	1.0	nd		nd
Chloroform	1.0	nd		nd
1,1,1-Trichloroethane	1.0	nd		nd
Carbontetrachloride	1.0	nd		nd
1,1-Dichloropropene	1.0	nd		nd
Benzene	1.0	nd	120%	4.3
1.2-Dichloroethane(EDC)	1.0	nd		nd
Trichloroethene	1.0	nd	80%	nd
1.2-Dichloropropane	1.0	nd		nd
Dibromomethane	1.0	nd		nd
Bromodichloromethane	1.0	nd		nd
cis-1.3-Dichloropropene	1.0	nd		7.3
Toluene	1.0	nd	91%	nd
trans-1.3-Dichloropropene	10	nd	• • • •	nd
1.1.2-Trichloroethane	1.0	nd		nd
Tetrachloroethene	10	nd		nd
1 3-Dichloropropane	10	nd		nd
Dibromochloromethane	10	nd		nd
1 2-Dibromoethane (FDB)*	0.01	nd		nd
Chlorobenzene	10	nd	95%	nd
1 1 1 2-Tetrachloroethane	10	nd	00/0	nd
Fthylbenzene	10	nd		11
Xvlenes	1.0	nd		45
Styrene	1.0	nd		nd
Bromoform	1.0	nd		nd
Isopropylbenzene	1.0	nd		11
1.2.3-Trichloropropane	1.0	nd		nd
Bromohenzene	1.0	nd		nd
1 1 2 2 Tetrachloroethane	1.0	nd		nd
n_Pronylbenzene	1.0	nd		22
2 Chlorotoluono	1.0	nd		2.2 nd
	1.0	nd		nu
1 3 5 Trimethylbenzone	1.0	uu rd		10
tort-Butylbonzono	1.0	nu		4.0 nd
1.2 1. Trimethylbenzono	1.0	uu rd		17
sec-Butylbenzene	1.0	nu		17 nd
	1.0	ilu		i lu

AAL Job Number: C	81207-2
Client: H	art Crowse
Project Manager: Ju	ulie Wukel
Client Project Name: M	ontlake (V
Client Project Number: 19	9426-00
Date received: 12	2/07/18

C81207-2
Hart Crowser, Inc.
Julie Wukelic
Montlake (WSDOT)
19426-00
12/07/18

Analytical Results				
8260B, μg/L		MTH BLK	LCS	H-21-18, H1
Matrix	Water	Water	Water	Water
Date analyzed	Reporting Limits	12/08/18	12/08/18	12/08/18
1,3-Dichlorobenzene	1.0	nd		nd
Isopropyltoluene	1.0	nd		nd
1,4-Dichlorobenzene	1.0	nd		nd
1,2-Dichlorobenzene	1.0	nd		nd
n-Butylbenzene	1.0	nd		nd
1,2-Dibromo-3-Chloropropane	1.0	nd		nd
1,2,4-Trichlorobenzene	1.0	nd		6.9
Hexachloro-1,3-butadiene	1.0	nd		nd
1,2,3-Trichlorobenzene	1.0	nd		nd
*-instrument detection limits				
Surrogate recoveries				
Dibromofluoromethane		86%	95%	95%
Toluene-d8		92%	78%	96%
1,2-Dichloroethane-d4		104%	103%	108%
4-Bromofluorobenzene		96%	101%	103%

Data Qualifiers and Analytical Comments nd - not detected at listed reporting limits Acceptable Recovery limits: 70% TO 130% Acceptable RPD limit: 30%

AAL Job Number:	C81207-2
Client:	Hart Crowser, Inc.
Project Manager:	Julie Wukelic
Client Project Name:	Montlake (WSDOT)
Client Project Number:	19426-00
Date received:	12/07/18

