Supplemental Phase II Environmental Site Assessment Brightwater Conveyance System Ballinger Way Portal 20031 Ballinger Way NE Shoreline, Washington

May 19, 2005

Prepared For:

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Brightwater Project
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CDM Project No. 19897.43507

A Report Prepared For:

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SUPPLEMENTAL PHASE II ENVIRONMENTAL SITE ASSESSMENT
BRIGHTWATER CONVEYANCE SYSTEM
20031 BALLINGER WAY NE
SHORELINE, WASHINGTON

May 19, 2005

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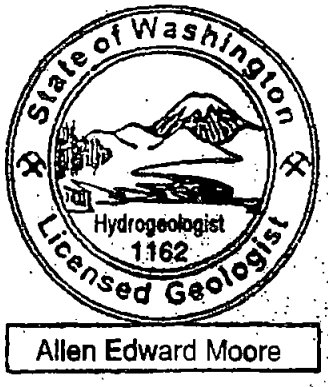

CDM Project No. 19897.43507

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Executive Summary

This report presents the results of a supplemental Phase II environmental site assessment (ESA) conducted by Camp Dresser & McKee Inc. (CDM) at the proposed Ballinger Way Portal location (the site) at 20031 Ballinger Way NE in Shoreline, Washington. The 0.94-acre, rectangular shaped site contains two one- story commercial buildings: one office/retail building and one warehouse.

A Phase I ESA identified the migration of petroleum hydrocarbon constituents and volatile organic compounds (VOCs) from off-site sources as potential contamination sources. No onsite sources were identified. CDM completed a Phase II ESA in September 2004 which confirmed groundwater contamination was present in two groundwater monitoring wells (HB-1 and HB-2) located in the northeast corner of the property. The Phase II ESA findings were indicative of an offsite source. This supplemental Phase II ESA further investigated subsurface conditions to evaluate the nature and extent of the petroleum hydrocarbon contamination, determine the local groundwater gradient, and evaluate possible sources of the contamination.

The supplemental investigation further explored subsurface conditions by drilling three soil borings to depths of between 28 and 34 feet below ground surface (bgs). Two soil borings were drilled offsite and upgradient of the adjacent Shurgard property and one was drilled on the site near the southeast corner and down gradient from HB-1 and HB-2. Subsurface soil conditions encountered included Recessional Outwash and Glacial Till. Perched groundwater was encountered in the wells constructed in each boring and varied in depth of between 22 and 28 feet bgs. The groundwater flow direction is to the south and southeast.

Soil samples collected from the borings were analyzed for petroleum hydrocarbon constituents and VOCs. Analytical test results were compared to Model Toxics Control Act (MTCA) Method A cleanup levels. Petroleum hydrocarbon constituents and VOCs detected were at concentrations below Method A cleanup levels.

Groundwater samples were collected from each of the monitoring wells and analyzed for petroleum hydrocarbon constituents and VOCs. Gasoline-range hydrocarbons and one or more of petroleum hydrocarbon constituents benzene, ethyl benzene, toluene, and xylene were detected at concentrations exceeding Method A cleanup in the onsite wells. Tetrachloroethene (PCE) was detected at concentrations exceeding Method A cleanup in the two offsite wells.

The hydrocarbons encountered in groundwater appear quite different between the property upgradient of the Shurgard property and the site itself. The source of the contamination in the offsite wells is most likely the former dry cleaning operation in the Ballinger Way Shopping Center and possibly older releases from USTs upgradient from the Shurgard property. The source of the hydrocarbon and VOC contamination onsite is most likely associated with existing or former leaking gasoline tanks or lines on the adjacent Shurgard property.

Section 1 - Introduction

1.1 Purpose and Scope

This report summarizes supplemental Phase II environmental site assessment (ESA) activities performed by Camp Dresser & McKee Inc. (CDM) on behalf of King County (the county) at the proposed Ballinger Way Portal (the site) at 20031 Ballinger Way NE in Shoreline, Washington (**Figure 1**). CDM's services were performed in accordance with our October 8, 2004 proposal, under Contract No. E23007E Task 622.

The purpose of the supplemental Phase II ESA was to perform investigation of subsurface conditions both onsite and offsite, determine the groundwater gradient along the southeast side of Ballinger Way NE, evaluate the nature and extent of the petroleum hydrocarbon contamination onsite and offsite, and determine which offsite sources may have affected soil and groundwater. CDM's scope of services included:

- Drilling three soil borings (two off-site and one onsite) and installing groundwater monitoring wells to evaluate soil and groundwater conditions.
- Obtaining and analyzing soil and groundwater samples.
- Evaluating chemical analysis results against applicable State of Washington Model Toxics Control Act (MTCA) cleanup criteria (Ecology, 2001).
- Preparing this report.

1.2 Previous Investigations

Gary Struthers Associates Inc. in association with HDR Engineering, Inc. conducted a Phase I ESA for the county and presented the results in a report dated April 2004. Potential soil and groundwater contamination sources from onsite chemical use and storage and five off-site sources were identified. Potential on-site sources of contamination identified during the Phase I ESA included heating oil and stored chemicals associated with the swimming pool/hot tub business. The five potential off-site sources for soil and groundwater contamination in close proximity to the site include three service stations and two properties not listed in the regulatory agency databases, Ballinger Cleaners and Washington Tree Service. Both Ballinger Cleaners and Washington Tree Service are located upgradient to the site. A Chevron service station (formerly Exxon) with an ongoing cleanup action is located across the street.

The initial Phase I ESA report was prepared before this site was selected for the Ballinger Way Portal and the center of the area searched for potential offsite sources was north of the site's actual location. The radius of concern was expanded to ensure all sites within the minimum distance (per ASTM guidance) would be included.

An additional property with historic operations that could affect the site was identified: Sound Oil (presently occupied by Shurgard). This property is located immediately adjacent to the site's northwest property boundary and was previously used by a paving company, Seattle Service, and a distribution facility for heating oil

(Seattle Service and Sound Oil Company). Sound Oil Company was the last major tenant. The environmental conditions recognized on the adjacent property include:

- Four 20,000-gallon bulk heating oil USTs.
- One 500-gallon heating oil supply UST.
- One former waste oil UST and one former gasoline UST (removed in 1989).
- Used oil drainage sink.
- Concrete-lined wash rack and sump.

The four 20,000-gallon heating oil USTs were located at the south side of the property. Only diesel and heating oil were known to have been stored in these four USTs. TPH releases were noted to be associated with the fill pipes. TPH-Diesel was detected in a soil sample at 15 feet bgs from a soil boring drilled west of the tank nest.

All identified USTs, the drainage sink, and concrete-lined wash rack and sump were removed in 2003 and an independent cleanup action undertaken including removal of contaminated soil and testing to confirm cleanup levels were obtained. TPH-Gas was not detected in soils associated with the former gasoline UST. Trace levels of dichlorobenzene were detected in a soil sample collected beneath the concrete-lined wash rack. Groundwater was not encountered and groundwater quality was not investigated either during the ESA investigations that identified the hydrocarbon contamination or during the independent cleanup action.

CDM conducted a Phase II ESA in August 2004. Six borings were drilled and completed as groundwater monitoring wells (HB-1 through HB-6). The only field evidence of petroleum hydrocarbons found during the subsurface investigation was in Borings HB-1, HB-2, and HB-3 and consisted of noticeable hydrocarbon-like odors in soils near the groundwater table and elevated organic vapor readings obtained using the OVM-PID. Analytical testing of groundwater identified petroleum hydrocarbon contamination in HB-1 and HB-2 at the northeast corner of the property. Volatile organic compounds (VOCs) 1,1,1-trichloroethane and trichloroethene were also detected in groundwater from HB-1 and HB-2.

1.3 Site Description

The site is rectangular shaped and covers an area of 0.94 acres, with the long axis trending northeast. The site contains two 1-story commercial buildings: one office/retail building, and one warehouse. **Figure 1** shows a site plan and pertinent site features.

The office/retail building, built in 1951, is wood framed construction. The warehouse, built in 1978, is prefabricated steel construction. The majority of the property around the buildings is asphalt paved.

Washington Tree Service owns the site. The current tenant is Master Pools, a swimming pool and hot tub business. The surrounding area is a general mix of residential and commercial development (e.g., office buildings, Washington Tree Service, Shurgard Storage Center, service stations with convenience stores, and the Ballinger Village Shopping Center). Commercial development is primarily along Ballinger Way NE, which parallels the eastern perimeter of the site. Residential properties are located to the south and southwest of the site.

Overall, the site slopes gently downward from the southwest to the northeast toward Ballinger Way NE. Mc Aleer creek is located about 1,000 feet to the southwest. Land immediately east, west, and north of the site slopes downwards toward the subject property.

1.4 Subsurface Conditions

The site is located within the Central Puget Lowland, a north-south trending structural and topographic depression bordered on the west by the Olympic Mountains and on the east by the Cascade Mountains. Soils deposited during and between repeated glacial advances and retreats in the Pleistocene Epoch underlie the Central Puget Lowland.

Geologic information for the area was obtained from the Pacific Northwest Center for Geologic Mapping Studies database at the University of Washington's Department of Earth and Space Sciences. The local subsurface geology consists of Recessional Outwash. Underlying the Recessional Outwash is Glacial Till.

Recessional Outwash is described as reddish-brown or brown, loose to medium dense silty sand and sandy silt with gravel. The Glacial Till is a heterogeneous mixture of clay, silt, sand, and gravel that was deposited and compacted by glacial ice. Groundwater is commonly perched on the immediately underlying Glacial Till or older strata.

For this investigation, three additional soil borings were drilled along the southeast side of Ballinger Way NE to explore subsurface conditions. Two soil borings were drilled offsite and upgradient of both HB-1 and the Shurgard property. One soil boring was drilled down gradient near the site's southeast property corner. Soil conditions encountered include Recessional Outwash and Glacial Till. A loose to medium dense sand and silty sand with gravels was encountered at or near the surface and interpreted to be Recessional Outwash. Underlying the Recessional Outwash, we encountered Glacial Till. The Glacial Till contact was encountered approximately 27 feet below ground surface (bgs) in each boring.

Perched groundwater was encountered in each boring and varied in depth between 22 and 28 feet bgs. All three borings were completed as groundwater monitoring wells in the Recessional Outwash to monitor seasonal fluctuations in groundwater elevations and quality, as needed, throughout the hydrogeologic cycle. The amount of perched water can vary with location and seasonal precipitation.

Section 2 - Investigation

CDM's supplemental Phase II ESA investigation was conducted between January 11 and April 28, 2005. This section describes the field activities and laboratory results. Subsurface exploration and sampling procedures are summarized in **Appendix A.** Soil samples collected during the investigation were submitted for analytical testing to OnSite Environmental Inc. (OnSite) in Redmond, Washington.

2.1 Drilling and Installation of Monitoring Wells

A drill rig equipped with a 4-inch-inside-diameter hollow-stem auger was used to drill 3 borings on January 11 and 12, 2005. Holt Drilling, Inc. of Fife, Washington, was the drilling contractor. Boring depths ranged from 28 to 34 feet bgs. Soil samples were collected at 5-foot intervals during drilling beginning at 2.5 feet bgs. The hollow-stem auger soil samples were collected using a split-barrel sampler. Soil samples were classified according to the Unified Soil Classification System as shown on **Figure B1** in **Appendix B.** Logs of all borings drilled in the Phase II ESA investigations and well construction details are presented in **Appendix B** as **Figures B3** through **B11.**

Groundwater was encountered during drilling in each of the three borings. All soil borings were completed as 2-inch-diameter PVC groundwater monitoring wells (designated, HB-7, HB-8, and HB-9 on **Figure 2),** in accordance with Washington Administrative Code (WAC) 173-160. A typical monitoring well construction is shown on **Figure B2** in **Appendix B.** Decontamination procedures for soil sampling and drilling equipment were conducted as described in **Appendix A.** Following installation, the wells were developed and surveyed. Jacobs Associates of Seattle, Washington surveyed reference elevations for each well.

The only field evidence of petroleum hydrocarbons found during the supplemental Phase II ESA investigation was in Boring HB-9 (similar to that observed previously in HB-1 and HB-2) and consisted of noticeable hydrocarbon-like odors in soils near the groundwater table and elevated organic vapor readings obtained using the OVM-PID.

2.3 Groundwater Elevation Monitoring

Using a Sinco (electronic water-level indicator), CDM measured groundwater levels to the nearest 0.01 foot in HB-1, HB-2, HB-3, HB-7, HB-8, and HB-9 on January 13 and April 28, 2005. Groundwater elevations (**Table 1**) were calculated relative to the previously established top-of-casing elevations.

2.3 Groundwater Quality Sampling

CDM conducted groundwater quality sampling on January13, 2005. Groundwater monitoring wells HB-1, HB-2, HB-7, HB-8, and HB-9 were the only monitoring wells that were purged and sampled. Groundwater monitoring well purging and sampling was conducted as described in **Appendix A.**

2.4 Analytical Schedule

Soil samples were screened in the field for the presence of volatile organic compounds using an OVM-PID. In addition, odor indications or stained soils were noted. Selected soil samples from each boring performed in the supplemental Phase II ESA were submitted for the following analyses:

- Gasoline-range total petroleum hydrocarbons (TPH) and benzene, toluene, ethyl benzene, and xylenes (BTEX) by Northwest Method NWTPH-Gx/BTEX.
- Diesel- and oil-range TPH by Northwest Method NWTPH-Dx.
- Halogenated volatiles by EPA Method 8260B.

Groundwater samples were submitted for the following analyses:

- Gasoline-range TPH and BTEX by Northwest Method NWTPH-Gx/BTEX.
- Diesel- and oil-range TPH by Northwest Method NWTPH-Dx.
- Halogenated volatiles by EPA Method 8260B.

2.5 Analytical Testing Results

Laboratory results for soil and groundwater samples are presented in **Tables 2** and **3**, respectively. The laboratory report is presented in **Appendix C**.

2.5.1 Soil Chemistry

BTEX and VOCs detected in soil samples are listed below.

- HB-7 – Tetrachloroethene (PCE).
- HB-8 – Chloroform.
- HB-9 – Ethylbenzene , xylene, and 1,1,1-trichloroethane (1,1,1-TCA)

2.5.2 Groundwater Chemistry

Total petroleum hydrocarbons, BTEX, and VOC compounds detected in groundwater are listed below.

- HB-1 –TPH-gas, BTEX, and 1, 1, 1-TCA.
- HB-2 –TPH-gas, BETX, 1, 1, 1-TCA, trichloroethene (TCE), 1, 4-dichlorobenzene, and chloroform.
- HB-7 –TPH-gas, ethylbenzene, xylene, TCE, chloroform, and PCE.
- HB-8 –TPH-gas, xylene, TCE, chloroform, PCE, and bromodichloromethane.
- HB-9 –TPH-gas, benzene, ethylbenzene, xylene, 1, 1, 1-TCA, TCE, 1, 4-dichlorobenzene, chloroform, and chlorobenzene.

Figure 3 shows the distribution of the TPH-G, BETX, and various VOC compounds in groundwater.

Section 3 – Discussion

3.1 Groundwater Flow

The groundwater flow direction near the site is generally to the south as shown on **Figure 2**, Groundwater Contour Map. Groundwater flow turns to the southeast where it occurs on the site since it is bounded to the southwest by the rising Glacial Till elevation about 70 to 100 feet from Ballinger Way N.E. This interpretation of groundwater flow is based on both groundwater elevation data from our Phase II ESA wells and well data obtained from Washington State Department of Ecology (Ecology) files for the Chevron service station across Ballinger Way N.E.

3.2 Soil and Groundwater Contamination

3.2.1 Soil

Gasoline constituents, ethylbenzene and xylene, were detected in a soil sample from HB-9 at 22.5 feet bgs. A VOC, 1,1,1-TCA, was also detected in this sample. VOCs detected in soil samples off site include; PCE in a sample collected from HB-7 at 27.5 feet bgs and chloroform in a sample from HB-8 at 17.5 feet bgs. All soil concentrations detected were below Method A cleanup levels.

Although chemical analyses results show the presence of gasoline constituents and VOCs in soil, all results indicate that these constituents are associated with the like constituents in groundwater and are limited to a few feet above the groundwater table. This soil contamination results from absorption of hydrocarbons and VOCs onto soil as the contaminated groundwater rises and falls with seasonal fluctuation. No soil contamination that could be the source of the groundwater contamination was encountered in our explorations (including the numerous geotechnical explorations on the site performed for the portal construction and shown on **Figure 1**).

3.2.2 Groundwater

The hydrocarbons encountered in groundwater appear quite different between the area upgradient of the Shurgard property (HB-7 and HB-8) and the area of the site itself (HB-1, HB-2, and HB-9).

Onsite Groundwater

Groundwater quality chemical analyses results indicate the presence of TPH-Gas and one or more of the gasoline constituents, benzene, ethylbenzene, toluene, and xylene in the onsite wells HB-1, HB-2, and HB-9. Petroleum hydrocarbon concentrations above Method A Cleanup Levels include BTEX and TPH-Gas in HB-1 and benzene and TPH-Gas in HB-2 and HB-9. Chromatographs for HB-1, HB-2, and HB-9 show TPH-Gas to be somewhat aged compared to fresh gasoline and much less weathered than the TPH-Gas chromatographs from HB-7 and HB-8.

VOCs detected in the onsite wells include 1,1,1-TCA, TCE, 1,4 -dichlorobenzene, chloroform, and chlorobenzene.

The groundwater chemistry results for HB-1 and HB-2 showed a slight increase in TPH-Gas concentrations (66,000 to 67,000 ppb and 2,200 to 4,100 ppb, respectively) from when they were sampled in August 2004. BETX constituents showed a greater increase in concentrations in HB-1 than in HB-2 over the same period. This could be the result of an ongoing upgradient source, lowered groundwater levels resulting in concentration, or normal variations between sampling events.

Offsite Groundwater

TPH-Gas concentrations were significantly lower in the offsite monitoring wells HB-7 and HB-8 than the onsite wells. Chromatograms and BETX data for HB-7 and HB-8 show very little of the lighter hydrocarbons indicating an older and more weathered gasoline product than the product seen in the onsite wells.

VOCs detected in the offsite wells include TCE, chloroform, PCE, and bromodichloromethane. PCE was the only VOC detected above Method A Cleanup Levels in the Phase II investigations and was only detected in the offsite wells HB-7 and HB-8.

3.3 Potential Sources

3.3.1 Offsite Contamination

The PCE found above Method A cleanup levels in HB-7 and HB-8 upgradient of the site and the adjacent Shurgard property are most likely associated with a release from a dry cleaner operation (Ballinger Cleaners formerly located in the Ballinger Village Shopping Center) across Ballinger Way N.E. PCE above Method A cleanup levels was detected in groundwater monitoring Wells MW-1a, MW-2a, MW-3a, and MW-11 installed as part of the Chevron site investigation. These wells are located across Ballinger Way N.E. to the north and northeast of the site (see **Figure 3**) and are down gradient of the former Ballinger Cleaners site.

The low levels of hydrocarbons found in the offsite wells are most likely associated with older releases on the property where they are located or older releases further upgradient.

3.3.2 Onsite Contamination

The hydrocarbons found in the onsite wells HB-1, HB-2, and HB-9 appear to result from a nearby release of gasoline. No gasoline tanks have ever been identified on the site and no soil contamination associated with a source has been found in numerous closely spaced borings in the front of the property. If the source were onsite, soil contamination above the seasonal fluctuation in groundwater levels would have been encountered in one of the borings. However, the nature of the contamination and the drop in hydrocarbon levels in groundwater across the site suggest the source is nearby. Therefore, the most likely source of the contamination is north, northwest of HB-1 and south, southeast of HB-8.

Section 4 – Conclusions

It is most likely that the source of the contamination north, northwest of the site is associated with existing or former leaking gasoline tanks or lines on the adjacent Shurgard property. A cleanup of contamination was performed on the Shurgard site and clean conditions were documented following cleanup; however, this activity took place in the southwestern ½ of the site away from Ballinger Way N.E. Impacts to soil and groundwater quality were not investigated in the front portion of the Shurgard property. Further, the TCE found in the onsite wells is often associated with vehicle maintenance operations such as took place on the Shurgard property.

It is unlikely that the contamination observed on the site could have originated at the Chevron station across Ballinger Way N.E. All the known gasoline contamination on the Chevron property is either cross gradient or down gradient of the site. If the service station release was crossing the street, hydrocarbon levels in HB-9 would be likely be similar to or higher than in HB-1, which is not the case. The only evidence contamination is crossing Ballinger Way N.E. is the PCE found in the wells HB-7 and HB-8. This is consistent with a source of the PCE upgradient from all wells installed in the Phase II ESA investigations and those installed across the street related to the Chevron site.

Section 5 – References

CDM, 2004. *Phase II Environmental Site Assessment, Ballinger Way Portal Site, Shoreline, Washington.* September 3, 2004.

Ecology. 2001. *Model Toxics Control Act Cleanup Regulation, Chapter 173-340 WAC* Washington State Department of Ecology Toxics Cleanup Program. Publication No. 94-06, Amended February 12, 2001.

Gary Struthers Associates, Inc. 2004. *Phase I Environmental Site Assessment, Brightwater Conveyance System, Ballinger Way Portal, 20031 Ballinger Way NE, Shoreline, Washington.* Prepared for King County Department of Natural Resources and Parks, Wastewater Treatment Division. April 2004.

