ASSOCIATED ENVIRONMENTAL GROUP, LLC

Phase II
Environmental Site Assessment

Conducted on:

12th Avenue Parking Lot
110 & 124 12th Ave
Seattle, Washington

Prepared for:

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Orion Environmental Services, Inc.
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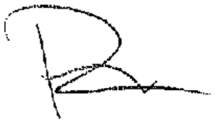
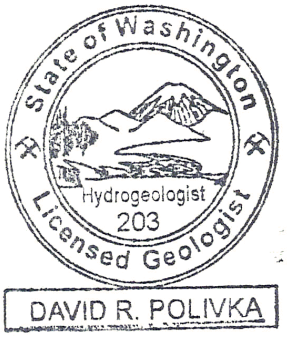
Prepared & Reviewed by:



Rebecca Dilba
Staff Geologist



David Polivka, L.G. /L.H.G.
Senior Project Hydrogeologist
L.G., L.HG. #203

AEG Project #: 14-142
Date of Report: November 14, 2014

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1.0 INTRODUCTION

Associated Environmental Group, LLC (AEG) was requested to and has completed a Phase II Environmental Site Assessment (ESA) at the property, located at 124 – 12th Avenue (parcel number 806100-0005), in Seattle, Washington (the Site). A Phase II ESA was also requested for the adjacent property to the south located at 110 – 12th Avenue (Parcel 806100-0015). However, the property was not accessible for invasive investigation at this time.

At parcel 806100-0005, the Phase II ESA was conducted by advancing six borings at locations throughout the parking lot, where at least one UST was believed to have been excavated at the Site. Soil and groundwater samples were collected from each boring and laboratory analyzed for gasoline-range total petroleum hydrocarbons (TPH-Gx), diesel-range total petroleum hydrocarbons (TPH-Dx), lube oil-range TPH, benzene, toluene, ethylbenzene, and total xylenes (BTEX). This Phase II ESA was performed to establish the subsurface environmental conditions of soil and groundwater in the potential areas of concerns.

1.1 Site and Vicinity Area Background

The Site and the adjacent parcel to the south is located on the corner of 12th Ave and East Fir Street in Seattle, Washington The Site and the adjacent parcel are positioned on approximately a 1/2 acre lot and is currently occupied by Saba Ethiopian Cuisine, Thanh Son Tofu (out of business), a parking lot, and Universal Auto Body & Services. The parking lot (the Site), where the Phase II was completed, is situated in the northwestern portion of the parcels, facing west. Gravel and dirt covers the parking throughout. The immediate vicinity of the Site is mixed residential, multi-family housing, and commercial businesses. Figure 1, *Vicinity Map*, presents the general layout of the Site.

The parking lot was believed to historically be an automotive service station with USTs, fuel dispensers, and associated piping. The Department of Ecology (Ecology) does not have any records for USTs on file for the Site.

Both properties were obtained in 1999 by Luc Vu Van Et Al, from seller Luc. John Van. Luc John Van obtained the property in 1992 from Casserd Freda E. No other information has been discovered regarding the sale of this property prior to 1992.

1.2 Previous Environmental Work Summary

AEG was made aware of a Phase I ESA conducted on the property, but has not been able to gain access to review the Phase I ESA.

1.3 Site Geology and Hydrogeology

The Site and greater vicinity is situated within the Puget Lowlands of Western Washington. This is a north-south trending trough, with the Olympic Mountains to the west and the Cascade Range to the east. Elevations range from sea level to several hundred feet. The topography is dominated by north-south trending valleys and low, nearly flat topped highlands cut by streams.

Surface geology is dominated by sandy strata from the Pleistocene-age glacial till consisting of unstratified and unsorted silt, sand, and gravel. Beds of thick till often contain discontinuous lenses or more permeable material. Perched groundwater associated within the area frequently occurs in the lenses, with the larger aquifers typically being found within 50 feet of the surface.

Though groundwater direction and gradient could not be determined due to lack of professional surveyed elevations, it is anticipated that the groundwater direction will follow the topographic contours toward the nearest water body. The water body closest to the Site is Puget Sound, located roughly 1-mile west-southwest, and anticipated to be downgradient of the Site.

Subsurface soils encountered at the boring locations for the investigation at this Site, to the maximum explored depth, consisted of medium dense gravelly sand, and dense silty sand (refer to Appendix B, *Supporting Documents, Boring Logs*). The maximum depth explored was 25 feet below ground surface (bgs).

Perched groundwater encountered at the time of subsurface exploration activities ranged from approximately 14 feet bgs in boring B-2, to approximately 20 feet bgs in boring B-6. Based on the local topography, the direction of groundwater flow is anticipated to be to the south-southeast.

2.0 OBJECTIVES AND SCOPE OF WORK

The objective of this Phase II investigation at the Site was to assess subsurface environmental conditions of what was known to be a historic auto station.

Specific tasks performed included:

- Conducting ground penetrating radar (GPR) survey in an attempt to find any USTs that may remain at the Site and/or to find evidence of former USTs at the Site.
- Conducting both public and private utilities locates for the Site and vicinity. The public rights of way locates were performed by the Underground Utilities Locate Center; Applied Professional Services (APS) provided private utility locates on the Site;
- Advancing six borings at selected locations using a Power Probe® direct-push drilling rig;
- Continuously logging the subsurface media during the investigation, and collecting soil samples at various depths to observe and to document soil lithology, color, moisture content, and sensory evidence of impairment;
- Collecting groundwater samples from temporary wells installed in the soil borings;
- Transporting and submitting the groundwater and select soil samples to a Washington State certified analytical laboratory for analyses;
- Completing data analysis of laboratory analytical results and comparing data to Ecology's Model Toxic Control Act (MTCA) Method A cleanup levels for soil;
- Containing investigation-derived-wastes, including soil cuttings and decontamination wash fluids, in 16-gallon steel drums, and storing them onsite awaiting the results of laboratory analyses; and
- Preparing this report presenting final documentation of the field activities and methodologies, summarizing the analytical results, conclusions, and recommendations.