Analytical Results		MS	MSD	RPD
8260B, μg/L		H-21-18, H1	H-21-18, H1	H-21-18, H1
Matrix	Water	Water	Water	Water
Date analyzed	Reporting Limits	12/08/18	12/08/18	12/08/18
MTBE	5.0			
Chloromethane	1.0			
Vinyl chloride(*)	0.2			
Bromomethane	1.0			
Chloroethane	1.0			
Trichlorofluoromethane	1.0			
1,1-Dichloroethene	1.0			
Methylene chloride	1.0			
trans-1,2-Dichloroethene	1.0			
1,1-Dichloroethane	1.0			
2,2-Dichloropropane	1.0			
cis-1,2-Dichloroethene	1.0			
Chloroform	1.0			
1,1,1-Trichloroethane	1.0			
Carbontetrachloride	1.0			
1,1-Dichloropropene	1.0			
Benzene	1.0	96%	124%	25%
1,2-Dichloroethane(EDC)	1.0			
Trichloroethene	1.0	73%	83%	13%
1,2-Dichloropropane	1.0			
Dibromomethane	1.0			
Bromodichloromethane	1.0			
cis-1,3-Dichloropropene	1.0			
Toluene	1.0	79%	101%	25%
trans-1,3-Dichloropropene	1.0			
1,1,2-Trichloroethane	1.0			
Tetrachloroethene	1.0			
1,3-Dichloropropane	1.0			
Dibromochloromethane	1.0			
1.2-Dibromoethane (EDB)*	0.01			
Chlorobenzene	1.0	81%	100%	20%
1.1.1.2-Tetrachloroethane	1.0			
Ethylbenzene	1.0			
Xvlenes	1.0			
Styrene	1.0			
Bromoform	1.0			
Isopropylbenzene	1.0			
1.2.3-Trichloropropane	1.0			
Bromobenzene	1.0			
1.1.2.2-Tetrachloroethane	1.0			
n-Propylbenzene	1.0			
2-Chlorotoluene	1.0			
4-Chlorotoluene	1.0			
1.3.5-Trimethylbenzene	1.0			
tert-Butvlbenzene	1.0			
1.2.4-Trimethylbenzene	1.0			
sec-Butylbenzene	1.0			

C81207-2
Hart Crowser, Inc.
Julie Wukelic
Montlake (WSDOT)
19426-00
12/07/18

Analytical Results		MS	MSD	RPD
8260B, μg/L		H-21-18, H1	H-21-18, H1	H-21-18, H1
Matrix	Water	Water	Water	Water
Date analyzed	Reporting Limits	12/08/18	12/08/18	12/08/18
1,3-Dichlorobenzene	1.0			
Isopropyltoluene	1.0			
1,4-Dichlorobenzene	1.0			
1,2-Dichlorobenzene	1.0			
n-Butylbenzene	1.0			
1,2-Dibromo-3-Chloropropane	1.0			
1,2,4-Trichlorobenzene	1.0			
Hexachloro-1,3-butadiene	1.0			
1,2,3-Trichlorobenzene	1.0			
*-instrument detection limits				
Surrogate recoveries				
Dibromofluoromethane		84%	84%	
Toluene-d8		88%	81%	
1,2-Dichloroethane-d4		101%	103%	
4-Bromofluorobenzene		99%	97%	

Data Qualifiers and Analytical Comments nd - not detected at listed reporting limits Acceptable Recovery limits: 70% TO 130% Acceptable RPD limit: 30%

AAL Job Number:	C81207-2
Client:	Hart Crowser, Inc.
Project Manager:	Julie Wukelic
Client Project Name:	Montlake (WSDOT)
Client Project Number:	19426-00
Date received:	12/07/18

Analytical Results				Dupl	RPD
NWTPH-Gx		MTH BLK	H-21-18, H1	H-21-18, H1	H-21-18, H1
Matrix	Water	Water	Water	Water	Water
Date analyzed	Reporting Limits	12/08/18	12/08/18	12/08/18	12/08/18
<u>NWTPH-Gx, mg/L</u>					
Mineral spirits/Stoddard	0.10	nd	nd	nd	
Gasoline	0.10	nd	0.59	0.69	16%
Surrogate recoveries:					
Trifluorotoluene		93%	92%	88%	
Bromofluorobenzene		107%	106%	126%	

Data Qualifiers and Analytical Comments nd - not detected at listed reporting limits

na - not analyzed

Acceptable Recovery limits: 70% TO 130%

Acceptable RPD limit: 30%

AAL Job Number:	C81207-2
Client:	Hart Crowser, Inc.
Project Manager:	Julie Wukelic
Client Project Name:	Montlake (WSDOT)
Client Project Number:	19426-00
Date received:	12/07/18