Pacific Northwest Center for Geologic Mapping Studies, Department of Earth and Space Sciences, University of Washington database. http://geomapnw.ess.washington.edu

Distribution

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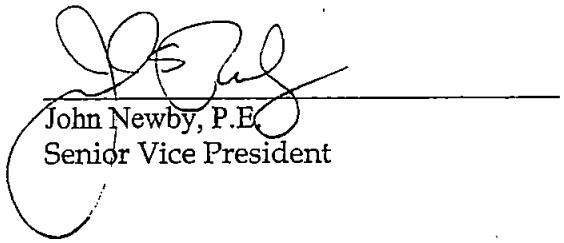

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Senior Vice President

Tables

Table 1
Groundwater Elevation Data
King County/Ballinger Way Portal Site
Shoreline, Washington

Well I.D.	Surveyed Reference Elevation (feet)	Dage Measured	Depth to Groundwater (feet)	Elevation Water Elevation (feet)
HB-1	406.22	08/03/04	19.04	387.18
		01/13/05	21.47	384.75
		04/28/05	21.75	384.47
HB-2	407.56	08/03/04	20.43	387.13
		01/13/05	22.46	385.10
		04/28/05	22.64	384.92
HB-3	409.53	04/28/05	20.59	388.94
HB-7	414.82	01/13/05	28.86	385.96
		04/28/05	28.61	386.21
HB-8	409.80	01/13/05	24.58	385.22
		04/28/05	24.43	385.37
HB-9	405.73	01/13/05	21.99	383.74
		04/28/05	22.15	383.58

Table 2
Summary of Soil Analytical Results
King County/Ballinger Way Portal Site
Shoreline, Washington

Sample Location:	HB 7	HB 8	HB 8	HB 9	
Sample I.D.:	HB-7 27.5 ft	HB-8 17.5 ft	HB-8 27.5 ft	HB-9 22.5 ft	Method A
Depth (ft bgs):	27.5	17.5	27.5	22.5	Cleanup
Compound					Level [a]
NWTPH-Gx/BTEX (mg/kg)					
Benzene	<0.020	<0.020	<0.020	<0.020	0.03
Toluene	<0.052	<0.039	<0.054	<0.047	7
Ethylbenzene	<0.052	<0.039	<0.054	0.30	6
m,p-Xylene	<0.052	<0.039	<0.054	0.40	9
o-Xylene	<0.052	<0.039	<0.054	<0.047	9
TPH-Gas	<5.2	<3.9	<5.4	<4.7	30
NWTPH-Dx (mg/kg)					
Diesel	<30	<30	<29	<31	2,000
Lube Oil	<60	<60	<58	<62	2,000
Halogenated Volatiles (mg/kg) (Detected)					
Tetrachloroethene	0.026	<0.0011	<0.0011	<0.0011	0.05
Chloroform	<0.0012	0.0017	<0.0011	<0.0011	N/A
1,1,1-Trichloroethane	<0.0011	<0.0011	<0.0011	0.0035	2

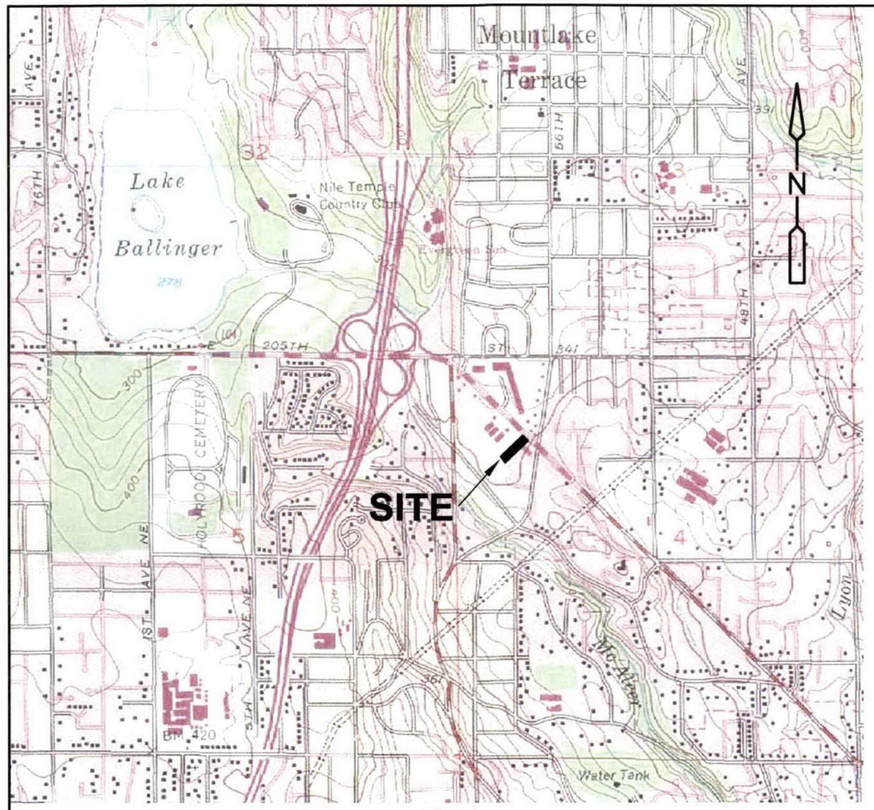
Notes:
a) Washington Administrative Code Chapter 173-340, Model Toxics Control Act Cleanup Regulation, Method A suggested soil cleanup level for unrestricted land uses; updated August 15, 2001.
ft bgs - feet below ground surface.
mg/kg - milligrams per kilogram.
N/A - not available.
< - analyte not detected at or greater than the listed concentration (practical quantitation limit [PQL]).

Table 3
Summary of Groundwater Analytical Results
King County/Ballinger Way Portal Site
Shoreline, Washington

Sample Location:	HB 1		HB 2		HB 7	HB 8	HB 9	Method A Cleanup Level [a]
Sampling Date:	08/05/04	01/13/05	08/05/04	01/13/05	01/13/05	01/13/05	01/13/05	
Compound								
NWTPH-Gx/BTEX (µg/L)								
MTBE	<5	--	<5	--	--	--	--	20
Benzene	40	130	8.8	30	ND	ND	19	5
Toluene	1,400	8,500	19	12	ND	ND	ND	1,000
Ethylbenzene	2,100	3,100	69	240	4.1	ND	550	700
m,p-Xylene	7,700	8,800	190	370	6.2	2.2	690	1,000
o-Xylene	3,600	4,500	130	ND	ND	ND	ND	1,000
TPH-Gas	66,000	67,000	2,200	4,100	270	240	8,200	800 [b]
NWTPH-Dx (mg/L)								
Diesel	<0.27	<0.26	<0.27	<0.25	<0.25	<0.26	<0.27	500
Lube Oil	<0.43	<0.41	<0.43	<0.40	<0.40	<0.41	<0.42	500
Halogenated Volatiles (µg/L) (Detected)								
1,1,1-Trichloroethane	22	50	2.8	1.2	<0.40	<0.20	11	200
Trichloroethene	<0.40	<10	1.1	1.4	0.60	1.0	2.2	5
1,3-Dichlorobenzene	<0.40	<10	0.81	<1.0	<0.40	<0.20	<1.0	N/A
1,4-Dichlorobenzene	<0.40	<10	0.81	2.0	<0.40	<0.20	1.2	N/A
Chloroform	<0.40	<10	<0.40	1.7	5	9.6	1.4	N/A
Tetrachloroethene	<0.40	<10	<0.40	<1.0	77	40	<1.0	5
Chlorobenzene	<0.40	<10	<0.40	<1.0	<0.40	<0.20	3.0	N/A
Bromodichloromethane	<0.40	<10	<0.40	<1.0	<0.40	0.66	<1.0	N/A

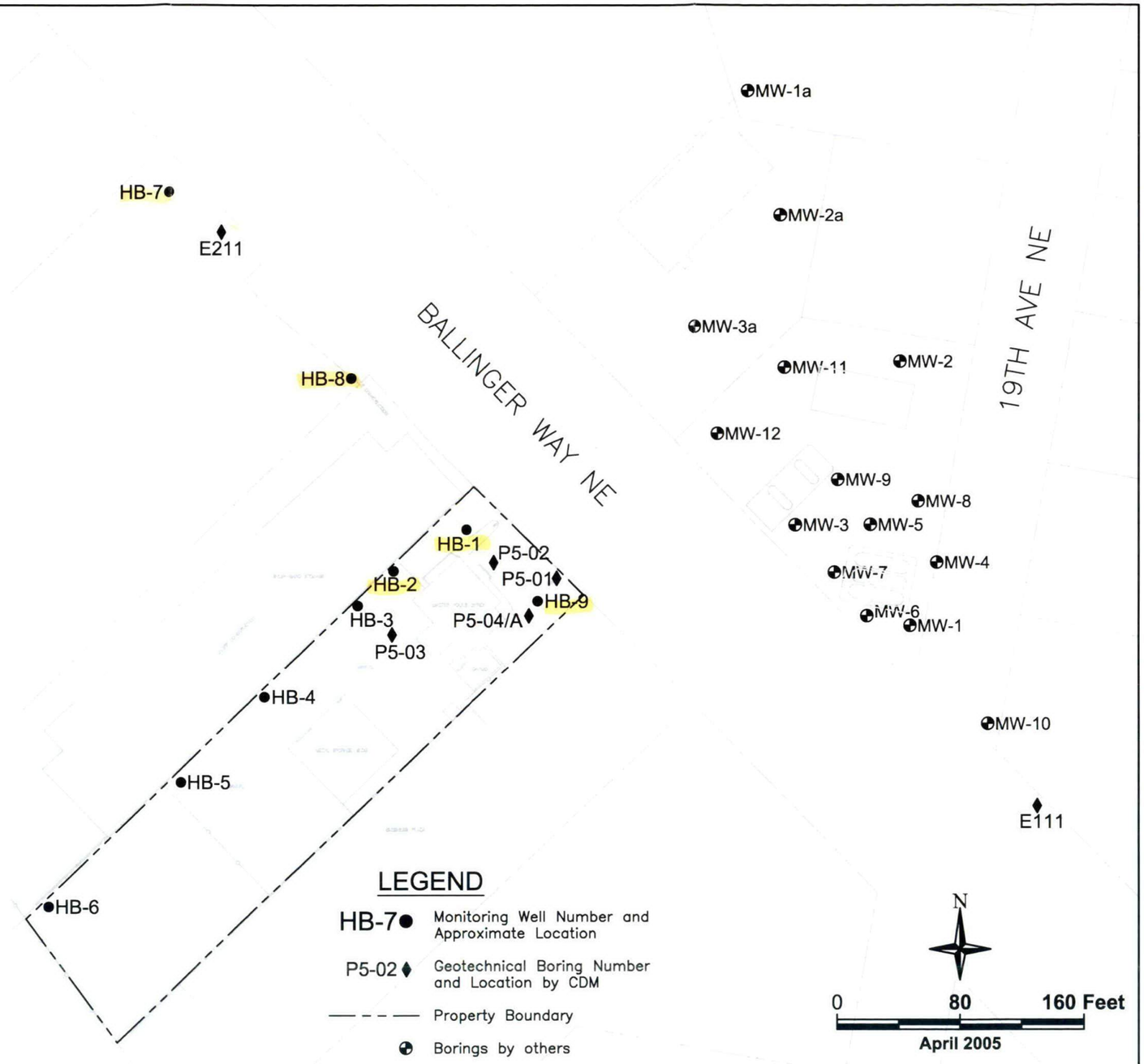
Notes:
a) Washington Administrative Code Chapter 173-340, Model Toxics Control Act Cleanup Regulation, Method A suggested groundwater cleanup level; updated August 15, 2001.
b) 800 µg/L if benzene is present in groundwater.
mg/L - milligrams per liter (parts per million).
µg/L - micrograms per liter (parts per billion).
N/A - not available.
-- not analyzed.
< - analyte not detected at or greater than the listed concentration (practical quantitation limit [PQL]).

Figures



REFERENCE: USGS MAP EDMONDS EAST. WA., 7.5 SERIES (TOPO) ,1981

Vicinity



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King County
Department of
Natural Resources and Parks
Wastewater Treatment Division

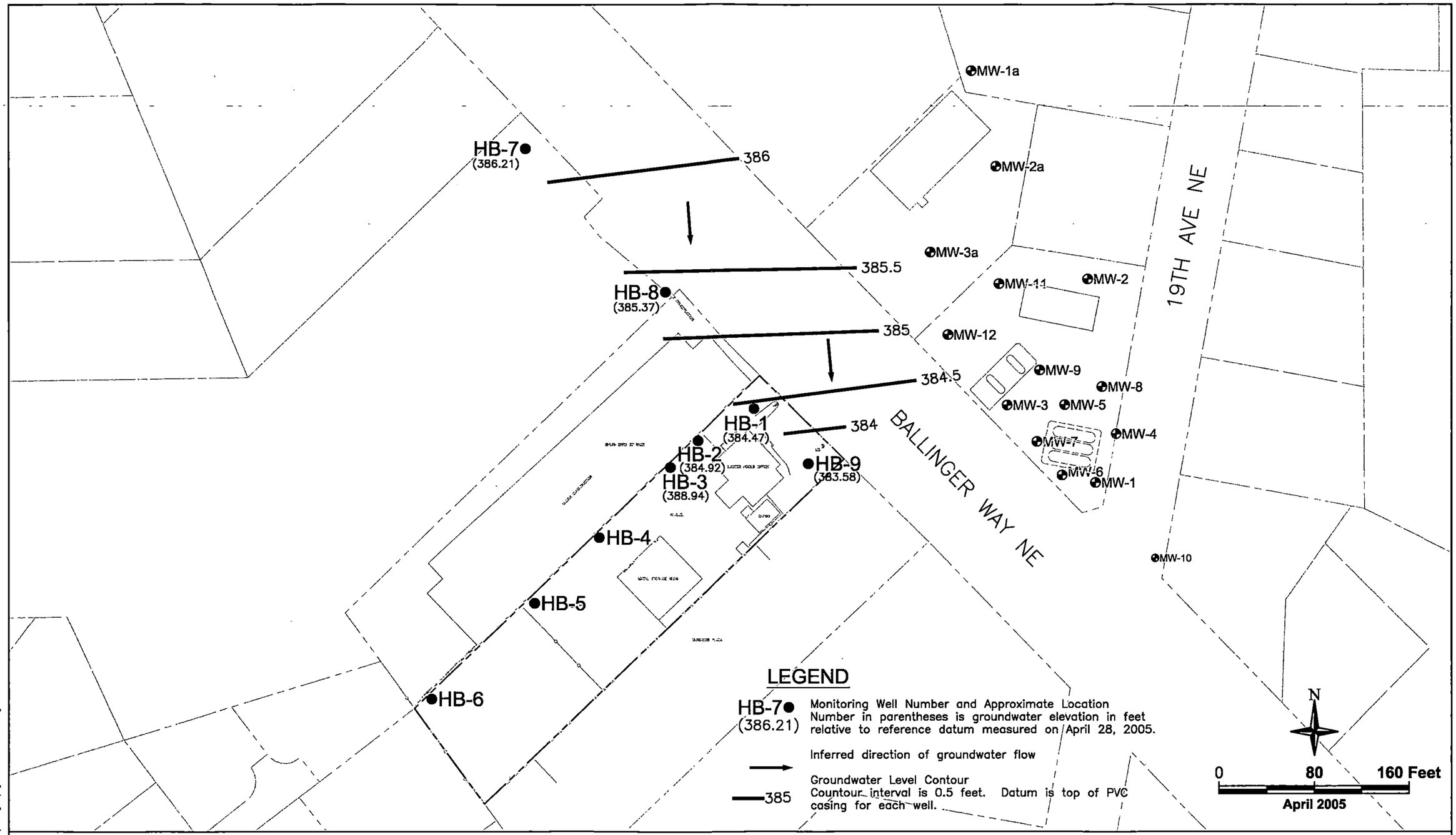
Data Sources:

File Name:

Figure 1

Ballinger Way Portal Vicinity Map & Site Plan

BRIGHTWATER REGIONAL WASTEWATER TREATMENT SYSTEM



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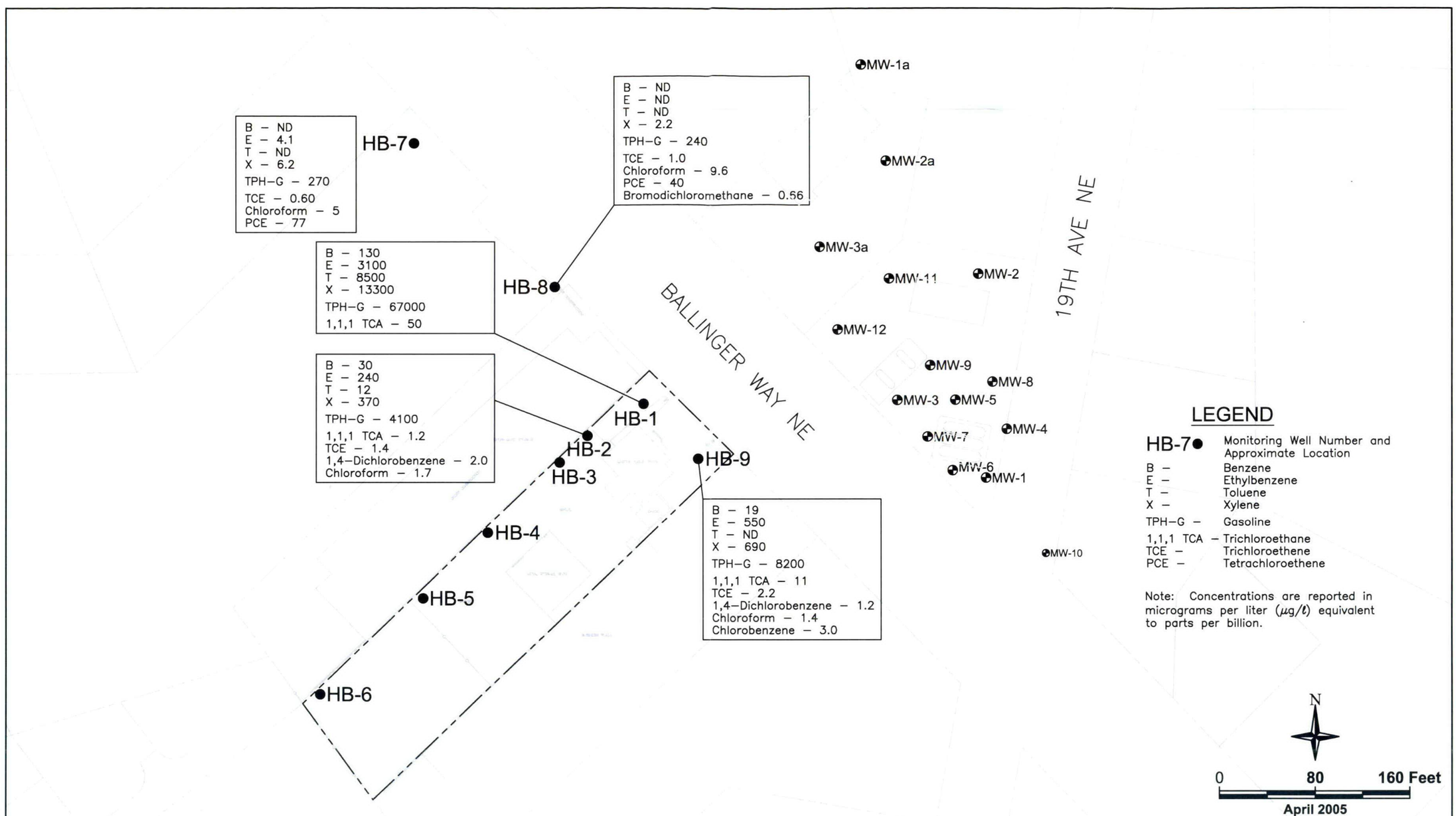
King County
Department of
Natural Resources and Parks
Wastewater Treatment Division

Data Sources:

File Name:

Figure 2
Ballinger Way Portal - Groundwater Contour Map
BRIGHTWATER REGIONAL WASTEWATER TREATMENT SYSTEM



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King County
Department of
Natural Resources and Parks
Wastewater Treatment Division

Data Sources:

File Name:

Figure 3

Ballinger Way Portal TPH-G, BETX & VOC Concentrations - Groundwater

BRIGHTWATER REGIONAL WASTEWATER TREATMENT SYSTEM

Appendix A

Field Exploration and Sampling Procedures

Appendix A

Field Exploration and Sampling Procedures

Drilling

Holt Drilling, Inc. of Fife, Washington drilled 3 soil borings, completing each boring as a groundwater monitoring well at the proposed Ballinger Way Portal on January 11 and 1 2, 2005. A Camp Dresser &McKee (CDM) geologist observed the drilling/monitoring well installation. The borings were advanced from 28 to 34 feet below ground surface (bgs) using a drill rig equipped with 4-inch inside-diameter hollow-stem augers.

Organic vapors were monitored during drilling to aid in protecting on-site personnel from potential inhalation hazards and to make qualitative judgments about the degree of petroleum hydrocarbons in soil. Measurements were taken routinely around the workers' breathing space.

Soil Sampling

During drilling, soil was sampled at 5-foot intervals by driving a 2-inch-diameter split-barrel sampler 18-inches into undisturbed soil ahead of the borehole bottom. Driving was terminated when the full 18-inch drive was completed or when 50 blows over less than a 6-inch drive was obtained. Each sampled interval was logged according to the Unified Soil Classification System.

The following procedures were used to collect subsurface soil samples during drilling:

1. Driller retrieved split-barrel sampler from borehole.

2. The split-barrel sampler was opened and sample recovery was measured.

3. At sampled intervals subject to laboratory analysis, a soil sample was collected in accordance with EPA Method 5035A. Each soil sample was collected using a coring device (Easy draw syringe and Powerstop handle) and placing the core into a pre-weighted 40ml VOA vial with septum. Additional soil was transferred to a 4-ounce laboratory supplied glass jars using a stainless steel implement. The sample containers were labeled, secured with a chain-of-custody seal, placed in a cooler, and chilled with ice.

4. A representative sample was placed in a resealable plastic bag to measure headspace using an organic vapor meter equipped with a photoionization detector (OVM-PID).

5. The contents of the sampler were described on the field log.

6. The split-barrel sampler was decontaminated by the procedures described later in this appendix.

Field Screening

An OVM-PID was used to screen samples from the soil borings as follows: soil samples were placed in a plastic resealable bag and disaggregated; after approximately 1 minute, the OVM-PID probe was inserted through the bag in the space (headspace) above the soil and the maximum reading on the instrument was recorded. This screening technique is not a compound-specific analysis and is affected by climate (e.g., temperature and humidity), soil type and condition, and instrument calibration and operation. The intent of this analysis is to qualitatively compare samples and assist in selecting samples for chemical analysis.

Monitoring Well Installation

Each groundwater monitoring well was installed in the soil boring as the augers were extracted. Each groundwater monitoring well was constructed in accordance with Chapter 173-160 Washington Administrative Code (WAC) *Standards for Resource Protection Wells* (March 13, 1990).

All monitoring wells were constructed of 2-inch-diameter Schedule 40, flush-threaded PVC screen and riser pipe. All screen, casing, and caps were precleaned by the manufacturer and shipped in plastic. The well was constructed with 10 feet of machine-slotted (No. 10 slot) screen with an end cap at the bottom. A blank riser pipe extended from the top of the screen to approximately 0.3 foot bgs. A PVC cap was placed at the top of the blank riser pipe.

The filter pack was installed in the borehole as the auger flights were withdrawn. Quantities of material used were recorded in the daily field investigation report. Depths to the well construction materials were measured frequently with a precleaned weighted measuring tape during installation to prevent overfilling and bridging in the augers. The 10-20 silica sand pack was then placed in the annular space from the bottom of the screen to approximately 2 feet above the top of the screen.

A seal of bentonite chips was placed on top of the sand pack to about 2 feet bgs. The well was completed with tamper-resistant, flush-mount, protective casings cemented into place.

Monitoring Well Elevation Survey

A representative from Jacobs Associates surveyed the ground and top of each PVC well casing to the nearest 0.01 foot using the reference datum as follows:

Horizontal Datum: Washington State Plane Coordinates, North Zone.

Vertical Datum: Metro Project Datum (Metro) = NAVD88 + 96.28 feet.

Monitoring Well Development and Sampling

Following monitoring well installation, each well was developed by a combination of surging with a surge block and steady pumping with a submersible pump. Physical parameters (conductivity, pH, and temperature) were measured during development. Once stabilized, the pump was moved to a different depth and the process repeated. Physical parameters, characteristics (odor and color), and pumping rate were recorded on a well development record. Well development water was contained in 55-gallon drums.