3.0 FIELD METHODOLOGY

3.1 Ground Penetrating Radar Survey

AEG oversaw and supervised the conducting of a GPR survey at the site by Applied Professional Services (APS) in an attempt to locate any USTs on the property. APS ran a GPR across the Site in a grid pattern searching for anomalies that could represent USTs. No USTs were discovered, however what appeared to be an excavation site was found in the center of the property.

3.2 Soil Borings

AEG supervised the advancement of soil borings B-1 through B-6 at the Site on October 21, 2014. The borings were advanced to a maximum depth of 25 feet bgs via a Power Probe® direct-push drilling rig operated by Environmental Services Network (ESN) of Olympia, Washington. Soil samples were collected during drilling for field screening and laboratory analyses. The borings were advanced throughout the parking lot, focusing on where the assumed excavation site identified in the GPR survey was located. The locations of the boreholes and Site features are illustrated in Figure 2, *Site Map*. Photo documentation of the subsurface investigations is presented in Appendix A, *Site Photographs*.

3.3 Soil Sampling Procedures

Soil sampling methods for this work followed the protocols established by Ecology and EPA. To minimize VOC losses, soil sampling for VOCs and field preservation methods followed methods set forth by EPA's Method 5035A and Ecology's guidance, "*Collecting and Preparing Soil Samples for VOC Analysis*". Soil samples were collected from the boreholes via continuous soil cores in an acetate sleeve inside the drilling rod's core barrel. Soils were observed to document soil lithology, color, moisture content, and sensory evidence of contamination.

A total of ten soil samples from six borings were transferred to laboratory provided pre-weighed 40-milliliter (ml) VOA glass vials for analysis of gasoline-range total petroleum hydrocarbons (TPH) and the gasoline components: benzene, toluene, ethylbenzene, and xylenes (BTEX). Samples for diesel and heavy oil-range TPH was transferred to laboratory provided pre-weighted 4 oz. glass jars. The soil samples were transported to ESN, a Washington State certified analytical laboratory in Olympia, Washington, for analysis following industry standard chain-of-custody procedures.

Boring logs and soil laboratory analytical results are provided in Appendix B, *Supporting Documents,* and *Laboratory Datasheets.*

3.4 Groundwater Sampling Procedures

AEG sampled the groundwater from five of six borings. A groundwater sample was not able to be collected from boring B-6 because water was not encountered at the depth drilled. To collect a groundwater sample, a temporary PVC well screen was installed in each boring immediately after reaching the total boring depth. The temporary well screen was placed at the interval below the vadose zone where groundwater was encountered during drilling activities. Dedicated polyethylene tubing was inserted into the retractable screen, and groundwater was then purged via the EPA approved low-flow purge technique using a peristaltic pump, until the discharge was relatively free of sediment, for sample collection.

Groundwater samples were collected in laboratory provided 40-ml vials for gasoline-range TPH and BTEX analyses. Diesel and heavy oil-range TPH was collected in laboratory provided ½ liter amber bottles. Upon collection, the samples were placed in a chilled cooler for transport to ESN's laboratory.

3.5 Quality Controls

All soil and groundwater samples were collected in general accordance with industry protocols for the collection, documentation, and handling of samples. Descriptions of soil and sampling depths were carefully logged in the field, and the drillers and geologist confirmed sample depths as soil samples were collected. Boring location maps were completed prior to leaving the Site, to document sampling locations.

Soil samples were tightly packed into laboratory provided sampling vials to eliminate sample headspace. Groundwater samples were collected in the provided vials so that there were no bubbles. Upon sampling, all samples were placed immediately into chilled ice chests.

All samples were transported and submitted to the laboratory under industry standard chain-of-custody protocols. The laboratory report provided standard quality assurance/quality control (QA/QC), which included the following: surrogate recoveries for each sample, method blank results, duplicate analyses, matrix or blank spiked analyses, and duplicate spiked analyses.

3.6 Investigation Derived Waste

Investigation derived waste for this project consisted of soil cuttings from the subsurface exploration activities, decontamination water from decontamination of the drilling core barrel and associated equipment, and from purge water. These wastes were separated and placed in Washington State Department of Transportation (DOT) approved 16-gallon drums. The drums were stored onsite for subsequent characterization and disposal.

4.0 ANALYTICAL RESULTS

Selected soil samples and the groundwater samples were analyzed for:

- Gasoline-range TPH by Method NWTPH-Gx;
- Diesel and heavy oil-range TPH by Method NWTPH-Dx; and
- Benzene, toluene, ethylbenzene, and total xylenes (BTEX) by EPA Method 8260C.

All analytical results were compared to the Ecology MTCA Method A Cleanup Levels (MTCA levels) for the respective media. Copies of the laboratory datasheets are provided in Appendix B, *Supporting Documents,* and *Laboratory Analytical Results.*

4.1 Soil Results

Analytical results of soil samples B3-S1-15 and B6-S1-13.5, collected from boring B-3 at a depth of 15 feet bgs, and boring B-6 at a depth of 13½ feet bgs, respectively, revealed the presence of gasoline-range TPH and BTEX constituents. Gasoline-range TPH, ethylbenzene, and xylene were the only constituents of concern detected. In sample B3-S1-15, the concentrations of gasoline-range TPH, ethylbenzene, and xylene were 2,500 milligrams per kilogram (mg/kg), 0.34 mg/kg, and 0.20 mg/kg, respectively. In sample B63-S1-13.5, the concentrations of gasoline-range TPH, ethylbenzene, and xylene were 480 mg/kg, 0.56 mg/kg, and 2.80 mg/kg, respectively. The concentration of gasoline-range TPH in both samples exceeds the MTCA levels of 100.0 mg/kg, whereas ethylbenzene and xylene are below the MTCA levels of 6.0 mg/kg, and 9.0 mg/kg, respectively.

