Phase II Subsurface Investigation

Gig Harbor Transmission
14610 Purdy Drive NW
Gig Harbor, Washington

February 19, 2010

Prepared for:
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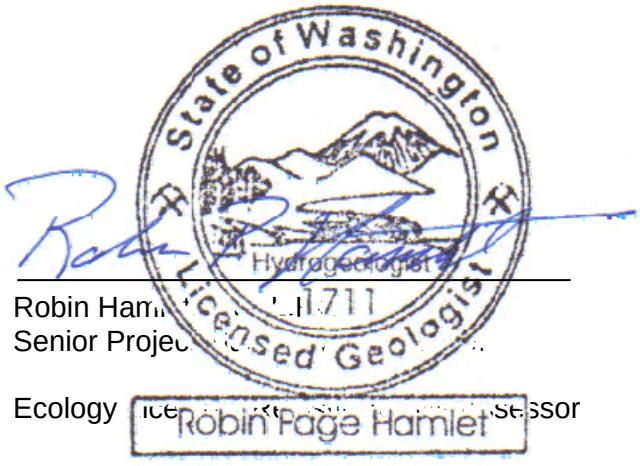
EMS Job No. 0359-01



Robin Ham[illegible]
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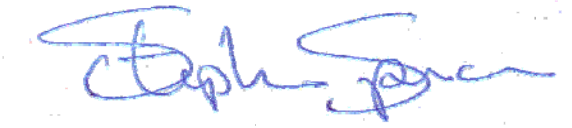

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ATTACHMENTS

EXECUTIVE SUMMARY

Environmental Management Services (EMS) completed a Phase II subsurface investigation as part of a due diligence for the subject site (Site) located at 14610 Purdy Drive NW, Gig harbor, Washington (Figure 1).

The Site is located on the west side of Purdy Drive Northwest in the 14600 block. The Site has reportedly been operating as a transmission and car repair for several years. The Property occupies a rectangular block of land bounded on the north by an automotive repair shop, on the east by Purdy Drive NW, on the west by residential housing and on the south by used car sales lot, a restaurant and parking. Figure 1 - Site Location Map and Figure 2 – Boring Location Map present Site location, configuration and boring location details. Figures, including photographs, are presented in Appendix A.

In 2009 the Washington Department of Ecology (Ecology) received a report that there had been a release or threatened release of hazardous substances at the subject Site. As a result the Site was put on Ecology's "Confirmed or Suspected Contaminated Sites": (CSCS) List. Ecology then requested the Tacoma-Pierce County Health Department (TPCHD) to conduct an environmental inspection of the Site. TPCHD conducted a site visit on January 14th, 2009 to perform a visual inspection of the site. On March 12, 2009 TPCHD returned to the Site and collected two (2) surface soil samples, one from the trench on the north side of the hydraulic lift area and one from the trench along the west side of the main building. These surface soil samples were collected from approximately the top two inches of the soil column. Analytical results reported heavy oil concentrations of 29,000 milligram per kilogram (mg/kg), PAH concentrations of 0.1855 mg/kg and cadmium and lead at concentrations of 8.8 mg/kg and 400 mg/kg respectively, all above the MTCA Method A Soil Cleanup Levels.

EMS completed a Phase II Subsurface Investigation with drilling and soil and groundwater sampling on Wednesday, February 10, 2010. On this day, six (6) soil borings (B1, B2, B3, B4, B5 and B6) were advanced using direct push drilling techniques (see Boring Location Map Figure 2). Borings B1, B3, B4 and B5 were placed on the south side of the site building. Boring B2 was placed in the southwest area of the exterior lift area and B6 was placed in front of the north working bay. EMS also collected four (4) surface soil samples from the north trench along the exterior lift area and the trench running parallel to the west side of the main building. One (1) surface soil sample was collected just off the sidewalk south of the building office area.

Shallow subsurface water was encountered in five (5) of the six (6) borings in isolated, perched lenses. Shallow, groundwater water was encountered in B1 at 9 feet bgs, in B2 at 8.5 feet bgs, in B4 at 11.5 feet bgs, in B5 at 10.5 feet bgs and in B6 at 9.5 feet bgs. Groundwater was not encountered in boring B3. At the completion of the drilling each boring was backfilled with bentonite pellets and sealed at the surface with an asphalt or concrete plug and patch.

Selected soil samples were analyzed for diesel and heavy oil range hydrocarbons by Ecology Method NWTPH-Dx, gasoline range hydrocarbons by Ecology Method NWTPH-Gx, benzene, toluene, ethylbenzene, xylenes (BTEX) by EPA Method 8021b, metals (lead, chromium and cadmium) by EPA Method 6020 and polyaromatic hydrocarbons (PAH) compounds by EPA Method 270C. The remaining samples were placed on hold and stored by the analytical laboratory for later analysis if required. All samples were placed in laboratory approved and supplied containers and delivered to the analytical laboratory under standard industry chain of custody. Chemical analysis for the media was selected based on suspected historical site use, suspected contaminates associated with that usage and previous investigations.

FINDINGS

Ten (10) discrete soil samples and three (3) water samples from five (5) boring locations and five (5) discrete surface soil samples were analyzed. The boring locations, sample locations and sample depths, were selected based on historical site use to best characterize the subsurface. Chemical analysis for each discrete sample was based on information provided in the Tacoma-Pierce County Health Department letter to Tracy Larson dated April 7 2009 and as well as historical Site use documented in the ALKAI Consultants LLC Phase I Environmental site Assessment Report dated January 22, 2010.

Based on the laboratory analytical results for the samples collected from the Phase II Subsurface Investigation, there appears to be no impact to the subsurface soils or the shallow, perched water zones by petroleum hydrocarbons, volatile organic compounds, polyaromatic hydrocarbons (PAHs) or metals.

OPINION

Based on the analytical results for samples collected it is EMS's professional opinion that the subsurface materials (soil and water) have not been impacted by contaminates of concern.

Contamination found by the TPCHD sampling has been remediated to below MTCA Method A Cleanup Levels. Therefore, no further site characterization is recommended or warranted.

1.0 INTRODUCTION

Environmental Management Services LLC (EMS) was retained by Tracy Larson to conduct a Phase II Subsurface Investigation of the Gig Harbor Transmission property located at 14610 Purdy Drive NW, Gig Harbor, Washington, "Site".

1.1 BACKGROUND

The Site is located on the west side of Purdy Drive Northwest in the 14600 block. The Site has reportedly been operating as a transmission and car repair for several years. The Property occupies a rectangular block of land bounded on the north by an automotive repair shop, on the east by Purdy Drive NW, on the west by residential housing and on the south by used car sales lot, a restaurant and parking. Figure 1 - Site Location Map and Figure 2 – Boring Location Map present Site location, configuration and boring location details. Figures, including photographs, are presented in Appendix A.

In 2009 the Washington Department of Ecology (Ecology) received a report that there had been a release or threatened release of hazardous substances at the subject Site. As a result the Site was put on Ecology's "Confirmed or Suspected Contaminated Sites": (CSCS) List. Ecology then requested the Tacoma-Pierce County Health Department (TPCHD) to conduct an environmental inspection of the Site. TPCHD conducted a site visit on January 14th, 2009 to perform a visual inspection of the site. On March 12, 2009 TPCHD returned to the Site and collected two (2) surface soil samples, one from the trench on the north side of the hydraulic lift area and one from the trench along the west side of the main building. These surface soil samples were collected from approximately the top two inches of the soil column. Analytical results reported heavy oil concentrations of 29,000 milligram per kilogram (mg/kg), PAH concentrations of 0.1855 mg/kg and cadmium and lead at concentrations of 8.8 mg/kg and 400 mg/kg respectively, all above the MTCA Method A Soil Cleanup Levels.

TPCHD recommended the Site be characterized and remediated to within the MTCA Method A Unrestricted Land Use Cleanup Levels (Chapter 173-340 of the Washington Administrative Code).

1.2 SCOPE OF SERVICES

EMS conducted the following tasks.

- Review reports of previous environmental activities.
- Prepare/conduct a Subsurface Drilling program for subject property.
- Sample subsurface media using direct push sampling techniques.
- Complete chemical analysis for site-specific contaminants of concern on selected samples.
- Complete a sampling report summarizing sampling activities and laboratory findings.

1.3 HEALTH & SAFETY

A site-specific Health and Safety Plan (HASP) was prepared in accordance with Chapter 296-62 of the Washington Administrative Code (WAC) and 29 CFR 1910.120 (Code of Federal Regulations). The HASP identified potential physical and chemical hazards and specified personal protection and safety monitoring requirements. Site health and safety meetings were conducted during fieldwork at the beginning of the project to review aspects of the HASP, and to provide an opportunity for EMS site workers and contractor personnel to discuss health and safety issues or concerns. On-site EMS personnel associated with the field activities were required to be familiar with and comply with provisions put forth in the HASP. Subcontractors on-site were required to have their own HASP that identified potential physical and chemical hazards associated with their own work activities.

1.4 UTILITY LOCATION IDENTIFICATION

Prior to implementing subsurface sampling activities at the Site, EMS notified the public underground utilities alert network of intrusive activities. The service contacted appropriate agencies or companies with underground utilities in the area. These agencies then marked the location of their utilities along the right-of-ways and easements of the Site. EMS contracted with Applied Professional Services Inc. (APS) to perform a private utility locate within the boundaries of the subject Site.

2.0 SITE AND VICINITY CHARACTERISTICS

The Site is located on the west side of Purdy Drive Northwest in the 14600 block. The Site has reportedly been operating as a transmission and car repair for several years. The Property occupies a rectangular block of land bounded on the north by an automotive repair shop, on the east by Purdy Drive NW, on the west by residential housing and on the south by used car sales lot, a restaurant and parking. Figure 1 - Site Location Map and Figure 2 – Boring Location Map present Site location, configuration and boring location details. Figures, including photographs, are presented in Appendix A.

2.1 LEGAL DESCRIPTION OF PROPERTY

The Site is comprised of one parcel identified as Pierce County Tax Parcel: 0122133085 located at 14610 Purdy Drive NW, Gig Harbor, Washington. The Property is occupied by Gig Harbor Transmission with vehicle parking and storage. The parcel is approximately 15,523 sq. ft. (0.36 acres). The Pierce County Assessor records list the owner/taxpayer as Tracy Larson.

2.2 PROPERTY AND VICINITY GENERAL CHARACTERISTICS

The Site is located on the west side of Purdy Drive Northwest in the 14600 hundred block. The surrounding properties exhibit land use as rural residential, low density commercial, used car and automotive repair businesses, parking lots, and restaurants.

3.0 PHYSICAL SETTING

Geologic conditions can often affect, to some extent, the environmental integrity of property. Underlying soil and bedrock formations may facilitate or impede the migration of chemical contaminants in groundwater, and may even be the source of contaminants such as radon and metals. This section of the report summarizes geologic factors that may affect the Site with regard to environmental concerns.

3. 1 TOPOGRAPHY

The United States Geological Survey (USGS), Quadrangle Gig Harbor, WA Quadrangle 7.5-Minute series topographic map (1983) was reviewed and according to the contour lines on the topographic map, the Site is located at approximately 45 feet above mean sea level (MSL). The topographic contour lines in the vicinity of the Site indicate the gradient slopes gently toward the southwest. The subject Site and immediately adjacent properties slope gently to the south and southwest toward the Carr Inlet water body less than a ½ mile to the west of the Site.

3.2 GEOLOGY AND SOILS

The Site is located in the region of the Puget Lowlands an elongated topographic and structural depression filled with complex sequences of glacial and nonglacial sediments that overlie bedrock. Continental ice sheets up to 3,000 feet thick covered portions of the Puget Lowland several times during the Quaternary period. Retreating ice carved new landscapes, rechanneled rivers, drained or formed lakes, and deposited glacial drift including till and outwash (WA DNR, 2002).