Analytical Results				Dupl
NWTPH-Dx, mg/L		MTH BLK	H-21-18, H1	H-21-18, H1
Matrix	Water	Water	Water	Water
Date extracted	Reporting	12/09/18	12/09/18	12/09/18
Date analyzed	Limits	12/09/18	12/09/18	12/09/18
Kerosene/Jet fuel	0.20	nd	nd	nd
Diesel/Fuel oil	0.20	nd	nd	nd
Heavy oil	0.50	nd	nd	nd
Surrogate recoveries:				
Fluorobiphenyl		121%	124%	125%
o-Terphenyl		130%	120%	125%

Data Qualifiers and Analytical Comments nd - not detected at listed reporting limits na - not analyzed Acceptable Recovery limits: 70% TO 130% Acceptable RPD limit: 30%

AAL Job Number:	C81207-2
Client:	Hart Crowser, Inc.
Project Manager:	Julie Wukelic
Client Project Name:	Montlake (WSDOT)
Client Project Number:	19426-00
Date received:	12/07/18

Analytical Results					MS	MSD	RPD
8270, μg/L		MTH BLK	LCS	H-21-18, H1	H-21-18, H1	H-21-18, H1	H-21-18, H1
Matrix	Water	Water	Water	Water	Water	Water	Soil
Date extracted	Reporting	12/08/18	12/08/18	12/08/18	12/08/18	12/08/18	12/08/18
Date analyzed	Limits	12/08/18	12/08/18	12/08/18	12/08/18	12/08/18	12/08/18
Phenol	1.0	nd		nd			
2-Chlorophenol	1.0	nd	101%	nd	98%	100%	3%
1,3-Dichlorobenzene	1.0	nd		nd			
1,4-Dichlorobenzene	1.0	nd	98%	nd	98%	97%	1%
1,2-Dichlorobenzene	1.0	nd		nd			
2-Methylphenol (o-cresol)	1.0	nd		nd			
3,4-Methylphenol (m,p-cresol)	1.0	nd		nd			
Hexachloroethane	1.0	nd		nd			
2-Nitrophenol	5.0	nd		nd			
2,4-Dimethylphenol	5.0	nd		nd			
Bis (2-chloroethoxy) methane	1.0	nd		nd			
2.4-Dichlorophenol	5.0	nd		nd			
1.2.4-Trichlorobenzene	1.0	nd	113%	nd	109%	116%	6%
1-MethylNaphthalene	0.1	nd		0.12			
2-MethylNaphthalene	0.1	nd		0.10			
Naphthalene	0.1	nd		0.52			
2 6-Dichlorophenol	5.0	nd		nd			
Hexachloropropylene	5.0	nd		nd			
Hexachlorobutadiene	5.0	nd		nd			
4-Chloro-3-methylphenol	5.0	nd	99%	nd	103%	101%	2%
Hexachlorocyclopentadiene	1.0	nd	0070	nd	10070	10170	270
2.1.6-Trichlorophenol	5.0	nd		nd			
2 4 5 Trichlorophenol	5.0	nd		nd			
2.Chloropaphthalene	1.0	nd		nd			
Dimothylphthalata	1.0	nd		nd			
	0.1	nu		nu			
Acenaphilipiene	0.1	nu	1020/	nu	1010/	1020/	10/
Acenapinnene 2.4 Dipitraphanal	0.1	nu	102 %	nu	10176	103 %	1 70
2,4-Dillillophenol	5.0	nu		nu			
4-INITOPTICIO	5.0	nu		na			
	1.0	nu		nu			
Fluorene	0.1	na		na			
Dietnyiphthalate	5.0	na		na			
N-Nitrosodipnenylamine	1.0	na		na			
2,4,6-1 ribromophenoi	5.0	na		na			
4-Bromopnenyipnenyietner	1.0	na		na			
Hexachiorobenzene	1.0	na		na			
Pentachiorophenoi	5.0	na		na			
Phenanthrene	0.1	nd		nd			
Anthracene	0.1	nd		nd			
Di-n-butylphthalate	1.0	nd		nd			
Fluoranthene	0.1	nd		nd			
Pyrene	0.1	nd	102%	nd	108%	103%	4%
Benzo(a)anthracene	0.1	nd		nd			
Chrysene	0.1	nd		nd			
Bis (2-ethylhexyl) ether	1.0	nd		nd			
Di-n-octylphthalate	5.0	nd		nd			
Benzo(b)fluoranthene	0.1	nd		nd			