The analytical results of soil samples collected from borings B-2 at 20 feet bgs and B-6 at 18 feet bgs detected gasoline, diesel, and heavy-oil range TPH along with ethylbenzene and xylenes. However, all were below the MTCA levels. The results did not reveal the presence of the constituents of concern in any of the other samples analyzed. Table 1, *Summary of Soil Analytical Results,* presents analytical results as compared to the Ecology MTCA levels.

4.2 Groundwater Results

Gasoline-range TPH was detected in groundwater samples collected from two of six borings, B-3 and B-4. In the sample from boring B-3, the gasoline-range TPH concentration was quantified at 14,000 micrograms per liter (µg/l), exceeding the MTCA level of 800 µg/l at sites where benzene has been detected. Benzene was detected in B-3 at a concentration of 7.6 µg/l, exceeding the MTCA levels of 5.0 µg/l. The analysis of the groundwater sample from B-4 detected gasoline-range TPH at a concentration of 740 µg/l and benzene at 15 µg/l.

Toluene was detected in the sample from boring B-3 at a concentration of 4.2 µg/l, below the MTCA level of 1,000 µg/l. Ethylbenzene was detected in the sample from boring B-3 at a concentration of 26.0 µg/l, below the MTCA level of 700 µg/l. Total xylenes were detected in the groundwater from boring B-3 at a concentration of 12.0 µg/l. The MTCA level for total xylenes is 1,000 µg/l. Other than benzene, only xylene at a concentration of 14.0 µg/l was detected in the groundwater sample from B-4.

Table 2, *Summary of Groundwater Analytical Results,* presents the groundwater analytical results obtained during assessment activities at the Site, as compared to the Ecology MTCA Method A groundwater cleanup levels. Laboratory datasheets for the groundwater analytical results are provided in Appendix B, *Supporting Documents, Laboratory Datasheets.*

5.0 FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

The findings and conclusions derived during the subsurface assessment activities at the Orion 12th Ave Parking Lot are as follows:

5.1 Findings and Conclusions

- Gasoline, diesel, and heavy oil-range TPH were detected in the soil samples from three of the six borings in the areas investigated.
- The soil sample collected from approximately 15 feet bgs in **boring B-3**, contained **gasoline-range TPH** at a concentration of 2500 mg/kg which is **above** Ecology's MTCA levels.
- The soil sample collected from approximately 13½ feet bgs in **boring B-6**, contained **gasoline-range TPH** at a concentration of 480 mg/kg which is **above** Ecology's MTCA levels.
- The sample collected from approximately 18 feet bgs in boring B-6 detected gasoline-range TPH at a concentration of 50 mg/kg, **below** the MTCA level.
- The soil sample collected from approximately 20 feet bgs in boring B-2 indicated concentrations of diesel- and gasoline-range TPH at concentrations **below** MTCA Method A cleanup levels.
- The soil sample collected from boring B-2 at approximately 10 feet detected heavy oil-range TPH at a concentration of 160 mg/kg which is **below** the MTCA levels.
- The groundwater sample from **boring B-3** indicates that gasoline-range TPH and benzenes are present at concentrations **above** the respective MTCA Method A cleanup levels. Toluene ethylbenzene, and xylene were also detected, at a concentration **below** the MTCA level. In the groundwater sample from boring B-3, the following concentrations were detected:
    - Gasoline-range TPH at 14,000 µg/l ;
    - Benzene at 7.6 ug/l;
    - Toluene at 4.2 µg/l ;
    - Ethylbenzene at 26.0 µg/l ; and
    - Total xylenes at 12.0 µg/l.
- The groundwater sample from **boring B-4** indicates that benzene is present at a concentration of 15 ug/l, **above** the MTCA Method A cleanup level of 5 ug/l.

- Xylenes were also detected in the groundwater sample from boring B-4 at a concentration **below** the MTCA Method A cleanup level.

  A groundwater sample was not able to be collected from boring B-6 due to the boring being dry at the depth drilled.

- The lateral extent of affected groundwater in the areas of B-3, B-4, and B-6 has not been determined.

- Direction of groundwater flow is anticipated to be towards the south-southeast

Based on the findings from this investigation AEG concludes:

- Gasoline-range TPH contamination appears to be present in the soil and groundwater at the Site.

- The source of the contamination is unknown. However, due to the sites historical use and depth of contamination, the Sites historical USTs, previously removed, are a possible cause for the contamination.

- Based on the samples collected, the groundwater contamination may be a result of releases from the former UST system at the Site.

5.2 Recommendations

Based on the laboratory analytical results, it is recommended that:

- The installation of a minimum of four groundwater monitoring wells to a depth of 30 feet bgs should take place, to determine groundwater quality. It is recommended that the wells be placed in the following locations:

  - Two wells along the southern property boundary near borings B-3 and B-4 where gasoline-range TPH and benzene were found in the water samples;
  - One well located near boring B-2 where low levels of gasoline-range TPH and diesel were found in the soil.
  - One well near boring B-6 where gasoline-range TPH was found in in the soil and where sufficient water to sample was not present at the depth drilled.