The groundwater monitoring wells were allowed to stabilize between 24 and 48 hours before sampling. Prior to collecting a representative groundwater sample, each monitoring well was purged using a bailer. Physical parameters listed above were measured frequently during purging. Measurements were taken until three well volumes had been removed or the variation of physical parameters was less than 10 percent for three successive measurements.

A bailer equipped with a Teflon check-valve and suspended on nylon chord was used to sample each monitoring well. The bailer was slowly emptied into the sample containers, two amber colored 500 milliliter (mL) glass and five 40 mL glass vials to avoid degassing.

Decontamination Procedures

Drilling Equipment

Drilling equipment, including the auger flights and sampling tools, were decontaminated with a high-pressure steam cleaner/pressure wash between each exploration location.

Sampling Equipment

The following decontamination procedures were used to decontaminate soil and groundwater sampling equipment:

1. Rinse and preclean in potable water.
2. Wash and scrub with nonphosphate-based detergent and potable water.
3. Rinse with potable tap water.
4. Rinse with deionized water.
5. Store on clean plastic between sampling.

Sample Handling and Shipping

Soil and groundwater samples were kept out of direct sunlight and were checked for label completeness and cap tightness. Each sealed sample container was placed in packing material upright in a cooler and chilled with Blue Ice. Chain of custody seals were placed on the cooler prior to delivery to the analytical laboratory. The samples were stored and

transported under chain-of-custody procedures. Copies of the completed chain-of-custody forms are presented with the laboratory reports in **Appendix C.**

Materials Generated During Fieldwork

Materials generated during fieldwork were placed in 55-gallon drums, labeled to identify the contents, and temporarily stored onsite pending laboratory results. Materials included soil cuttings and decontamination, development, and purge water.

Documentation

Daily Field Report

The CDM representative reported daily activities on a Field Investigation Daily Report form. Personnel on site, visitors, weather, general activities planned and performed, and any problems were included on the Daily Report. Daily Field Reports and other documentation of field activities are contained in the project file.

Drilling and Well Construction

Drilling was conducted by Holt Drilling, Inc. and documented by a CDM geologist. Documentation of drilling, soil sampling, and well construction was made on a Field Log of Exploration. The CDM representative completed the log in the field.

Appendix B

Monitoring Well and Boring Logs

SOIL CLASSIFICATION LEGEND

MAJOR DIVISIONS				TYPICAL NAMES
COARSE GRAINED SOILS (More than half is larger than No. 200 sieve)	GRAVELS (More than half coarse fraction is larger than No. 4 sieve size)	Clean gravels with little or no fines.	GW	Well graded gravels, gravel-sand mixtures
			GP	Poorly graded gravels, gravel-sand mixtures
		Gravel with over 12% fines	GM	Silty gravels, gravel-sand-silt mixtures
			GC	Clayey gravels, gravel-sand-clay mixtures
	SANDS (More than half coarse fraction is smaller than No. 4 sieve size)	Clean sands with little or no fines	SW	Well graded sands, gravelly sands
			SP	Poorly graded sands, gravelly sands
		Sands with over 12% fines	SM	Silty sand, sand-silt mixtures
			SC	Clayey sands, sand-clay mixtures
FINE GRAINED SOILS (More than half is smaller than No. 200 sieve)	SILTS AND CLAYS (Liquid limit less than 50)		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, or clayey silts with slight plasticity
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
			OL	Organic clays and organic silty clays of low plasticity
	SILTS AND CLAYS (Liquid limit greater than 50)		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
			CH	Inorganic clays of high plasticity, fat clays
			OH	Organic clays of medium to high plasticity, organic silts
HIGHLY ORGANIC SOILS			PT	Peat and other highly organic soils

SAMPLE TYPE SYMBOLS

- Disturbed bag or jar sample
- Std. Penetration Test (2.0" OD)
- Type U Ring Sampler (3.25" OD)
- California Sampler (3.0" OD)
- Undisturbed Tube Sample
- Grab Sample
- Core Run
- Non-standard Penetration Test (with split spoon sampler)
- Bulk Sample

CONTACT BETWEEN UNITS

- Change in geologic unit
- Soil type change within geologic unit
- Obscure or gradational change

DESCRIPTORS FOR SOIL STRATA AND STRUCTURE (ENGLISH/METRIC)

General Thickness or Spacing

Parting:	less than 1/16 in. (1/6 cm)
Seam:	1/16 to 1/2 in. (1/6 to 1 1/4 cm)
Layer:	1/2 to 12 in. (1 1/4 to 30 1/2 cm)
Stratum:	> 12 in. (30 1/2 cm)
Scattered:	< 1 per ft. (30 1/2 cm)
Numerous:	> 1 per ft. (30 1/2 cm)

Structure

Pocket:	Erratic, discontinous deposit of limited extent
Lens:	Lenticular deposit
Varved:	Alternating seams of silt and clay
Laminated:	Alternating seams
Interbedded:	Alternating layers

General Attitude

Near horizontal:	0 to 10 deg.
Low angle:	10 to 45 deg.
High angle:	45 to 80 deg.
Near Vertical:	80 to 90 deg.

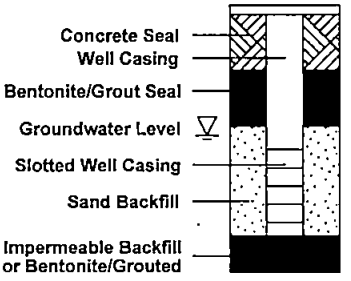
STRUCTURE DESCRIPTION (cont.)

Fractured	Breaks easily along definite fractured planes
Slickensided	Polished, glossy, fractured planes
Blocky, Diced	Breaks easily into small angular lumps
Sheared	Disturbed texture, mix of strengths
Homogenous	Same color and appearance throughout

MOISTURE DESCRIPTION

- Dry - Free of moisture, dusty
- Moist - Damp but no visible free water
- Wet - Visible free water, saturated

WELL COMPLETIONS



RELATIVE DENSITY OR CONSISTENCY VS. SPT N-VALUE

COARSE GRAINED			FINE GRAINED		
Density	N (blows/ft)	Approx. Relative Density (%)	Consistency	N (blows/ft)	Approx. Undrained Shear Str. (psf)
Very Loose	0 to 4	0 - 15	Very Soft	0 to 2	<250
Loose	4 to 10	15 - 35	Soft	2 to 4	250 - 500
Medium Dense	10 to 30	35 - 65	Medium Stiff	4 to 8	500 - 1000
Dense	30 to 50	65 - 85	Stiff	8 to 15	1000 - 2000
Very Dense	Over 50	85 - 100	Very Stiff	15 to 30	2000 - 4000
			Hard	over 30	>4000

PHYSICAL PROPERTY TEST

- AL - Atterberg Limits
- FC - Fines Content
- GSD - Grain Size Distribution
- MC - Moisture Content
- MD - Moisture Content/Dry Density
- Comp - Compaction Test (Proctor)
- SG - Specific Gravity
- CBR - California Bearing Ratio
- RM - Resilient Modulus
- Perm - Permeability
- TXP - Triaxial Permeability
- Cons - Consolidation
- Chem - Analytical Chemical Analysis
- Corr - Corrosion
- VS - Vane Shear
- DS - Direct Shear
- UC - Unconfined Compression
- TX - Triaxial Compression
- UU - Unconsolidated, Undrained
- CU - Consolidated, Undrained
- CD - Consolidated, Drained

Notes:

1. Sample descriptions in this report are based on visual field and laboratory observations, which include density/consistency, moisture condition, grain size, and plasticity estimates, and should not be construed to imply field or laboratory testing unless presented herein. Visual-manual classification methods in accordance with ASTM D 2488 were used as an identification guide. Where laboratory data are available, soil classifications are in general accordance with ASTM D 2487.

2. Dual symbols are used to indicate gravel and sand units with 5 to 12 percent fines.

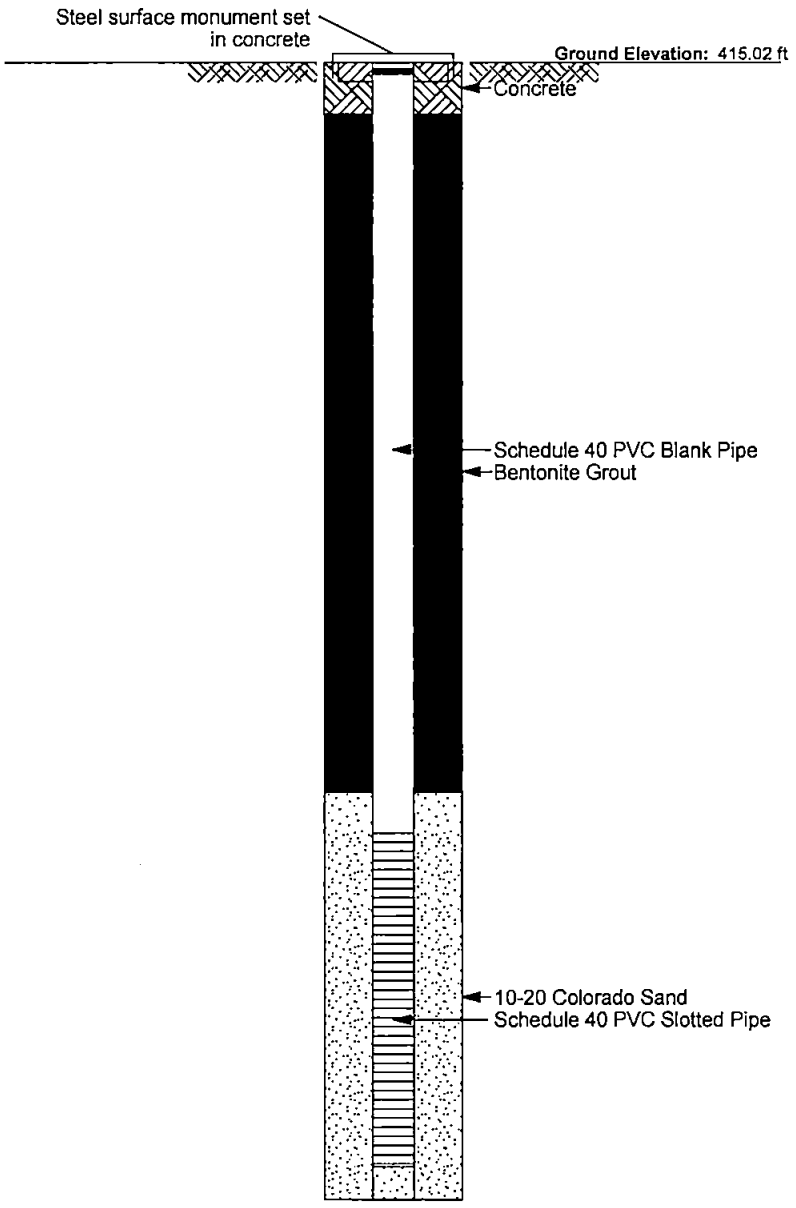
3. WOR = weight of rod.

CDM

King County
Brightwater Conveyance System
Shoreline, Washington

Project No: 19897.43502 Figure: B1

SOIL CLASSIFICATION/LEGEND 19897-BRIGHTWATER ENVIRONMENTAL.GPJ CDM BLLV.GDT 5/6/05 REV.



MONITORING WELL CONSTRUCTION 19897-BRIGHTWATER ENVIRONMENTAL.GPJ CDM_BLLV.GDT 5/6/05 REV.

TYPICAL MONITORING WELL CONSTRUCTION

King County
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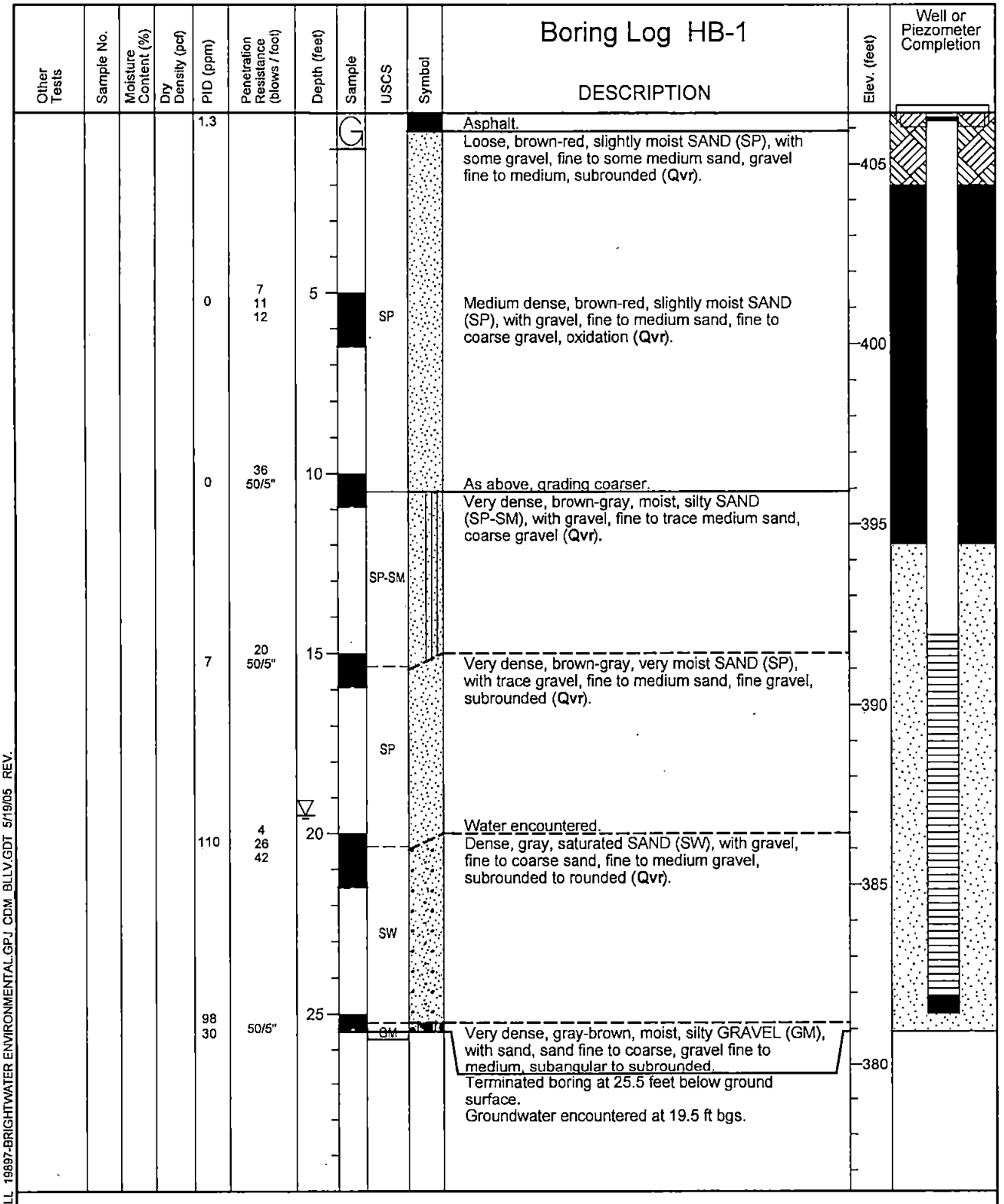
Shoreline, Washington

Project No: 19897.43502 Figure: B2
1 of 1

CDM

Boring Log HB-1



LOG OF BORING WITH WELL 19897-BRIGHTWATER ENVIRONMENTAL.GPJ CDM_BLLV.GDT 5/19/05 REV.

Location:

Surface Elevation: 406.42'

Logged By: SEC

Drill Rig: HSA Foremost Mobile B-59

Equipment/Hammer: D&M/300/30

Date Completed: 8-3-04

CDM

King County
Brightwater Conveyance System
Shoreline, Washington

Boring Log HB-1

Project No: 19897.43502

Figure: B3

Boring Log HB-2

Other Tests	Sample No.	Moisture Content (%)	Dry Density (pcf)	PID (ppm)	Penetration Resistance (blows / foot)	Depth (feet)	Sample	USCS	Symbol	DESCRIPTION	Elev. (feet)	Well or Piezometer Completion
				0			G	FILL		Crushed Rock/Gravel (Fill).		
				0	14 11 7	5		SP		Loose, brown-red, slightly moist SAND (SP), with gravel, fine to medium sand, fine to medium gravel (Qvr). Medium dense, brown-red, moist SAND (SP), with gravel, same as above, some coarse gravel, subrounded (Qvr).	405 400	
				0	14 19 18	10				Medium dense, same as above, except grading coarser with depth, subrounded.		
				65/6"		15		SP-SM		Very dense, brown-gray, moist SAND (SP-SM), with graveland trace clay/silt binder, sand grading coarse.	395 390	
				0	27 50/3"							
				0	27 50/3"	20				Becomes very moist.		
								SP		Gray-brown, very moist to wet SAND (SP), with silt, some fine to medium sand, trace gravel.	385	
				9.6	37 50/6"	25		SP-SM		Very dense, gray-brown, wet, silty SAND (SP-SM), sand fine to medium. Terminated boring at 25 feet below ground surface.	380	

Location:

Surface Elevation: 407.9'

Logged By: SEC

Drill Rig: HSA Foremost Mobile B-59

Equipment/Hammer: D&M/300/30

Date Completed: 8-3-04

King County
Brightwater Conveyance System
Shoreline, Washington

CDM

Boring Log HB-2
Project No: 19897.43502

Figure: B4
1 of 1

LOG OF BORING WITH WELL 19897-BRIGHTWATER ENVIRONMENTAL.GPJ CDM_BLLV.GDT 5/19/05 REV.

Boring Log HB-3

Other Tests	Sample No.	Moisture Content (%)	Dry Density (pcf)	PID (ppm)	Penetration Resistance (blows / foot)	Depth (feet)	Sample	USCS	Symbol	DESCRIPTION	Elev. (feet)	Well or Piezometer Completion
				23						Loose, brown-red, slightly moist SAND (SP), with gravel, fine to medium sand, fine to medium gravel, subangular to subrounded, odor-woody (**Qvr**).		
				0	11 14 17	5		SP		Medium dense, brown-red, slightly moist SAND (SP), with some gravel, fine to medium sand, fine to medium gravel, subrounded, no odor (**Qvr**).	405	
				0	14 16 20	10				As above, except moist, increase in gravel, medium to coarse, trace coarse sand, grading coarse (**Qvr**).	400	
				0	21 50/5"	15		SP-SM		Very dense, brown-gray, moist, silty SAND (SP-SM), with gravel, fine to medium sand, fine to medium gravel, subangular to subrounded, weathered till(?) (**Qvr & Qvt**).	395	
				0.7	15 50/5"	20				Very dense, brown-gray, very moist, silty sand, increase in silt at 20.5 ft bgs, trace gravel, fine to medium sand, fine gravel.	390	
				0	30 50/2"	25		SP		Very dense, brown-gray, moist SAND (SP), with trace silt, fine to medium sand (**Qvr**).	385	
								SP-SM		Very dense, gray-brown, moist, silty SAND (SP-SM), with some gravel, fine to medium sand, fine gravel, subangular to subrounded (**Qvt**).		
				0	50/6"	30				Terminated boring at 30.5 feet below ground surface.	380	

Location: _____
Surface Elevation: 409.74'
Logged By: SEC

Drill Rig: HSA Foremost Mobile B-59
Equipment/Hammer: D&M/300/30
Date Completed: 8-3-04

King County
Brightwater Conveyance System
Shoreline, Washington

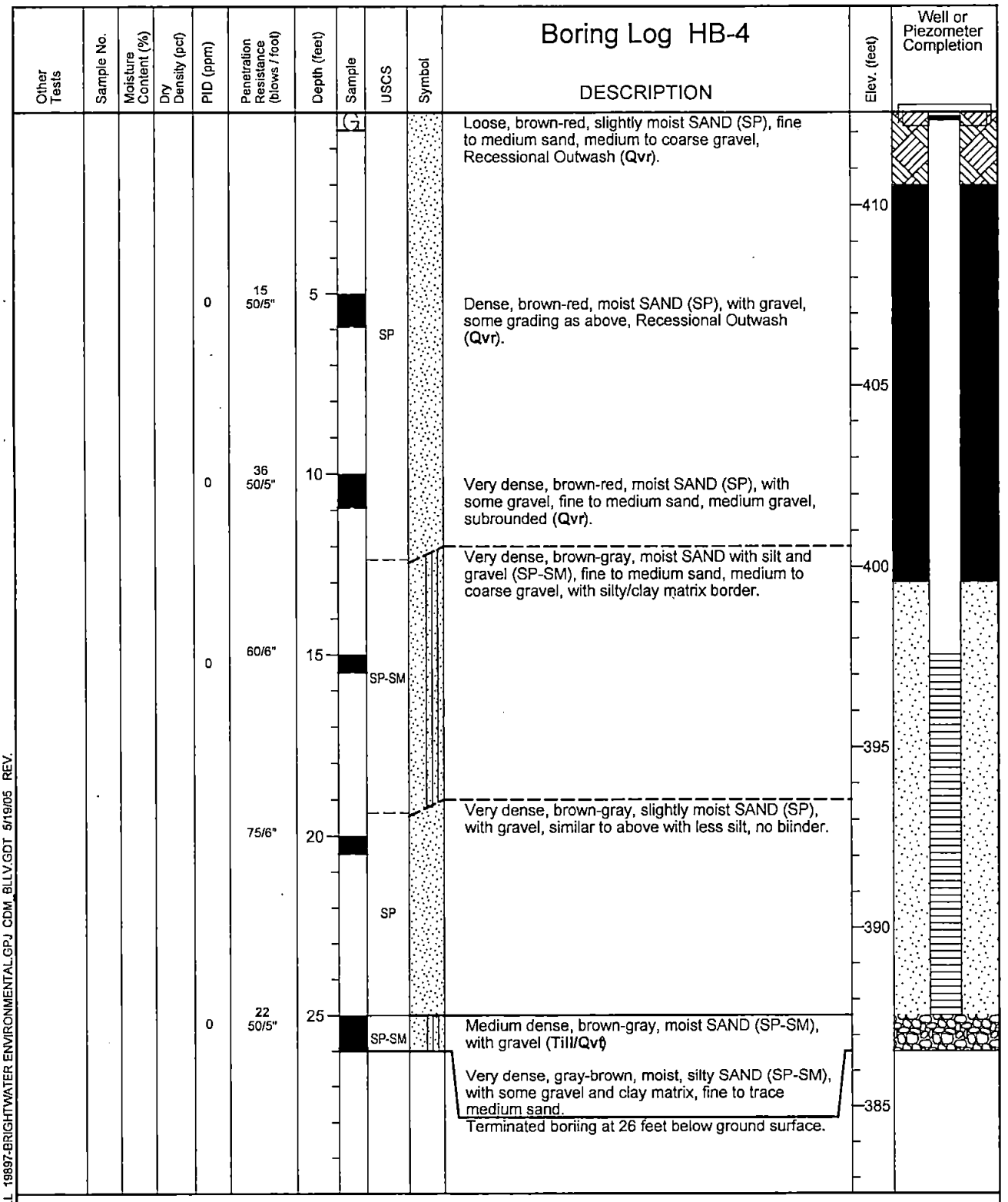
CDM

Boring Log HB-3
Project No: 19897.43502

Figure: B5
1 of 1

LOG OF BORING WITH WELL 19897-BRIGHTWATER ENVIRONMENTAL.GPJ CDM_BLLV.GDT 5/19/05 REV.