The Site's shallow geology varies across the Site depending on surface usage at any one location. South of the Site's main structure the shallow soils consist clayey sands and concrete within the former tank pit to clayey, gravelly sand to clay Till at depth. The soils at the B2 location consisted of clayey, silty and gravelly sand fill to approximately 15 feet bgs when clay Till was encountered. The shallow soils around location B6 consisted of clayey, silty and gravelly sand fill to a depth of 14 feet bgs when clay Till was encountered. Refer to the soil boring logs presented in Attachment D for details.

3.3 HYDROGEOLOGIC ENVIRONMENT

The primary aquifers in the Puget Sound region are typically overlain by relatively impermeable glacial till deposits that are present at or near the ground surface. Within these till deposits are localized areas or lenses of water-bearing sands and gravels that may result in a shallow, perched water table. Lateral and vertical migration of shallow groundwater may be impeded by the relatively impermeable nature of the till and by the sometimes-discontinuous nature of the perched water-bearing sands and gravel. Perched and discontinuous zones of shallow groundwater may be seasonally or perennially present, depending on site-specific conditions.. Shallow groundwater flow directions fluctuate and tend to follow topographic gradient but are also affected by seasonal high water tables and variable soil porosity characteristics. Groundwater migration pathways may also follow underground conduits.

A review of Washington State Department of Ecology well logs for the Site vicinity within one-eighth mile indicates depth to the first water bearing zone at approximately 33 feet below ground surface (bgs) and a second water bearing zone at depths greater than 110 feet bgs. At the subject Site shallow groundwater (perched water table) ranges from approximately 8.5 to 10.5 feet (bgs) and exist as discontinuous lenses. No settling ponds, lagoons, surface impoundments, wetlands or natural catch basins were observed at the Site or surrounding properties.

4.0 INVESTIGATION FIELD ACTIVITIES AND OBSERVATIONS

EMS mobilized to the Site on February 10, 2010. EMS senior project manager/geologist, Robin Hamlet, completed field activities including drilling, soil and water sampling. Pacific Northwest Probe and Drilling completed all probing activities with a direct-push drill rig. These activities included the completion of six (6) direct-push soil probe borings and collection of soil and water samples from the six (6) borings. EMS also collected five (5) shallow surface soil samples from the west and north trenches and an open area on the south side of the building.

4.1 DRILLING AND SOIL SAMPLING ACTIVITIES

The drilling and sampling event occurred on Wednesday, February 10, 2010. On this day, six (6) soil borings (B1, B2, B3, B4, B5 and B6) were advanced using direct push drilling techniques (see Boring Location Map Figure 2). Borings B1, B3, B4 and B5 were placed on the south side of the site building in the vicinity of a former UST pit. Boring B2 was placed in the southwest area of the exterior lift area and B6 was placed in front of the north working bay. EMS also collected four (4) soils samples from the north trench along the exterior lift area and the trench running parallel to the west side of the main building. One (1) surface soil sample was collected just off the sidewalk south of the building office area.

Boring B1 was planned for the former UST excavation located on the south side of the property. EMS and PNW Probe made approximately six (6) attempts to place B1 in the UST excavation and could not probe below four (4) feet below ground surface (bgs) because of impenetrable subsurface debris consisting of concrete and abandoned UST piping. B1 was re-located approximately 15 feet to the west and the drilling was successful and was drilled to a total refusal depth of 15 feet bgs. B3 was drilled to a refusal depth of 11 feet bgs, B4 to a refusal depth of 15 feet bgs and B5 to a refusal depth of 14 feet bgs. B2 and B6 were both drilled to a refusal depth of 14 feet bgs.

Soil samples retrieved, when using the direct push equipment, were collected using a 2-inch diameter, 4-foot long stainless steel sampler fitted with virgin acetate liners. The sampling technique consisted of advancing the sampler starting from the surface in four-foot increments. This sampling method allowed for the continuous review of soil from each boring location. At the completion of each boring and sample collection each boring was backfilled with bentonite chips and sealed at the surface with an asphalt or concrete plug and surface seal.

Each discrete soil sample was visually observed for staining and was field screened using a photo ionization detector (PID) for volatile organic compounds. No visual evidence of petroleum hydrocarbon impacts or volatile organic odors was detected during the identification or collection of soil samples. The soils and soil column were logged in general accordance with the Unified Soil Classification System. Soil descriptions and field screening results were recorded on the boring logs provided in Attachment D. Soil samples were placed into laboratory-supplied, manufacturer-cleaned 4 oz. glass jars with Teflon®-lined plastic lids and maintained at 4° Celsius in a chilled cooler and delivered to Fremont Analytical, a Washington State accredited analytical laboratory, for chemical analysis under accordance with industry standard chain of custody protocols.

The Site's shallow geology varies across the Site. South of the Site's main structure the shallow soils consist of clayey sands and concrete within the former tank pit to clayey, gravelly sand to clay Till outside the former UST pit. The soils at the B2 location consisted of clayey, silty and gravelly sand fill to approximately 15 feet bgs when clay Till was encountered. The shallow soils around location B6 consisted of clayey, silty and gravelly sand fill to a depth of 14 feet bgs when clay Till was encountered. Refer to the soil boring logs presented in Attachment D for details.

4.1.1 SUBSURFACE WATER

Shallow subsurface water was encountered in five (5) of the six (6) borings in isolated, perched lenses. Shallow, groundwater water was encountered in B1 at 9 feet bgs, in B2 at 8.5 feet bgs, in B4 at 11.5 feet bgs, in B5 at 10.5 feet bgs and in B6 at 9.5 feet bgs. Groundwater was not encountered in boring B3. Groundwater samples were collected using a peristaltic pump and low-flow sampling technology and placed in laboratory approved sampling containers. At the completion of the drilling each boring was backfill with bentonite pellets and sealed at the surface with an asphalt or concrete plug and patch.

4.2 LABORATORY ANALYSIS & RESULTS

4.2.1 SOIL SAMPLE RESULTS

EMS collected 11 subsurface and five (5) near surface (6"-12") soil samples from the six borings and from five (5) surface locations. Selected soil samples were analyzed for diesel and heavy oil range hydrocarbons by Ecology Method NWTPH-Dx, gasoline range hydrocarbons by Ecology Method NWTPH-Gx, benzene, toluene, ethylbenzene, xylenes (BTEX) by EPA Method 8021b,

metals (lead, chromium and cadmium) by EPA Method 6020 and polyaromatic hydrocarbons (PAH) compounds by EPA Method 270C. The remaining samples were placed on hold and stored by the analytical laboratory for later analysis, if required. All samples were placed in laboratory approved and supplied containers and delivered to the analytical laboratory under standard industry chain of custody.

Laboratory analytical results for all soil samples collected reported diesel and heavy hydrocarbon compounds, gasoline range hydrocarbons and PAHs below the analytical method reporting limit (i.e. non-detect). Analytical results reported metal concentrations in the five (5) shallow soil samples (T1, T2, T3, T4 and SS1) above the laboratories practical quantification limit and but below the MTCA Method A Soil Cleanup Levels. A review of Ecology's publication on metal background concentrations in the Puget Sound Area indicate that the metals concentrations reported are within acceptable parameters for background concentrations. Laboratory results for soils are presented in Attachment A.

4.2.2 WATER SAMPLE RESULTS

EMS collected a total of four (4) water samples (B1H2O, B2H2O, B4H2O and B6H2O) from borings B1, B2, B4 and B6. All four (4) water samples were transported to the analytical laboratory for analysis under industry standard chain of custody procedures. Water samples B1H2O, B2H2O and B6H2O were analyzed for diesel and heavy oil range hydrocarbons by Ecology Method NWTPH-Dx, gasoline range hydrocarbons by Ecology Method NWTPH-Gx, benzene, toluene, ethylbenzene, xylenes (BTEX) by EPA Method 8021b, metals (lead, chromium and cadmium) by EPA Method 6020 and polyaromatic hydrocarbons (PAH) compounds by EPA Method 270C. Water sample B4H2O was placed on hold for later analysis, if the analyzed water samples indicated that the groundwater had been impacted.

Laboratory analytical results for the three (3) water samples collected reported diesel and heavy hydrocarbon compounds, gasoline range hydrocarbons, PAHs and metals below the respective analytical method detection limits (i.e. non-detect).

5.0 CONCLUSIONS

Ten (10) discrete soil samples and three (3) water samples were analyzed from five (5) boring locations. The boring locations, sample locations and sample depths, were selected to best characterize the subsurface for potential impact from off-site historical site use. Chemical analysis for each discrete sample was based on information provided in the Tacoma-Pierce County Health Department letter to Tracy Larson dated April 7 2009 and the ALKAI Consultants LLC Phase I Environmental Site Assessment Report dated January 22, 2010.

Based on the laboratory analytical results for the samples collected from the borings, there appears to be no impact to the subsurface soils or the shallow, perched water zones by petroleum hydrocarbons, volatile organic compounds, polyaromatic hydrocarbons (PAHs) or metals.

Results from the TPCHD sampling indicated heavy oils, PAHs and metals exceeding MTCA Method A Soil Cleanup Levels present in the surface soil samples collected from the trenches north of the hydraulic lift area and on the west side of the main building. Soil was reportedly excavated from these trench locations by the owner of the property. EMS had visual observations that the near surface soils had been remediated.

The five shallow soil samples collected by EMS from 6 inches to 12 inches bgs in the area of the TPCHD findings were reported as non-detect for the analytes of interest. Therefore, it appears that the remediation efforts conducted by GHT were successful in addressing the impacts identified by TPCHD.

Opinion

Based on the analytical results for samples collected it is EMS's professional opinion that the subsurface materials (soil and water) have not been impacted by contaminates of concern. Contamination found by the TPCHD sampling has been remediated to below MTCA Method A Cleanup Levels. Therefore, no further site characterization is recommended or warranted.