- Quarterly groundwater monitoring/sampling events be conducted to determine groundwater quality over time.

- A professional topographic survey of the monitoring wells be conducted to establish the elevation of the wells, so that the groundwater flow direction and fluctuations beneath the Site can be determined, and to assist in determining the extent of groundwater contamination.

6.0 LIMITATIONS

This report summarizes the findings of the services authorized under our agreement with Mr. Nelson Miles of Orion Environmental Services, Inc. It has been prepared using generally accepted professional practices, related to the nature of the work accomplished. This report was prepared for the exclusive use of Orion Environmental Services, Inc., and their designated representatives for the specific application to the project purpose.

Recommendations, opinions, site history, and proposed actions contained in this report apply to conditions and information available at the time this report was completed. Since conditions and regulations beyond our control can change at any time after completion of this report, or our proposed work, we are not responsible for any impacts of any changes in conditions, standards, practices, and/or regulations subsequent to our performance of services. We cannot warrant or validate the accuracy of information supplied by others, in whole or part.

7.0 REFERENCES

American Society for Testing and Materials (ASTM) Standard E 1903-97. *Standard Guide Environmental Site Assessments: Phase II Environmental Site Assessment Process*.

Encon Solution Services, *Phase I Environmental Site Assessment*, 2014

Kimerling, A.J., and Jackson, P.L., eds., 1985; Atlas of the Pacific Northwest; Corvallis, Oregon State University Press

Schasse H.W., 1987. *Geologic Map of the Centralia Quadrangle, Washington. Washington Division of Geology and Earth Resources, Open File Report 87-11*

Washington State Department of Ecology, 2004, *Collecting and Preparing Soil Samples for VOC Analysis*, Implementation Memorandum #5

FIGURES AND TABLES

605 11th Ave. SE, Suite 201 • Olympia, WA • 98501
Phone: 360-352-9835 • Fax: 360-352-8164 • Email: admin@aegwa.com

FILENAME	DRAWN BY		CHECKED BY		APPROVED BY		PROJECT NUMBER
14-142_14Q4_1.DWG	ICD	11/4/2014	LC	11/4/2014	LC	11/4/2014	14-142

N
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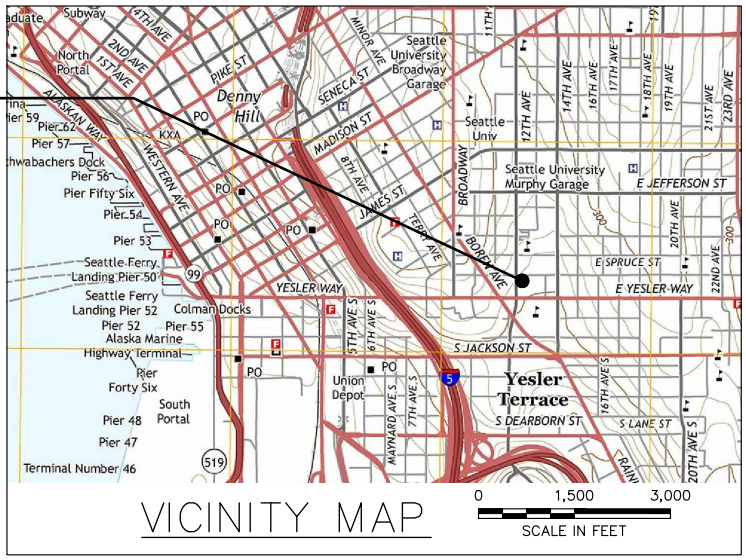
PROJECT LOCATION



VICINITY MAP

NOTES

1. THE LOCATIONS OF ALL FEATURES SHOWN ARE APPROXIMATE
2. THIS DRAWING IS FOR INFORMATION PURPOSES. IT IS INTENDED TO ASSIST IN SHOWING FEATURES DISCUSSED IN AN ATTACHED DOCUMENT.

REFERENCE

DRAWING CREATED FROM AERIAL PHOTOGRAPH AND NOTES PROVIDED BY AEG, LLC.
VICINITY IMAGE SOURCE: U.S. GEOLOGICAL SURVEY– 2013, 7.5 MINUTE QUADRANGLE MAP SEATTLE, WASHINGTON

ASSOCIATED ENVIRONMENTAL GROUP, LLC

FIGURE 1

SITE VICINITY MAP

110 12TH AVENUE
SEATTLE, WASHINGTON

PROJECT NUMBER 14-142

APPROVED BY LC 11/04/2014

CHECKED BY LC 11/04/2014

DRAWN BY ICD 11/04/2014

FILENAME 14-142_1404_1.DWG

SIDEWALK

BUILDING

SIDEWALK

PLANTER

PLANTER

E FIRST STREET

SIDEWALK

PLANTER

PLANTER

SIDEWALK

SIDEWALK

BUILDING

PLANTER

SIDEWALK

PLANTER

B-6

B-1

PARKING LOT

B-2

B-5

B-3

B-4

BUILDING

BUILDING

BUILDING

BUILDING

BUILDING

BUILDING

BUILDING

BUILDING

12TH AVENUE

N

W E

S

LEGEND

PROPERTY LINE

TENTATIVE BORING LOCATION

NOTES

1. THE LOCATIONS OF ALL FEATURES SHOWN ARE APPROXIMATE
2. THIS DRAWING IS FOR INFORMATION PURPOSES. IT IS INTENDED TO ASSIST IN SHOWING FEATURES DISCUSSED IN AN ATTACHED DOCUMENT.

REFERENCE

DRAWING CREATED FROM AERIAL PHOTOGRAPH AND NOTES PROVIDED BY AEG, LLC.