Boring Log HB-4



LOG OF BORING WITH WELL 19897-BRIGHTWATER ENVIRONMENTAL.GPJ CDM_BLLV.GDT 5/19/05 REV.

Location: _____
Surface Elevation: 412.56'
Logged By: SEC

Drill Rig: HSA Foremost Mobile B-59
Equipment/Hammer: D&M/300/30
Date Completed: 8-3-04

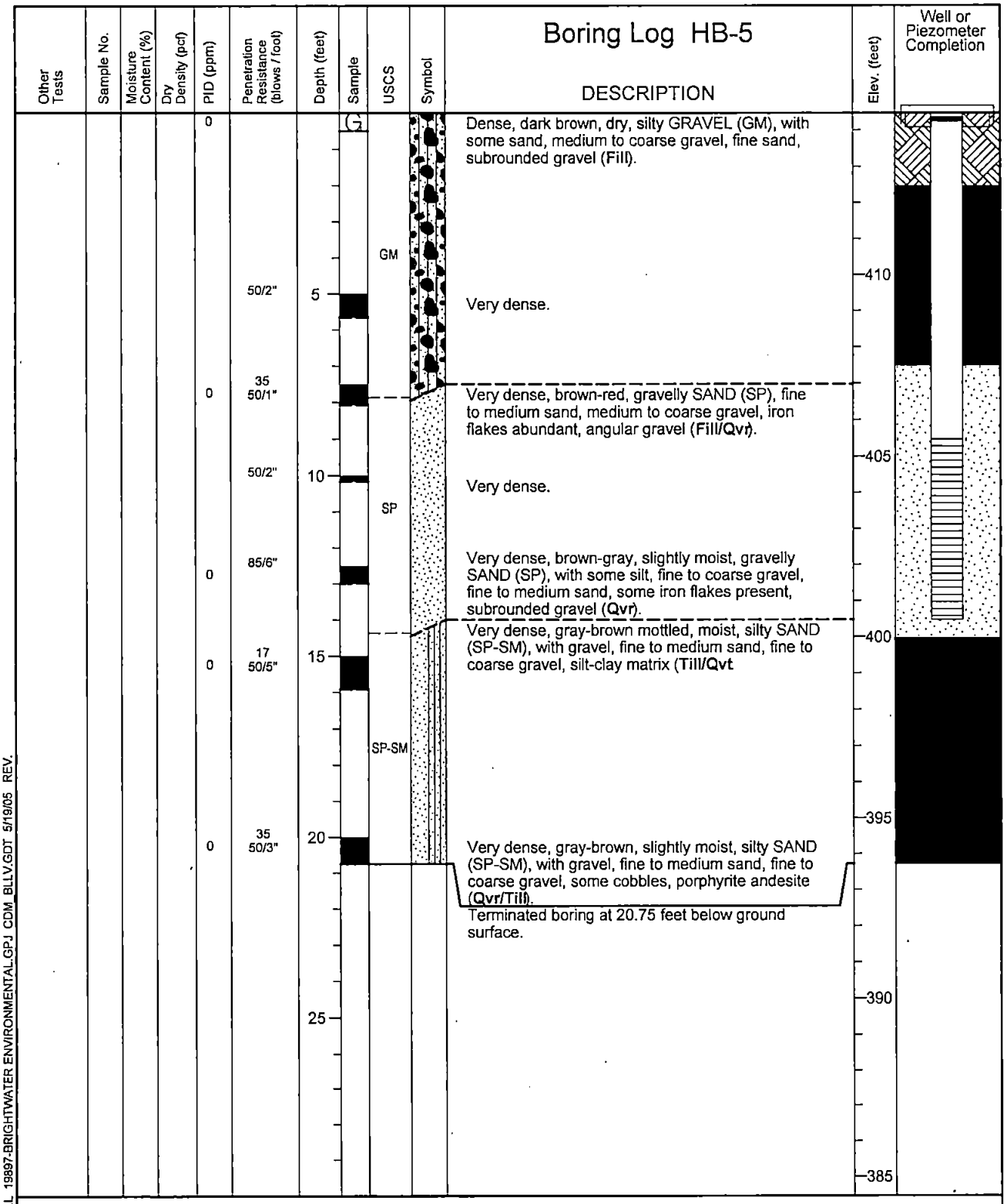
CDM

King County
Brightwater Conveyance System
Shoreline, Washington

Boring Log HB-4
Project No: 19897.43502

Figure: B6
1 of 1

Boring Log HB-5



LOG OF BORING WITH WELL 19897-BRIGHTWATER ENVIRONMENTAL.GPJ CDM_BLLV.GDT 5/19/05 REV.

Location:

Surface Elevation: 414.47'

Logged By: SEC

Drill Rig: HSA Foremost Mobile B-59

Equipment/Hammer: D&M/300/30

Date Completed: 8-2-04

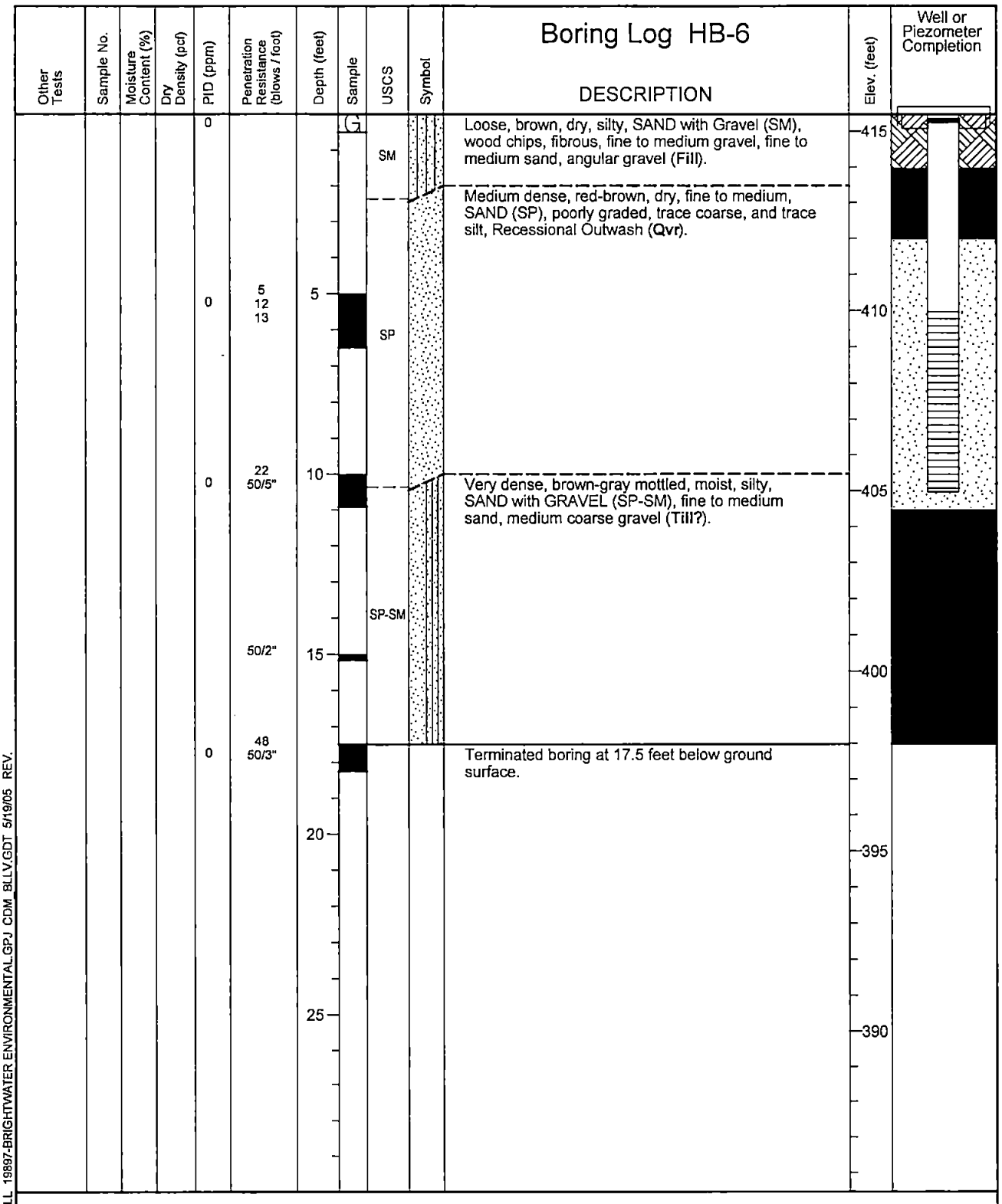
King County
Brightwater Conveyance System
Shoreline, Washington

CDM

Boring Log HB-5
Project No: 19897.43502

Figure: B7
1 of 1

Boring Log HB-6



Location:

Surface Elevation: 415.47'

Logged By: SEC

Drill Rig: HSA Foremost Mobile B-59

Equipment/Hammer: D&M/300/30

Date Completed: 8-2-04

King County
Brightwater Conveyance System
Shoreline, Washington

CDM

Boring Log HB-6 Figure: B8

Project No: 19897.43502 1 of 1

LOG OF BORING WITH WELL 19897-BRIGHTWATER ENVIRONMENTAL.GPJ CDM_BLLV.GDT 5/19/05 REV.

Boring Log HB-7

Other Tests	Sample No.	Moisture Content (%)	Dry Density (pcf)	PID (ppm)	Penetration Resistance (blows / 6 in.)	Depth (feet)	Sample	USCS	Symbol	DESCRIPTION	Elev. (feet)	Well or Piezometer Completion
				0	9 6 9	5				Asphalt/Gravel 3/4-inch minus gravel base. Medium dense,, brown, moist, poorly graded SAND (SP), fine to medium, no odor, with some fine to coarse gravel.	410	
				0	9 13 15	10		SP		Medium dense, gray-brown, moist, fine to medium sand, with some gravel, trace cobbles.	405	
				2	37 50/4"	15				Very dense, tan-gray, sand and gravel (SW), with silt, trace cobbles.	400	
				1.2	14 20 40	20		SM		Very dense, tan-gray, silty SAND (SM), very moist, with some trace gravel and trace clay.	395	
				0	22 50/6"	25		SP		Very dense, tan-brown, moist SAND (SP), with gravel, fine- to medium-grained sand, medium gravel.	390	
				0.4	18 50/6"	30	▽	SM		Very dense, tan-brown, very silty SAND (SM), very moist to wet, fine sand. Water encountered at ~28 ft bgs.	385	
				0	20 50/5"	35		SP		Very dense, gray-tan silty, clayey sand with gravel (SP-SM). Very dense, gray SAND (SP), medium coarse, wet/saturated, sand lense within till. Boring terminated at 34 feet below ground surface.	380	

Location:

Surface Elevation: 415.02'

Logged By: SEC/PJH

Drill Rig: HSA Foremost Mobile B-59

Equipment/Hammer: D&M/300/30

Date Completed: 1-11-05

King County
Brightwater Conveyance System
Shoreline, Washington

CDM

Boring Log HB-7
Project No: 19897.43502

Figure: B9
1 of 1

LOG OF BORING WITH WELL 19897-BRIGHTWATER ENVIRONMENTAL.GPJ CDM_BLLV.GDT 5/19/05 REV.

Boring Log HB-8

Other Tests	Sample No.	Moisture Content (%)	Dry Density (pcf)	PID (ppm)	Penetration Resistance (blows / 6 in.)	Depth (feet)	Sample	USCS	Symbol	DESCRIPTION	Elev. (feet)	Well or Piezometer Completion
										Asphalt, 7 inches.	410	
				0	5 4 9	5				Loose to medium dense, gray-brown, moist, fine to medium sand (SP), with some gravel, trace cobbles.	405	
				0	10 13 12	10				Medium dense.	400	
				3.2	17 50/6"	15		SP		Very dense, tan-gray, moist SAND (SP), coarse grained, with gravel. With cobbles.	395	
					9 16 22	20				Dense, tan-brown, moist to wet, poorly graded SAND (SP).	390	
				4.4	15 50/6"	25				Very dense, tan, dry to moist, same as above with more coarse SAND (SP). Water encountered at ~25 ft bgs during drilling.	385	
					15 22 50/4"			SM		Very dense, tan, wet, fine to medium SILTY SAND (SM), with trace gravel.		
						30				Terminated boring at 29 feet below ground surface.	380	
						35					375	

Location:

Surface Elevation: 410.20'

Logged By: PJH

Drill Rig: HSA Foremost Mobile B-59

Equipment/Hammer: D&M/300/30

Date Completed: 1-11-05

King County
Brightwater Conveyance System
Shoreline, Washington

CDM

Boring Log HB-8 Figure: B10

Project No: 19897.43502 1 of 1

LOG OF BORING WITH WELL 19897-BRIGHTWATER ENVIRONMENTAL.GPJ CDM_BLLV.GDT 5/19/05 REV.

Boring Log HB-9

Other Tests	Sample No.	Moisture Content (%)	Dry Density (pcf)	PID (ppm)	Penetration Resistance (blows / 6 in.)	Depth (feet)	Sample	USCS	Symbol	DESCRIPTION	Elev. (feet)	Well or Piezometer Completion
										Asphalt, 3 Inches.	405	
				0	6 8 7	5		SP		Medium dense, reddish-brown, slightly moist SAND (SP), with some gravel to reddish-tan sand with some gravel and some small cobbles.	400	
				0.6	22 50/4"					Very dense, tan, dry to moist SAND (SP), with gravel, fine to medium grained.		
						10					395	
				0.3	50/6"			SM		Very dense, grayish-tan, dry tomoist, silty SAND (SM), with some gravel and some cobbles.		
						15					390	
				20.2	50/5.5"			SP		Very dense, grayish tan SAND (SP), with silt, with gravel, subrounded.		
						20				Wet, fine SAND (SP).	385	
							▽			Water encountered at ~22 ft bgs during drilling.		
				116	32 46 35	25		SP		Very dense.	380	
				9.7	50/6"			SM		Very dense, tan-gray, wet, silty SAND (SM), with gravel, subrounded.		
						30				Terminated boring at 28 feet below ground surface.	375	
						35					370	

Location:

Surface Elevation: 405.73'

Logged By: PJH/SEC

Drill Rig: HSA Foremost Mobile B-59

Equipment/Hammer: D&M/300/30

Date Completed: 1-12-05

King County
Brightwater Conveyance System
Shoreline, Washington

CDM

Boring Log HB-9
Project No: 19897.43502

Figure: B11
1 of 1

LOG OF BORING WITH WELL 19897-BRIGHTWATER ENVIRONMENTAL.GPJ CDM_BLLV.GDT 5/19/05 REV.

Appendix C

Analytical Laboratory Reports

QUALITY ASSURANCE REPORT

PROJECT AND SAMPLE INFORMATION

Project Name:	Brightwater - Ballinger Way Site
Project No.:	19897 43507 – Lab.Sub.Land
Lab Name:	OnSite Environmental Inc (Onsite) - Redmond, Wa
Lab Number:	OnSite 0501-078, 0501-094 and 0501-107
Sample No.:	Soil Samples: HB-7 17.5 (HOLD), HB-7 27.5, HB-8 17.5, HB-8 27.5; HB-9 22.5' Water Samples: HB-1, HB-2, HB-7, HB-8, and HB-9
Matrix:	Soil and Water

REPORT ORGANIZATION

This report is a quality assurance (QA) review of the chemical data associated with samples listed above. Associated worksheets are stored with project files and can be provided upon request.

QUALITY ASSURANCE SUMMARY

Four soil samples and five water samples were collected by Camp Dresser & McKee Inc. (CDM) on January 11 and 15, 2005 and submitted to OnSite for analyses. Samples submitted to OnSite were analyzed for volatile organic compounds (VOCs); gasoline, benzene, ethylbenzene, toluene, and xylenes (BETX); and diesel extended range fuel hydrocarbons, and measured for moisture content. Data review was performed using OnSite control limit criteria and USEPA National Functional Guidelines for Organics (USEPA, 1999).

All data are of known quality and acceptable for use.

ANALYTICAL METHODS

Parameter	Technique	Method
VOCs	GC/MS	EPA 8260B
Gasoline/BETX	GC/PID	NWTPH-Gx
Diesel and Extended Range	GC/FID	NWTPH-Dx

TIMELINESS

All samples were extracted and analyzed within recommended holding times.

CHAIN OF CUSTODY

Samples were collected January 11 and 15, 2005 and hand delivered to OnSite in insulated shipping containers. Field chain-of-custody forms (COCs) were completed and accompanied each container. There were no problems with sample receipt conditions for samples received by OnSite. All COCs were signed and dated.

FIELD QUALITY CONTROL SAMPLES

No field quality control samples were collected.

QUALITY ASSURANCE REPORT

PROJECT AND SAMPLE INFORMATION

Project Name:	Brightwater - Ballinger Way Site
Project No.:	19897 43507 – Lab.Sub.Land
Lab Name:	OnSite Environmental Inc (Onsite) - Redmond, Wa
Lab Number:	OnSite 0501-078, 0501-094 and 0501-107
Sample No.:	Soil Samples: HB-7 17.5 (HOLD), HB-7 27.5, HB-8 17.5, HB-8 27.5; HB-9 22.5' Water Samples: HB-1, HB-2, HB-7, HB-8, and HB-9
Matrix:	Soil and Water

LAB QUALITY CONTROL SAMPLES

Method Blank:

VOCs: No target compounds were detected in the blank at concentrations greater than or equal to the reporting limits.

NWTPH-Gx/BTEX and NWTPH-Dx: No target compounds were detected in the blanks at concentrations greater than or equal to the reporting limits.

Surrogates:

VOCs: The laboratory used three surrogate spiking compounds for VOC analyses. All surrogate percent recoveries (%R) values were within the laboratory control limits.

NWTPH-Gx/BTEX: The laboratory used one surrogate spiking compound for gasoline/BETX analysis. All surrogate %R values were within the laboratory control limits.

NWTPH-Dx: The laboratory used one surrogate spiking compound for diesel and extended range screening analyses. All surrogate %R values were within the laboratory control limits.

Matrix/Blank Spike:

VOCs: Matrix spike/matrix spike duplicate (MS/MSD) and/or blank spike/blanks spike duplicate (BS/BSD) analyses were performed and spike %R and relative percent difference (RPD) were acceptable and within OnSite's control limit criteria.

NWTPH-Gx/BTEX: Matrix spike/matrix spike duplicate (MS/MSD) analyses were performed and spike %R and RPD were acceptable and within OnSite's control limit criteria.

NWTPH-Dx: MS/MSD analyses were not performed. Refer to laboratory duplicate data for precision results.

Laboratory Duplicate:

VOCs: Laboratory duplicate analyses were not performed. Refer to MS/MSD results for precision data.

NWTPH-Gx/BTEX: Laboratory duplicate RPD value was less than the control limit of 20%.

QUALITY ASSURANCE REPORT

PROJECT AND SAMPLE INFORMATION

Project Name:	Brightwater - Ballinger Way Site
Project No.:	19897 43507 – Lab.Sub.Land
Lab Name:	OnSite Environmental Inc (Onsite) - Redmond, Wa
Lab Number:	OnSite 0501-078, 0501-094 and 0501-107
Sample No.:	Soil Samples: HB-7 17.5 (HOLD), HB-7 27.5, HB-8 17.5, HB-8 27.5; HB-9 22.5' Water Samples: HB-1, HB-2, HB-7, HB-8, and HB-9
Matrix:	Soil and Water

NWTPH-Dx: Laboratory duplicate RPD value was less than the control limit of 20%.

General Chemistry: Laboratory duplicate analyses were not performed with moisture measurements. No action is taken other than to note this in the report.

Laboratory Control Sample: All parameters: Laboratory control and laboratory control sample duplicate (LCS/LCSD) samples were not performed. For VOCs, gasoline, and diesel, refer to laboratory duplicate data, matrix spike, or blank spike data for precision and accuracy.

Reporting Limits: VOCs: The laboratory met the reporting limit levels for all analytes with a few exceptions.

Laboratory Number 0501-107: OnSite notes that MTCA cleanup levels are not achievable for samples HB-1, HB-2, and HB-9 due to a high concentration of non-target analytes in the samples. Review of sample HB-1, HB-2, and HB-9 results indicates that there are elevated concentrations of gasoline in these three samples. No action is taken other than to note this in the report.

NWTPH-Gx/BTEX: The laboratory met the reporting limit levels for all analytes with a few exceptions:

Laboratory Number 0408-042: Reporting limits are elevated due to the high concentrations of target analytes in samples HB-1, HB-2, and HB-9.

SIGNATURES

Jessie Compeau

Prepared by Informa, LLC Date 05-23-05

Checked by Ali Moore Date 05/23/05

OnSite Environmental Inc.
Analytical Testing and Mobile Laboratory Services

Received
JAN 21 2005
CDM

January 19, 2005

Allen Moore
CDM
P.O. Box 3885
Bellevue, WA 98009

Re: Analytical Data for Project 19897-43507-Lab.Sub.land
Laboratory Reference No. 0501-078

Dear Allen:

Enclosed are the analytical results and associated quality control data for samples submitted on January 12, 2005.

The standard policy of OnSite Environmental Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

David Baumeister
Project Manager

Enclosures

14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881 • Fax (425) 885-4603

Date of Report: January 19, 2005
Samples Submitted: January 12, 2005
Laboratory Reference: 0501-078
Project: 19897-43507-Lab.Sub.land

Case Narrative

Samples were collected on January 11, 2005 and received by the laboratory on January 12, 2005. They were maintained at the laboratory at a temperature of 2°C to 6°C.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

NWTPH-G/BTEX and Halogenated Volatiles EPA 8260B Analysis

Per EPA Method 5035A, samples were received by the laboratory in preweighed 40 mL VOA vials within 48 hours of sample collection. They were stored in a freezer at between -7°C and -20°C until extraction or analysis.

Any other QA/QC issues associated with this extraction and analysis will be indicated with a footnote reference and discussed in detail on the Data Qualifier page.