AAL Job Number:	C81207-2
Client:	Hart Crowser, Inc.
Project Manager:	Julie Wukelic
Client Project Name:	Montlake (WSDOT)
Client Project Number:	19426-00
Date received:	12/07/18

Analytical Results					MS	MSD	RPD
8270, μg/L		MTH BLK	LCS	H-21-18, H1	H-21-18, H1	H-21-18, H1	H-21-18, H1
Matrix	Water	Water	Water	Water	Water	Water	Soil
Date extracted	Reporting	12/08/18	12/08/18	12/08/18	12/08/18	12/08/18	12/08/18
Date analyzed	Limits	12/08/18	12/08/18	12/08/18	12/08/18	12/08/18	12/08/18
Benzo(k)fluoranthene	0.1	nd		nd			
Benzo(a)pyrene	0.1	nd		nd			
Dibenzo(a,h)anthracene	0.1	nd		nd			
Benzo(ghi)perylene	0.1	nd		nd			
Indeno(1,2,3-cd)pyrene	0.1	nd		nd			
Surrogate recoveries							
Phenol-d6		87%	83%	94%	61%	71%	
Nitrobenzene-d5		80%	96%	97%	68%	80%	
2-Fluorobiphenyl		118%	136%	136%	143%	136%	
2,4,6-Tribromophenol		94%	106%	107%	103%	105%	
4-Terphenyl-d14		109%	114%	116%	112%	112%	

Data Qualifiers and Analytical Comments nd - not detected at listed reporting limits M - matrix interference Acceptable Recovery limits: 50% TO 150% Acceptable RPD limit: 50%

AAL Job Number:	C81207-2	
Client:	Hart Crowser, Inc.	
Project Manager:	Julie Wukelic	
Client Project Name:	Montlake (WSDOT)	
Client Project Number:	19426-00	
Date received:	12/07/18	

TSS (160.2)		H-21-18, H1
Matrix	Water	Water
Date analyzed	Reporting Limits	12/10/18
Total Suspended Solids, ma/L	10	19.000


#### Hart Crowser, Inc. 3131 Elliott Avenue, Suite 600 Seattle, Washington 98121 Office: 206.324.9530 • Fax 206.328.5581

Samples Shipped to:

JOB <u>19426-00</u>	LAB	NUMBER		REQUESTED ANALYSIS								
PROJECT NAME	Mune h	S. D. J. Sung	sling	OBSERVATIONS/COMM	IENTS/							
HART CROWSER CONTA	ct_Juli	e Wichelic		らぶう、 賞 つ	TIONS							
SAMPLED BY:	re McC.	abe		NON NO								
LAB NO. SAMPLE ID	DESCRIPTI	ON DATE TIME	MATRIX									
H-16-18,55		12/3/18 23:2	5 Sail									
H-16-18.55	>	12/3/18 23:0	1 1									
H-16-18552		12/3/18 23:5	3									
H-16-18 554	,	12/4/18 00:3	<u>S</u>									
11-16-18 521		12/4/18 00:4	5 4									
4-17-18-55		12/4/12 02:25										
H-17-18-55	/	12/4/18 2:3	,	2								
11-17-18.55	~	12/4/18 2:53										
14-11-18-50		12/4/18 3:20	, , ,	2								
H-17-18.5C2	_	12/1/18 3:25	1	2								
RELINQUISHED BY	DATE	RECEIVED BY	DATE	PECIAL SHIPMENT HANDLING OR TOTAL NUMBER OF CONT	AINERS							
160.a	12718	haur	12/07/	TORAGE REQUIREMENTS: SAMPLE RECEIPT INFORMATION								
Juned Wither	TIME	SIGNATURE LAND	TIME	RUSH - DYES DNO DN/A								
PRINT NAME	2.22 P.M	PRINT NAMEAL	1620	CELULTS ON GOOD CONDITION								
COMPANY		COMPANY	770									
RELINQUISHED BY	DATE	RECEIVED BY	DATE	SHIPMENT METHOD: HAND								
				OOLER NO.: STORAGE LOCATION: TURNAROUND TIME:	TURNAROUND TIME:							
SIGNATURE	TIME	SIGNATURE	TIME	□ 24 HOURS □ 1 WEEK								
PRINT NAME		PRINT NAME		ee Lab Work Order No 🗆 🗆 STANDARD								
COMPANY		COMPANY		for Other Contract Requirements D72 HOURS OTHER								