0 10 20

SCALE IN FEET

ASSOCIATED ENVIRONMENTAL GROUP, LLC

FIGURE 2

SITE MAP

110 12TH AVENUE
SEATTLE, WASHINGTON

Table 1 - Summary of Soil Analytical Results

Orion 12th Ave Seattle
Seattle, Washington

Boring	Sample Number	Depth Collected (feet)	Date Collected	Total Petroleum Hydrocarbons (TPH) (mg/kg)			Volatile Organic Compounds (mg/kg)			
				Gasoline	Diesel	Lube Oil	Benzene	Toluene	Ethylbenzene	Xylenes
B-1	B1-S1-15	15.0	10/21/2014	<10	<50	<100	<0.02	<0.05	<0.05	<0.15
B-2	B2-S1-10	10.0	10/21/2014	<10	<50	**160**	<0.02	<0.05	<0.05	<0.15
	B2-S2-13.5	13.5	10/21/2014	<10	<50	<100	<0.02	<0.05	<0.05	<0.15
	B2-S3-20	20.0	10/21/2014	**11**	**150**	<100	<0.02	<0.05	<0.05	<0.15
B-3	B3-S1-15	15.0	10/21/2014	**2500**	<50	<100	<0.02	<0.05	**0.34**	**0.20**
B-4	B4-S1-14	14.0	10/21/2014	<10	<50	<100	<0.02	<0.05	<0.05	<0.15
B-5	B5-S1-11.5	11.5	10/21/2014	<10	<50	<100	<0.02	<0.05	<0.05	<0.15
	B5-S2-18.5	18.5	10/21/2014	<10	<50	<100	<0.02	<0.05	<0.05	<0.15
B-6	B6-S1-13.5	13.5	10/21/2014	**480**	<50	<100	<0.02	<0.05	**0.56**	**2.80**
	B6-S2-18	18.0	10/21/2014	**50**	<50	<100	<0.02	<0.05	**0.23**	**0.66**
PQL (mg/kg)				10	50	50	0.02	0.05	0.05	0.15
MTCA Method A Cleanup Levels (mg/kg)				100	2000	2000	0.03	7	6	9

Notes:
mg/kg = milligrams per kilogram
-- Not analyzed for constituent
< Not detected at the listed laboratory detection limits
PQL = Practical Quantification Limit (laboratory detection limit)
Red Bold indicates the detected concentration exceeds Ecology MTCA Method A cleanup level
Bold indicates the detected concentration is below Ecology MTCA Method A cleanup levels

Table 2 - Summary of Groundwater Analytical Results

Orion 12th Ave Seattle
Seattle, Washington

Sample Number	Date Collected	Total Petroleum Hydrocarbons (TPH) (ug/l)			Volatile Organic Compounds (µg/l)			
		Gasoline (µg/l)	Diesel	Lube Oil	Benzene	Toluene	Ethylbenzene	Xylenes
B1-W	10/21/2014	<100	<250	<500	<1.0	<1.0	<1.0	<3.0
B2-W	10/21/2014	<100	<250	<500	<1.0	<1.0	<1.0	<3.0
B3-W	10/21/2014	**14,000**	<250	<500	**7.6**	**4.2**	**26.0**	**12.0**
B4-W	10/21/2014	**740**	<250	<500	**15**	<1.0	<1.0	**14.0**
B5-W	10/21/2014	<100	<250	<500	<1.0	<1.0	<1.0	<3.0
PQL (µg/l)		100	250	500	1.0	1.0	1.0	3.0
MTCA Method A Cleanup Levels (µg/l)		800	500	500	5.0	1,000	700	1,000

Notes:
ug/L= micrograms per liter
-- Not analyzed for constituent
< Not detected at the listed laboratory detection limits
PQL = Practical Quantification Limit (laboratory detection limit)
Red Bold indicates the detected concentration exceeds Ecology MTCA Method A cleanup level
Bold indicates the detected concentration is below Ecology MTCA Method A cleanup levels

APPENDIX A

Site Photographs

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ASSOCIATED ENVIRONMENTAL GROUP, LLC

SITE PHOTOGRAPHIC RECORD

Orion 12th Ave Seattle
Project Number: 14-142
November 4, 2014

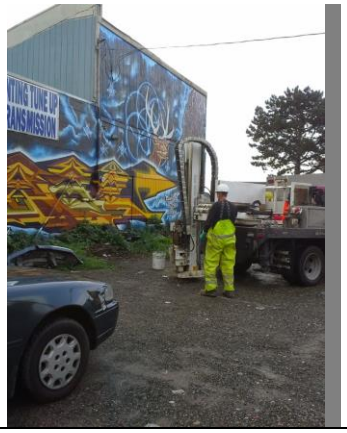

Photo #1:	*Boring B-1 being advanced. Photo looking southwest.*

Photo #2:	*Boring B-6 being advanced. Photo looking east.*

Photo #3:	*Core samples from B-3.*

Photo #4:	*Core samples from B-4.*

Photo #5:	*Core samples from B-2.*

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APPENDIX B

Supporting Documents
Boring Logs
Laboratory Datasheets

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ASSOCIATED ENVIRONMENTAL GROUP, LLC **LOG OF BOREHOLE**

PROJECT:	***Orion 12th Avenue - Seattle***	**JOB #** ***14-142***	**BORING #** ***B-1*** **PAGE 1 OF 1**
Location:	*110 12th Ave, Seattle, Washington*	**Approximate Elevation:**	
Subcontractor / Driller:	*ESN / Casey*	**Equipment / Drilling Method:**	*Geoprobe / Direct Push*
Date:	*October 21, 2014*	**Logged By:**	*B. Dilba*

