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BP Tranche 2 Project

Limited Site Investigation Report

Former ARCO Facility No. 00862
Manhole 34 Facility
Vicinity of North 6th Street and
Yakima Valley Highway, Sunnyside, WA

October 7, 2011

ARCADIS

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2011 Limited Site Investigation Report

Manhole 34 Facility
Vicinity of North 6th Street and
Yakima Valley Highway,
Sunnyside, WA

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Acronyms and Abbreviations

ARCADIS	ARCADIS U.S., Inc.
bgs	below ground surface
BMP	best management practice
BTEX	benzene, toluene, ethylbenzene, total xylenes
btoc	below top of casing
CAP	cleanup action plan
cfm	cubic feet per minute
cy	cubic yards
COC	constituents of concern
CSM	conceptual site model
CL	cleanup levels
Ecology	Washington State Department of Ecology
DPVE	dual phase vacuum extraction
DRO	diesel range organics
EDB	1,2-dibromoethane
EDC	1,2-dichloroethane
FA	Further Action
ft/ft	foot per foot
GRO	gasoline range organics
HSA	hollow stem auger
HO	heavy oil
IDW	investigation-derived waste
lbs	pounds
LNAPL	light nonaqueous phase liquids
LUST	leaking underground storage tank

MSL	mean sea level
mg/kg	milligrams per kilogram
MTBE	methyl tertiary-butyl ether
MTCA	Model Toxics Control Act
NFA	No Further Action
NWTPH	Northwest Total Petroleum Hydrocarbons
O&M	operation and maintenance
PID	photoionization detector
PQL	Practical Quantitation Limit
PVC	polyvinyl chloride
RP	responsible parties
Site	Manhole 34 Facility, North 6th Street and Yakima Valley Highway, Sunnyside, Washington
SIC	Standard Industrial Classification
SVE	soil vapor extraction system
TEE	Terrestrial Ecological Evaluation
TEH	total extractable hydrocarbons
µg/L	micrograms per liter
USCS	Unified Soil Classification System
USGS	U.S. Geologic Society
USEPA	U.S. Environmental Protection Agency
UST	underground storage tank
VCP	Voluntary Cleanup Program
WADNR	Washington State Department of Natural Resources

1. Introduction

On behalf of BP West Coast Products, LLC, ARCADIS U.S., Inc. (ARCADIS) has prepared this Limited Site Investigation Report for Manhole 34 Facility located in the Vicinity of North 6th Street and Yakima Valley Highway, Sunnyside, WA. This Report presents a thorough record of activities undertaken by ARCADIS as outlined in the Site Review Work Plan (the "Work Plan"). The Work Plan was drafted in response to the October 25, 2010 Comprehensive Review Request submitted to ARCADIS and BP by Mr. Norm Hepner of the Washington State Department of Ecology (Ecology).

2. Property Information

The Site is located in the vicinity of Yakima Valley Highway and North 6th Avenue in Sunnyside, Washington (**Figure 1**). The Site currently consists of three private properties and portions of Yakima Valley Highway (U.S. Highway 12) and North 6th Avenue in the vicinity of these properties.

2.1 Property Description & Use

The Site currently consists of three private properties and portions of Yakima Valley Highway (U.S. Highway 12) and North 6th Avenue in the vicinity of these properties. The private properties associated with the facility are:

- Yakima County Parcels No. 221025-21425 and 221025-21439. Sunnyside Food Mart (former Jackpot Food Mart) at 600 Yakima Valley Highway. Currently owned by Jugesh & Bhawana Kumar and Joginder & Irene Kumar.

- Yakima County Parcel No. 221025-21452. Vacant undeveloped lot (location of former Sunnyside Tire Center) at 604 Yakima Valley Highway. Currently owned by La Mas Barata Properties LLC.

- Yakima County Parcel No. 221025-21454. Vacant paved lot (location of former R&R Tires) at 601 Yakima Valley Highway. Currently owned by Marisol Madriz.