White to Lab Yellow to Project Manager

Pink to Sample Custodian



1

#### Hart Crowser, Inc. 3131 Elliott Avenue, Suite 600 Seattle, Washington 98121 Office: 206.324.9530 • Fax 206.328.5581

Samples Shipped to: \_\_\_\_\_

JOB <u>19</u> PROJECT	mpl.ng		12.13			REQ	UEST	ED ANAL	YSIS					ATTIONS/COMMENTS/				
HART CRO	OWSER CONTAC	T JULI	e Wuke	UC		NH-61	+-6-4	#-0;	كأزلا	L A1674	1001							COMPOSITING INSTRUCTIONS
SAMPLED	BY: Cou	re Mc	CABE			15	del	R	. •	1004	^`							0 Z
LAB NO.	SAMPLE ID	DESCRIPTIO	N DATE	TIME	MATRIX													
	11-18-18,551		12/5/18	00 : 3D	SOIL													2
	H-18-18,501			∞:50														2
	H-18-18,552			1:06														2
	H-18-18,5CZ	<u> </u>		1:20		N /												2
	1-18-18,523		×	1:45	<u>√</u>	<u> </u>	<i>"</i> .											2
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RELINQUI	SHED BY	DATE	RECEIVED BY		DATE	SP	ECIAL	SHI	PME	NT H	ANDI	ING OR						TOTAL NUMBER OF CONTAINERS
SIGNATURE	KU:C	12/1/11		us	12/07/12	<b>7</b> 511	URAG	t KE שב גר	QUI	KEIVIE	:NTS:							SAMPLE RECEIPT INFORMATION CUSTODY SEALS:
PRINT NAM	Kwiwilla E	TIME	PRINT NAME	KNOV	TIME			K	۲N	H		~						
COMPANY	Clowsn	- 2:22 Pm	COMPANY	L	1620			R	<u>.</u>	s٢	Ŋ	0~ 1	M	5	0A	$\checkmark$		
RELINOU	SHED BY	DATE	RECEIVED BY		DATE		12-10/12									SHIPMENT METHOD: HAND		
						COOLER NO.: STORAGE LOCATION: T												
SIGNATURE		TIME	SIGNATURE		TIME													□ 24 HOURS □ 1 WEEK
PRINT NAM	E		PRINT NAME			Se	e Lab	Wor	k Oro	der N	0							□48 HOURS □STANDARD
COMPANY		for Other Contract Requirements D72 HOURS OTHER								□72 HOURS OTHER								

White to Lab Yellow to Project Manager

\_\_\_\_\_

E CBILD7-2 3/5 HARTCROWSER

#### Hart Crowser, Inc. 3131 Elliott Avenue, Suite 600 Seattle, Washington 98121 Office: 206.324.9530 • Fax 206.328.5581

Samples Shipped to: \_\_\_\_

JOB <u>1942600</u> LAB NUMBER	REQUESTED ANALYSIS	RS
PROJECT NAME Montlake (WSDOI) Soil Sumpling		
HART CROWSER CONTACT Julie White Kelics	× × ×	COMPOSITING INSTRUCTIONS
		OF C
SAMPLED BY: Coire McCabe	101 - 10 - 10 - 10 - 10 - 10 - 10 - 10	°.
LAB NO. SAMPLE ID DESCRIPTION DATE TIME MATRIX		
H-19-18,551 12/5/18 12 23:52 50:1		2
H-19-18 = 12/6/18 00:05		2
11-19-18,553 12/6/18 20:18		2
11-19-18-501 12/6/18 00:45		2
H-20-18, SCI 12/6/18 2:18		2
H-20-18,551 12/6/13 L:25		2
11-20-18,552 2:52		2
11-20-18,553 12/6/3 2:45		2
H-20-18,502 12/6/13 3:13 V		2
RELINQUISHED BY DATE RECEIVED BY DATE	SPECIAL SHIPMENT HANDLING OR	TOTAL NUMBER OF CONTAINERS
12/07/		SAMPLE RECEIPT INFORMATION
JULIE IV KRIC TIME JULIE WANT TIME	KUSH-	
COMPANY 2:23 COMPANY 1/20	REJULTS ON 1	GOOD CONDITION
COMPANY 757 COMPANY 76	MONDAY 12/10/18	
RELINQUISHED BY DATE RECEIVED BY DATE		
SIGNATURE	COOLER NO.: STORAGE LOCATION:	TURNAROUND TIME:
TIME TIME TIME		□ 24 HOURS □ 1 WEEK
	See Lab Work Order No	
	Tor Utner Contract Requirements	