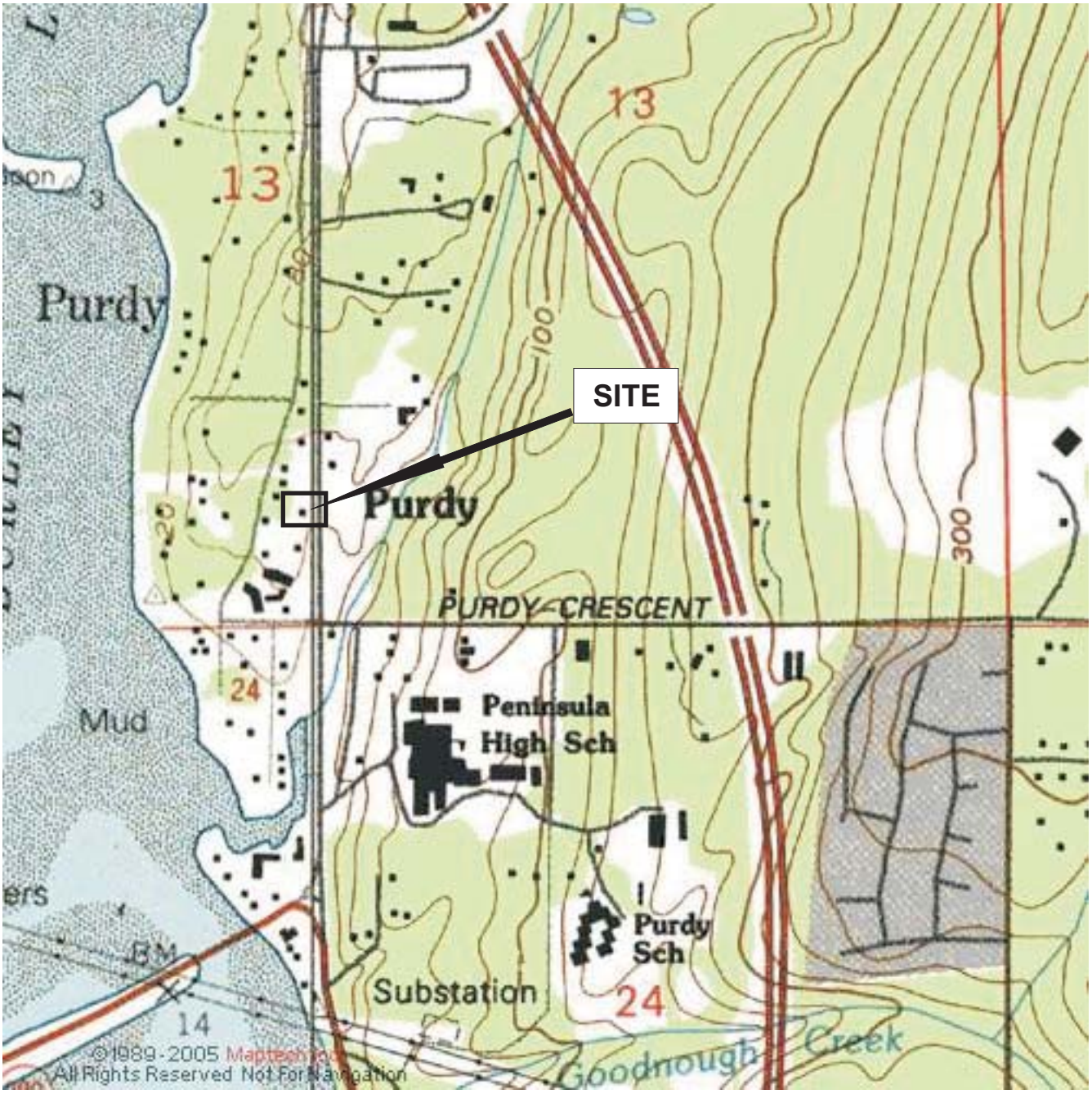
6.0 LIMITATIONS

The findings and conclusions documented in this report have been prepared for the specific application to this project and have been developed in a manner consistent with that level of care and skill normally exercised by members of the environmental science profession currently practicing under similar conditions in the area. A potential always remains for the presence of unknown, unidentified, or unforeseen subsurface contamination. No warranty, expressed or implied, is made. This report is for the exclusive use of Tracy and Leonard Larson and / or their representatives or assigns.

If new information is developed in future site work (which may include excavations, additional borings, or other studies), EMS should be contracted to re-evaluate the interpretations in this report, and to provide amendments as required.

Attachment A

List Of Figures



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Not To Scale

ems Environmental Services www.emsgroupllc.com	Site Topographic Map Gig Harbor Transmission Phase II Subsurface Investigation 14610 Purdy Drive NW Gig Harbor, Washington	Date: February 17, 2010 Completed: R. Hamlet Checked By: S. Spencer Revision No.:	Figure No. 1

N

Not To Scale

B1
Boring Location & ID

T1/S1
Trench/Shallow Soil Location & ID

ems Environmental Services www.emsgroupllc.com	Boring & Sample Location Map Gig Harbor Transmission Phase II Subsurface Investigation 14610 Purdy Drive NW Gig Harbor, Washington	Date: February 17, 2010 Completed: R. Hamlet Checked By: S. Spencer Revision No.:	Figure No. 2

Photo 01 - Setting up on boring B1west side of former UST Pit

Photo 02 - Drilling on boring B1

Photo 03 - Drilling on boring B2

Photo 04 - Drilling on boring B4 north of former UST Pit.

Photo 05 - Drilling on boring B6 east of former hydraulic lift.

ems Environmental Services www.emsgroupllc.com	Project Photographs Gig Harbor Transmission Phase II Subsurface Investigation 14610 Purdy Drive NW Gig Harbor, Washington	Date: February 17, 2010 Completed: R. Hamlet Checked By: S. Spencer Version No: 001	Figure No. 3 Sheet No. 01-01

Attachment B

Project Tables

Table 1 - Soil Sample Analytical Results- Hydrocarbons
Table 2 - Water Sample Analytical Results- Hydrocarbons
Table 3 - Soil & Water Sample Analytical Results-PAHs & Metals

Attachment B
Project Tables

Environmental Services
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Table 1 - Soil Samples
Analytical Results - Hydrocarbons
14610 Purdy Drive NW
Gig Harbor, Washington

2/17/2010

Sample Number	Sample Location	Sample Depth	Sample Type	Sample Date	Results		NWTPH-Dx			NWTPH-Gx	BTEX (8260b)			
					Headspace	Sheen Test	Diesel	Mineral Oil	Heavy Oil	Gasoline	Benzene	Toluene	Ethyl benzene	Xylene
		feet bgs			ppm		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
SOIL BORING SAMPLES														
B1-10-021010	B1	10	Soil	2/10/2010	0	N	<20.0	<40.0	<5.0	<5.0	<.03	<.05	<.05	<.06
B2-8-021010	B2	8	Soil	2/10/2010	0	N	<20.0	<40.0	<50.0	<5.0	<.03	<.05	<.05	<.06
B3-10-021010	B3	10	Soil	2/10/2010	0	N	<20.0	<40.0	<50.0	<5.0	<.03	<.05	<.05	<.06
B4-11-021010	B4	11	Soil	2/10/2010	0	N	<20.0	<40.0	<50.0	<5.0	<.03	<.05	<.05	<.06
B5-14-021010	B5	14	Soil	2/10/2010	0	N	<20.0	<40.0	<50.0	<5.0	<.03	<.05	<.05	<.06
B6-8-021010	B6	8	Soil	2/10/2010	0	N	<20.0	<40.0	<50.0	<5.0	<.03	<.05	<.05	<.06
MTCA Method A Soil Cleanup Levels for Unrestricted Land Use							2000.0	2000.0	4000.0	100/30	0.03	7.0	6.0	9.0
Laboratory Detection or Practical Quantification Limit Soil							20.0	40.0	50.0	5.0	0.03	0.05	0.05	0.06

BOLD = Analyte reading above MTCA Method A Cleanup for soils.

RED = Analyte reading above laboratory practical quantification limit.

Values are reported in milligrams per kilograms (mg/kg).

< # (ND) = analyte not detected above the analytical method detection limit cited.

Gasoline/BTEX (soil) - Analysis Method Ecology NWTPH-Gx, BTEX by EPA 8260b

Diesel compounds (soil) - Analysis Method Ecology NWTPH-Dx

bgs=below ground surface

NA=Not Applicable

Sheen Test - Y-Yes, N-None

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Table 2- Water Samples
Analytical Results - Hydrocarbons
14610 Purdy Drive NW
Gig Harbor, Washington

2/17/2010

Sample Number	Sample Location	Sample Depth	Sample Type	Sample Date	Results		NWTPH-Dx			NWTPH-Gx		BTEX (8260b)			
					Headspace	Sheen Test	Diesel	Mineral Oil	Motor Oil	Gasoline	GRO	Benzene	Toluene	Ethyl benzene	Xylene
		feet bgs			ppm		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
GROUNDWATER SAMPLE															
B1H2O-021010	B1	14	H2O	2/10/2010	NA	NA	<100.0	<100.0	<200.0	<50.0	<50.0	<0.02	<0.02	<0.03	<0.03
B2H2O-021010	B3	14	H2O	2/10/2010	NA	NA	<100.0	<100.0	<200.0	<50.0	<50.0	<0.02	<0.02	<0.03	<0.03
B6H2O-021010	B6	14	H2O	2/10/2010	NA	NA	<100.0	<100.0	<200.0	<50.0	<50.0	<0.02	<0.02	<0.03	<0.03
Ecology MTCA Method A Cleanup Levels for Ground Water (ug/l)							500.0	500.0	500.0	800/1,000	800/1,000	5.00	1000.00	700.00	1000.00
Laboratory Detection or Practical Quantification Limit Water							100.0	100.0	200.0	50.0	50.0	0.02	0.02	0.03	0.03

BOLD = Analyte reading above MTCA Method A Cleanup level for groundwater.

RED = Analyte reading above laboraotry practical quantification limit.

Values are reported in micrograms per Liter (ug/L).

< # (ND) = analyte not detected above the analytical method detection limit cited.

Gasoline/BTEX (soil) - Ecology NWTPH-Gx

Diesel Compounds (water) - Ecology NWTPH-Dx/D Ext.

bgs=below ground surface

NA=Not Applicable

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Table 3 - Soil & Groundwater Samples
Analytical Results -PAHs & Metals
14610 Purdy Drive NW
Gig Harbor, Washington

February 17, 2010

Sample Number	Sample Location	Sample Depth bgs	Sample Type	Sample Date	PAHs	Metals		
					Benzo(a)pyrene	Cadmium (Cd)	Chromium (Cr)	Lead (Pb)
					mg/kg	mg/kg	mg/kg	mg/kg
SHALLOW SOIL SAMPLES								
SS1-.5-021010	South side	0.5	Soil	2/10/2010	<0.08	0.6	3.4	17.0
T1-.5-021010	W. Trench	0.5	Soil	2/10/2010	<0.08	0.5	8.4	35.0
T2-.5-021010	W. Trench	0.5	Soil	2/10/2010	<0.08	0.3	13.0	20.0
T3-.5-021010	N. Trench	0.5	Soil	2/10/2010	<0.08	0.4	35.0	53.0
T4-.5-021010	N. Trench	0.5	Soil	2/10/2010	<0.08	1.2	33.0	30.0
Laboratory Detection or Practical Quantification Limit Soil					0.08	0.20	1.0	1.0
MTCA Method A Soil Cleanup Levels for Industrial Land					0.2	2.00	19/2000	250
GROUNDWATER SAMPLES (mg/L)								
B2H2O-021010	B2	14	H2O	2/10/2010	<0.1	ND	0.1	0.0
B6H2O-021010	B6	14	H2O	2/10/2010	<0.1	NA	NA	NA
Laboratory Detection or Practical Quantification Limit Soil					0.10	0.0004	0.002	0.002
MTCA Method A Soil Cleanup Levels for Industrial Land					0.2	2.00	19/2000	250

BOLD = Analyte above MTCA Method A Cleanup Level for soils.

RED = Analyte above Laboratory Detection/Practical Quantification Limit.

Values are reported in milligrams per kilograms (mg/kg) for soils & micrograms per liter (mg/l) for water.

< # (ND) = analyte not detected above the analytical method detection limit cited.

bgs=below ground surface

NA=Not Applicable

Attachment C

Analytical Results

Sample Analytical Results
Sample Chain Of Custody

Attachment C
Analytical Results

ems
Environmental Services
www.emsgroupllc.com

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Environmental Management Services, LLC
Attn: Robin Hamlet
PO Box 153
652 8th Ave.
Fox Island, WA 98333

RE: Gig Harbor Transmission
Fremont Project No: CHM100211-8
EMS Project No: 0359-01

February 18th, 2010

Robin:

Enclosed are the analytical results for the ***Gig Harbor Transmission*** soil and water samples submitted to Fremont Analytical on Thursday February 11th, 2010.

Examination of these samples was conducted for the presence of the following:

- ***Gasoline (NWTPH-Gx) & BTEX (EPA Method 8021B)***
- ***Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.***
- ***Polyaromatic Hydrocarbons by EPA Method 8270***
- ***Total Metals by EPA Method 6020***

These applications were performed under Washington State Department of Ecology accreditation parameters. All appropriate Quality Assurance / Quality Control method parameters have been applied.

Laboratory Notation – 6020 (soil): Matrix Effect - The relative percent difference between the sample and sample duplicate for lead was outside of the laboratory control limits (40%, range = 30%).

Please contact the laboratory if you should have any questions about the report.

Thank you for using Fremont Analytical!