Boring Depth (feet)	Soil Description	Unified Soil Symbol	Sample Depth	Sample Recovery	Sample Number	Time	Blows/Foot	PID Reading	Sheen	Observations
	Gravel surface underlain by; Light gray, moist, medium dense GRAVELLY SAND; fine grained sand, fine to medium gravel	SP				9:00	N/A			
5	at 4.5 feet; broken brick material									
10										
15	Dark brown, moist, medium dense SILTY SAND; fine grained	SM			B1-S1-15	9:15		0.0		
20	at 19 feet; saturated, with medium gravel, some silt								Not observed	
25										

Explanation

- Sample Advance / Recovery
- No Recovery
- Contact located approximately
- ATD — Groundwater level at time of drilling or date of measurement

ASSOCIATED ENVIRONMENTAL GROUP, LLC **LOG OF BOREHOLE**

PROJECT:	***Orion 12th Avenue c- Seattle***	**JOB #** ***14-142***	**BORING #** ***B-2*** **PAGE 1 OF 1**
Location:	*110 12th Ave, Seattle, Washington*	**Approximate Elevation:**	
Subcontractor / Driller:	*ESN / Casey*	**Equipment / Drilling Method:**	*Geoprobe / Direct Push*
Date:	*October 21, 2014*	**Logged By:**	*B. Dilba*

Boring Depth (feet)	Soil Description	Unified Soil Symbol	Sample Depth	Sample Recovery	Sample Number	Time	Blows/Foot	PID Reading	Sheen	Observations
	Gravel surface underlain by; Light gray, moist, dense GRAVELLY SAND; medium grained sand, fine to medium gravel, trace of organic material	SP				9:55	N/A			
5										
10					B2-S1-10	10:10		0.1		Odor
	at 10 feet; discolored soil									
					B2-S2-13.5	10:15		0.3		Strong Odor
		▽							Not observed	
15	at 14 feet; dark gray, saturated, dense									
	Dark gray, moist, stiff GRAVELLY SILT; trace of clay	ML								
20					B2-S3-20	11:00				Odor
	Dark gray, saturated, loose SANDY GRAVEL; fine grained grael, fine sand	GP								
	Dark gray, moist, stiff GRAVELLY SILT; fine gravel, trace of clay, trace organics	ML								
25										

Explanation

- Sample Advance / Recovery
- No Recovery
- Contact located approximately
- ATD — Groundwater level at time of drilling or date of measurement

ASSOCIATED ENVIRONMENTAL GROUP, LLC **LOG OF BOREHOLE**

PROJECT:	***Orion 12th Avenue - Seattle***	**JOB #** ***14-142***	**BORING #** ***B-3*** **PAGE 1 OF 1**
Location:	*110 12th Ave, Seattle, Washington*	**Approximate Elevation:**	
Subcontractor / Driller: *ESN / Casey*		**Equipment / Drilling Method:** *Geoprobe / Direct Push*	
Date:	*October 21, 2014*	**Logged By:**	*B. Dilba*

Boring Depth (feet)	Soil Description	Unified Soil Symbol	Sample Depth	Sample Recovery	Sample Number	Time	Blows/Foot	PID Reading	Sheen	Observations
	Gravel surface underlain by; Brown, dry, medium dense GRAVELLY SAND; fine grained sand, fine gravel, organic content	SP				11:30	N/A			
	at 7 feet; Yellowish brown									
5										
	at 9 feet; brick residue									
10										
15	Black, moist, medium dense SILTY SAND; fine grained, trace organics	SM			B3-S1-15	11:00		0.3	Not observed	Odor
	at 17 feet; gray, saturated, dense									
20										
	Dark gray, moist, stiff GRAVELLY SILT; fine gravel, trace organics	ML								
25										

Explanation

- Sample Advance / Recovery
- No Recovery
- Contact located approximately
- ATD — Groundwater level at time of drilling or date of measurement

ASSOCIATED ENVIRONMENTAL GROUP, LLC **LOG OF BOREHOLE**

PROJECT:	***Orion 12th Avenue - Seatlle***	**JOB #** ***14-142***	**BORING #** ***B-4*** **PAGE 1 OF 1**
Location:	*110 12th Ave, Seattle, Washington*	**Approximate Elevation:**	
Subcontractor / Driller: *ESN / Casey*		**Equipment / Drilling Method:** *Geoprobe / Direct Push*	
Date:	*October 21, 2014*	**Logged By:**	*B. Dilba*

Boring Depth (feet)	Soil Description	Unified Soil Symbol	Sample Depth	Sample Recovery	Sample Number	Time	Blows/Foot	PID Reading	Sheen	Observations
	Gravel surface underlain by; Light brown, moist, medium, dense GRAVELLY SAND; fine to medium grained sand, fine gravel, trace organics	SP	1–5				N/A			
5	at 9.5 feet; brick material		6–10							
10			11–15		B4-S1-14	13:00		0.1	Not observed	Slight odor
15	Greenish gray, saturated, dense SILTY SAND; fine grained	SM	16–20							
20	at 16.5 feet; moist		21–25							
25										

Explanation

- Sample Advance / Recovery
- No Recovery
- Contact located approximately
- ATD — Groundwater level at time of drilling or date of measurement

ASSOCIATED ENVIRONMENTAL GROUP, LLC **LOG OF BOREHOLE**

PROJECT: *12th Ave Parking Lot*	**JOB #** *14-142*	**BORING #** *B-5*	**PAGE 1 OF 1**
Location: *110 12th Ave, Seattle, Washington*	**Approximate Elevation:**		
Subcontractor / Driller: *ESN/Casey*	**Equipment / Drilling Method:**		*Geoprobe*
Date: *October 21, 2014*	**Logged By:** *B. Dilba*		