A number of Responsible Parties (RPs) were associated with the Site under the May 4, 2004 Consent Decree (No. 04201467) between the RPs and Ecology. Through various settlements, the RPs undertaking the remedial efforts for the Site (the "Manhole 34 Coordinating Group") were Atlantic Richfield Company (ARCO), ChevronTexaco Corporation, and Time Oil Company. ARCO was associated with past operations at the

Sunnyside Tire Center property, ChevronTexaco Corporation was associated with past operations at the R&R Tires property, and Time Oil Company was associated with past operations at the Jackpot Food Mart property. Through assorted acquisitions and/or sales, responsibility for the ARCO liability has transferred to BP West Coast Products Company (BP) and responsibility for the Time Oil Company liability has transferred to Pacific Convenience & Fuels LLC.

An additional property at 613 Yakima Valley Highway (Yakima County Parcel No. 221025-21428) was determined to be impacted by facility operations but not a contributor or RP. This property is currently occupied by the China Wok Restaurant. The property is currently owned by Anna Yit Chi.

The former Sunnyside Tire Center property (the "STC Property") is currently a vacant unpaved lot. The Sunnyside Food Mart (the "Food Mart") consists of a convenience store, canopy, and three retail fuel dispensers on one dispenser island. Associated with the fuel dispensers are one 6,000-gallon gasoline underground storage tank (UST), one 8,000-gallon gasoline UST, and one 12, 000-gallon gasoline UST. The former R&R Tires property (the "R&R Property") is currently an undeveloped paved lot used as a used automobile dealership. A mobile office facility is located on the R&R Property. A complete site investigation history was presented in the November 9, 1994 "*Interim Actions and Remedial Investigation/Feasibility Study, Manhole 34 Facility, Sunnyside Washington*" as prepared by SEACOR International Inc. (SEACOR, 1994) A facility site plan is presented as **Figure 2**.

3. Geology & Hydrogeology

The Washington State Department of Natural Resources Map *Geologic Map of the East Half of the Toppenish 1:10,0000 Quadrangle, Washington* compiled by J. Shuster in 1994 shows the Site to be situated in Quaternary-age alluvium deposits. These deposits are stated to be directly related to the Yakima River, currently located southwest of the Site.

Previous subsurface investigations at the Site, including borehole and monitoring well installation, have shown the shallow subsurface sediments to be composed of stratified alluvial sediments. Grain sizes encountered range from silt to gravel with silt content decreasing with depth. Near-surface soils are characterized as silt and sandy silt; depths greater than 15-feet are characterized as silty sand to sand. Gravels were encountered at depths greater than 40 feet.

Topography at the Site is generally flat, with an elevation of approximately 750 feet above mean sea level (amsl). Measured groundwater elevations indicate the potentiometric surface at the facility ranges from approximately 738 to 740 feet amsl, with little seasonable variation. During the summer months, the water table elevation increases; this increase is likely to due to the effect of seasonal irrigation. Groundwater flow direction is difficult to define for the Site due to the presence of numerous utilities in conjunction with relatively shallow groundwater depths. The general site groundwater flow direction is calculated as northeast to southwest, towards the Yakima River, at a hydraulic gradient of 0.006 foot per foot. Previous hydraulic testing by SEACOR estimated a hydraulic conductivity of 3.3×10^{-3} feet per minute (approximately 4.7 feet per day) in the vicinity of MW-5.

4. Discovery and Summary of Previous Site Investigations and Remedial Action

In 1989, the presence of light nonaqueous phase liquid (LNAPL) petroleum hydrocarbon ("free-phase" hydrocarbon) was discovered by Ecology and city of Sunnyside officials following reports of gasoline odors in the site area. Following the LNAPL discovery, numerous subsurface investigations were conducted to determine the extent and source of hydrocarbon contamination. Sixty-eight (68) soil borings were advanced for investigative purposes, with 26 being completed as monitoring wells. The result of these investigative efforts was the determination that shallow groundwater and site soils were impacted by dissolved and free phase hydrocarbons. A Cleanup Action Plan (CAP) was adopted August 6, 2001. The CAP dictates compliance monitoring, and removal of LNAPL through Dual Phase Vacuum Extraction (DPVE) at selected points within recovery trenches, monitoring wells, storm water access points (manholes), and recovery wells. Quarterly DPVE operations have been ongoing since adoption of the CAP.