Sincerely,

Michael Dee
Sr. Chemist / Principal
mikedee@fremontanalytical.com

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Analysis of Gasoline (NWTPH-Gx) and BTEX (EPA Method 8021B) in Soil

Project: Gig Harbor Transmission
Client: EMS
Client Project #: 0359-01
Lab Project #: CHM100211-8

8021B+NWTPH-Gx (mg/kg)	MRL	Method Blank	LCS	B1-10-021010	B1-10-021010 Duplicate	B3-10-021010
Date Preserved				2/11/10	2/11/10	2/11/10
Date Analyzed		2/15/10	2/15/10	2/15/10	2/15/10	2/15/10
Matrix				Soil	Soil	Soil
8021B (mg/kg)						
Benzene	0.02	nd	80%	nd	nd	nd
Toluene	0.05	nd	77%	nd	nd	nd
Ethylbenzene	0.05	nd		nd	nd	nd
Total Xylenes	0.15	nd		nd	nd	nd
NWTPH-Gx (mg/kg)						
Gasoline	5.0	nd	108%	nd	nd	nd
Gasoline Range Hydrocarbons (GRO)*	5.0	nd		nd	nd	nd
Surrogate Recovery						
(Surr 1) a,a,a-Trifluorotoluene		105%	105%	99%	103%	105%
(Surr 2) Bromofluorobenzene		81%	85%	81%	82%	82%

"nd" Indicates not detected at listed reporting limits
"C" Indicates coelution prevents determination
"J" Indicates estimated value
"MRL" Indicates Method Reporting Limits
"LCS" Indicates Laboratory Control Sample
"MS" Indicates Matrix Spike
"MSD" Indicates Matrix Spike Duplicate
"RPD" Indicates Relative Percent Difference
" * " Indicates presence of petroleum distilate

Acceptable RPD is determined to be less than 30%
Acceptable Recovery Limits:
Surrogate = 65% to 135%
LCS, LCSD, MS, MSD = 65% to 135%
Surrogate Concentration = 0.25 mg/kg
BTEX Spike Concentration = 0.5 mg/kg
Gx Spike Concentration = 5.0 mg/kg
GRO = C6-C12

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Analysis of Gasoline (NWTPH-Gx) and BTEX (EPA Method 8021B) in Soil

Project: Gig Harbor Transmission
Client: EMS
Client Project #: 0359-01
Lab Project #: CHM100211-8

8021B+NWTPH-Gx (mg/kg)	MRL	B4-11-021010	B5-14-021010	MS B1-10-021010	MSD B1-10-021010	RPD %
Date Preserved		2/11/10	2/11/10	2/11/10	2/11/10	
Date Analyzed		2/15/10	2/15/10	2/15/10	2/15/10	
Matrix		Soil	Soil	Soil	Soil	
8021B (mg/kg)						
Benzene	0.02	nd	nd	79%	81%	3%
Toluene	0.05	nd	nd	78%	79%	1%
Ethylbenzene	0.05	nd	nd			
Total Xylenes	0.15	nd	nd			
NWTPH-Gx (mg/kg)						
Gasoline	5.0	nd	nd			
Gasoline Range Hydrocarbons (GRO)*	5.0	nd	nd			
Surrogate Recovery						
(Surr 1) a,a,a-Trifluorotoluene		100%	103%	104%	107%	
(Surr 2) Bromofluorobenzene		80%	82%	90%	90%	

"nd" Indicates not detected at listed reporting limits
"C" Indicates coelution prevents determination
"J" Indicates estimated value
"MRL" Indicates Method Reporting Limits
"LCS" Indicates Laboratory Control Sample
"MS" Indicates Matrix Spike
"MSD" Indicates Matrix Spike Duplicate
"RPD" Indicates Relative Percent Difference
" * " Indicates presence of petroleum distilate

Acceptable RPD is determined to be less than 30%
Acceptable Recovery Limits:
Surrogate = 65% to 135%
LCS, LCSD, MS, MSD = 65% to 135%
Surrogate Concentration = 0.25 mg/kg
BTEX Spike Concentration = 0.5 mg/kg
Gx Spike Concentration = 5.0 mg/kg
GRO = C6-C12

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Analysis of Gasoline (NWTPH-Gx) and BTEX (EPA Method 8021B) in Water

Project: Gig Harbor Transmission
Client: EMS
Client Project #: 0359-01
Lab Project #: CHM100211-8

8021B+NWTPH-Gx (µg/L)	MRL	Method Blank	LCS	B1H$_2$O-021010	Duplicate B1H$_2$O-021010	B2H$_2$O-021010
Date Analyzed		2/15/10	2/15/10	2/15/10	2/15/10	2/15/10
Matrix				Water	Water	Water
8021B (µg/L)						
Benzene	1.0	nd	82%	nd	nd	nd
Toluene	1.0	nd	83%	nd	nd	nd
Ethylbenzene	1.0	nd		nd	nd	nd
Total Xylenes	2.0	nd		nd	nd	nd
NWTPH-Gx (µg/L)						
Gasoline	50	nd	104%	nd	nd	nd
Gasoline Range Hydrocarbons (GRO)*	50	nd		nd	nd	nd
Surrogate Recovery						
(Surr 1) a,a,a-Trifluorotoluene		103%	105%	107%	105%	107%
(Surr 2) Bromofluorobenzene		87%	91%	89%	86%	88%

"nd" Indicates not detected at listed reporting limits
"C" Indicates coelution prevents determination
"J" Indicates estimated value
"MRL" Indicates Method Reporting Limits
"LCS" Indicates Laboratory Control Sample
"MS" Indicates Matrix Spike
"MSD" Indicates Matrix Spike Duplicate
"RPD" Indicates Relative Percent Difference
" * " Indicates presence of petroleum distilate

Acceptable RPD is determined to be less than 30%
Acceptable Recovery Limits:
Surrogate = 65% to 135%
LCS, LCSD, MS, MSD = 65% to 135%
Surrogate Concentration = 5.0 µg/L
BTEX Spike Concentration = 10 µg/L
Gx Spike Concentration = 100 µg/L
GRO = C6-C12

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Analysis of Gasoline (NWTPH-Gx) and BTEX (EPA Method 8021B) in Water

Project: Gig Harbor Transmission
Client: EMS
Client Project #: 0359-01
Lab Project #: CHM100211-8

8021B+NWTPH-Gx (µg/L)	MRL	B6H$_2$O-021010	MS B2H$_2$O-021010	MSD B2H$_2$O-021010	RPD %
Date Analyzed		2/15/10	2/15/10	2/15/10	
Matrix		Water	Water	Water	
8021B (µg/L)					
Benzene	1.0	nd	76%	79%	4%
Toluene	1.0	nd	77%	79%	3%
Ethylbenzene	1.0	nd			
Total Xylenes	2.0	nd			
NWTPH-Gx (µg/L)					
Gasoline	50	nd			
Gasoline Range Hydrocarbons (GRO)*	50	nd			
Surrogate Recovery					
(Surr 1) a,a,a-Trifluorotoluene		105%	101%	104%	
(Surr 2) Bromofluorobenzene		87%	89%	91%	

"nd" Indicates not detected at listed reporting limits
"C" Indicates coelution prevents determination
"J" Indicates estimated value
"MRL" Indicates Method Reporting Limits
"LCS" Indicates Laboratory Control Sample
"MS" Indicates Matrix Spike
"MSD" Indicates Matrix Spike Duplicate
"RPD" Indicates Relative Percent Difference
" * " Indicates presence of petroleum distilate

Acceptable RPD is determined to be less than 30%
Acceptable Recovery Limits:
Surrogate = 65% to 135%
LCS, LCSD, MS, MSD = 65% to 135%
Surrogate Concentration = 5.0 µg/L
BTEX Spike Concentration = 10 µg/L
Gx Spike Concentration = 100 µg/L
GRO = C6-C12

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Analysis of Diesel and Heavy Oil in Soil by NWTPH-Dx / Dx Ext.

Project: Gig Harbor Transmission
Client: EMS
Client Project #: 0359-01
Lab Project #: CHM100211-8

NWTPH-Dx/Dx Ext. (mg/kg)	MRL	Method Blank	LCS	B1-10-021010	B1-10-021010 Duplicate
Date Extracted		2/17/10	2/17/10	2/17/10	2/17/10
Date Analyzed		2/17/10	2/17/10	2/17/10	2/17/10
Matrix				Soil	Soil
Diesel (Fuel Oil)	20	nd	121%	nd	nd
Mineral Oil	40	nd		nd	nd
Heavy Oil	50	nd		nd	nd
Surrogate Recovery					
(Surr 1) 2-Fluorobiphenyl		107%	119%	109%	103%
(Surr 2) o-Terphenyl		108%	110%	106%	99%

"nd" Indicates not detected at listed reporting limits
"int" Indicates that interference prevents determination
"J" Indicates estimated value
"C" Indicates coelution prevents determination
"RPD" Indicates Relative Percent Difference
"MRL" Indicates Method Reporting Limit

Acceptable RPD is determined to be less than 30%
Acceptable Recovery Limits:
Surrogate = 65% to 135%
Surrogate Concentration = 20 mg/kg
Spike Concentration = 500 mg/kg
Diesel (Fuel Oil) = C12-C24
Mineral Oil = C15-C40
Heavy Oil = C24-C40

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Analysis of Diesel and Heavy Oil in Soil by NWTPH-Dx / Dx Ext.

Project: Gig Harbor Transmission
Client: EMS
Client Project #: 0359-01
Lab Project #: CHM100211-8

NWTPH-Dx/Dx Ext. (mg/kg)	MRL	B2-8-021010	B3-10-021010	B4-11-021010	B5-14-021010
Date Extracted		2/17/10	2/17/10	2/17/10	2/17/10
Date Analyzed		2/17/10	2/17/10	2/17/10	2/17/10
Matrix		Soil	Soil	Soil	Soil
Diesel (Fuel Oil)	20	nd	nd	nd	nd
Mineral Oil	40	nd	nd	nd	nd
Heavy Oil	50	nd	nd	nd	nd
Surrogate Recovery					
(Surr 1) 2-Fluorobiphenyl		107%	104%	103%	104%
(Surr 2) o-Terphenyl		102%	100%	99%	100%

"nd" Indicates not detected at listed reporting limits
"int" Indicates that interference prevents determination
"J" Indicates estimated value
"C" Indicates coelution prevents determination
"RPD" Indicates Relative Percent Difference
"MRL" Indicates Method Reporting Limit

Acceptable RPD is determined to be less than 30%
Acceptable Recovery Limits:
Surrogate = 65% to 135%
Surrogate Concentration = 20 mg/kg
Spike Concentration = 500 mg/kg
Diesel (Fuel Oil) = C12-C24
Mineral Oil = C15-C40
Heavy Oil = C24-C40

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Analysis of Diesel and Heavy Oil in Soil by NWTPH-Dx / Dx Ext.

Project: Gig Harbor Transmission
Client: EMS
Client Project #: 0359-01
Lab Project #: CHM100211-8

NWTPH-Dx/Dx Ext. (mg/kg)	MRL	B6-8-021010	SS1-.5-021010
Date Extracted		2/17/10	2/17/10
Date Analyzed		2/17/10	2/17/10
Matrix		Soil	Soil
Diesel (Fuel Oil)	20	nd	nd
Mineral Oil	40	nd	nd
Heavy Oil	50	nd	nd
Surrogate Recovery			
(Surr 1) 2-Fluorobiphenyl		103%	104%
(Surr 2) o-Terphenyl		98%	99%

"nd" Indicates not detected at listed reporting limits
"int" Indicates that interference prevents determination
"J" Indicates estimated value
"C" Indicates coelution prevents determination
"RPD" Indicates Relative Percent Difference
"MRL" Indicates Method Reporting Limit

Acceptable RPD is determined to be less than 30%
Acceptable Recovery Limits:
Surrogate = 65% to 135%
Surrogate Concentration = 20 mg/kg
Spike Concentration = 500 mg/kg
Diesel (Fuel Oil) = C12-C24
Mineral Oil = C15-C40
Heavy Oil = C24-C40

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Analysis of Diesel and Heavy Oil in Water by NWTPH-Dx / Dx Ext.