White to Lab Yellow to Project Manager

Pink to Sample Custodian



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Samples Shipped to: \_\_

JOB 194 USUC		REQUESTED ANALYSIS											SS .				
PROJECT NAME Mor	and Alexandre	1.20 6.4	Same	<u>V. N.K.</u>		Â		,	22							AINE	
HART CROWSER CONT	ACT <u>John</u>	Wokefic	<u>ر</u>				X		412	3						CONT	COMPOSITING INSTRUCTIONS
					j.	75	Ú ±	Ž	,¥ L	22.1						OF (	
SAMPLED BY:	sire Mc	0,000			4 <i>UC</i> ,	The	1	1	214	N						NO	
LAB NO. SAMPLE ID	DESCRIPTI	ON DATE	TIME	MATRIX													
14-21-18,50		12/0/18	10:36	Soil												2	
11-21-18,55	1		10:42			À	X									2	
H-21-18,50			10,54					<b>.</b>								2	
17-21-18,52	3		11:21	V			X	-61	YM1	N	>		-			2	
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	DATE			DATE													
RELINQUISHED BY		RECEIVED BY	. N/		SPE	CIAL RAG	SHII F RF	PMEN Ouif	NT HA REME	ANDI NTS:	ING OR						TOTAL NUMBER OF CONTAINERS
SIGNATURE	- 12 7/18	SIGNALURE T	COV	12/07/1	8			<b>Q</b> 0 11									STODY SEALS:
PRINT NAME		PRINT NAMELI	R/V0V	TIME												GO	ES INO N/A OD CONDITION
COMPANY	- 2:23.	COMPANY		16-													
				DATE	-												
						OLER	NO.	:			51	ORAG	ELO	ATIC	N:		
SIGNATURE	TINAE	SIGNATURE		TINAE											24 HOURS		
PRINT NAME		PRINT NAME			See	Lab	Wor	k Orc	ler No	).						-  -4	8 HOURS 🗆 STANDARD
COMPANY		COMPANY			for	Othe	r Coi	ntrac	t Req	uire	ments						2 HOURS OTHER

Samples Shipped to: \_\_\_\_\_



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JOB <u>1</u> PROJECT HART CRC	npi ince	6×	L L	2	22	inter merge	JEST		5				OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS				
SAMPLED	вү: Со	ire M	(Cake	) 		#UL	Hixz.	rec.	ivis	Diss	R						ON N
LAB NO.	SAMPLE ID	DESCRIPTIO	MATRIX								1						
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PRINT NAME	SWICK	2:231.	PRINT NAME	82	16 29												GOOD CONDITION
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CICNATURE.						C00	DLER	NO.:				STOR	AGE LO	OCAT	ION:	T	URNAROUND TIME:
		TIME			TIME												□ 24 HOURS □ 1 WEEK
						See	Lab V	Work	Cord	er No	)	nonto					
	1										_						

Yellow to Project Manager White to Lab



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

Dec 19 2018 Advanced Analytical 2821 152nd Ave NE Redmond, WA 98052 Attention: Val Ivanov

Dear Val Ivanov:

Enclosed please find the analytical data for your MONTLAKE (DOT) project.

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

CLIENT ID	MATRIX	AMTEST ID	TEST
H-21-18, H1	Water	18-A021764	MET

Your sample was received on Monday, December 10, 2018. At the time of receipt, the sample was logged in and properly maintained prior to the subsequent analysis.