Date of Report: January 19, 2005
Samples Submitted: January 12, 2005
Laboratory Reference: 0501-078
Project: 19897-43507-Lab.Sub.land

NWTPH-Gx/BTEX

Date Extracted: 1-13-05
Date Analyzed: 1-13-05

Matrix: Soil
Units: mg/kg (ppm)

Client ID:	**HB-7 27.5**			**HB-8 17.5**		
Lab ID:	01-078-02			01-078-03		
	Result	Flags	PQL	**Result**	Flags	PQL
Benzene	**ND**		0.020	**ND**		0.020
Toluene	**ND**		0.052	**ND**		0.039
Ethyl Benzene	**ND**		0.052	**ND**		0.039
m,p-Xylene	**ND**		0.052	**ND**		0.039
o-Xylene	**ND**		0.052	**ND**		0.039
TPH-Gas	**ND**		5.2	**ND**		3.9
Surrogate Recovery: Fluorobenzene	86%			83%		

Date of Report: January 19, 2005
Samples Submitted: January 12, 2005
Laboratory Reference: 0501-078
Project: 19897-43507-Lab.Sub.land

NWTPH-Gx/BTEX

Date Extracted:	1-13-05
Date Analyzed:	1-13-05
Matrix: Soil	
Units: mg/kg (ppm)	
Client ID:	**HB-8 27.5**
Lab ID:	01-078-04

	Result	Flags	PQL
Benzene	**ND**		0.020
Toluene	**ND**		0.054
Ethyl Benzene	**ND**		0.054
m,p-Xylene	**ND**		0.054
o-Xylene	**ND**		0.054
TPH-Gas	**ND**		5.4
Surrogate Recovery:			
Fluorobenzene	89%		

Date of Report: January 19, 2005
Samples Submitted: January 12, 2005
Laboratory Reference: 0501-078
Project: 19897-43507-Lab.Sub.land

NWTPH-Gx/BTEX
METHOD BLANK QUALITY CONTROL

Date Extracted: 1-13-05
Date Analyzed: 1-13-05

Matrix: Soil
Units: mg/kg (ppm)

Lab ID: MB0113S1

	Result	Flags	PQL
Benzene	ND		0.020
Toluene	ND		0.050
Ethyl Benzene	ND		0.050
m,p-Xylene	ND		0.050
o-Xylene	ND		0.050
TPH-Gas	ND		5.0
Surrogate Recovery: Fluorobenzene	100%		

Date of Report: January 19, 2005
Samples Submitted: January 12, 2005
Laboratory Reference: 0501-078
Project: 19897-43507-Lab.Sub.land

NWTPH-Gx/BTEX
DUPLICATE QUALITY CONTROL

Date Extracted: 1-13-05
Date Analyzed: 1-13-05

Matrix: Soil
Units: mg/kg (ppm)

Lab ID:	01-088-01 Original	01-088-01 Duplicate	RPD	Flags
Benzene	ND	ND	NA	
Toluene	ND	ND	NA	
Ethyl Benzene	ND	ND	NA	
m,p-Xylene	ND	ND	NA	
o-Xylene	ND	ND	NA	
TPH-Gas	ND	ND	NA	
Surrogate Recovery:				
Fluorobenzene	91%	87%		

Date of Report: January 19, 2005
Samples Submitted: January 12, 2005
Laboratory Reference: 0501-078
Project: 19897-43507-Lab.Sub.land

NWTPH-Gx/BTEX
MS/MSD QUALITY CONTROL

Date Extracted: 1-13-05
Date Analyzed: 1-13-05

Matrix: Soil
Units: mg/kg (ppm)

Spike Level (ppm): 2.50

Lab ID:	01-088-01 **MS**	Percent Recovery	01-088-01 **MSD**	Percent Recovery	**RPD**	**Flags**
Benzene	**2.62**	**105**	**2.65**	**106**	1	
Toluene	**2.74**	**110**	**2.77**	**111**	1	
Ethyl Benzene	**2.77**	**111**	**2.80**	**112**	1	
m,p-Xylene	**2.77**	**111**	**2.80**	**112**	1	
o-Xylene	**2.74**	**110**	**2.78**	**111**	2	
Surrogate Recovery:						
Fluorobenzene	90%		89%			

Date of Report: January 19, 2005
Samples Submitted: January 12, 2005
Laboratory Reference: 0501-078
Project: 19897-43507-Lab.Sub.land

NWTPH-Dx

Date Extracted:	1-13-05
Date Analyzed:	1-14-05
Matrix:	Soil
Units:	mg/kg (ppm)

Client ID:	**HB-7 27.5**	**HB-8 17.5**	**HB-8 27.5**
Lab ID:	01-078-02	01-078-03	01-078-04
Diesel Range:	**ND**	**ND**	**ND**
PQL:	30	30	29
Identification:	---	---	---
Lube Oil Range:	**ND**	**ND**	**ND**
PQL:	60	60	58
Identification:	---	---	---
Surrogate Recovery			
o-Terphenyl:	98%	101%	97%
Flags:	Y	Y	Y

Date of Report: January 19, 2005
Samples Submitted: January 12, 2005
Laboratory Reference: 0501-078
Project: 19897-43507-Lab.Sub.land

NWTPH-Dx
METHOD BLANK QUALITY CONTROL

Date Extracted:	1-13-05
Date Analyzed:	1-14-05
Matrix:	Soil
Units:	mg/kg (ppm)
Lab ID:	MB0113S1
Diesel Range:	**ND**
PQL:	25
Identification:	---
Lube Oil Range:	**ND**
PQL:	50
Identification:	---
Surrogate Recovery	
o-Terphenyl:	97%
Flags:	Y

Date of Report: January 19, 2005
Samples Submitted: January 12, 2005
Laboratory Reference: 0501-078
Project: 19897-43507-Lab.Sub.land

NWTPH-Dx
DUPLICATE QUALITY CONTROL

Date Extracted:	1-13-05
Date Analyzed:	1-14-05
Matrix:	Soil
Units:	mg/kg (ppm)

Lab ID:	01-078-04	01-078-04 DUP
Diesel Range:	**ND**	**ND**
PQL:	25	25
RPD:	N/A	
Surrogate Recovery		
o-Terphenyl:	97%	106%
Flags:	Y	Y

Date of Report: January 19, 2005
Samples Submitted: January 12, 2005
Laboratory Reference: 0501-078
Project: 19897-43507-Lab.Sub.land

HALOGENATED VOLATILES by EPA 8260B

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Date Extracted:	1-13-05
Date Analyzed:	1-13-05
Matrix:	Soil
Units:	mg/kg (ppm)
Lab ID:	01-078-02
Client ID:	**HB-7 27.5**

Compound	Results	Flags	PQL
Dichlorodifluoromethane	ND		0.0012
Chloromethane	ND		0.0012
Vinyl Chloride	ND		0.0012
Bromomethane	ND		0.0012
Chloroethane	ND		0.0012
Trichlorofluoromethane	ND		0.0012
1,1-Dichloroethene	ND		0.0012
Iodomethane	ND		0.0061
Methylene Chloride	ND		0.0061
(trans) 1,2-Dichloroethene	ND		0.0012
1,1-Dichloroethane	ND		0.0012
2,2-Dichloropropane	ND		0.0012
(cis) 1,2-Dichloroethene	ND		0.0012
Bromochloromethane	ND		0.0012
Chloroform	ND		0.0012
1,1,1-Trichloroethane	ND		0.0012
Carbon Tetrachloride	ND		0.0012
1,1-Dichloropropene	ND		0.0012
1,2-Dichloroethane	ND		0.0012
Trichloroethene	ND		0.0012
1,2-Dichloropropane	ND		0.0012
Dibromomethane	ND		0.0012
Bromodichloromethane	ND		0.0012
2-Chloroethyl Vinyl Ether	ND		0.0061
(cis) 1,3-Dichloropropene	ND		0.0012
(trans) 1,3-Dichloropropene	ND		0.0012

Date of Report: January 19, 2005
Samples Submitted: January 12, 2005
Laboratory Reference: 0501-078
Project: 19897-43507-Lab.Sub.land

HALOGENATED VOLATILES by EPA 8260B

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Lab ID: 01-078-02
Client ID: HB-7 27.5

Compound	Results	Flags	PQL
1,1,2-Trichloroethane	ND		0.0012
Tetrachloroethene	0.026		0.0012
1,3-Dichloropropane	ND		0.0012
Dibromochloromethane	ND		0.0012
1,2-Dibromoethane	ND		0.0012
Chlorobenzene	ND		0.0012
1,1,1,2-Tetrachloroethane	ND		0.0012
Bromoform	ND		0.0012
Bromobenzene	ND		0.0012
1,1,2,2-Tetrachloroethane	ND		0.0012
1,2,3-Trichloropropane	ND		0.0012
2-Chlorotoluene	ND		0.0012
4-Chlorotoluene	ND		0.0012
1,3-Dichlorobenzene	ND		0.0012
1,4-Dichlorobenzene	ND		0.0012
1,2-Dichlorobenzene	ND		0.0012
1,2-Dibromo-3-chloropropane	ND		0.0061
1,2,4-Trichlorobenzene	ND		0.0012
Hexachlorobutadiene	ND		0.0061
1,2,3-Trichlorobenzene	ND		0.0012

Surrogate	Percent Recovery	Control Limits
Dibromofluoromethane	86	71-126
Toluene, d8	98	73-130
4-Bromofluorobenzene	96	70-130

Date of Report: January 19, 2005
Samples Submitted: January 12, 2005
Laboratory Reference: 0501-078
Project: 19897-43507-Lab.Sub.land

HALOGENATED VOLATILES by EPA 8260B

Date Extracted:	1-12-05
Date Analyzed:	1-12-05
Matrix:	Soil
Units:	mg/kg (ppm)
Lab ID:	01-078-03
Client ID:	**HB-8 17.5**

Compound	Results	Flags	PQL
Dichlorodifluoromethane	ND		0.0011
Chloromethane	ND		0.0011
Vinyl Chloride	ND		0.0011
Bromomethane	ND		0.0011
Chloroethane	ND		0.0011
Trichlorofluoromethane	ND		0.0011
1,1-Dichloroethene	ND		0.0011
Iodomethane	ND		0.0054
Methylene Chloride	ND		0.0054
(trans) 1,2-Dichloroethene	ND		0.0011
1,1-Dichloroethane	ND		0.0011
2,2-Dichloropropane	ND		0.0011
(cis) 1,2-Dichloroethene	ND		0.0011
Bromochloromethane	ND		0.0011
Chloroform	0.0017		0.0011
1,1,1-Trichloroethane	ND		0.0011
Carbon Tetrachloride	ND		0.0011
1,1-Dichloropropene	ND		0.0011
1,2-Dichloroethane	ND		0.0011
Trichloroethene	ND		0.0011
1,2-Dichloropropane	ND		0.0011
Dibromomethane	ND		0.0011
Bromodichloromethane	ND		0.0011
2-Chloroethyl Vinyl Ether	ND		0.0054
(cis) 1,3-Dichloropropene	ND		0.0011
(trans) 1,3-Dichloropropene	ND		0.0011

Date of Report: January 19, 2005
Samples Submitted: January 12, 2005
Laboratory Reference: 0501-078
Project: 19897-43507-Lab.Sub.land

HALOGENATED VOLATILES by EPA 8260B

Lab ID: 01-078-03
Client ID: HB-8 17.5

Compound	Results	Flags	PQL
1,1,2-Trichloroethane	ND		0.0011
Tetrachloroethene	ND		0.0011
1,3-Dichloropropane	ND		0.0011
Dibromochloromethane	ND		0.0011
1,2-Dibromoethane	ND		0.0011
Chlorobenzene	ND		0.0011
1,1,1,2-Tetrachloroethane	ND		0.0011
Bromoform	ND		0.0011
Bromobenzene	ND		0.0011
1,1,2,2-Tetrachloroethane	ND		0.0011
1,2,3-Trichloropropane	ND		0.0011
2-Chlorotoluene	ND		0.0011
4-Chlorotoluene	ND		0.0011
1,3-Dichlorobenzene	ND		0.0011
1,4-Dichlorobenzene	ND		0.0011
1,2-Dichlorobenzene	ND		0.0011
1,2-Dibromo-3-chloropropane	ND		0.0054
1,2,4-Trichlorobenzene	ND		0.0011
Hexachlorobutadiene	ND		0.0054
1,2,3-Trichlorobenzene	ND		0.0011

Surrogate	Percent Recovery	Control Limits
Dibromofluoromethane	93	71-126
Toluene, d8	98	73-130
4-Bromofluorobenzene	96	70-130

Date of Report: January 19, 2005
Samples Submitted: January 12, 2005
Laboratory Reference: 0501-078
Project: 19897-43507-Lab.Sub.land

HALOGENATED VOLATILES by EPA 8260B

Date Extracted:	1-12-05
Date Analyzed:	1-12-05
Matrix:	Soil
Units:	mg/kg (ppm)
Lab ID:	01-078-04
Client ID:	**HB-8 27.5**

Compound	Results	Flags	PQL
Dichlorodifluoromethane	ND		0.0011
Chloromethane	ND		0.0011
Vinyl Chloride	ND		0.0011
Bromomethane	ND		0.0011
Chloroethane	ND		0.0011
Trichlorofluoromethane	ND		0.0011
1,1-Dichloroethene	ND		0.0011
Iodomethane	ND		0.0056
Methylene Chloride	ND		0.0056
(trans) 1,2-Dichloroethene	ND		0.0011
1,1-Dichloroethane	ND		0.0011
2,2-Dichloropropane	ND		0.0011
(cis) 1,2-Dichloroethene	ND		0.0011
Bromochloromethane	ND		0.0011
Chloroform	ND		0.0011
1,1,1-Trichloroethane	ND		0.0011
Carbon Tetrachloride	ND		0.0011
1,1-Dichloropropene	ND		0.0011
1,2-Dichloroethane	ND		0.0011
Trichloroethene	ND		0.0011
1,2-Dichloropropane	ND		0.0011
Dibromomethane	ND		0.0011
Bromodichloromethane	ND		0.0011
2-Chloroethyl Vinyl Ether	ND		0.0056
(cis) 1,3-Dichloropropene	ND		0.0011
(trans) 1,3-Dichloropropene	ND		0.0011

Date of Report: January 19, 2005
Samples Submitted: January 12, 2005
Laboratory Reference: 0501-078
Project: 19897-43507-Lab.Sub.land

HALOGENATED VOLATILES by EPA 8260B

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Lab ID: 01-078-04
Client ID: HB-8 27.5

Compound	Results	Flags	PQL
1,1,2-Trichloroethane	ND		0.0011
Tetrachloroethene	0.036		0.0011
1,3-Dichloropropane	ND		0.0011
Dibromochloromethane	ND		0.0011
1,2-Dibromoethane	ND		0.0011
Chlorobenzene	ND		0.0011
1,1,1,2-Tetrachloroethane	ND		0.0011
Bromoform	ND		0.0011
Bromobenzene	ND		0.0011
1,1,2,2-Tetrachloroethane	ND		0.0011
1,2,3-Trichloropropane	ND		0.0011
2-Chlorotoluene	ND		0.0011
4-Chlorotoluene	ND		0.0011
1,3-Dichlorobenzene	ND		0.0011
1,4-Dichlorobenzene	ND		0.0011
1,2-Dichlorobenzene	ND		0.0011
1,2-Dibromo-3-chloropropane	ND		0.0056
1,2,4-Trichlorobenzene	ND		0.0011
Hexachlorobutadiene	ND		0.0056
1,2,3-Trichlorobenzene	ND		0.0011

Surrogate	Percent Recovery	Control Limits
Dibromofluoromethane	96	71-126
Toluene, d8	91	73-130
4-Bromofluorobenzene	94	70-130

Date of Report: January 19, 2005
Samples Submitted: January 12, 2005
Laboratory Reference: 0501-078
Project: 19897-43507-Lab.Sub.land

HALOGENATED VOLATILES by EPA 8260B
METHOD BLANK QUALITY CONTROL

Date Extracted:	1-12-05
Date Analyzed:	1-12-05
Matrix:	Soil
Units:	mg/kg (ppm)
Lab ID:	MB0112S1

Compound	Results	Flags	PQL
Dichlorodifluoromethane	ND		0.0010
Chloromethane	ND		0.0010
Vinyl Chloride	ND		0.0010
Bromomethane	ND		0.0010
Chloroethane	ND		0.0010
Trichlorofluoromethane	ND		0.0010
1,1-Dichloroethene	ND		0.0010
Iodomethane	ND		0.0050
Methylene Chloride	ND		0.0050
(trans) 1,2-Dichloroethene	ND		0.0010
1,1-Dichloroethane	ND		0.0010
2,2-Dichloropropane	ND		0.0010
(cis) 1,2-Dichloroethene	ND		0.0010
Bromochloromethane	ND		0.0010
Chloroform	ND		0.0010
1,1,1-Trichloroethane	ND		0.0010
Carbon Tetrachloride	ND		0.0010
1,1-Dichloropropene	ND		0.0010
1,2-Dichloroethane	ND		0.0010
Trichloroethene	ND		0.0010
1,2-Dichloropropane	ND		0.0010
Dibromomethane	ND		0.0010
Bromodichloromethane	ND		0.0010
2-Chloroethyl Vinyl Ether	ND		0.0050
(cis) 1,3-Dichloropropene	ND		0.0010
(trans) 1,3-Dichloropropene	ND		0.0010

Date of Report: January 19, 2005
Samples Submitted: January 12, 2005
Laboratory Reference: 0501-078
Project: 19897-43507-Lab.Sub.land

HALOGENATED VOLATILES by EPA 8260B
METHOD BLANK QUALITY CONTROL
page 2 of 2

Lab ID: MB0112S1

Compound	Results	Flags	PQL
1,1,2-Trichloroethane	ND		0.0010
Tetrachloroethene	ND		0.0010
1,3-Dichloropropane	ND		0.0010
Dibromochloromethane	ND		0.0010
1,2-Dibromoethane	ND		0.0010
Chlorobenzene	ND		0.0010
1,1,1,2-Tetrachloroethane	ND		0.0010
Bromoform	ND		0.0010
Bromobenzene	ND		0.0010
1,1,2,2-Tetrachloroethane	ND		0.0010
1,2,3-Trichloropropane	ND		0.0010
2-Chlorotoluene	ND		0.0010
4-Chlorotoluene	ND		0.0010
1,3-Dichlorobenzene	ND		0.0010
1,4-Dichlorobenzene	ND		0.0010
1,2-Dichlorobenzene	ND		0.0010
1,2-Dibromo-3-chloropropane	ND		0.0050
1,2,4-Trichlorobenzene	ND		0.0010
Hexachlorobutadiene	ND		0.0050
1,2,3-Trichlorobenzene	ND		0.0010

Surrogate	Percent Recovery	Control Limits
Dibromofluoromethane	93	71-126
Toluene, d8	97	73-130
4-Bromofluorobenzene	96	70-130

Date of Report: January 19, 2005
Samples Submitted: January 12, 2005
Laboratory Reference: 0501-078
Project: 19897-43507-Lab.Sub.land

HALOGENATED VOLATILES by EPA 8260B
METHOD BLANK QUALITY CONTROL

Date Extracted:	1-13-05
Date Analyzed:	1-13-05
Matrix:	Soil
Units:	mg/kg (ppm)
Lab ID:	MB0113S1

Compound	Results	Flags	PQL
Dichlorodifluoromethane	ND		0 0010
Chloromethane	ND		0.0010
Vinyl Chloride	ND		0.0010
Bromomethane	ND		0.0010
Chloroethane	ND		0.0010
Trichlorofluoromethane	ND		0.0010
1,1-Dichloroethene	ND		0.0010
Iodomethane	ND		0.0050
Methylene Chloride	ND		0.0050
(trans) 1,2-Dichloroethene	ND		0.0010
1,1-Dichloroethane	ND		0.0010
2,2-Dichloropropane	ND		0.0010
(cis) 1,2-Dichloroethene	ND		0.0010
Bromochloromethane	ND		0.0010
Chloroform	ND		0.0010
1,1,1-Trichloroethane	ND		0.0010
Carbon Tetrachloride	ND		0.0010
1,1-Dichloropropene	ND		0.0010
1,2-Dichloroethane	ND		0.0010
Trichloroethene	ND		0.0010
1,2-Dichloropropane	ND		0.0010
Dibromomethane	ND		0.0010
Bromodichloromethane	ND		0.0010
2-Chloroethyl Vinyl Ether	ND		0.0050
(cis) 1,3-Dichloropropene	ND		0.0010
(trans) 1,3-Dichloropropene	ND		0.0010

Date of Report: January 19, 2005
Samples Submitted: January 12, 2005
Laboratory Reference: 0501-078
Project: 19897-43507-Lab.Sub.land

HALOGENATED VOLATILES by EPA 8260B
METHOD BLANK QUALITY CONTROL
page 2 of 2

Lab ID: MB0113S1

Compound	Results	Flags	PQL
1,1,2-Trichloroethane	ND		0.0010
Tetrachloroethene	ND		0.0010
1,3-Dichloropropane	ND		0.0010
Dibromochloromethane	ND		0.0010
1,2-Dibromoethane	ND		0.0010
Chlorobenzene	ND		0.0010
1,1,1,2-Tetrachloroethane	ND		0.0010
Bromoform	ND		0.0010
Bromobenzene	ND		0.0010
1,1,2,2-Tetrachloroethane	ND		0.0010
1,2,3-Trichloropropane	ND		0.0010
2-Chlorotoluene	ND		0.0010
4-Chlorotoluene	ND		0.0010
1,3-Dichlorobenzene	ND		0.0010
1,4-Dichlorobenzene	ND		0.0010
1,2-Dichlorobenzene	ND		0.0010
1,2-Dibromo-3-chloropropane	ND		0.0050
1,2,4-Trichlorobenzene	ND		0.0010
Hexachlorobutadiene	ND		0.0050
1,2,3-Trichlorobenzene	ND		0.0010

Surrogate	Percent Recovery	Control Limits
Dibromofluoromethane	88	71-126
Toluene, d8	95	73-130
4-Bromofluorobenzene	93	70-130

Date of Report: January 19, 2005
Samples Submitted: January 12, 2005
Laboratory Reference: 0501-078
Project: 19897-43507-Lab.Sub.land

HALOGENATED VOLATILES by EPA 8260B
SB/SBD QUALITY CONTROL

Date Extracted: 1-12-05
Date Analyzed: 1-12-05

Matrix: Soil
Units: mg/kg (ppm)

Lab ID: SB0112S2

Compound	Spike Amount	SB	Percent Recovery	SBD	Percent Recovery	Recovery Limits	Flags
1,1-Dichloroethene	0.0500	0.0614	123	0.0607	121	70-130	
Benzene	0.0500	0.0554	111	0.0546	109	70-130	
Trichloroethene	0.0500	0.0562	112	0.0564	113	70-130	
Toluene	0.0500	0.0541	108	0.0525	105	70-130	
Chlorobenzene	0.0500	0.0554	111	0.0571	114	70-130	

	RPD	RPD Limit	Flags
1,1-Dichloroethene	1	11	
Benzene	1	11	
Trichloroethene	0	13	
Toluene	3	11	
Chlorobenzene	3	12	

Date of Report: January 19, 2005
Samples Submitted: January 12, 2005
Laboratory Reference: 0501-078
Project: 19897-43507-Lab.Sub.land

HALOGENATED VOLATILES by EPA 8260B
SB/SBD QUALITY CONTROL

Date Extracted: 1-13-05
Date Analyzed: 1-13-05

Matrix: Soil
Units: mg/kg (ppm)

Lab ID: SB0113S1

Compound	Spike Amount	SB	Percent Recovery	SBD	Percent Recovery	Recovery Limits	Flags
1,1-Dichloroethene	0.0500	0.0441	88	0.0489	98	70-130	
Benzene	0.0500	0.0415	83	0.0462	92	70-130	
Trichloroethene	0.0500	0.0475	95	0.0521	104	70-130	
Toluene	0.0500	0.0440	88	0.0458	92	70-130	
Chlorobenzene	0.0500	0.0470	94	0.0524	105	70-130	

	RPD	RPD Limit	Flags
1,1-Dichloroethene	10	11	
Benzene	11	11	
Trichloroethene	9	13	
Toluene	4	11	
Chlorobenzene	11	12	

Date of Report: January 19, 2005
Samples Submitted: January 12, 2005
Laboratory Reference: 0501-078
Project: 19897-43507-Lab.Sub.land

% MOISTURE

Date Analyzed: 1-12-05

Client ID	Lab ID	% Moisture
HB-7 27.5	01-078-02	17
HB-8 17.5	01-078-03	16
HB-8 27.5	01-078-04	14

OnSite Environmental Inc.

Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

G - Insufficient sample quantity for duplicate analysis.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range (toluene-napthalene) are present in the sample.

O - Hydrocarbons indicative of diesel fuel are present in the sample and are impacting the gasoline result

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a silica gel cleanup procedure.

Y - Sample extract treated with an acid/silica gel cleanup procedure.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

Chain of Custody

Page 1 of 1

OnSite Environmental Inc.
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • Fax: (425) 885-4603

Laboratory Number: 01-078

Company: CDM

Project Number: 17897-413507-6272 Lab. Subtotal

Project Name: Brightwater Phase II ESA Ballinger

Project Manager: Al Moore

Sampled by: PJH/SEC

Turnaround Request (in working days)

(Check One)

☐ Same Day ☐ 1 Day

☐ 2 Day ☐ 3 Day

☒ Standard (7 working days)

☐ _____ (other)

Requested Analysis

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	No. Cont.	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Dx	Volatiles by 8260B	Halogenated Volatiles by 8260B	Semivolatiles by 8270C	PAHs by 8270C / SIM	PCBs by 8082	Pesticides by 8081A	Herbicides by 8151A	Total RCRA Metals (8)	TCLP Metals	HEM by 1664	VPH	EPH					% Moisture
1	HB-7 17.5	1-11-05	1000	Soil	5		X	X	X	X															
2	HB-7 27.5	"	1036	"	"		X	X		X															X
3	HB-8 17.5	"	1346	"	"		X	X		X															X
4	HB-8 37.5	"	1427	"	"		X	X		X															X

	Signature	Company	Date	Time
Relinquished by		CDM	01/12/05	0945
Received by		OSE Inc.	1/12/05	945
Relinquished by				
Received by				
Relinquished by				
Received by				

Comments/Special Instructions

Hold HB-7 @ 17.5 + ~~HB-8 @ 17.5~~ RUSH
will call in

Reviewed by/Date

Reviewed by/Date

Chromatograms with final report ☐

DISTRIBUTION LEGEND: White - OnSite Copy Yellow - Report Copy Pink - Client Copy

OnSite Environmental Inc.
Analytical Testing and Mobile Laboratory Services

Received
JAN 25 2005
CDM

January 21, 2005

Allen Moore
CDM
P.O. Box 3885
Bellevue, WA 98009

Re: Analytical Data for Project 19897-43507-Lab.Sub.land
Laboratory Reference No. 0501-094

Dear Allen:

Enclosed are the analytical results and associated quality control data for samples submitted on January 13, 2005.

The standard policy of OnSite Environmental Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

David Baumeister
Project Manager

Enclosures

Date of Report: January 21, 2005
Samples Submitted: January 13, 2005
Laboratory Reference: 0501-094
Project: 19897-43507-Lab.Sub.land

Case Narrative

Samples were collected on January 11, 2005 and received by the laboratory on January 13, 2005. They were maintained at the laboratory at a temperature of 2°C to 6°C.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

NWTPH Gx/BTEX and Halogenated Volatiles EPA 8260B Analysis

Per EPA Method 5035A, samples were received by the laboratory in preweighed 40 mL VOA vials within 48 hours of sample collection. They were stored in a freezer at between -7°C and -20°C until extraction or analysis.

Any other QA/QC issues associated with this extraction and analysis will be indicated with a footnote reference and discussed in detail on the Data Qualifier page.

Date of Report: January 21, 2005
Samples Submitted: January 13, 2005
Laboratory Reference: 0501-094
Project: 19897-43507-Lab.Sub.land

NWTPH-Gx/BTEX

Date Extracted:	1-13-05
Date Analyzed:	1-19-05
Matrix: Soil	
Units: mg/kg (ppm)	
Client ID:	**HB9 22.5'**
Lab ID:	01-094-01

	Result	Flags	PQL
Benzene	**ND**		0.020
Toluene	**ND**		0.047
Ethyl Benzene	**0.30**		0.047
m,p-Xylene	**0.40**		0.047
o-Xylene	**ND**		0.047
TPH-Gas	**ND**		4.7
Surrogate Recovery:			
Fluorobenzene	81%		

Date of Report: January 21, 2005
Samples Submitted: January 13, 2005
Laboratory Reference: 0501-094
Project: 19897-43507-Lab.Sub.land

NWTPH-Gx/BTEX
METHOD BLANK QUALITY CONTROL

Date Extracted: 1-13-05
Date Analyzed: 1-13-05

Matrix: Soil
Units: mg/kg (ppm)

Lab ID: MB0113S2

	Result	Flags	PQL
Benzene	ND		0.020
Toluene	ND		0.050
Ethyl Benzene	ND		0.050
m,p-Xylene	ND		0.050
o-Xylene	ND		0.050
TPH-Gas	ND		5.0
Surrogate Recovery: Fluorobenzene	103%		

Date of Report: January 21, 2005
Samples Submitted: January 13, 2005
Laboratory Reference: 0501-094
Project: 19897-43507-Lab.Sub.land

NWTPH-Gx/BTEX
DUPLICATE QUALITY CONTROL

Date Extracted: 1-13-05
Date Analyzed: 1-13-05

Matrix: Soil
Units: mg/kg (ppm)

Lab ID:	01-078-02 Original	01-078-02 Duplicate	RPD	Flags
Benzene	ND	ND	NA	
Toluene	ND	ND	NA	
Ethyl Benzene	ND	ND	NA	
m,p-Xylene	ND	ND	NA	
o-Xylene	ND	ND	NA	
TPH-Gas	ND	ND	NA	
Surrogate Recovery:				
Fluorobenzene	86%	85%		

Date of Report: January 21, 2005
Samples Submitted: January 13, 2005
Laboratory Reference: 0501-094
Project: 19897-43507-Lab.Sub.land

NWTPH-Gx/BTEX
MS/MSD QUALITY CONTROL

Date Extracted: 1-13-05
Date Analyzed: 1-13-05

Matrix: Soil
Units: mg/kg (ppm)

Spike Level (ppm): 2.50

Lab ID:	01-088-01 **MS**	Percent Recovery	01-088-01 **MSD**	Percent Recovery	**RPD**	**Flags**
Benzene	**2.62**	**105**	**2.65**	**106**	1	
Toluene	**2.74**	**110**	**2.77**	**111**	1	
Ethyl Benzene	**2.77**	**111**	**2.80**	**112**	1	
m,p-Xylene	**2.77**	**111**	**2.80**	**112**	1	
o-Xylene	**2.74**	**110**	**2.78**	**111**	2	

Surrogate Recovery:
Fluorobenzene 90% 89%

Date of Report: January 21, 2005
Samples Submitted: January 13, 2005
Laboratory Reference: 0501-094
Project: 19897-43507-Lab.Sub.land

NWTPH-Dx

Date Extracted:	1-14-05
Date Analyzed:	1-14-05
Matrix:	Soil
Units:	mg/kg (ppm)
Client ID:	**HB9 22.5'**
Lab ID:	01-094-01
Diesel Range:	ND
PQL:	31
Identification:	---
Lube Oil Range:	ND
PQL:	62
Identification:	---
Surrogate Recovery	
o-Terphenyl:	88%
Flags:	Y

Date of Report: January 21, 2005
Samples Submitted: January 13, 2005
Laboratory Reference: 0501-094
Project: 19897-43507-Lab.Sub.land

NWTPH-Dx
METHOD BLANK QUALITY CONTROL

Date Extracted:	1-14-05
Date Analyzed:	1-14-05
Matrix:	Soil
Units:	mg/kg (ppm)
Lab ID:	MB0114S1
Diesel Range:	**ND**
PQL:	25
Identification:	---
Lube Oil Range:	**ND**
PQL:	50
Identification:	---
Surrogate Recovery	
o-Terphenyl:	104%
Flags:	Y

Date of Report: January 21, 2005
Samples Submitted: January 13, 2005
Laboratory Reference: 0501-094
Project: 19897-43507-Lab.Sub.land

NWTPH-Dx
DUPLICATE QUALITY CONTROL

Date Extracted:	1-14-05	
Date Analyzed:	1-14-05	
Matrix:	Soil	
Units:	mg/kg (ppm)	
Lab ID:	01-084-01	01-084-01 DUP
Diesel Range:	**ND**	**ND**
PQL:	25	25
RPD:	N/A	
Surrogate Recovery		
o-Terphenyl:	94%	91%
Flags:	Y	Y

Date of Report: January 21, 2005
Samples Submitted: January 13, 2005
Laboratory Reference: 0501-094
Project: 19897-43507-Lab.Sub.land

HALOGENATED VOLATILES by EPA 8260B

page 1 of 2

Date Extracted:	1-14-05
Date Analyzed:	1-14-05
Matrix:	Soil
Units:	mg/kg (ppm)
Lab ID:	01-094-01
Client ID:	**HB 9 22.5'**

Compound	Results	Flags	PQL
Dichlorodifluoromethane	ND		0.0011
Chloromethane	ND		0.0011
Vinyl Chloride	ND		0.0011
Bromomethane	ND		0.0011
Chloroethane	ND		0.0011
Trichlorofluoromethane	ND		0.0011
1,1-Dichloroethene	ND		0.0011
Iodomethane	ND		0.0055
Methylene Chloride	ND		0.0055
(trans) 1,2-Dichloroethene	ND		0.0011
1,1-Dichloroethane	ND		0.0011
2,2-Dichloropropane	ND		0.0011
(cis) 1,2-Dichloroethene	ND		0.0011
Bromochloromethane	ND		0.0011
Chloroform	ND		0.0011
1,1,1-Trichloroethane	0.0035		0.0011
Carbon Tetrachloride	ND		0.0011
1,1-Dichloropropene	ND		0.0011
1,2-Dichloroethane	ND		0.0011
Trichloroethene	ND		0.0011
1,2-Dichloropropane	ND		0.0011
Dibromomethane	ND		0.0011
Bromodichloromethane	ND		0.0011
2-Chloroethyl Vinyl Ether	ND		0.0055
(cis) 1,3-Dichloropropene	ND		0.0011
(trans) 1,3-Dichloropropene	ND		0.0011

Date of Report: January 21, 2005
Samples Submitted: January 13, 2005
Laboratory Reference: 0501-094
Project: 19897-43507-Lab.Sub.land

HALOGENATED VOLATILES by EPA 8260B

Lab ID: 01-094-01
Client ID: HB 9 22.5'

Compound	Results	Flags	PQL
1,1,2-Trichloroethane	ND		0.0011
Tetrachloroethene	ND		0.0011
1,3-Dichloropropane	ND		0.0011
Dibromochloromethane	ND		0.0011
1,2-Dibromoethane	ND		0.0011
Chlorobenzene	ND		0.0011
1,1,1,2-Tetrachloroethane	ND		0.0011
Bromoform	ND		0.0011
Bromobenzene	ND		0.0011
1,1,2,2-Tetrachloroethane	ND		0.0011
1,2,3-Trichloropropane	ND		0.0011
2-Chlorotoluene	ND		0.0011
4-Chlorotoluene	ND		0.0011
1,3-Dichlorobenzene	ND		0.0011
1,4-Dichlorobenzene	ND		0.0011
1,2-Dichlorobenzene	ND		0.0011
1,2-Dibromo-3-chloropropane	ND		0.0055
1,2,4-Trichlorobenzene	ND		0.0011
Hexachlorobutadiene	ND		0.0055
1,2,3-Trichlorobenzene	ND		0.0011

Surrogate	Percent Recovery	Control Limits
Dibromofluoromethane	83	71-126
Toluene, d8	92	73-130
4-Bromofluorobenzene	94	70-130

Date of Report: January 21, 2005
Samples Submitted: January 13, 2005
Laboratory Reference: 0501-094
Project: 19897-43507-Lab.Sub.land

HALOGENATED VOLATILES by EPA 8260B
METHOD BLANK QUALITY CONTROL
page 1 of 2

Date Extracted:	1-14-05
Date Analyzed:	1-14-05
Matrix:	Soil
Units:	mg/kg (ppm)
Lab ID:	MB0114S1

Compound	Results	Flags	PQL
Dichlorodifluoromethane	ND		0.0010
Chloromethane	ND		0.0010
Vinyl Chloride	ND		0.0010
Bromomethane	ND		0.0010
Chloroethane	ND		0.0010
Trichlorofluoromethane	ND		0.0010
1,1-Dichloroethene	ND		0.0010
Iodomethane	ND		0.0050
Methylene Chloride	ND		0.0050
(trans) 1,2-Dichloroethene	ND		0.0010
1,1-Dichloroethane	ND		0.0010
2,2-Dichloropropane	ND		0.0010
(cis) 1,2-Dichloroethene	ND		0.0010
Bromochloromethane	ND		0.0010
Chloroform	ND		0.0010
1,1,1-Trichloroethane	ND		0.0010
Carbon Tetrachloride	ND		0.0010
1,1-Dichloropropene	ND		0.0010
1,2-Dichloroethane	ND		0.0010
Trichloroethene	ND		0.0010
1,2-Dichloropropane	ND		0.0010
Dibromomethane	ND		0.0010
Bromodichloromethane	ND		0.0010
2-Chloroethyl Vinyl Ether	ND		0.0050
(cis) 1,3-Dichloropropene	ND		0.0010
(trans) 1,3-Dichloropropene	ND		0.0010

Date of Report: January 21, 2005
Samples Submitted: January 13, 2005
Laboratory Reference: 0501-094
Project: 19897-43507-Lab.Sub.land

HALOGENATED VOLATILES by EPA 8260B
METHOD BLANK QUALITY CONTROL
page 2 of 2

Lab ID: MB0114S1

Compound	Results	Flags	PQL
1,1,2-Trichloroethane	ND		0.0010
Tetrachloroethene	ND		0.0010
1,3-Dichloropropane	ND		0.0010
Dibromochloromethane	ND		0.0010
1,2-Dibromoethane	ND		0.0010
Chlorobenzene	ND		0.0010
1,1,1,2-Tetrachloroethane	ND		0.0010
Bromoform	ND		0.0010
Bromobenzene	ND		0.0010
1,1,2,2-Tetrachloroethane	ND		0.0010
1,2,3-Trichloropropane	ND		0.0010
2-Chlorotoluene	ND		0.0010
4-Chlorotoluene	ND		0.0010
1,3-Dichlorobenzene	ND		0.0010
1,4-Dichlorobenzene	ND		0.0010
1,2-Dichlorobenzene	ND		0.0010
1,2-Dibromo-3-chloropropane	ND		0.0050
1,2,4-Trichlorobenzene	ND		0.0010
Hexachlorobutadiene	ND		0.0050
1,2,3-Trichlorobenzene	ND		0.0010

Surrogate	Percent Recovery	Control Limits
Dibromofluoromethane	87	71-126
Toluene, d8	95	73-130
4-Bromofluorobenzene	91	70-130

Date of Report: January 21, 2005
Samples Submitted: January 13, 2005
Laboratory Reference: 0501-094
Project: 19897-43507-Lab.Sub.land

HALOGENATED VOLATILES by EPA 8260B
SB/SBD QUALITY CONTROL

Date Extracted: 1-14-05
Date Analyzed: 1-14-05

Matrix: Soil
Units: mg/kg (ppm)

Lab ID: SB0114S1

Compound	Spike Amount	SB	Percent Recovery	SBD	Percent Recovery	Recovery Limits	Flags
1,1-Dichloroethene	0.0500	0.0425	85	0.0437	87	70-130	
Benzene	0.0500	0.0453	91	0.0418	84	70-130	
Trichloroethene	0.0500	0.0515	103	0.0520	104	70-130	
Toluene	0.0500	0.0478	96	0.0469	94	70-130	
Chlorobenzene	0.0500	0.0518	104	0.0489	98	70-130	

	RPD	RPD Limit	Flags
1,1-Dichloroethene	3	11	
Benzene	8	11	
Trichloroethene	1	13	
Toluene	2	11	
Chlorobenzene	6	12	

Date of Report: January 21, 2005
Samples Submitted: January 13, 2005
Laboratory Reference: 0501-094
Project: 19897-43507-Lab.Sub.land

% MOISTURE

Date Analyzed: 1-13-05

Client ID	Lab ID	% Moisture
HB 9 22.5'	01-094-01	19

OnSite Environmental Inc.

Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

G - Insufficient sample quantity for duplicate analysis.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range (toluene-napthalene) are present in the sample.

O - Hydrocarbons indicative of diesel fuel are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a silica gel cleanup procedure.

Y - Sample extract treated with an acid/silica gel cleanup procedure.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

Chain of Custody

OnSite Environmental Inc.
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • Fax: (425) 885-4603

Laboratory Number: 01-094

Company: CDM

Project Number: 19897-43507-Lab.Sub.land

Project Name: Bridgewater Phase II ESA

Project Manager: ALLEN MOORE

Sampled by: PJH | CDM

Turnaround Request (in working days)

(Check One)

- ☐ Same Day
- ☐ 1 Day
- ☐ 2 Day
- ☐ 3 Day
- ☒ Standard (7 working days)
- ☐ ______ (other)

Requested Analysis

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Dx	Volatiles by 8260B	Halogenated Volatiles by 8260B	Semivolatiles by 8270C	PAHs by 8270C / SIM	PCBs by 8082	Pesticides by 8081A	Herbicides by 8151A	Total RCRA Metals (8)	TCLP Metals	HEM by 1664	VPH	EPH					% Moisture
1	HB9 22.5'	1/11/05	1119	soil	6		X	X		X															X

	Signature	Company	Date	Time
Relinquished by	[signature]	CDM	1/13/05	0906
Received by	[signature]	OnSite Env	1/13/05	9:06
Relinquished by				
Received by				
Relinquished by				
Received by				
Reviewed by/Date		Reviewed by/Date		

Comments/Special Instructions:

Chromatograms with final report ☐

DISTRIBUTION LEGEND: White - OnSite Copy Yellow - Report Copy Pink - Client Copy

OnSite Environmental Inc.
Analytical Testing and Mobile Laboratory Services

January 26, 2005

Allen Moore
CDM
P.O. Box 3885
Bellevue, WA 98009

Re: Analytical Data for Project 19897-43507-Lab.Sub.land
Laboratory Reference No. 0501-107

Dear Allen:

Enclosed are the analytical results and associated quality control data for samples submitted on January 14, 2005.

The standard policy of OnSite Environmental Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

David Baumeister
Project Manager

Enclosures

Date of Report: January 26, 2005
Samples Submitted: January 14, 2005
Laboratory Reference: 0501-107
Project: 19397-43507-Lab.Sub.land

Case Narrative

Samples were collected on January 13, 2005 and received by the laboratory on January 14, 2005. They were maintained at the laboratory at a temperature of 2°C to 6°C.

General QA /QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

Halogenated Volatiles EPA 8260B Analysis

Some MTCA cleanup levels are non-achievable for samples HB-1, HB-2, and HB-9 due to the high concentration of hydrocarbons in the samples.

Any other QA/QC issues associated with this extraction and analysis will be indicated with a footnote reference and discussed in detail on the Data Qualifier page.

Date of Report: January 26, 2005
Samples Submitted: January 14, 2005
Laboratory Reference: 0501-107
Project: 19897-43507-Lab.Sub.land

NWTPH-Gx/BTEX

Date Extracted:	1-17&20-05	
Date Analyzed:	1-17&20-05	
Matrix: Water		
Units: ug/L (ppb)		
Client ID:	**HB-1**	**HB-2**
Lab ID:	01-107-01	01-107-02

	Result	Flags	PQL	**Result**	Flags	PQL
Benzene	**130**		50	**30**		5.0
Toluene	**8500**		100	**12**		5.0
Ethyl Benzene	**3100**		50	**240**		5.0
m,p-Xylene	**8800**		100	**370**		5.0
o-Xylene	**4500**		50	**ND**		5.0
TPH-Gas	**67000**		5000	**4100**		500
Surrogate Recovery:						
Fluorobenzene	118%			121%		

Date of Report: January 26, 2005
Samples Submitted: January 14, 2005
Laboratory Reference: 0501-107
Project: 19697-43507-Lab.Sub.land

NWTPH-Gx/BTEX

Date Extracted: 1-17-05
Date Analyzed: 1-17-05

Matrix: Water
Units: ug/L (ppb)

Client ID:	HB-7			HB-8		
Lab ID:	01-107-03			01-107-04		
	Result	Flags	PQL	**Result**	Flags	PQL
Benzene	**ND**		1.0	**ND**		1.0
Toluene	**ND**		1.0	**ND**		1.0
Ethyl Benzene	**4.1**		1.0	**ND**		1.0
m,p-Xylene	**6.2**		1.0	**2.2**		1.0
o-Xylene	**ND**		1.0	**ND**		1.0
TPH-Gas	**270**		100	**240**		100
Surrogate Recovery:						
Fluorobenzene	116%			115%		

Date of Report: January 26, 2005
Samples Submitted: January 14, 2005
Laboratory Reference: 0501-107
Project: 19-97-43507-Lab.Sub.land

NWTPH-Gx/BTEX

Date Extracted: 1-17-05
Date Analyzed: 1-17-05

Matrix: Water
Units: ug/L (ppb)

Client ID: **HB-9**
Lab ID: 01-107-05

	Result	Flags	PQL
Benzene	**19**		10
Toluene	**ND**		10
Ethyl Benzene	**550**		10
m,p-Xylene	**690**		10
o-Xylene	**ND**		10
TPH-Gas	**8200**		1000
Surrogate Recovery:			
Fluorobenzene	120%		

Date of Report: January 26, 2005
Samples Submitted: January 14, 2005
Laboratory Reference: 0501-107
Project: 19 97-43507-Lab.Sub.land

NWTPH-Gx/BTEX
METHOD BLANK QUALITY CONTROL

Date Extracted. 1-17-05
Date Analyzed: 1-17-05

Matrix: Water
Units: ug/L (ppb)

Lab ID: MB0117W2

	Result	Flags	PQL
Benzene	ND		1.0
Toluene	ND		1.0
Ethyl Benzene	ND		1.0
m,p-Xylene	ND		1.0
o-Xylene	ND		1.0
TPH-Gas	ND		100

Surrogate Recovery:
Fluorobenzene 95%

Date of Report: January 26, 2005
Samples Submitted: January 14, 2005
Laboratory Reference: 0501-107
Project: 19597-43507-Lab.Sub.land

NWTPH-Gx/BTEX
METHOD BLANK QUALITY CONTROL

Date Extracted: 1-20-05
Date Analyzed: 1-20-05

Matrix: Water
Units: ug/L (ppb)