Project: Gig Harbor Transmissi
Client: EMS
Client Project #: 0359-01
Lab Project #: CHM100211-8

NWTPH-Dx/Dx Ext. (µg/L)	MRL	Method Blank	LCS	B1H$_2$O-021010	Duplicate B1H$_2$O-021010	B$_2$H2O-021010	B6H$_2$O-021010
Date Extracted		2/16/10	2/16/10	2/16/10	2/16/10	2/16/10	2/16/10
Date Analyzed		2/17/10	2/17/10	2/17/10	2/17/10	2/17/10	2/17/10
Matrix				Water	Water	Water	Water
Diesel (Fuel Oil)	100	nd	110%	nd	nd	nd	nd
Mineral Oil	100	nd		nd	nd	nd	nd
Heavy Oil	200	nd		nd	nd	nd	nd
Surrogate Recovery							
(Surr 1) 2-Fluorobiphenyl		99%	95%	68%	132%	98%	97%
(Surr 2) o-Terphenyl		80%	88%	84%	74%	84%	97%

"nd" Indicates not detected at listed reporting limits
"int" Indicates that interference prevents determination
"J" Indicates estimated value
"C" Indicates coelution prevents determination
"RPD" Indicates Relative Percent Difference
"MRL" Indicates Method Reporting Limit

Acceptable RPD is determined to be less than 30%
Acceptable Recovery Limits:
Surrogate = 65% to 135%
Surrogate Concentration = 160 µg/L
Spike Concentration = 4000 µg/L
Diesel (Fuel Oil) = C12-C24
Mineral Oil = C15-C40
Heavy Oil = C24-C40

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Analysis of Polyaromatic Hydrocarbons in Soil by EPA Method 8270C

Project: Gig Harbor Transmission
Client: EMS
Client Project #: 0359-01
Lab Project #: CHM100211-8

EPA 8270C (mg/kg)	MRL	Method Blank	LCS	SS1-.5-021010	T1-.5-021010	T1-.5-021010 Duplicate
Date Extracted		2/16/10	2/16/10	2/16/10	2/16/10	2/16/10
Date Analyzed		2/16/10	2/16/10	2/16/10	2/16/10	2/16/10
Matrix				Soil	Soil	Soil
Naphthalene	0.1	nd		nd	nd	nd
1-Methylnaphthalene	0.1	nd		nd	nd	nd
2-Methylnaphthalene	0.1	nd		nd	nd	nd
Acenaphthene	0.1	nd	57%	nd	nd	nd
Acenaphthylene	0.1	nd		nd	nd	nd
Fluorene	0.1	nd		nd	nd	nd
Phenanthrene	0.1	nd		nd	nd	nd
Anthracene	0.1	nd		nd	nd	nd
Fluoranthene	0.1	nd		nd	nd	nd
Pyrene	0.1	nd	126%	nd	nd	nd
Benzo(a)anthracene	0.08	nd		nd	nd	nd
Chrysene	0.08	nd		nd	nd	nd
Benzo(b)fluoranthene	0.08	nd		nd	nd	nd
Benzo(k)fluoranthene	0.08	nd		nd	nd	nd
Benzo(a)pyrene	0.08	nd		nd	nd	nd
Indeno(1,2,3-cd)pyrene	0.08	nd		nd	nd	nd
Dibenzo(a,h)anthracene	0.08	nd		nd	nd	nd
Benzo(g,h,i)perylene	0.1	nd		nd	nd	nd
Total PAH Carcinogens				0.0	0.0	0.0

Total PAH Carcinogens Defined as:
Benzo(a)anthracene, Chrysene, Benzo(b)fluoranthene,
Benzo(k)fluoranthene, Benzo(a)pyrene,
Ideno(1,2,3-cd)pyrene & Dibenzo(a,h)anthracene

Surrogate Recovery					
(Surr 1) 2-Fluorobiphenyl	73%	68%	76%	86%	83%
(Surr 2) p-Terphenyl	66%	63%	67%	67%	65%

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"J" Indicates estimated value
"MRL" Indicates Method Reporting Limit
"LCS" Indicates Laboratory Control Sample
"MS" Indicates Matrix Spike
"MSD" Indicates Matrix Spike Duplicate
"RPD" Indicates Relative Percent Difference

Acceptable RPD is determined to be less than 30%
Acceptable Recovery Limits:
Surrogates = 50% to 150%
LCS, LCSD, MS, MSD = 50% to 150%
Surrogate Concentration = 0.5 mg/kg
Spike Concentration = 1.0 mg/kg

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Analysis of Polyaromatic Hydrocarbons in Soil by EPA Method 8270C

Project: Gig Harbor Transmission
Client: EMS
Client Project #: 0359-01
Lab Project #: CHM100211-8

EPA 8270C (mg/kg)	MRL	T2-.5-021010	T3-.5-021010	T4-.5-021010
Date Extracted		2/16/10	2/16/10	2/16/10
Date Analyzed		2/16/10	2/16/10	2/16/10
Matrix		Soil	Soil	Soil
Naphthalene	0.1	nd	nd	nd
1-Methylnaphthalene	0.1	nd	nd	nd
2-Methylnaphthalene	0.1	nd	nd	nd
Acenaphthene	0.1	nd	nd	nd
Acenaphthylene	0.1	nd	nd	nd
Fluorene	0.1	nd	nd	nd
Phenanthrene	0.1	nd	nd	nd
Anthracene	0.1	nd	nd	nd
Fluoranthene	0.1	nd	nd	nd
Pyrene	0.1	nd	nd	nd
Benzo(a)anthracene	0.08	nd	nd	nd
Chrysene	0.08	nd	nd	nd
Benzo(b)fluoranthene	0.08	nd	nd	nd
Benzo(k)fluoranthene	0.08	nd	nd	nd
Benzo(a)pyrene	0.08	nd	nd	nd
Indeno(1,2,3-cd)pyrene	0.08	nd	nd	nd
Dibenzo(a,h)anthracene	0.08	nd	nd	nd
Benzo(g,h,i)perylene	0.1	nd	nd	nd
Total PAH Carcinogens		0.0	0.0	0.0

Total PAH Carcinogens Defined as:
Benzo(a)anthracene, Chrysene, Benzo(b)fluoranthene,
Benzo(k)fluoranthene, Benzo(a)pyrene,
Ideno(1,2,3-cd)pyrene & Dibenzo(a,h)anthracene

Surrogate Recovery			
(Surr 1) 2-Fluorobiphenyl	77%	74%	81%
(Surr 2) p-Terphenyl	64%	64%	67%

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"int" Indicates that interference prevents determination
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"MRL" Indicates Method Reporting Limit
"LCS" Indicates Laboratory Control Sample
"MS" Indicates Matrix Spike
"MSD" Indicates Matrix Spike Duplicate
"RPD" Indicates Relative Percent Difference

Acceptable RPD is determined to be less than 30%
Acceptable Recovery Limits:
Surrogates = 50% to 150%
LCS, LCSD, MS, MSD = 50% to 150%
Surrogate Concentration = 0.5 mg/kg
Spike Concentration = 1.0 mg/kg

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Analysis of Polyaromatic Hydrocarbons in Soil by EPA Method 8270C

Project: Gig Harbor Transmission
Client: EMS
Client Project #: 0359-01
Lab Project #: CHM100211-8

EPA 8270C (mg/kg)	MRL	MS T1-.5-021010	MSD T1-.5-021010	RPD %
Date Extracted		2/16/10	2/16/10	
Date Analyzed		2/16/10	2/16/10	
Matrix		Soil	Soil	
Naphthalene	0.1			
1-Methylnaphthalene	0.1			
2-Methylnaphthalene	0.1			
Acenaphthene	0.1	54%	56%	4%
Acenaphthylene	0.1			
Fluorene	0.1			
Phenanthrene	0.1			
Anthracene	0.1			
Fluoranthene	0.1			
Pyrene	0.1	121%	110%	10%
Benzo(a)anthracene	0.08			
Chrysene	0.08			
Benzo(b)fluoranthene	0.08			
Benzo(k)fluoranthene	0.08			
Benzo(a)pyrene	0.08			
Indeno(1,2,3-cd)pyrene	0.08			
Dibenzo(a,h)anthracene	0.08			
Benzo(g,h,i)perylene	0.1			
Total PAH Carcinogens				

Total PAH Carcinogens Defined as:
Benzo(a)anthracene, Chrysene, Benzo(b)fluoranthene,
Benzo(k)fluoranthene, Benzo(a)pyrene,
Ideno(1,2,3-cd)pyrene & Dibenzo(a,h)anthracene

Surrogate Recovery		
(Surr 1) 2-Fluorobiphenyl	70%	66%
(Surr 2) p-Terphenyl	56%	48%

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"int" Indicates that interference prevents determination
"J" Indicates estimated value
"MRL" Indicates Method Reporting Limit
"LCS" Indicates Laboratory Control Sample
"MS" Indicates Matrix Spike
"MSD" Indicates Matrix Spike Duplicate
"RPD" Indicates Relative Percent Difference

Acceptable RPD is determined to be less than 30%
Acceptable Recovery Limits:
Surrogates = 50% to 150%
LCS, LCSD, MS, MSD = 50% to 150%
Surrogate Concentration = 0.5 mg/kg
Spike Concentration = 1.0 mg/kg

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Analysis of Polyaromatic Hydrocarbons in Water by EPA Method 8270C

Project: Gig Harbor Transmission
Client: EMS
Client Project #: 0359-01
Lab Project #: CHM100211-8

EPA 8270C (ug/L)	MRL	Method Blank	LCS	$B2H_2O$-021010	$B6H_2O$-021010
Date Extracted		2/16/10	2/16/10	2/16/10	2/16/10
Date Analyzed		2/16/10	2/16/10	2/16/10	2/16/10
Matrix				Water	Water
Naphthalene	0.5	nd		nd	nd
1-Methylnaphthalene	0.5	nd		nd	nd
2-Methylnaphthalene	0.5	nd		nd	nd
Acenaphthene	0.5	nd	95%	nd	nd
Acenaphthylene	0.5	nd		nd	nd
Fluorene	0.5	nd		nd	nd
Phenanthrene	0.5	nd		nd	nd
Anthracene	0.5	nd		nd	nd
Fluoranthene	0.5	nd		nd	nd
Pyrene	0.5	nd	65%	nd	nd
Benzo(a)anthracene	0.1	nd		nd	nd
Chrysene	0.1	nd		nd	nd
Benzo(b)fluoranthene	0.1	nd		nd	nd
Benzo(k)fluoranthene	0.1	nd		nd	nd
Benzo(a)pyrene	0.1	nd		nd	nd
Indeno(1,2,3-cd)pyrene	0.1	nd		nd	nd
Dibenzo(a,h)anthracene	0.1	nd		nd	nd
Benzo(g,h,i)perylene	0.5	nd		nd	nd
Total PAH Carcinogens				0.0	0.0

Total PAH Carcinogens Defined as:
Benzo(a)anthracene, Chrysene, Benzo(b)fluoranthene,
Benzo(k)fluoranthene, Benzo(a)pyrene,
Ideno(1,2,3-cd)pyrene & Dibenzo(a,h)anthracene

Surrogate Recovery				
(Surr 1) 2-Fluorobiphenyl	66%	78%	103%	120%
(Surr 2) p-Terphenyl	97%	95%	103%	99%

"nd" Indicates not detected at listed reporting limits
"int" Indicates that interference prevents determination
"J" Indicates estimated value
"MRL" Indicates Method Reporting Limit
"LCS" Indicates Laboratory Control Sample
"MS" Indicates Matrix Spike
"MSD" Indicates Matrix Spike Duplicate
"RPD" Indicates Relative Percent Difference

Samples may be run under SIM
Acceptable RPD is determined to be less than 30%
Acceptable Recovery Limits:
Surrogates = 50% to 150%
LCS, LCSD, MS, MSD = 50% to 150%
Surrogate Concentration = 4.0 µg/L
Spike Concentration = 8.0 µg/L

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Analysis of Polyaromatic Hydrocarbons in Water by EPA Method 8270C

Project: Gig Harbor Transmission
Client: EMS
Client Project #: 0359-01
Lab Project #: CHM100211-8