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

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

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

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

Sincerely,

Aaron W. Young Laboratory Manager

Project #: C81207-2

BACT = Bacteriological CONV = Conventionals MET = Metals ORG = Organics NUT=Nutrients DEM=Demand **MIN=Minerals** 

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



Professional Analytical Services

### **ANALYSIS REPORT**

Advanced Analytical 2821 152nd Ave NE Redmond, WA 98052 Attention: Val Ivanov Project Name: MONTLAKE (DOT) Project #: C81207-2 All results reported on an as received basis.

AMTEST Identification Number	18-A021764
Client Identification	H-21-18, H1
Sampling Date	12/07/18

### **Dissolved Metals**

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Dissolved Silver	0.842	mg/L		0.005	EPA 200.7	KQ	12/11/18
Dissolved Arsenic	1.05	mg/l		0.005	EPA 200.7	KQ	12/11/18
Dissolved Barium	1.04	mg/l		0.0005	EPA 200.7	KQ	12/11/18
Dissolved Cadmium	0.969	mg/l		0.0005	EPA 200.7	KQ	12/11/18
Dissolved Chromium	0.9941	mg/l		0.005	EPA 200.7	KQ	12/11/18
Dissolved Mercury	0.00006	mg/l		0.00002	EPA 245.1	JH	12/17/18
Dissolved Lead	0.92	mg/l		0.01	EPA 200.7	KQ	12/11/18
Dissolved Selenium	1.06	mg/l		0.005	EPA 200.7	KQ	12/11/18

σ'n Aardn W. Young Laboratory Manager

Date Received: 12/10/18 Date Reported: 12/19/18 Am Test Inc. 13600 NE 126th PL Suite C Kirkland, WA, 98034 (425) 885-1664 www.amtestlab.com



### QC Summary for sample number: 18-A021764

#### DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE VAL	UE  DUP VAL	E DUP VALUE				
18-A021764	Dissolved Mercury	mg/l	0.00006	0.00006	C	0.00			
MATRIX SP	IKES								
SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPK AMT	RECOVERY			
18-A021471	Dissolved Barium	mg/l	0.0212	2.10	2.00	103.94 %			
18-A021471	Dissolved Barium	mg/l	0.0212	2.13	2.00	105.44 %			
18-A021602	Dissolved Barium	mg/l	0.0142	2.14	106.29 %				
18-A021471	Dissolved Chromium	mg/l	< 0.005	2.038	101.90 %				
18-A021471	Dissolved Chromium	mg/l	< 0.005	2.070	2.000	103.50 %			
18-A021602	Dissolved Chromium	mg/l	0.0060	2.025	2.000	100.95 %			
18-A021764	Dissolved Mercury	mg/l	0.00006	0.00109	0.00100	103.00 %			
SAMPLE #	ANALYTE		SAMDIE + SDK			RPD			
Snike	Dissolved Barium	ma/l	2 10	2 13					
Spike	Dissolved Chromium	mg/l	2.038	2 070		1.4			
opino		1	2.000	12:01:0		1110			
STANDARD	REFERENCE MATERIAL	S							
ANALYTE		UNITS	TRUE VALUE	MEASURED	VALUE	RECOVERY			
Dissolved Silv	/er	mg/L	0.200	0.214	107. %				
Dissolved Silv	/er	mg/L	0.200	0.210	105. %				
Dissolved Silv	/er	mg/L	0.200	0.177	88.5 %				
Dissolved Ars	enic	mg/l	2.00	2.05	102. %				
Dissolved Ars	enic	mg/l	2.00	2.06	103. %				
Dissolved Ars	enic	mg/l	2.00	2.07		104. %			
Dissolved Bar	ium	mg/l	0.800	0.826		103. %			
Dissolved Bar	ium	mg/l	0.800	0.811		101. %			
<b>Dissolved Bar</b>	ium	mg/l	0.800	0.825		103. %			
Dissolved Ca	dmium	mg/l	0.800	0.806		101. %			
Dissolved Ca	dmium	mg/l	0.800	0.804		100. %			
Dissolved Ca	dmium	mg/l	0.800	0.803		100. %			
Dissolved Chr	omium	mg/l	0.8000	0.8137		102. %			
Dissolved Chr	omium	mg/l	0.8000	0.8001		100. %			
Dissolved Chr	omium	mg/l	0.8000	0.7932		99.2 %			
Dissolved Me	rcury	mg/l	0.00250	0.00256		102. %			
Dissolved Lea	ad	mg/l	0.80	0.82	102. %				
Dissolved Lea	d	mg/l	0.80	0.81	101. %				
Dissolved Lea	d	mg/l	0.80	0.81	101. %				
<b>Dissolved Sel</b>	enium	mg/l	2.00	2.05	102. %				
<b>Dissolved Sel</b>	enium	mg/l	2.00	2.06	103. %				
Dissolved Sel	enium	mg/l	2.00	2.07	104. %				