Boring Depth (feet)	Soil Description	Unified Soil Symbol	Sample Depth	Sample Recovery	Sample Number	Time	Blows/Foot	PID Reading	Sheen	Observations
	Gravel surface underlain by; Light gray, moist, medium dense GRAVELLY SAND; fine grained sand, fine gravel	SP				13:55	N/A			
5										
	Brown,moist, medium dense SILTY SAND; fine grained sand, with fine to medium gravel	SM								
10					B5-S1-11.5	1415		0.1		faint odor
	at 11.5 feet; greenish gray									
15										
	at 16 feet; a 0.5 foot layer of light gray GRAVELLY SAND, underlain by: Black moist, dense SILTY SAND, fine grained	SP SM								
			▽		B5-S2-18.5	14:25		0.0	Not observed	
20	at 19 feet; greenish gray, saturated									
25										

Explanation

- Sample Advance / Recovery
- No Recovery
- Contact located approximately
- ATD — Groundwater level at time of drilling or date of measurement

ASSOCIATED ENVIRONMENTAL GROUP, LLC **LOG OF BOREHOLE**

PROJECT:	***Orion 12th Avenue - Seattle***	**JOB #** ***14-142***	**BORING #** ***B-6*** **PAGE 1 OF 1**
Location:	*110 12th Ave, Seattle, Washington*	**Approximate Elevation:**	
Subcontractor / Driller: *ESN / Casey*		**Equipment / Drilling Method:** *Geoprobe / Direct Push*	
Date:	*October 21, 2014*	**Logged By:** *B. Dilba*	

Boring Depth (feet)	Soil Description	Unified Soil Symbol	Sample Depth	Sample Recovery	Sample Number	Time	Blows/Foot	PID Reading	Sheen	Observations
	Gravel surface underlain by; Brown, moist, medium dense GRAVELLY SAND; fine grained sand, fine gravel	SP	1–5				N/A			
5			5							
10			10							
			13		B6-S1-13.5	15:15		10		odor from 13.5 to 15.0
	Dark green, moist, dense SILTY SAND with GRAVEL; fine sand, fine gravel	SM	14							
15	at 14 feet; GREENISH GRAY, trace of fine gravel, trace of clay		15							
			18		B6-S2-18	15:25		2.8		Odor from 16.5 to 18.5
20	at 19.5 feet; wet, with fine gravel	▽	20						Not observed	
25			25							

Explanation

- Sample Advance / Recovery
- No Recovery
- Contact located approximately
- ATD — Groundwater level at time of drilling or date of measurement

ESN NORTHWEST, INC. | Environmental Services Network

CHAIN-OF-CUSTODY RECORD

CLIENT: AEG
ADDRESS: 605 11th Ave Suite 201 Olympia, WA
PHONE: (360) 352-9835 FAX:
CLIENT PROJECT #: 14-142 PROJECT MANAGER: M. Chun

DATE: 10/22/14 PAGE 1 OF 1
PROJECT NAME: 12th Ave Parking Lot
LOCATION: Seattle, WA
COLLECTOR: B. Dulba DATE OF COLLECTION: 10/21/14

Sample Number	Depth	Time	Sample Type	Container Type	TPH - HCID	TPH - Diesel & Oil	TPH - Gasoline	BTEX	VOC 8260CL	VOC 8260	SemiVol 8270	PAH's 8270	PCB's 8082	CL Pesticides 8081	RCRA 8 Metals	MTCA 5 Metals	Pb	Asbestos - PLM	GRO Suite	DRO Suite	WO Suite	NOTES	Total Number of Containers	Laboratory Note Number
1. B1-S1-15	15	0915	Soil	4oz/40mL	X	X	X																3	
2. B2-S1-10	10	1010																					3	
3. B2-S2-13.5	13.5	1015																					3	
4. B2-S3-20	20	1100																					3	
5. B3-S1-15	15	1145																					3	
6. B4-S1-14	14	1300																					3	
7. B5-S1-11.5	11.5	1415																					3	
8. B5-S2-18.5	18.5	1425																					3	
9. B6-S1-13.5	13.5	1515																					3	
10. B6-S2-18	18	1525	Soil																				3	
11. B1-W	-	1615	Water	Amber/40mL																			2	
12. B2-W	-	1115		Amber/40mL																			3	
13. B3-W	-	1215																					3	
14. B4-W	-	1338																					3	
15. B5-W	-	1455																					3	
16.																								
17.																								
18.																								

RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME
[signature]	10/22/14 0930	[signature]	10/22/14
RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME
			930

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	
CHAIN OF CUSTODY SEALS Y/N/NA	
SEALS INTACT? Y/N/NA	
RECEIVED GOOD COND./COLD	
NOTES:	

LABORATORY NOTES:

Turn Around Time: 24 HR 48 HR (5 DAY)

1210 Eastside Street SE, Suite 200
Olympia, Washington 98501
Phone: 360-459-4670
Fax: 360-459-3432
Website: www.esnnw.com
E-Mail: info@esnnw.com

ESN NORTHWEST CHEMISTRY LABORATORY

Associated Environmental Group
PROJECT 12th AVE PARKING LOT
PROJECT #14-142
Seattle, Washington

ESN Northwest
1210 Eastside Street SE Suite 200
Olympia, WA 98501
(360) 459-4670 (360) 459-3432 Fax
lab@esnnw.com

Analysis of Diesel Range Organics & Lube Oil Range Organics in Soil by Method NWTPH-Dx Extended