EPA 8270C (ug/L)	MRL	QA Sample Batch 100211-8-17	QA Duplicate Batch 100211-8-17	MS B6H2O-021010
Date Extracted		2/16/10	2/16/10	2/16/10
Date Analyzed		2/16/10	2/16/10	2/16/10
Matrix		Water	Water	Water
Naphthalene	0.5	nd	nd	
1-Methylnaphthalene	0.5	nd	nd	
2-Methylnaphthalene	0.5	nd	nd	
Acenaphthene	0.5	nd	nd	110%
Acenaphthylene	0.5	nd	nd	
Fluorene	0.5	nd	nd	
Phenanthrene	0.5	nd	nd	
Anthracene	0.5	nd	nd	
Fluoranthene	0.5	nd	nd	
Pyrene	0.5	nd	nd	105%
Benzo(a)anthracene	0.1	nd	nd	
Chrysene	0.1	nd	nd	
Benzo(b)fluoranthene	0.1	nd	nd	
Benzo(k)fluoranthene	0.1	nd	nd	
Benzo(a)pyrene	0.1	nd	nd	
Indeno(1,2,3-cd)pyrene	0.1	nd	nd	
Dibenzo(a,h)anthracene	0.1	nd	nd	
Benzo(g,h,i)perylene	0.5	nd	nd	
Total PAH Carcinogens		0.0	0.0	

Total PAH Carcinogens Defined as:
Benzo(a)anthracene, Chrysene, Benzo(b)fluoranthene,
Benzo(k)fluoranthene, Benzo(a)pyrene,
Ideno(1,2,3-cd)pyrene & Dibenzo(a,h)anthracene

Surrogate Recovery			
(Surr 1) 2-Fluorobiphenyl	86%	109%	95%
(Surr 2) p-Terphenyl	103%	97%	103%

"nd" Indicates not detected at listed reporting limits
"int" Indicates that interference prevents determination
"J" Indicates estimated value
"MRL" Indicates Method Reporting Limit
"LCS" Indicates Laboratory Control Sample
"MS" Indicates Matrix Spike
"MSD" Indicates Matrix Spike Duplicate
"RPD" Indicates Relative Percent Difference

Samples may be run under SIM
Acceptable RPD is determined to be less than 30%
Acceptable Recovery Limits:
Surrogates = 50% to 150%
LCS, LCSD, MS, MSD = 50% to 150%
Surrogate Concentration = 4.0 µg/L
Spike Concentration = 8.0 µg/L

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Analysis of Total Metals in Soil by EPA Method 6020

Project: Gig Harbor Transmission
Client: EMS
Client Project #: 0359-01
Lab Project #: CHM100211-8

EPA 6020 (mg/kg)	MRL	Method Blank	LCS	SS1-.5-021010	T1-.5-021010	T2-.5-021010
Date Extracted		2/16/10	2/16/10	2/16/10	2/16/10	2/16/10
Date Analyzed		2/17/10	2/17/10	2/17/10	2/17/10	2/17/10
Matrix				Soil	Soil	Soil
Cadmium (Cd)	0.2	nd	84%	**0.6**	**0.5**	**0.3**
Chromium (Cr)	1.0	nd	93%	**3.4**	**8.4**	**13**
Lead (Pb)	1.0	nd	84%	**17**	**35**	**20**

"nd" Indicates no detection at the listed reporting limits
"int" Indicates that interference prevents determination
"J" Indicates estimated value
"MRL" Indicates Method Reporting Limit
"LCS" Indicates Laboratory Control Sample
"MS" Indicates Matrix Spike
"MSD" Indicates Matrix Spike Duplicate
"RPD" Indicates Relative Percent Difference

Acceptable RPD is determined to be less than 30%
Acceptable Recovery Limits:
LCS, LCSD, MS, MSD: 65% to 135%
Spiked Soil Concentrations:
Cr = 50 mg/kg
Pb = 25 mg/kg
Cd = 2.5 mg/kg

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Analysis of Total Metals in Soil by EPA Method 6020

Project: Gig Harbor Transmission
Client: EMS
Client Project #: 0359-01
Lab Project #: CHM100211-8

				Duplicate		MS
EPA 6020 (mg/kg)	**MRL**	**T3-.5-021010**	**T4-.5-021010**	**T4-.5-021010**	**RPD**	**T4-.5-021010**
Date Extracted		2/16/10	2/16/10	2/16/10	%	2/16/10
Date Analyzed		2/17/10	2/17/10	2/17/10		2/17/10
Matrix		Soil	Soil	Soil		Soil
Cadmium (Cd)	0.2	**0.4**	**1.2**	**1.4**	13%	91%
Chromium (Cr)	1.0	**35**	**33**	**34**	5%	86%
Lead (Pb)	1.0	**53**	**30**	**45**	40%	119%

"nd" Indicates no detection at the listed reporting limits
"int" Indicates that interference prevents determination
"J" Indicates estimated value
"MRL" Indicates Method Reporting Limit
"LCS" Indicates Laboratory Control Sample
"MS" Indicates Matrix Spike
"MSD" Indicates Matrix Spike Duplicate
"RPD" Indicates Relative Percent Difference

Acceptable RPD is determined to be less than 30%
Acceptable Recovery Limits:
LCS, LCSD, MS, MSD: 65% to 135%
Spiked Soil Concentrations:
Cr = 50 mg/kg
Pb = 25 mg/kg
Cd = 2.5 mg/kg

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Analysis of Total Metals in Water by EPA Method 6020

Project: Gig Harbor Transmission
Client: EMS
Client Project #: 0359-01
Lab Project #: CHM100211-8

					Duplicate		MS	MSD	
EPA 6020 (mg/L)	**MRL**	**Method Blank**	**LCS**	**B_2H2O-021010**	**B_2H2O-021010**	**RPD %**	*Batch 100212-3-1*	*Batch 100212-3-1*	**RPD %**
Date Extracted		2/16/10	2/16/10	2/16/10	2/16/10		2/16/10	2/16/10	
Date Analyzed		2/16/10	2/16/10	2/16/10	2/16/10		2/16/10	2/16/10	
Matrix				Water	Water		Water	Water	
Cadmium (Cd)	0.0004	nd	97%	nd	nd		104%	109%	5%
Chromium (Cr)	0.002	nd	107%	**0.050**	**0.047**	5%	113%	120%	6%
Lead (Pb)	0.002	nd	110%	**0.035**	**0.039**		102%	109%	7%

"nd" Indicates no detection at the listed reporting limits
"int" Indicates that interference prevents determination
"J" Indicates estimated value
"MRL" Indicates Method Reporting Limit
"LCS" Indicates Laboratory Control Sample
"MS" Indicates Matrix Spike
"MSD" Indicates Matrix Spike Duplicate
"RPD" Indicates Relative Percent Difference

Acceptable RPD is determined to be less than 30%
Acceptable Recovery Limits:
LCS, LCSD, MS, MSD: 65% to 135%
Spike Concentrations:
Cr = 100 µg/L
Pb = 50 µg/L
Cd = 5.0 µg/L

From: Robin Hamlet
To: Mike Ridgeway (mridgeway@fremontanalytical.com);
Subject: Revised Chain of custody Gig Harbor Samples
Date: Friday, February 12, 2010 12:59:27 PM

Mike,

Here is the revised analysis plan for soils. We reduced the metals to the three listed below. Soil sample B5-9 put on hold. Please revise the chain.

B1-10	Dx/DxExt, Gx-BTEX
B2-8	Dx/DxExt
B3-10	Dx/DxExt, Gx-BTEX
B4-11	Dx/DxExt, Gx-BTEX
B5-14	Dx/DxExt, Gx-BTEX
B6-8	Dx/DxExt
SS1	Dx/DxExt, Cadmium, chromium, lead, PAHs
T1	Cadmium, chromium, lead, PAHs
T2	Cadmium, chromium, lead, PAHs
T3	Cadmium, chromium, lead, PAHs
T4	Cadmium, chromium, lead, PAHs

Changes for waters.

B1H2O	Gx-BTEX, Dx/DxExt
B2H2O	Gx-BTEX, Dx/DxExt, cadmium, chromium, lead, PAHs
B6H2O	Gx-BTEX, Dx/DxExt, PAHs

All other samples on hold. Any remaining material from analysis please hold if there is enough material.

Thanks
Robin

Fremont Analytical

Chain of Custody Record

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Laboratory Project No (internal): CHM100211-8

Date: 2/10/10

Page: 1 of: 3

Client: CMS

Address:

City, State, Zip

Tel:

Project Name: GIG HARBOR TRANSMISSION

Location: GIG HARBOR

Collected by: R. HAMLET

Reports To (PM): ROBIN HAMLET

Fax:

Email:

Project No: 0359-01

Sample Name	Time	Sample Type (Matrix)	Container Type	Date of Collection	VOA 8260	VOA 8021B BTEX	NWTPH-Gx	NWTPH-HCID	NWTPH-Dx/Dx Ext.	SEMI VOL 8270C	PAH 8270	PCBs 8082	Cl PESTICIDES 8081	Cl HERBICIDES 8151A	Metals*	Total (T) | Dissolved (D)	Anions (IC)**					HOLD*-HOLD 4 LATER ANALYSIS IF REQUIRED Comments/Depth
1 B1-10-021010	1029	SOIL	4oz						X		X				X							
2 B1-13-021010	1031								X		X				X							HOLD*
3 B2-8-021010	1120								X		X				X							
4 B2-12-021010	~~1209~~ 1123								X		X				X							HOLD*
5 B3-10-021010	1259								X		X				X							
6 B4-11-021010	1230								X		X				X							
7 B4-13-021010	~~1235~~								X		X				X							HOLD*
8 B5-9-021010	1312								X		X				X							
9 B5-14-021010	1314								X		X				X							HOLD*
10 B6-8-021010	1348								X		X				X							

*Metals Analysis (Circle): MTCA 5 ~~RCRA 8~~ Priority Pollutants TAL *Individual:* Ag Al As B Ba Be Ca Cd Co Cr Cu Fe Hg K Mg Mn Mo Na Ni Pb Sb Se Sr Sn Ti Tl U V Zn

**Anions (Circle): Nitrate Nitrite Chloride Sulfate Bromide O-Phosphate Fluoride Nitrate+Nitrite

Relinquished	Date/Time	Received	Date/Time
x R Hamlet	2/11/10 1250	x	2/11/10 1250
Relinquished	Date/Time	Received	Date/Time
x		x	

Sample Receipt:

Good?	Y
Cooler Temperature:	OK
Seals Intact?:	n/a
Total Number of Containers:	28

Special Remarks:

TAT --> 24HR 48HR Standard

Distribution: White - Lab, Yellow - File, Pink - Originator

Fremont Analytical

Chain of Custody Record

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Laboratory Project No (internal): _____

Date: 2/10/10

Page: 2 of: 3

Client: EMS

Address: _____

City, State, Zip _____ Tel: _____

Project Name: GIG HARBOR TRANSMISSION

Location: GIG HARBOR

Collected by: R. HAMLET

Reports To (PM): ROBIN HAMLET Fax: Email: Project No: 0359-01

	Sample Name	Time	Sample Type (Matrix)	Container Type	Date of Collection	VOA 8260	VOA 8021B BTEX	NWTPH-Gx	NWTPH-HCID	NWTPH-Dx/Dx Ext.	SEMI VOL 8270C	PAH 8270	PCBs 8082	Cl PESTICIDES 8081	Cl HERBICIDES 8151A	Metals*	Total (T) | Dissolved (D)	Anions (IC)**					Comments/Depth
1	B6-12-021010	1352	SOIL	4 oz	2/9/10					X		X				X							HOLD*
2	SS1-.5-021010	1400								X		X				X							
3	T1-.5-021010	1004								X		X				X							
4	T2-.5-021010	1015								X		X				X							
5	T3-.5-021010	1026								X		X				X							
6	T4-.5-021010	1035								X		X				X							
7																							
8																							
9																							
10																							

HOLD* - HOLD 4 LATER ANALYSIS IF REQUIRED

*Metals Analysis (Circle): MTCA-5 RCRA-8 Priority Pollutants TAL *Individual:* Ag Al As B Ba Be Ca Cd Co Cr Cu Fe Hg K Mg Mn Mo Na Ni Pb Sb Se Sr Sn Ti Tl U V Zn

**Anions (Circle): Nitrate Nitrite Chloride Sulfate Bromide O-Phosphate Fluoride Nitrate+Nitrite

Relinquished	Date/Time	Received	Date/Time
x R Hamlet	2/11/10 1250	x	2/11/10 1250
Relinquished	Date/Time	Received	Date/Time
x		x	