ARCADIS became the Implementing Consultant for the Site in January 2010. Work completed by ARCADIS since that time is in accordance with the Consent Decree for the Site. Cleanup action activities performed by ARCADIS are currently performed according to the Ecology-accepted CAP. The CAP specifies a schedule of biannual compliance monitoring and quarterly DPVE. DPVE uses a vacuum-assisted pumping system to concurrently remove groundwater, LNAPL, and associated vapors from the subsurface by creating a localized vacuum in a remedial groundwater well and/or recovery well. ARCADIS subcontracted with Emerald Services, Inc. (Emerald) of Seattle, Washington to provide vacuum truck services. The vacuum truck is capable of applying a high vacuum to a drop tube placed at a given depth below the LNAPL layer within selected monitoring and recovery wells, recovery trenches, and storm drain

access areas (manholes). Extracted fluids are removed through a drop tube and stored in the vacuum truck. Extracted vapors are emitted to the atmosphere via a stack on the vacuum truck. The recovered liquids (groundwater and LNAPL) are transported to an approved facility for treatment and/or disposal.

5. Potential Constituents of Concern

According to Ecology's Model Toxics Control Act (MTCA) 173-340-900, Table 830-1 "Required Testing for Petroleum Releases," several potential COCs are associated with the current and past use of the Site. Potential COCs associated with the past storage and distribution of gasoline and diesel at the property include:

- Potential COCs Associated with GRO:
    - BTEX
    - 1,2-Dibromoethane (EDB)
    - 1,2-Dichloroethane (EDC)
    - Methyl tertiary-butyl ether (MTBE)
    - Total lead
    - Naphthalenes

- Potential COCs Associated with diesel range organics (DRO):
    - BTEX
    - Carcinogenic polycyclic aromatic hydrocarbons (cPAHs)
    - Naphthalenes

During historic site characterization activities several of these COCs were identified in soil and groundwater at the Site at concentrations exceeding MTCA Method A CLs.

6. Subsurface Investigation

The October 25, 2010 Comprehensive Review Request from Ecology called for an evaluation of the current remedial system and its ability to effectively treat the LNAPL petroleum hydrocarbon plume present between monitoring wells MW-4 and MW-5. Specifically, ARCADIS was requested to perform the following investigation tasks:

- Evaluate the range of influence of the existing recovery trenches and their ability to actively and effectively recover LNAPL from the LNAPL plume present in the MW-4/MW-5 LNAPL area.

- Evaluate the levels and depth of soil contamination on the STC Property adjacent to and within the MW-4/MW-5 plume.

- Evaluate the predicted timeline for natural attenuation of the plume with and without additional remediation measures.

This investigation is primarily focused on and associated with the former STC Property area and its immediate vicinity. ARCADIS utilized the following scope of work to accomplish the investigation tasks.

6.1 North Recovery Trench Range-of-Influence Testing

On May 26, 2011, ARCADIS performed active hydraulic testing of the North Recovery Trench (NRT). This testing was designed to assess the range-of-influence (ROI) of the NRT as it relates to capturing LNAPL from the petroleum hydrocarbon plume present in the well MW-4/MW-5 area.

ARCADIS deployed data logger/pressure transducers in wells MW-4, MW-7 and MW-30 prior to the commencement of the ROI testing. The North Trench A2 (NT-A2) deep sump port (DSP) served as the “pumping well” for the ROI test. Observation wells MW-4, MW-7, and MW-30 are approximately 60.4, 53.2, and 78.3 feet from NT-A2. Fluid pumping from NT-A2 DSP was accomplished using vacuum extraction techniques. The vacuum truck was provided and operated by Emerald. At the time of ROI testing, The NT-A2 DSP was located 8.11 feet below top of casing (btoc) based on direct measurement; depth to water in the NT-A2 DSP was measured to be 5.19 feet btoc, which provided approximately 3 feet of hydraulic head available for drawdown during the test.

Prior to conducting the ROI test, ARCADIS assumed for planning purposes an estimated recovery rate similar to historical rates recorded during previous extraction events. Typical measured flow rates at the Site have ranged from 3 to 5 gallons per minute (gpm). As such, ARACDIS estimated a total pumping time measured in multiple hours to achieve the 2,500-gallon target for total fluid extraction. However, due to seasonally high groundwater elevation, and a corresponding high fluid volume in the recovery trench, the 2500-gallon fluid extraction target was reached in less than one hour, giving an average extraction rate of approximately 40 gallons per minute.