### QC Summary for sample number: 18-A021764...

### BLANKS

ANALYTE	UNITS	RESULT
Dissolved Silver	mg/L	0.009
Dissolved Silver	mg/L	0.012
Dissolved Silver	mg/L	< 0.005
Dissolved Arsenic	mg/l	< 0.005
Dissolved Arsenic	mg/l	< 0.005
Dissolved Arsenic	mg/l	< 0.005
Dissolved Barium	mg/l	< 0.0005
Dissolved Barium	mg/l	0.0012
Dissolved Barium	mg/l	0.0023
Dissolved Cadmium	mg/l	< 0.0005
Dissolved Cadmium	mg/l	< 0.0005
Dissolved Cadmium	mg/l	0.0005
Dissolved Chromium	mg/l	< 0.005
Dissolved Chromium	mg/l	0.0069
Dissolved Chromium	mg/l	0.0062
Dissolved Mercury	mg/l	< 0.00005
Dissolved Lead	mg/l	< 0.01
Dissolved Lead	mg/l	< 0.01
Dissolved Lead	mg/l	< 0.01
Dissolved Selenium	mg/l	< 0.005
Dissolved Selenium	mg/l	< 0.005
Dissolved Selenium	mg/l	< 0.005

		Relinguished by:	1/1/ aug 12/19	Relinguished by:		12	10	U	ω	7	σ	σ	4	ω	2	1 H-21-18, HI	21764 Sample ID	Phone: 1 2 3 一 T 2 ~ る 3 7 1	12-10-1-201	Address:	Project Manager: VAL J	client: HAVANEER ANA		ANAL	ADVANCED
		Date/Time	12 Hart 811	Date/Time	the second s											W b	Time Matrix		1		VANOV	Whice L		CYTICAL	
CLIEN		Received by:	A S	Received by:	<i>D</i>										poly		Container type					aB		Laboratory Job #:	Chain of Custody Re
~		Date/Time	12/10/18@	Date/Time																Collector:	Project N	Project Na			cord
	Comments:	Seals (intact?, Y/N)	A:55 Condition (temp, °C)	Total # of containers:	Sample receipt info:											X			01/10/ C1		umber: C81207-2	ame: Montlake (	(425) 702-8571 aachemlab@yahoo.com	Redmond, WA 98052	 1078 148 Avenue NE
(ASAP)	Standard O	48 hr O	24 hr	Same day O	Turnaround time:										Please filter	* Dissolved. 1	Notes, comments # of containers					DOT	P.	5	Page of

## APPENDIX B References



## APPENDIX B REFERENCES

Innovex Environmental Management, Inc., December 8, 2016, Phase II Environmental Site Assessment, State Route (SR) 520 Eastbound Off-Ramp to Montlake Vicinity, Seattle, Washington. Prepared for Washington State Department of Transportation.

Innovex Environmental Management, Inc., February 21, 2018, Supplemental Limited Phase II Environmental Site Assessment, State Route (SR) 520 Eastbound Off-Ramp to Montlake Vicinity, Seattle, Washington. Prepared for Washington State Department of Transportation.

Innovex Environmental Management, Inc., June 15, 2018, Second Supplemental Limited Phase II Environmental Site Assessment, State Route (SR) 520 Eastbound Off-Ramp to Montlake Vicinity, Seattle, Washington. Prepared for Washington State Department of Transportation.

Innovex Environmental Management, Inc., January 16, 2019, Third Supplemental Limited Phase II Environmental Site Assessment, 2625 East Montlake Place East, Seattle, Washington. Prepared for Washington State Department of Transportation.