Sample Receipt:

Good?	Y
Cooler Temperature:	OK n/a
Seals Intact?:	
Total Number of Containers:	28

Special Remarks:

TAT --> 24HR 48HR Standard

Distribution: White - Lab, Yellow - File, Pink - Originator

Chain of Custody Record

Fremont Analytical

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Laboratory Project No (internal): _____

Date: 2/10/10

Page: 3 of: 3

Client: EMS
Address: _____
City, State, Zip _____ Tel: _____
Reports To (PM): ROBIN HAMLET Fax: Email:

Project Name: GIG HARBOR TRANSMISSION
Location: GIG HARBOR
Collected by: RHAMLET
Project No: 0359-01

Sample Name	Time	Sample Type (Matrix)	Container Type	Date of Collection	VOA 8260	VOA 8021B BTEX	NWTPH-Gx	NWTPH-HCID	NWTPH-Dx/Dx Ext.	SEMI VOL 8270C	PAH 8270	PCBs 8082	Cl PESTICIDES 8081	Cl HERBICIDES 8151A	Metals*	Total (T) | Dissolved (D)	Anions (IC)**					HOLD*-HOLD 4 LATER ANALYSIS IF REQUIRED Comments/Depth
1 B1 H_2O 021010	1040	H_2O	1 LITER 500 POLY	2/10/10					X		X				X	T						
2 B2 H_2O 021010	1140								X		X				X	T						
3 B4 H_2O 021010	1242								X		X				X	T						HOLD*
4 B6 H_2O 021010	1355								X		X				X	T						
5																						
6																						
7																						
8																						
9																						
10																						

*Metals Analysis (Circle): MTCA-5 RCRA-8 Priority Pollutants TAL *Individual:* Ag Al As B Ba Be Ca Cd Co Cr Cu Fe Hg K Mg Mn Mo Na Ni Pb Sb Se Sr Sn Ti Tl U V Zn

**Anions (Circle): Nitrate Nitrite Chloride Sulfate Bromide O-Phosphate Fluoride Nitrate+Nitrite

Relinquished	Date/Time	Received	Date/Time
x R Hamlet	2/11/10 1250	x	2/11/10 1250
Relinquished	Date/Time	Received	Date/Time
x		x	

Sample Receipt:

Good?	Y
Cooler Temperature:	4°C
Seals Intact?:	N/A
Total Number of Containers:	28

Special Remarks:

TAT --> 24HR 48HR Standard

Distribution: White - Lab, Yellow - File, Pink - Originator

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Attachment D

Boring Logs

Attachment D
Boring Logs

ems Environmental Services emsgroupllc.com				Boring Number:	B1	Sheet Number:	1	of	1		
				Job Name:	Gig Harbor Transmission		Date:	2/10/2010			
				Client:	Tracy Larson						
				Location:	14610 Purdy Drive NW						
			Casing Depth:	NA	Surface Elevation:			Water Level:			
		Well Screen Size:		NA	Drilling Type:	Direct Push		9' to 13'			
			Surface Conditions:	Gravels				Drilling:			
					Longitude:			Start	Finish		
					Latitude:		Time:	905	1035		
					Comments:	Drillers using 4 foot Sampler					

Inches Driven	Inches Recovered	Sample Number	Sample Depth	Field Reading	Depth to Water	Boring Depth	Soil Description
						0	Gravel
							Pea gravel, sands & clay subgrade materials
						1	
							Medium brown, dense, sandy, gravelly Clay Fill dry.
						2	
						3	
						4	
						5	Medium brown, dense, very fine to fine grained Sand, dry.
						6	
						7	
						8	fine-med gravels
					▽	9	Medium brown, dense, sl. clayey, fine to coarse grained Sand w/fine-med gravels becoming wet
						10	
						11	
						12	
						13	fine-coarse gravels
					△		Medium brown, stiff, silty Clay, moist.
						14	No odors
						15	
						16	Refusal @ Total Depth of 15' bgs
						17	
						18	
						19	
						20	

ems Environmental Services emsgroupllc.com					
Boring Number:	B2	Sheet Number:	1	of	1
Job Name:	Gig Harbor Transmission		Date:	2/10/2010	
Client:	Tracy Larson				
Location:	14610 Purdy Drive NW				
Casing Depth:	NA	Surface Elevation:		Water Level:	
Well Screen Size:	NA	Drilling Type:	Direct Push	8.5' to 14'	
Surface Conditions:	Asphalt			Drilling:	
Longitude:				Start	Finish
Latitude:			Time:	1102	1125
Comments:	Drillers using 4 foot Sampler				

Inches Driven	Inches Recovered	Sample Number	Sample Depth	Field Reading	Depth to Water	Boring Depth	Soil Description
						0	Asphalt Paving
							Black subgrade gravels
						1	Medium brown, clay layer
						2	
						3	Medium brown ,dense, gravelly clay fill
						4	
						5	
						6	Medium brown, dense, sl. clayey, fine grained Sand w/fine-med gravels, moist.
						7	
						8	Medium brown, dense, fine grained Sand sl. silty, dry.
						9	Medium brown, dense, fine-coarse grained Sand w/tr. clay & fine gravels, dry.
						10	
						11	
						12	Medium brown, dense, fine grained Sand w/traces of silt & clay, wet.
						13	Medium brown, dense, fine-coarse grained Sand w/fine-med. coarse gravels, wet.
						14	
						15	Refusal at Total Depth of 14' bgs
						16	
						17	
						18	
						19	
						20	

ems Environmental Services emsgroupllc.coms emsgroupllc.com				Boring Number:	B3		Sheet Number:	1	of	1	
				Job Name:	Gig Harbor Transmission			Date:	2/10/2010		
				Client:	Tracy Larson						
				Location:	14610 Purdy Drive NW						
			Casing Depth:	NA	Surface Elevation:				Water Level:		
		Well Screen Size:		NA	Drilling Type:		Direct Push		None		
			Surface Conditions:	Concrete					Drilling:		
					Longitude:				Start	Finish	
					Latitude:			Time:	1153	1205	
					Comments:	Drillers using 4 foot Sampler					

Inches Driven	Inches Recovered	Sample Number	Sample Depth	Field Reading	Depth to Water	Boring Depth	Soil Description
						0	Concrete
						1	Medium brown, dense, fine-medium grained Sand w/tr. clay & fine-med. gravels, dry.
						2	
						3	
						4	
						5	Medium brown, dense, fine-medium grained Sand w/tr. clay & fine-med. gravels, dry.
						6	
						7	
						8	
						9	Medium brown, dense, fine-medium grained Sand w/tr. clay & fine-med. gravels, dry.
						10	
						11	
						12	Refusal @ Total Depth of 11' bgs Dry Hole
						13	
						14	
						15	
						16	
						17	
						18	
						19	
						20	

Environmental Services
emsgroupllc.com

Boring Number:	B4	Sheet Number:	1	of	1
Job Name:	Gig Harbor Transmission		Date:	2/10/2010	
Client:	Tracy Larson				
Location:	14610 Purdy Drive NW				
Casing Depth:	NA	Surface Elevation:		Water Level:	
Well Screen Size:	NA	Drilling Type:	Direct Push	11.5' to 14'	
Surface Conditions:	Gravels			Drilling:	
Longitude:				Start	Finish
Latitude:			Time:	1210	1233
Comments:	Drillers using 4 foot Sampler				

Inches Driven	Inches Recovered	Sample Number	Sample Depth	Field Reading	Depth to Water	Boring Depth	Soil Description
						0	Gravels
						1	Medium brown, loose, med. Grained Sand w/med. gravels & asphalt materials (Fill).
						2	
						3	
						4	
						5	Medium brown, loose, med. Grained Sand w/fine-med. gravels ,dry FILL
						6	
						7	
						8	
						9	
						10	Light brown, dense, fine-med. Grained Sand w/fine-coarse gravels, wet @ 11.5' bgs.
						11	
						12	
						13	Light brown, dense, fine-med. Grained Sand w/fine-coarse gravels, wet.
						14	
						15	
						16	Refusal @ Total Depth of 15' bgs.
						17	
						18	
						19	
						20	

Environmental Services
emsgroupllc.com

Boring Number:	B5	Sheet Number:	1	of	1
Job Name:	Gig Harbor Transmission		Date:	2/10/2010	
Client:	Tracy Larson				
Location:	14610 Purdy Drive NW				
Casing Depth:	NA	Surface Elevation:		Water Level:	
Well Screen Size:	NA	Drilling Type:	Direct Push	10.5' to 14'	
Surface Conditions:	Concrete			Drilling:	
Longitude:				Start	Finish
Latitude:			Time:	1245	1315
Comments:	Drillers using 4 foot Sampler				

Inches Driven	Inches Recovered	Sample Number	Sample Depth	Field Reading	Depth to Water	Boring Depth	Soil Description
						0	Concrete
						1 – 4	Gray to medium brown, dense, fine-med. Grained Sand w/fine-med. Gravels, dry. (Fill)
						4 – 8	Medium brown, fine to coarse, sandy Gravels, dry.
						8 – 10	Medium brown, fine to coarse, sandy Gravels, dry.
						10 – 12	Medium brown, dense, fine-med. grained Sand w/fine-med. gravels & trace of clay, wet.
						12 – 14	Gray, fine-coarse, sandy Gravels, wet.
						14 – 20	Refusal @ Total Depth of 14' bgs.

EMS Environmental Services
emsgroupllc.com

Boring Number:	B6	Sheet Number:	1 of 1
Job Name:	Gig Harbor Transmission	Date:	2/10/2010
Client:	Tracy Larson		
Location:	14610 Purdy Drive NW		
Casing Depth:	NA	Surface Elevation:	
Well Screen Size:	NA	Drilling Type:	Direct Push
Surface Conditions:	Asphalt		
Water Level:	9.5' to 14'		
Longitude:			
Latitude:		Drilling Time:	Start 1326, Finish 1353
Comments:	Drillers using 4 foot Sampler		

Boring Depth	Soil Description
0	Asphalt Paving
0–4	Orange-brown, stiff, sl. silty Clay Fill, dry.
4–8	Medium brown, dense, fine-med. grained Sand, w/tr. clay & fine-med gravels, dry. Organics, dry
8–12	Medium brown, dense, fine-med. grained Sand, w/tr. clay & fine-med gravels, moist to wet.
12–14	Medium brown, very dense, fine-med. Grained Sand, w/sl. clayey, fine-med. gravels, wet.
15	Refusal @ Total Depth of 15' bgs.

Column headings: Inches Driven, Inches Recovered, Sample Number, Sample Depth, Field Reading, Depth to Water, Boring Depth (0–20)

Attachment E

Professional Qualifications

Attachment E
Professional Qualifications

Environmental Management Services

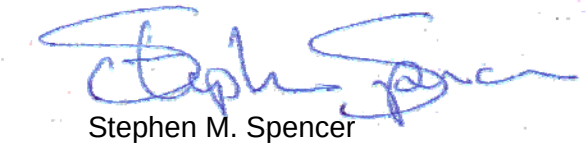
Environmental Management Services (EMS) is an environmental engineering and consulting company servicing clients throughout the west coast. EMS understands the importance of blending a variety of expertise and experience in order to provide our clients the most effective support in addressing their specific project needs. Our professionals combine a high level of technical ability with a broad understanding of the overall regulatory compliance requirements.

As an environmental services and consulting company, EMS is obligated to maintain a broad understanding of the most current regulatory compliance requirements, local and state permitting requirements and our regions environmental advocacy group's positions. EMS provides our clients the services they require by offering non-biased, practical, realistic solutions while maintaining positive relations with the regulatory community.

Our associates have completed projects including remedial investigation / feasibility studies (RI/FS), remediation design and management, facility regulatory compliance assessments, due diligence assessments, regulatory compliance training, underground storage tank compliance and hazardous materials management as well as many other environmental compliance related matters for clients throughout the west coast in all avenues of business. The varied background of our associates compliments the diverse nature of our clientele, providing better understanding of our client's needs and ultimate goals for their projects.