Data collected by pressure transducers installed in monitoring wells MW-4, MW-7, and MW-30 indicate that the three wells experienced a drawdown as a result of fluid extraction in the trench. The amount of drawdown was directly related to the horizontal distance between the pumping well and the observation well. Monitoring well MW-30 experienced the greatest drawdown effect, calculated to be 0.896 foot. Well MW-7 experienced 0.239 foot of drawdown, and MW-4 experienced 0.148 foot of drawdown. These results indicate a range of influence with respect to dewatering capabilities to be nonlinear. The range of influence is best described logarithmically with respect to horizontal distance and vertical drawdown of the water table. Further, analysis of the distance-drawdown data for time equal to 76 minutes indicates that the ROI while extracting fluid from NT-A2 is approximately 88 feet. Range-of-Influence testing results and supporting field data are included as **Appendix A**.

6.2 Hydraulic Property Testing

ARCADIS investigated the hydraulic properties of the MW-4/MW-5 area using well RW-1 as a pumping well and well MW-4 as an observation well. ARCADIS deployed a data logger/pressure transducer (Solinst Levelogger™) in well MW-4 approximately12 hours prior to initiating DPVE operations to record short-term background water level conditions and/or fluctuations. Fluid pumping from well RW-1 was accomplished using vacuum extraction techniques. Pumping discharge was monitored and measured during the extraction event. Depth to water in well RW-1 was measured at 15-minute intervals over the duration of the pumping test.

Pumping continued for approximately 8 hours or until 2000 gallons of fluid was extracted from well RW-1. Upon reaching a pumping test duration limit, fluid extraction was stopped and a recovery test was performed. Water levels in the observation well MW-4 were measured and recorded for a period of approximately 13 hours during the recovery test portion. Recorded data was evaluated using aquifer testing analytical methods.

Drawdown data collected in MW-4 was analyzed using the Jacob Straight Line analytical method. Analysis of the drawdown data resulted in a transmissivity of 104 feet^2 per day and a storativity of 2.3 x10^{-3}. Assuming an aquifer thickness of 13 feet based on the well log of MW-4, a hydraulic conductivity of 8.0 feet per day is calculated. Hydraulic property testing results and supporting field data are included as **Appendix B**.

6.3 Soil Boring Installation

To assess the lateral and vertical extent of hydrocarbon impact to soil within the MW-4/MW-5 area at the STC Property, ARCADIS completed 20 exploratory soil borings within an area near the Food Mart/STC Property boundary (**Figure 2**). All borings were located on STC Property.

Twenty soil borings were advanced within the investigation area depicted on **Figure 3**. The initial 3 feet of the boreholes were cleared using hand tools to reduce potential for damage to undetected underground utilities. The borings were installed using direct-push (Geoprobe™-type) methods. The direct-push rig was provided and operated by Cascade Drilling, L.P. (Cascade) of Woodinville, Washington. The work was performed in general accordance with American Society for Testing and Materials (ASTM) D6282 - *Standard Guide for Direct Push Soil Sampling for Environmental Site Characterizations*.

Two of the borings were advanced to a depth of 36 feet bgs; the purpose of these borings was to further characterize the lithology of the saturated soils at the STC property. The remaining 18 borings were advanced to approximately 5 feet below the presence of water-saturated soils (the “water table”). Encountered lithology is described below and boring logs are presented in **Appendix C**.

Soil Boring One (BH-1): Fine, light brown silt with trace coarse gravel, and increasing black sand content with depth, was encountered from the surface to nine feet below the ground surface (bgs). From 9 to 14 feet bgs stiff, black, saturated silt was encountered. Sand content increased with depth. Below this was fine, brown, medium sand with a lense of stiff brown silt. Total boring depth was 16.5 feet bgs. Groundwater as encountered at 8.5 feet bgs. Petroleum hydrocarbon impacts were observed from 4 to 16.5 feet bgs.

Soil Boring Two (BH-1a): From the ground surface to 3 feet bgs was light brown, gravelly silt, darkening to with depth. Below this, brown silty sand was encountered,

becoming gray with depth. The boring was advanced to a depth of 7 feet bgs. Groundwater was encountered at 7 feet bgs. Hydrocarbon impacts were observed from 3 to 7 feet bgs.