Lab ID: MB0120W1

	Result	Flags	PQL
Benzene	ND		1.0
Toluene	ND		1.0
Ethyl Benzene	ND		1.0
m,p-Xylene	ND		1.0
o-Xylene	ND		1.0
TPH-Gas	ND		100

Surrogate Recovery:
Fluorobenzene 100%

Date of Report: January 26, 2005
Samples Submitted: January 14, 2005
Laboratory Reference: 0501-107
Project: 19997-43507-Lab.Sub.land

NWTPH-Gx/BTEX
DUPLICATE QUALITY CONTROL

Date Extracted: 1-17-05
Date Analyzed: 1-17-05

Matrix. Water
Units: ug/L (ppb)

Lab ID:	01-061-09 Original	01-061-09 Duplicate	RPD	Flags
Benzene	ND	ND	NA	
Toluene	ND	ND	NA	
Ethyl Benzene	ND	ND	NA	
m,p-Xylene	ND	ND	NA	
o-Xylene	ND	ND	NA	
TPH-Gas	ND	ND	NA	
Surrogate Recovery:				
Fluorobenzene	116%	117%		

Date of Report: January 26, 2005
Samples Submitted: January 14, 2005
Laboratory Reference: 0501-107
Project: 19-97-43507-Lab.Sub.land

NWTPH-Gx/BTEX
MS/MSD QUALITY CONTROL

Date Extracted: 1-17-05
Date Analyzed: 1-17-05

Matrix: Water
Units: ug/L (ppb)

Spike Level: 50.0 ppb

Lab ID:	01-111-01 **MS**	Percent Recovery	01-111-01 **MSD**	Percent Recovery	**RPD**	**Flags**
Benzene	**53.5**	**107**	**53.5**	**107**	0	
Toluene	**55.6**	**111**	**55.0**	**110**	1	
Ethyl Benzene	**55.1**	**110**	**55.0**	**110**	0	
m,p-Xylene	**54.9**	**110**	**54.5**	**109**	1	
o-Xylene	**54.2**	**108**	**53.9**	**108**	1	

Surrogate Recovery:

Fluorobenzene	107%	106%

Date of Report: January 26, 2005
Samples S ibmitted: January 14, 2005
Laboratory Reference: 0501-107
Project: 19697-43507-Lab.Sub.land

NWTPH-Dx

Date Extra ted:	1-24-05
Date Analy zed:	1-24-05
Matrix:	Water
Units:	mg/L (ppm)

Client ID:	**HB-1**	**HB-2**	**HB-7**
Lab ID:	01-107-01	01-107-02	01-107-03
Diesel Ran e:	**ND**	**ND**	**ND**
PQL:	0.26	0.25	0.25
Identificatio n:	---	---	---
Lube Oil R nge:	**ND**	**ND**	**ND**
PQL:	0.41	0.40	0.40
Identificatio n:	---	---	---
Surrogate - ecovery			
o-Terpheny.:	93%	104%	111%
Flags:	Y	Y	Y

Date of Report: January 26, 2005
Samples Submitted: January 14, 2005
Laboratory Reference: 0501-107
Project: 19397-43507-Lab.Sub.land

NWTPH-Dx

Date Extracted:	1-24-05
Date Analyzed:	1-24-05
Matrix:	Water
Units:	mg/L (ppm)

Client ID:	**HB-8**	**HB-9**
Lab ID:	01-107-04	01-107-05
Diesel Range:	**ND**	**ND**
PQL:	0.26	0.27
Identification:	---	---
Lube Oil Range:	**ND**	**ND**
PQL:	0.41	0.43
Identification:	---	---
Surrogate Recovery		
o-Terphenyl	111%	114%
Flags:	Y	Y

Date of Report: January 26, 2005
Samples Submitted: January 14, 2005
Laboratory Reference: 0501-107
Project: 19497-43507-Lab.Sub.land

NWTPH-Dx
METHOD BLANK QUALITY CONTROL

Date Extracted:	1-24-05
Date Analyzed:	1-24-05
Matrix.	Water
Units:	mg/L (ppm)
Lab ID:	MB0124W1
Diesel Range:	**ND**
PQL:	0.25
Identification	---
Lube Oil Range:	**ND**
PQL:	0.40
Identification:	---
Surrogate Recovery	
o-Terphenyl:	103%
Flags:	Y

Date of Report: January 26, 2005
Samples Submitted: January 14, 2005
Laboratory Reference: 0501-107
Project: 19897-43507-Lab.Sub.land

NWTPH-Dx
DUPLICATE QUALITY CONTROL

Date Extracted:	1-24-05
Date Analyzed:	1-24-05
Matrix:	Water
Units:	mg/L (ppm)

Lab ID:	01-107-01	01-107-01 DUP
Diesel Range:	**ND**	**ND**
PQL.	0.26	0.25
RPD:	N/A	
Surrogate Recovery		
o-Terphenyl:	93%	95%
Flags:	Y	Y

Date of Report: January 26, 2005
Samples Submitted: January 14, 2005
Laboratory Reference: 0501-107
Project: 19397-43507-Lab.Sub.land

HALOGENATED VOLATILES by EPA 8260B

Date Extracted: 1-18-05
Date Analyzed: 1-19-05

Matrix: Water
Units: ug/L (ppb)

Lab ID: 01-107-01
Client ID: HB-1

Compound	Results	Flags	PQL
Dichlorodifluoromethane	ND		10
Chloromethane	ND		10
Vinyl Chloride	ND		10
Bromomethane	ND		10
Chloroethane	ND		10
Trichlorofluoromethane	ND		10
1,1-Dichloroethene	ND		10
Iodomethane	ND		50
Methylene Chloride	ND		50
(trans) 1,2-Dichloroethene	ND		10
1,1-Dichloroethane	ND		10
2,2-Dichloropropane	ND		10
(cis) 1,2-Dichloroethene	ND		10
Bromochloromethane	ND		10
Chloroform	ND		10
1,1,1-Trichloroethane	50		10
Carbon Tetrachloride	ND		10
1,1-Dichloropropene	ND		10
1,2-Dichloroethane	ND		10
Trichloroethene	ND		10
1,2-Dichloropropane	ND		10
Dibromomethane	ND		10
Bromodichloromethane	ND		10
2-Chloroethyl Vinyl Ether	ND		50
(cis) 1,3-Dichloropropene	ND		10
(trans) 1,3-Dichloropropene	ND		10

Date of Report: January 26, 2005
Samples Submitted: January 14, 2005
Laboratory Reference: 0501-107
Project: 19397-43507-Lab.Sub.land

HALOGENATED VOLATILES by EPA 8260B

Lab ID: 01-107-01
Client ID: HB-1

Compound	Results	Flags	PQL
1,1,2-Trichloroethane	ND		10
Tetrachloroethene	ND		10
1,3-Dichloropropane	ND		10
Dibromochloromethane	ND		10
1,2-Dibromoethane	ND		10
Chlorobenzene	ND		10
1,1,1,2-Tetrachloroethane	ND		10
Bromoform	ND		50
Bromobenzene	ND		10
1,1,2,2-Tetrachloroethane	ND		10
1,2,3-Trichloropropane	ND		10
2-Chlorotoluene	ND		10
4-Chlorotoluene	ND		10
1,3-Dichlorobenzene	ND		10
1,4-Dichlorobenzene	ND		10
1,2-Dichlorobenzene	ND		10
1,2-Dibromo-3-chloropropane	ND		50
1,2,4-Trichlorobenzene	ND		10
Hexachlorobutadiene	ND		10
1,2,3-Trichlorobenzene	ND		10

Surrogate	Percent Recovery	Control Limits
Dibromofluoromethane	108	70-123
Toluene, d8	113	70-119
4-Bromofluorobenzene	106	70-119

Date of Report: January 26, 2005
Samples Submitted: January 14, 2005
Laboratory Reference: 0501-107
Project: 19397-43507-Lab.Sub.land

HALOGENATED VOLATILES by EPA 8260B

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Date Extracted:	1-18-05
Date Analyzed:	1-19-05
Matrix:	Water
Units:	ug/L (ppb)
Lab ID:	01-107-02
Client ID:	**HB-2**

Compound	Results	Flags	PQL
Dichlorodifluoromethane	ND		1.0
Chloromethane	ND		1.0
Vinyl Chloride	ND		1.0
Bromomethane	ND		1.0
Chloroethane	ND		1.0
Trichlorofluoromethane	ND		1.0
1,1-Dichloroethene	ND		1.0
Iodomethane	ND		5.0
Methylene Chloride	ND		5.0
(trans) 1,2-Dichloroethene	ND		1.0
1,1-Dichloroethane	ND		1.0
2,2-Dichloropropane	ND		1.0
(cis) 1,2-Dichloroethene	ND		1.0
Bromochloromethane	ND		1.0
Chloroform	1.7		1.0
1,1,1-Trichloroethane	1.2		1.0
Carbon Tetrachloride	ND		1.0
1,1-Dichloropropene	ND		1.0
1,2-Dichloroethane	ND		1.0
Trichloroethene	1.4		1.0
1,2-Dichloropropane	ND		1.0
Dibromomethane	ND		1.0
Bromodichloromethane	ND		1.0
2-Chloroethyl Vinyl Ether	ND		5.0
(cis) 1,3-Dichloropropene	ND		1.0
(trans) 1,3-Dichloropropene	ND		1.0

Date of Report: January 26, 2005
Samples Submitted: January 14, 2005
Laboratory Reference: 0501-107
Project: 19' 97-43507-Lab.Sub.land

HALOGENATED VOLATILES by EPA 8260B

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Lab ID: 01-107-02
Client ID: HB-2

Compound	Results	Flags	PQL
1,1,2-Trichloroethane	ND		1.0
Tetrachloroethene	ND		1.0
1,3-Dichloropropane	ND		1.0
Dibromochloromethane	ND		1.0
1,2-Dibromoethane	ND		1.0
Chlorobenzene	4.1		1.0
1,1,1,2-Tetrachloroethane	ND		1.0
Bromoform	ND		5.0
Bromobenzene	ND		1.0
1,1,2,2-Tetrachloroethane	ND		1.0
1,2,3-Trichloropropane	ND		1.0
2-Chlorotoluene	ND		1.0
4-Chlorotoluene	ND		1.0
1,3-Dichlorobenzene	ND		1.0
1,4-Dichlorobenzene	2.0		1.0
1,2-Dichlorobenzene	ND		1.0
1,2-Dibromo-3-chloropropane	ND		5.0
1,2,4-Trichlorobenzene	ND		1.0
Hexachlorobutadiene	ND		1.0
1,2,3 Trichlorobenzene	ND		1.0

Surrogate	Percent Recovery	Control Limits
Dibromofluoromethane	111	70-123
Toluene, d8	113	70-119
4-Bromofluorobenzene	114	70-119

Date of Report: January 26, 2005
Samples Submitted: January 14, 2005
Laboratory Reference: 0501-107
Project: 19897-43507-Lab.Sub.land

HALOGENATED VOLATILES by EPA 8260B

Date Extracted: 1-18-05
Date Analyzed: 1-19-05

Matrix: Water
Units: ug/L (ppb)

Lab ID: 01-107-03
Client ID: HB-7

Compound	Results	Flags	PQL
Dichlorodifluoromethane	ND		0.40
Chloromethane	ND		0.40
Vinyl Chloride	ND		0.40
Bromomethane	ND		0.40
Chloroethane	ND		0.40
Trichlorofluoromethane	ND		0.40
1,1-Dichloroethene	ND		0.40
Iodomethane	ND		2.0
Methylene Chloride	ND		2.0
(trans) 1,2-Dichloroethene	ND		0.40
1,1-Dichloroethane	ND		0.40
2,2-Dichloropropane	ND		0.40
(cis) 1,2-Dichloroethene	ND		0.40
Bromochloromethane	ND		0.40
Chloroform	5.0		0.40
1,1,1-Trichloroethane	ND		0.40
Carbon Tetrachloride	ND		0.40
1,1-Dichloropropene	ND		0.40
1,2-Dichloroethane	ND		0.40
Trichloroethene	0.60		0.40
1,2-Dichloropropane	ND		0.40
Dibromomethane	ND		0.40
Bromodichloromethane	ND		0.40
2-Chloroethyl Vinyl Ether	ND		2.0
(cis) 1,3-Dichloropropene	ND		0.40
(trans) 1,3-Dichloropropene	ND		0.40

Date of Report: January 26, 2005
Samples Submitted: January 14, 2005
Laboratory Reference: 0501-107
Project: 19597-43507-Lab.Sub.land

HALOGENATED VOLATILES by EPA 8260B

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Lab ID: 01-107-03
Client ID: HB-7

Compound	Results	Flags	PQL
1,1,2-Trichloroethane	ND		0.40
Tetrachloroethene	77		0.40
1,3-Dichloropropane	ND		0.40
Dibromochloromethane	ND		0.40
1,2-Dibromoethane	ND		0.40
Chlorobenzene	ND		0.40
1,1,1,2-Tetrachloroethane	ND		0.40
Bromoform	ND		2.0
Bromobenzene	ND		0.40
1,1,2,2-Tetrachloroethane	ND		0.40
1,2,3-Trichloropropane	ND		0.40
2-Chlorotoluene	ND		0.40
4-Chlorotoluene	ND		0.40
1,3-Dichlorobenzene	ND		0.40
1,4-Dichlorobenzene	ND		0.40
1,2-Dichlorobenzene	ND		0.40
1,2-Dibromo-3-chloropropane	ND		2.0
1,2,4-Trichlorobenzene	ND		0.40
Hexachlorobutadiene	ND		0.40
1,2,3-Trichlorobenzene	ND		0.40

Surrogate	Percent Recovery	Control Limits
Dibromofluoromethane	118	70-123
Toluene, d8	109	70-119
4-Bromofluorobenzene	112	70-119

Date of Report: January 26, 2005
Samples Submitted: January 14, 2005
Laboratory Reference: 0501-107
Project: 19097-43507-Lab.Sub.land

HALOGENATED VOLATILES by EPA 8260B

Page 1 of 2

Date Extracted:	1-18-05
Date Analyzed:	1-18-05
Matrix:	Water
Units:	ug/L (ppb)
Lab ID:	01-107-04
Client ID:	**HB-8**

Compound	Results	Flags	PQL
Dichlorodifluoromethane	ND		0.20
Chloromethane	ND		0.20
Vinyl Chloride	ND		0.20
Bromomethane	ND		0.20
Chloroethane	ND		0.20
Trichlorofluoromethane	ND		0.20
1,1-Dichloroethene	ND		0.20
Iodomethane	ND		1.0
Methylene Chloride	ND		1.0
(trans) 1,2-Dichloroethene	ND		0.20
1,1-Dichloroethane	ND		0.20
2,2-Dichloropropane	ND		0.20
(cis) 1,2-Dichloroethene	ND		0.20
Bromochloromethane	ND		0.20
Chloroform	9.6		0.20
1,1,1-Trichloroethane	ND		0.20
Carbon Tetrachloride	ND		0.20
1,1-Dichloropropene	ND		0.20
1,2-Dichloroethane	ND		0.20
Trichloroethene	1.0		0.20
1,2-Dichloropropane	ND		0.20
Dibromomethane	ND		0.20
Bromodichloromethane	0.66		0.20
2-Chloroethyl Vinyl Ether	ND		1.0
(cis) 1,3-Dichloropropene	ND		0.20
(trans) 1,3-Dichloropropene	ND		0.20

Date of Report: January 26, 2005
Samples Submitted: January 14, 2005
Laboratory Reference: 0501-107
Project: 19197-43507-Lab.Sub.land

HALOGENATED VOLATILES by EPA 8260B

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Lab ID: 01-107-04
Client ID: HB-8

Compound	Results	Flags	PQL
1,1,2-Trichloroethane	ND		0.20
Tetrachloroethene	40		0.20
1,3-Dichloropropane	ND		0.20
Dibromochloromethane	ND		0.20
1,2-Dibromoethane	ND		0.20
Chlorobenzene	ND		0.20
1,1,1,2-Tetrachloroethane	ND		0.20
Bromoform	ND		1.0
Bromobenzene	ND		0.20
1,1,2,2-Tetrachloroethane	ND		0.20
1,2,3-Trichloropropane	ND		0.20
2-Chlorotoluene	ND		0.20
4-Chlorotoluene	ND		0.20
1,3-Dichlorobenzene	ND		0.20
1,4-Dichlorobenzene	ND		0.20
1,2-Dichlorobenzene	ND		0.20
1,2-Dibromo-3-chloropropane	ND		1.0
1,2,4-Trichlorobenzene	ND		0.20
Hexachlorobutadiene	ND		0.20
1,2,3-Trichlorobenzene	ND		0.20

Surrogate	Percent Recovery	Control Limits
Dibromofluoromethane	117	70-123
Toluene, d8	112	70-119
4-Bromofluorobenzene	114	70-119

Date of Report: January 26, 2005
Samples Submitted: January 14, 2005
Laboratory Reference: 0501-107
Project: 19897-43507-Lab.Sub.land

HALOGENATED VOLATILES by EPA 8260B

Date Extracted: 1-18-05
Date Analyzed: 1-19-05

Matrix: Water
Units: ug/L (ppb)

Lab ID: 01-107-05
Client ID: HB-9

Compound	Results	Flags	PQL
Dichlorodifluoromethane	ND		1.0
Chloromethane	ND		1.0
Vinyl Chloride	ND		1.0
Bromomethane	ND		1.0
Chloroethane	ND		1.0
Trichlorofluoromethane	ND		1.0
1,1-Dichloroethene	ND		1.0
Iodomethane	ND		5.0
Methylene Chloride	ND		5.0
(trans) 1,2-Dichloroethene	ND		1.0
1,1-Dichloroethane	ND		1.0
2,2-Dichloropropane	ND		1.0
(cis) 1,2-Dichloroethene	ND		1.0
Bromochloromethane	ND		1.0
Chloroform	1.4		1.0
1,1,1-Trichloroethane	11		1.0
Carbon Tetrachloride	ND		1.0
1,1-Dichloropropene	ND		1.0
1,2-Dichloroethane	ND		1.0
Trichloroethene	2.2		1.0
1,2-Dichloropropane	ND		1.0
Dibromomethane	ND		1.0
Bromodichloromethane	ND		1.0
2-Chloroethyl Vinyl Ether	ND		5.0
(cis) 1,3-Dichloropropene	ND		1.0
(trans) 1,3-Dichloropropene	ND		1.0

Date of Report: January 26, 2005
Samples Submitted: January 14, 2005
Laboratory Reference: 0501-107
Project: 19697-43507-Lab.Sub.land

HALOGENATED VOLATILES by EPA 8260B
Page 2 of 2

Lab ID: 01-107-05
Client ID: HB-9

Compound	Results	Flags	PQL
1,1,2-Trichloroethane	ND		1.0
Tetrachloroethene	ND		1.0
1,3-Dichloropropane	ND		1.0
Dibromochloromethane	ND		1.0
1,2-Dibromoethane	ND		1.0
Chlorobenzene	3.0		1.0
1,1,1,2-Tetrachloroethane	ND		1.0
Bromoform	ND		5.0
Bromobenzene	ND		1.0
1,1,2,2-Tetrachloroethane	ND		1.0
1,2,3-Trichloropropane	ND		1.0
2-Chlorotoluene	ND		1.0
4-Chlorotoluene	ND		1.0
1,3-Dichlorobenzene	ND		1.0
1,4-Dichlorobenzene	1.2		1.0
1,2-Dichlorobenzene	ND		1.0
1,2-Dibromo-3-chloropropane	ND		5.0
1,2,4-Trichlorobenzene	ND		1.0
Hexachlorobutadiene	ND		1.0
1,2,3-Trichlorobenzene	ND		1.0

Surrogate	Percent Recovery	Control Limits
Dibromofluoromethane	112	70-123
Toluene, d8	112	70-119
4-Bromofluorobenzene	110	70-119

Date of Report: January 26, 2005
Samples Submitted: January 14, 2005
Laboratory Reference: 0501-107
Project: 19 ,97-43507-Lab.Sub.land

HALOGENATED VOLATILES by EPA 8260B
METHOD BLANK QUALITY CONTROL

Date Extra. ted: 1-18-05
Date Analy ed: 1-18-05

Matrix: Water
Units: ug/L (ppb)

Lab ID: MB0118W1

Compoun	Results	Flags	PQL
Dichlorodifl oromethane	ND		0.20
Chlorometl ane	ND		0.20
Vinyl Chlor de	ND		0.20
Bromometl ane	ND		0.20
Chloroetha e	ND		0.20
Trichlorofluoromethane	ND		0.20
1,1-Dichlor ethene	ND		0.20
Iodometha e	ND		1.0
Methylene hloride	ND		1.0
(trans) 1,2-)ichloroethene	ND		0.20
1,1-Dichlor ethane	ND		0.20
2,2-Dichlor propane	ND		0.20
(cis) 1,2-Dichloroethene	ND		0.20
Bromochloromethane	ND		0.20
Chloroform	ND		0.20
1,1,1-Trich roethane	ND		0.20
Carbon Tet achloride	ND		0.20
1,1-Dichlor propene	ND		0.20
1,2-Dichlor ethane	ND		0.20
Trichloroeth ene	ND		0.20
1,2-Dichlor propane	ND		0.20
Dibromomethane	ND		0.20
Bromodichl romethane	ND		0.20
2-Chloroetl l Vinyl Ether	ND		1.0
(cis) 1,3-Dic loropropene	ND		0.20
(trans) 1,3- ichloropropene	ND		0.20

Date of Report: January 26, 2005
Samples Submitted: January 14, 2005
Laboratory Reference: 0501-107
Project: 19397-43507-Lab.Sub.land

HALOGENATED VOLATILES by EPA 8260B
METHOD BLANK QUALITY CONTROL
Page 2 of 2

Lab ID: MB0118W1

Compound	Results	Flags	PQL
1,1,2-Trichloroethane	ND		0.20
Tetrachloroethene	ND		0.20
1,3-Dichloropropane	ND		0.20
Dibromochloromethane	ND		0.20
1,2-Dibromoethane	ND		0.20
Chlorobenzene	ND		0.20
1,1,1,2-Tetrachloroethane	ND		0.20
Bromoform	ND		1.0
Bromobenzene	ND		0.20
1,1,2,2-Tetrachloroethane	ND		0.20
1,2,3-Trichloropropane	ND		0.20
2-Chlorotoluene	ND		0.20
4-Chlorotoluene	ND		0.20
1,3-Dichlorobenzene	ND		0.20
1,4-Dichlorobenzene	ND		0.20
1,2-Dichlorobenzene	ND		0.20
1,2-Dibromo-3-chloropropane	ND		1.0
1,2,4-Trichlorobenzene	ND		0.20
Hexachlorobutadiene	ND		0.20
1,2,3-Trichlorobenzene	ND		0.20

Surrogate	Percent Recovery	Control Limits
Dibromofluoromethane	113	70-123
Toluene, d8	111	70-119
4-Bromofluorobenzene	106	70-119

Date of Report: January 26, 2005
Samples Submitted: January 14, 2005
Laboratory Reference: 0501-107
Project: 19497-43507-Lab.Sub.land

HALOGENATED VOLATILES by EPA 8260B
MS/MSD QUALITY CONTROL

Date Extracted: 1-18-05
Date Analyzed: 1-18-05

Matrix: Water
Units: ug/L (ppb)

Lab ID: 01-102-08

Compound	Sample Amount	Spike Amount	MS	Percent Recovery	MSD	Percent Recovery	Recovery Limits	Flags
1,1-Dichloroethene	ND	10.0	12.2	122	12.3	123	70-130	
Benzene	ND	10.0	10.5	105	10.8	108	71-128	
Trichloroethene	ND	10.0	8.50	85	8.85	89	76-124	
Toluene	ND	10.0	10.7	107	11.2	112	74-124	
Chlorobenzene	ND	10.0	10.3	103	10.5	105	72-118	

	RPD	RPD Limit	Flags
1,1-Dichloroethene	1	17	
Benzene	3	13	
Trichloroethene	4	12	
Toluene	4	14	
Chlorobenzene	3	9	

OnSite Environmental Inc.

Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

G - Insufficient sample quantity for duplicate analysis.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range (toluene-napthalene) are present in the sample.

O - Hydrocarbons indicative of diesel fuel are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a silica gel cleanup procedure.

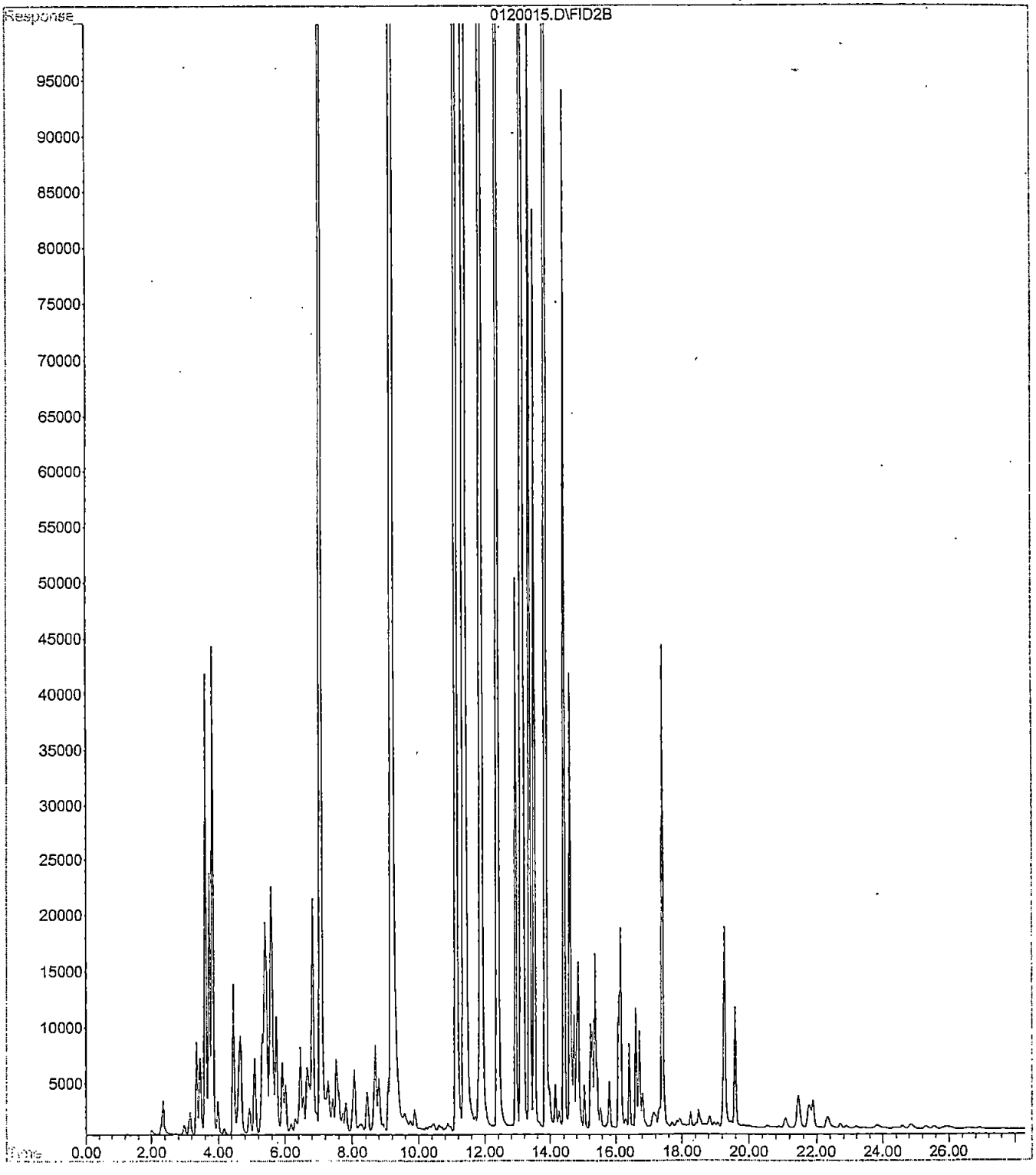
Y - Sample extract treated with an acid/silica gel cleanup procedure.

Z

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

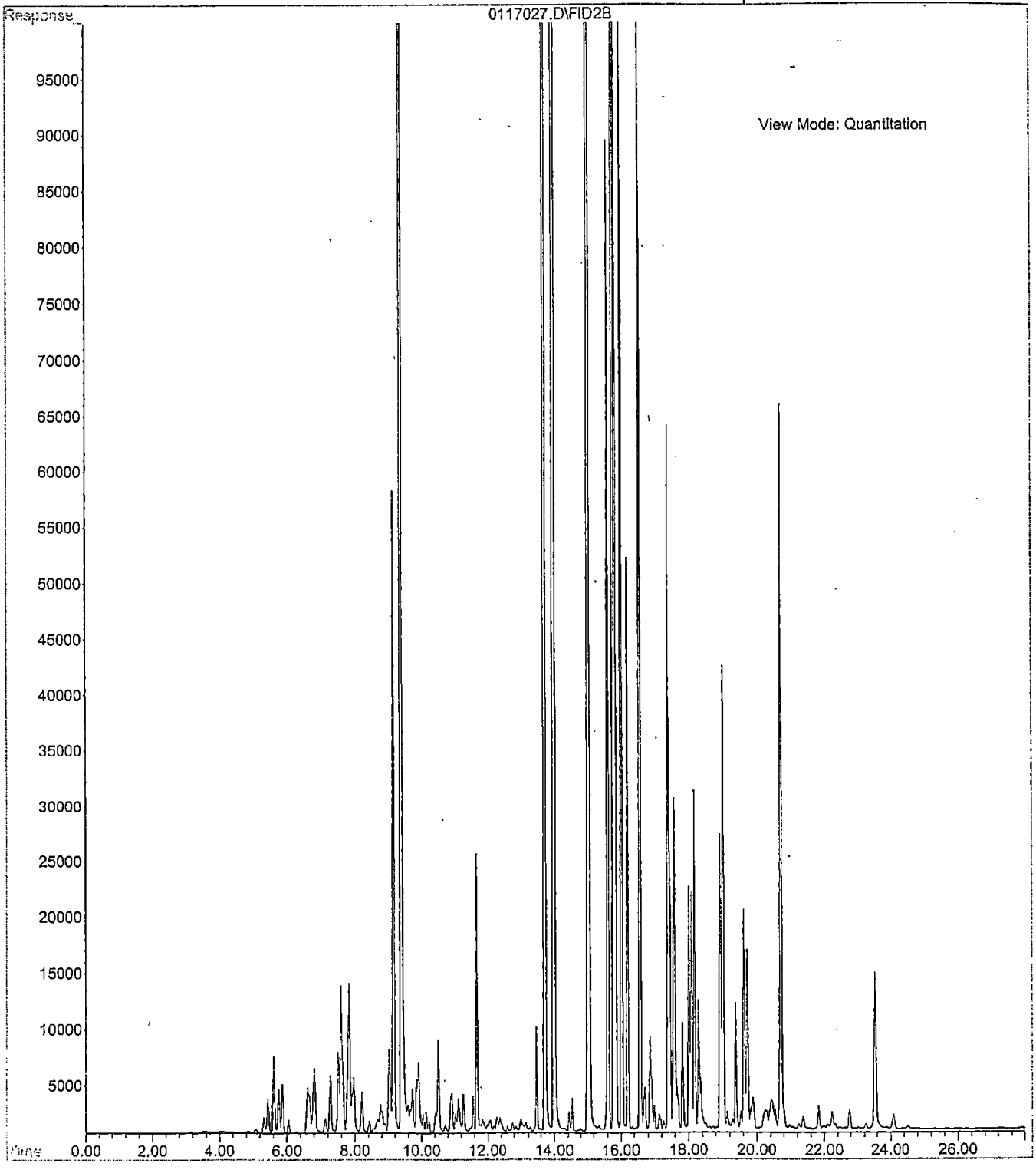
File : X:\BTEX\DARYL\DATA\D050120\0120015.D
Operator :
Acquired : 20 Jan 2005 19:07 using AcqMethod 1116BTEX.M
Instrument : BTEX
Sample Name: 01-107-01e 1:50
Misc Info :
Vial Number: 15

HB-1



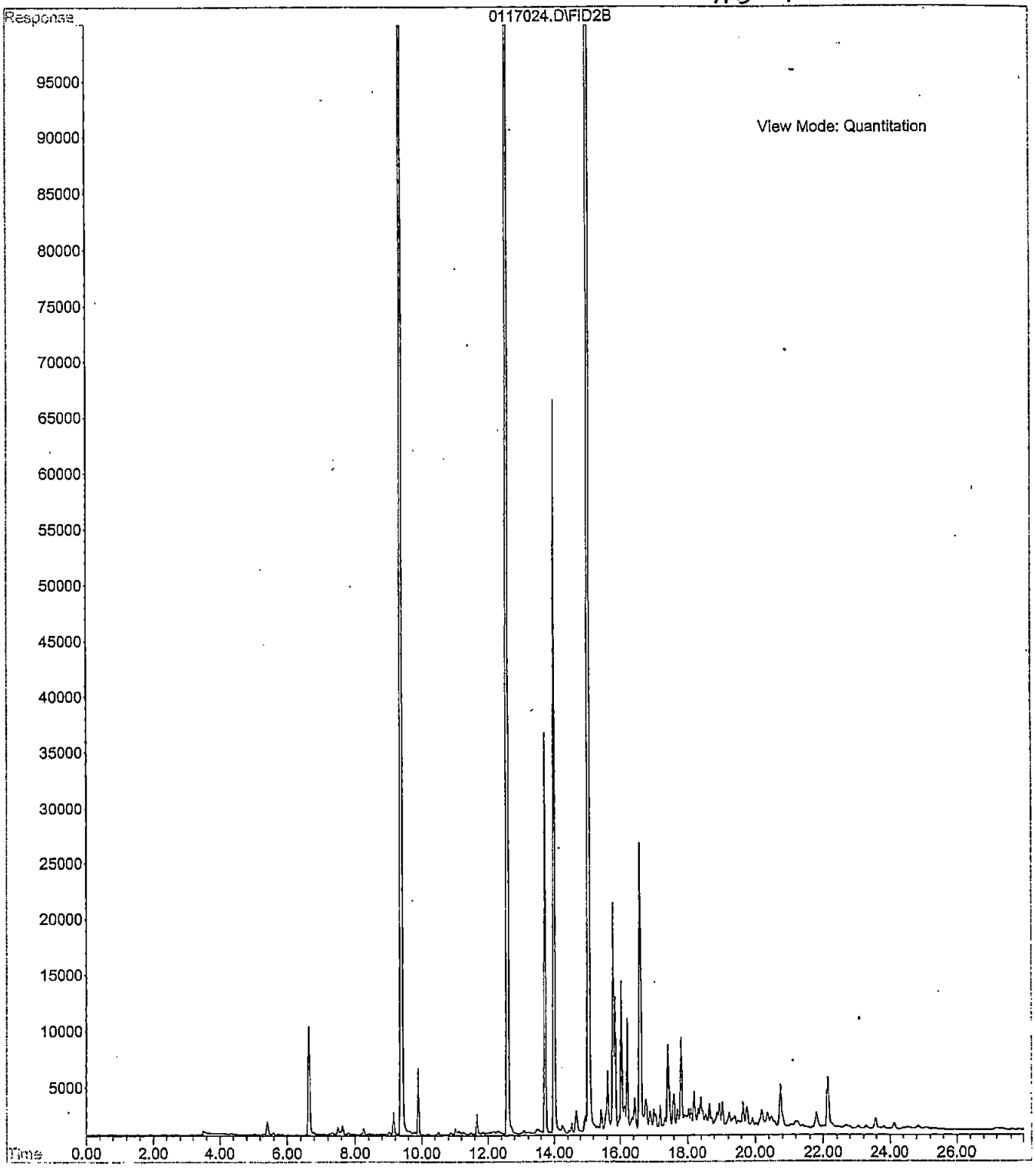
File : X:\BTEX\HOPE\DATA\H050117\0117027.D
Operator :
Acquired : 18 Jan 2005 2:11 using AcqMethod 050107HB.M
Instrument : Archon
Sample Name: 01-107-02b 1:5
Misc Info :
Vial Number: 27

HB-2



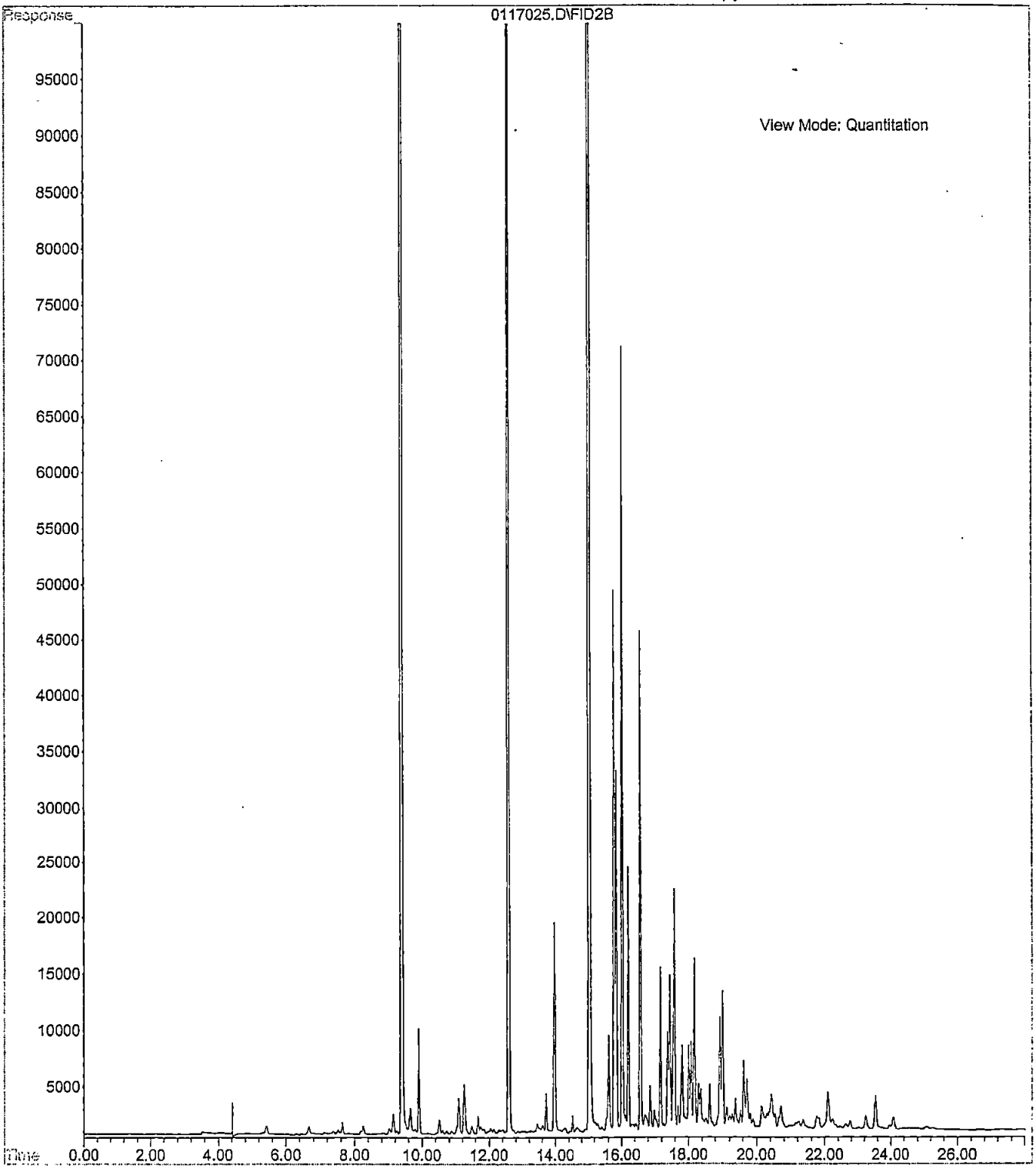
File : X:\BTEX\HOPE\DATA\H050117\0117024.D
Operator :
Acquired : 18 Jan 2005 00:18 using AcqMethod 050107HB.M
Instrument : Archon
Sample Name: 01-107-03b
Misc Info :
Vial Number: 24

HB-7



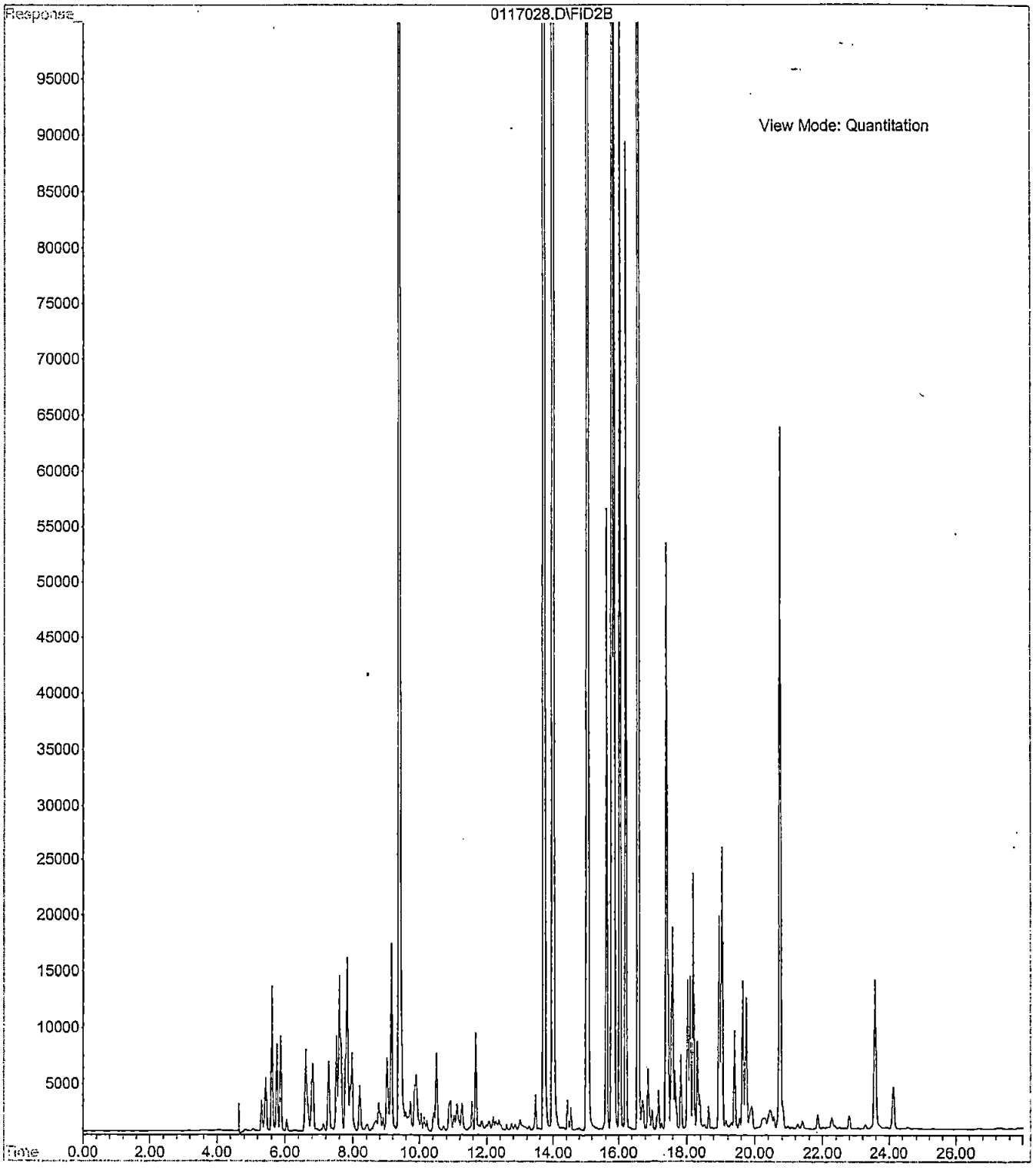
File : X:\BTEX\HOPE\DATA\H050117\0117025.D
Operator :
Acquired : 18 Jan 2005 00:55 using AcqMethod 050107HB.M
Instrument : Archon
Sample Name: 01-107-04b
Misc Info :
Vial Number: 25

HB-8



File : X:\BTEX\HOPE\DATA\H050117\0117028.D
Operator :
Acquired : 18 Jan 2005 2:48 using AcqMethod 050107HB.M
Instrument : Archon
Sample Name: 01-107-05b 1:10
Misc Info :
Vial Number: 28

HB-9



Chain of Custody

Page 1 of 1

OnSite Environmental Inc.
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Phone: (425) 883-3881 • Fax: (425) 885-4603

Company: CDM
Project Number: 19897-43507 Lab, Sub, Land
Project Name: Brightwater Phase II ESA
Project Manager: Allen Moore
Sampled by: SEC / PJH

Turnaround Request (in working days)
(Check One)
☐ Same Day ☐ 1 Day
☐ 2 Day ☐ 3 Day
☑ Standard (7 working days)
☐ _____ (other)

Laboratory Number: 01-107

Requested Analysis

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Dx	Volatiles by 8260B	Halogenated Volatiles by 8260B	Semivolatiles by 8270C	PAHs by 8270C / SIM	PCBs by 8082	Pesticides by 8081A	Herbicides by 8151A	Total RCRA Metals (8)	TCLP Metals	HEM by 1664	VPH	EPH	% Moisture
1	HB-1	1-13-05	1358	water	7		X	X		X											
2	HB-2		1321				X	X		X											
3	HB-7		1212				X	X		X											
4	HB-8		1245				X	X		X											
5	HB-9	↓	1443	↓	↓		X	X		X											

	Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by		CDM	1-14-05	1000	
Received by			1/14/05	1145	
Relinquished by					
Received by					
Relinquished by					
Received by					

Reviewed by/Date | Reviewed by/Date | Chromatograms with final report ☐

DISTRIBUTION LEGEND: White - OnSite Copy Yellow - Report Copy Pink - Client Copy