The information in the following pages outlines our professional experience and capabilities in providing environmental management and consulting services. We appreciate your interest in EMS. At your convenience, please feel free to contact our office should you have any questions regarding this document or for any other reason.

Sincerely,
Environmental Management Services



Stephen M. Spencer
Principal

Company Licenses & Insurance

Environmental Management Services, LLC (EMS) is a Washington licensed Limited Liability Company. EMS maintains $2,000,000 in general liability, professional liability (E&O) and pollution liability insurance (Insurance Certificate Attached).

Washington State Contractors License Number: ENVIRMS961DT
Washington State UBI Number: 602-178-517
Federal Tax ID: 04-3754871

Stephen M. Spencer
Principal

Mr. Spencer started his career in the environmental services and construction industry in 1987. During his career, he has worked on and successfully completed projects in many varied aspects of the environmental industry. During the past five years, as principal and senior project manager, Mr. Spencer has successfully completed projects for clients throughout the west coast. His forte is in facility assessment, due diligence investigation, health & safety program development and remediation management.

Mr. Spencer has established positive working relationships with regulatory agencies throughout the west coast, affording his clients a superior level of confidence in his approach to their specific project.

Mr. Spencer's skills as a project manager frequently result in significant savings in both time and budget to his clients. He is proficient in report writing providing a clear, concise detail of project activities including supporting documents and figures. His client's have ranged from property owners and facility operators to the regulatory agencies themselves. Mr. Spencer's overall understanding of environmental compliance requirements provides a unique perspective on assessing potential and realized environmental risk and a creative understanding of remediation technique.

Robin P. Hamlet, L.G. / L.HG
Sr. Project Manager

- State of Washington Licensed Geologist/Hydrogeologist
- Ecology Licensed Washington State Site Assessor
- Ecology Licensed UST Decommissioning Supervisor
- AHERA Licensed Building Inspector
- OSHA Hazardous Materials & Emergency Response Certified

Robin P. Hamlet is a Licensed Geologist and Hydrogeologist in the State of Washington**.** Mr. Hamlet has 30 years experience in the geological sciences with over 25 years providing professional environmental consulting services. Mr. Hamlet has been involved with environmental investigations working on Environmental Protection Agency (EPA), United States Navy and Air Force environmental projects, as a project geologist and project manager. As a Senior Project Manager in the private sector, Mr. Hamlet has performed multiple Phase I and Phase II Environmental Site Assessments; including geophysical surveys, soil and groundwater studies and has managed the design and implementation of soil and groundwater remediation projects.

As a Washington State Licensed Underground Storage Tank (UST) Decommissioner and Site Assessor, Mr. Hamlet has managed multiple UST decommissioning and remediation projects, has prepared proposals, final reports, budgets, contracts with subcontractors, negotiated with prospective clients, and coordinated activities with regulatory agencies. Mr. Hamlet has been involved in training personnel in environmental field operations and Health & Safety programs, has working knowledge of state (NW states) and federal environmental regulations and the ASTM standards. As an AHERA Building Inspector, Mr. Hamlet has performed hazardous materials surveys, air monitoring projects as well as providing asbestos abatement projects.

James E. Corcoran, P.E.
Sr. Project Manager / Sr. Project Engineer - Principal, Summit Design Group, LLC

- Bachelor of Science - Civil Engineering - Oregon State University - 1991
- Washington State Registered Professional Engineer – 1999
- OSHA Hazardous Materials & Emergency Response Certified

Mr. Corcoran has 17 years of experience in Civil Engineering and Project Management. For the past three years, Mr. Corcoran has been the principal of a consulting business that provides civil engineering consulting and site development services including:

- Critical Areas Review
- FEMA floodplain study
- State Environmental Policy Act (SEPA) checklist
- Stormwater Pollution Prevention Plans (SWPPP)
- Spill Prevention, Control, and Countermeasure (SPCC) plans
- Temporary Erosion/Sediment Control (TESC) plans
- Permanent soil stabilization and precise grading plans
- Surface water collection, detention, retention, treatment, and infiltration design
- Construction coordination with utility purveyors
- Site inspection to verify conformance with design intent and contract documents

Mr. Corcoran has provided civil engineering consulting and stormwater management on residential, commercial, and industrial development projects in multiple Washington state jurisdictions including the City of Tacoma, the City of Lacey, the City of Kent, Pierce County, and King County. Specific projects that Mr. Corcoran provided engineering service include:

- Preparing a TESC plan, SPCC plan, and surface water drainage collection and treatment system for a proposed petroleum products recycling process facility which discharges to a municipal storm sewer located in the Port of Tacoma
- Preparing a SEPA checklist, TESC plan, SPCC plan and surface water drainage collection and treatment system for a proposed privately owned fueling facility, which drains to an environmentally sensitive wetland in the City of Kent.
- Preparing a TESC plan, and permanent surface water drainage retention and treatment system, which infiltrates to site soils underlying a proposed commercial retail center in Pierce County.
- Preparing a TESC plan and permanent surface water drainage collection and treatment system which discharges to a municipal storm sewer in the City of Tacoma.
- Preparing a TESC plan and permanent surface water drainage collection, detention and treatment system for a proposed supermarket and commercial retail center located on the Key Peninsula.

Collette Foley, B.S. Geology
Environmental Scientist / Geologist

- Ecology Licensed Site Assessor
- Ecology Licensed UST Decommissioning Supervisor
- AHERA Licensed Building Inspector
- OSHA Compliance Supervisor
- OSHA Hazardous Materials & Emergency Response Certified

Ms. Foley has been conducting Phase I and II Environmental Site Assessments of commercial, industrial, multi- and single-family residential properties throughout western Washington since 2004. Ms. Foley performs a variety of activities associated with completing due diligence investigations including, but not limited to current and historical site research, regulatory agency file reviews, and subsurface investigations including drilling soil borings and installing monitoring wells to determine the presence and outcome of contamination in soil and groundwater.

Additionally, Ms. Foley completes asbestos "*Good Faith*" surveys prior to demolition or renovation of buildings; conducts project oversight for UST removals; and provides extensive environmental consulting as requested. Ms. Foley received her Bachelors degree in Geology and Environmental Science in 2003 from Pacific Lutheran University and has over two years experience as a field geologist / hydrogeologist performing regional hydrogeologic characterization and production well drilling.

Gina Mulderig, B.S. Chemistry
Environmental Scientist / Chemist

- Ecology Licensed Site Assessor
- Ecology Licensed UST Decommissioning Supervisor
- AHERA Licensed Building Inspector
- Certified Erosion and Sediment Control Lead
- OSHA Hazardous Materials & Emergency Response Certified

Ms. Mulderig received her Bachelors degree in Chemistry from the University of Puget Sound in 1979. Ms. Mulderig has been working in the environmental regulatory compliance field since 1985, starting her career with a position as an environmental analyst for Weyerhaeuser Company. Her fifteen year position at Weyerhaeuser required a thorough knowledge of environmental regulatory compliance, focusing on groundwater monitoring, waste water management, storm water management and facility compliance audits.

Ms. Mulderig worked with two local environmental services / consulting firms from 2000 until 2007, greatly increasing her overall regulatory compliance, hydrogeology and environmental engineering knowledge and experience.

Her position with EMS as a Project Manager / Environmental Scientist provides a vast knowledge base to EMS clients in multiple areas of regulatory compliance and environmental science.

Kaitlyn Allegretti, B.S. Geology
Environmental Scientist / Technician

- Ecology Licensed UST Decommissioning Supervisor
- Ecology Licensed Site Assessor
- AHERA Licensed Building Inspector
- OSHA Hazardous Materials & Emergency Response Certified

Ms. Allegretti serves as a site manager and field technical for EMS. Ms. Allegretti graduated from the University of Dayton (2005) with a Bachelor's degree in Geology. Ms. Allegretti's primary responsibilities are field work including monitoring well sampling, underground storage tank closure and decommissioning and asbestos inspections. Ms. Allegretti was licensed as an AHERA building inspector and UST Decommissioner within the first 60 days of her employment.

During her two years with EMS, Ms. Allegretti has completed in excess of fifty Phase I Environmental Site Assessments and in excess of 20 commercial underground storage tank closure projects.

Nick Jackson
Superintendent

- Certified Asbestos/Demolition Supervisor
- Certified lead Supervisor
- 30 hr. OSHA Safety Class
- CPR & First Aid Certified
- Certified in Manufactured Housing
- Machinery Operator License
- Certified Competent Person for Scafford

Mr. Jackson has 10 years experience in the construction business including all phases of construction from startup to completion. He is knowledgeable in all the local and federal construction codes and regulations. Mr. Jackson has experience in the management of several asbestos abatement projects from design to completion and dealing with local and federal regulators. Mr. Jackson is a certified lead inspector as well as a certified asbestos/demolition supervisor. He is also a certified competent person, OSHA and health and safety trained.

Syed K. Hasan, B.S. Environmental Science (Sub-Consultant)
Industrial Hygienist

- Washington State Licensed Risk Assessor
- EPA Licensed Risk Assessor
- AHERA Licensed Building Inspector

Mr. Hasan has worked in the environmental services business since 2001. He is a licensed asbestos building inspector and lead paint risk assessor. He has completed hundreds of asbestos and lead paint assessment projects for residential and commercial properties throughout Washington State. As a project manager, Mr. Hasan has managed multiple projects for private parties as well as government agencies. His forte is working on difficult project schedules with a exemplarily record meeting his clients time frame requirements.

Mary Loftfield, M.S. Environmental Science (Contract Employee)
Environmental Scientist

- Ecology Licensed Site Assessor
- AHERA Licensed Building Inspector

Mary Loftfield is a soil scientist trained in the assessment, research and design, and field implementation of bioremediation solutions for site clean-up. She has had five years of experience designing supervising remediation projects in the Pacific Northwest. Ms. Loftfield also has extensive experienced in laboratory and field techniques for the evaluation and analysis of water quality, soil and plant chemistry, and microbiology. She specializes in soil and plant remediation (phytoremediation).

Working through the voluntary clean up program Ms. Loftfield has successfully used bioremediation strategies she developed and tested in the laboratory and greenhouse in the field. She successfully used soil amendments to sequester and degrade pollutants in the soil,

preventing them from harming human health and the environment. Research into phytoremediation (plant remediation) resulted in field projects using tress to take up and degrade chlorinated solvents and using rhizosphere (rooting zone) remediation to degrade hydrocarbons. Ms. Loftfield's' extensive understanding of environmental chemistry and risk assessment as well as her knowledge of passive remediation strategies offer another approach site investigations and cleanups under the Model Toxics Control Act (MTCA) and corrective Action under RCRA/Dangerous Waste.

James D. Coppernoll, L.G. / L.HG (Sub-Consultant)
Licensed Geologist / Hydrogeologist

- Washington State Licensed Geologist and Hydrogeologist
- Ecology Licensed Site Assessor

James D. Coppernoll is a Washington State licensed Geologist and Hydrogeologist with thirteen years of experience practicing environmental geology in the Northwest. During his career, Mr. Coppernoll worked with clients ranging from major oil companies and national corporations to local businesses to identify, manage, and resolve their environmental problems and helped local agencies, businesses, and individuals with their environmental, geological, and regulatory issues.

Mr. Coppernoll has conducted various environmental and geological investigations ranging from numerous Phase I Environmental Assessments to contaminated site investigations and remedial planning and implementation as well as land use and development studies in Washington, Oregon, Idaho, Montana, and Alaska, and has frequently acted as a regulatory liaison and client representative in third-party negotiations.

Mr. Coppernoll managed all phases of assessment and remediation at dozens of retail and bulk fuel facilities for major oil companies in the Northwest including: excavation and disposal of contaminated soil; free product recovery; feasibility studies; and design, installation, and operation/maintenance of in-situ soil and ground water remediation systems. Mr. Coppernoll managed many of these sites from initial assessment through remediation and closure with the state.

Mr. Coppernoll has conducted geological investigations and assessments for diverse property development projects in the northwest including landfills, hot springs, and residential properties. The purpose of these assessments and investigations was to provide professional and reliable information for use in developing sensitive areas properties.