Sample Number	Date Prepared	Date Analyzed	Surrogate Recovery (%)	Diesel Range Organics (mg/kg)	Lube Oil Range Organics (mg/kg)
Method Blank	10/24/2014	10/24/2014	118	nd	nd
LCS	10/24/2014	10/24/2014	119	62%	---
B1-S1-15	10/24/2014	10/24/2014	115	nd	nd
B2-S1-10	10/24/2014	10/24/2014	124	nd	**160**
B2-S2-13.5	10/24/2014	10/24/2014	102	nd	nd
B2-S3-20	10/24/2014	10/24/2014	126	**150**	nd
B3-S1-15	10/24/2014	10/24/2014	126	nd	nd
B4-S1-14	10/24/2014	10/24/2014	131	nd	nd
B4-S1-14 Duplicate	10/24/2014	10/24/2014	119	nd	nd
B5-S1-11.5	10/24/2014	10/24/2014	118	nd	nd
B5-S2-18.5	10/24/2014	10/24/2014	107	nd	nd
B6-S1-13.5	10/24/2014	10/27/2014	115	nd	nd
B6-S2-18	10/24/2014	10/27/2014	128	nd	nd
Reporting Limits				50	100

"nd" Indicates not detected at the listed detection limits.
"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE : 50% TO 150%

ESN NORTHWEST CHEMISTRY LABORATORY

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Analysis of Diesel Range Organics & Lube Oil Range Organics in Water by Method NWTPH-Dx Extended

Sample Number	Date Prepared	Date Analyzed	Surrogate Recovery (%)	Diesel Range Organics (ug/L)	Lube Oil Range Organics (ug/L)
Method Blank	10/23/2014	10/23/2014	132	nd	nd
LCS	10/23/2014	10/23/2014	138	89%	---
B1-W	10/23/2014	10/23/2014	129	nd	nd
B2-W	10/23/2014	10/23/2014	147	nd	nd
B3-W	10/23/2014	10/23/2014	134	nd	nd
B4-W	10/23/2014	10/23/2014	117	nd	nd
B5-W	10/23/2014	10/23/2014	109	nd	nd
Reporting Limits				250	500

"nd" Indicates not detected at the listed detection limits.
"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE : 50% TO 150%

ESN NORTHWEST CHEMISTRY LABORATORY

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Analysis of Gasoline Range Organics & BTEX in Soil by Method NWTPH-Gx/8260

Sample Number	Date Prepared	Date Analyzed	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)	Gasoline Range Organics (mg/kg)	Surrogate Recovery (%)
Method Blank	10/22/2014	10/22/2014	nd	nd	nd	nd	nd	118
LCS	10/22/2014	10/22/2014	76%	85%	87%	91%	92%	104
LCSD	10/22/2014	10/22/2014	90%	98%	102%	103%	---	102
B1-S1-15	10/21/2014	10/1/2314	nd	nd	nd	nd	nd	116
B2-S1-10	10/21/2014	10/22/2014	nd	nd	nd	nd	nd	116
B2-S2-13.5	10/21/2014	10/22/2014	nd	nd	nd	nd	nd	116
B2-S3-20	10/21/2014	10/22/2014	nd	nd	nd	nd	**11**	117
B3-S1-15	10/21/2014	10/22/2014	nd	nd	**0.34**	**0.20**	**2500**	113
B4-S1-14	10/21/2014	10/23/2014	nd	nd	nd	nd	nd	115
B5-S1-11.5	10/21/2014	10/23/2014	nd	nd	nd	nd	nd	108
B5-S2-18.5	10/21/2014	10/22/2014	nd	nd	nd	nd	nd	111
B6-S1-13.5	10/21/2014	10/23/2014	nd	nd	**0.56**	**2.8**	**480**	113
B6-S2-18	10/21/2014	10/23/2014	nd	nd	**0.23**	**0.66**	**50**	116
B6-S2-18 Duplicate	10/21/2014	10/23/2014	nd	nd	**0.08**	**0.24**	**23**	115
Reporting Limits			0.02	0.05	0.05	0.15	10	

"---" Indicates not tested for component.
"nd" Indicates not detected at the listed detection limits.
"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (Bromoflurorbenzene) & LCS : 65% TO 135%

ESN NORTHWEST CHEMISTRY LABORATORY

Associated Environmental Group
PROJECT 12th AVE PARKING LOT
PROJECT #14-142
Seattle, Washington

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Analysis of Gasoline Range Organics & BTEX in Water by Method NWTPH-Gx/8260

Sample Number	Date Analyzed	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Xylenes (ug/L)	Gasoline Range Organics (ug/L)	Surrogate Recovery (%)
Method Blank	10/24/2014	nd	nd	nd	nd	nd	114
LCS	10/24/2014	85%	85%	87%	86%	98%	102
LCSD	10/24/2014	91%	83%	94%	116%	---	132
B1-W	10/24/2014	nd	nd	nd	nd	nd	115
B2-W	10/24/2014	nd	nd	nd	nd	nd	117
B3-W	10/24/2014	**7.6**	**4.2**	**26**	**12**	**14,000**	119
B4-W	10/24/2014	**15**	nd	nd	**14**	**740**	115
B5-W	10/24/2014	nd	nd	nd	nd	nd	122
B5-W Duplicate	10/24/2014	nd	nd	nd	nd	nd	121
Trip Blank	10/24/2014	nd	nd	nd	nd	nd	119
Reporting Limits		1.0	1.0	1.0	3.0	100	

"nd" Indicates not detected at the listed detection limits.
"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (Bromoflurorbenzene) & LCS: 65% TO 135%