Soil Boring Three (BH-1b): Fine, brown silt with fine sand and coarse gravel was encountered from the ground surface to 8.5 feet bgs. Soil color transitioned from brown to gray with depth. From 8.5 to 9 feet bgs was wet, gray, fine to medium silty sand. Wet, gray sandy silt was encountered from 9 to 11.5 feet bgs. Below this was moist, brown, fine to medium sand. The boring was advance to a total depth of 12 feet bgs. Groundwater was encountered a 4 feet bgs. Petroleum Hydrocarbon impacts were observed from 4.5 to 10 feet bgs.

Soil Boring Four (BH-2): Brown gravelly silt with trace sand was encountered from the surface to 9 feet bgs. Below this was a 3 inch layer of very stiff silt. From approximately 9 to14 feet bgs was wet, brown, silty sand. Wet, brown, fine-to-medium sand was encountered from 14 to 15.5 feet bgs. Below this was wet, stiff, brown silt with fine sand and trace subangular gravel to a depth of 26 feet bgs. From 26 to 34 feet bgs was very stiff, moist brown silt increasing in sand content with depth. Soil also had inclusions of organics and coarse subrounded gravel. Below this, to a depth of 36 feet bgs, was very hard, brown, fine-to-medium sand with subrounded basalt cobbles. A swirling, cream-colored, silt-sized material was also encountered at this depth. The boring was advanced to a total depth of 36 feet. Groundwater was encountered at 3.5 feet bgs. Petroleum hydrocarbon impacts were observed from 3 to 9 feet bgs.

Soil Boring Five (BH-3): From the surface to 1.5 feet bgs was brown gravelly sand and silt. Below this, to a depth of 7 feet bgs, black and gray, fine sandy silt with trace gravel was encountered. From 7 to 8 feet bgs was wet, dark gray silt with some fine sand. Below this to a depth of 11 feet bgs was dark gray, fine to medium sand with traces of silt and subrounded gravel. From 11 to 12 feet bgs was wet, dark gray, sandy silt. The boring was advanced to a total depth of 12 feet bgs. Groundwater was encountered at 5.5 feet bgs. Petroleum hydrocarbon impacts were observed form 4 to 7 feet bgs.

Soil Boring Six (BH-4): From the surface to 3 feet bgs was brown gravelly silt with some cobbles. Below this, moist, dark brown and grayish silty sand was encountered to a depth of 4.5 feet. From 4.5 to 10 feet bgs was wet brownish gray silt with some fine sand. Fine to medium silty sand was encountered from 10 to 11.5 feet bgs. Below this was approximately 6 inches of wet, grayish brown silt. The boring was advanced to a total depth of 12 feet bgs. Groundwater was encountered at 4.5 feet bgs. Petroleum hydrocarbon impacts were observed from 3 to 11.5 feet bgs.

Soil Boring Seven (BH-4a): From the surface to 2 feet bgs was moist, brown, fine sand with silt. Below to 4.5 feet bgs was moist, fine, brown sand with silt. From 4.5 to 8.5 feet bgs wet, dark brown to grayish brown silt with fine sand was encountered. Below this, was a 6-inch layer of fine to medium, gray, silty sand. From 8.5 to 11 feet was gray silty sand with beds of 1- to 2- inch thick stiff silt. Below this, to a depth of 14 feet was stiff, brownish gray silt with a 3- to 4-inch thick interbed of fine sand. Wet, brown, fine to medium silty sand was encountered for 14 to 26 feet. From 26 to 36 feet bgs, dry, very stiff, brown silt with trace clay and organics was encountered. The boring was advanced to a total depth of 26 feet. Groundwater was encountered at 4.5 feet bgs. Petroleum hydrocarbon impacts were observed from 3 to 13 feet bgs.

Soil Boring Eight (BH-5): The first 1-foot of soil was gravelly silt with some cobbles. Below this, to a depth of 10 feet bgs, dry, brown, fine, silty sand with trace gravel was encountered. Soil moistened with depth. At 10 feet bgs, a 6-inch bed of wet, gray, stiff silt was encountered. Below this was wet, fine to medium, gray sand to a depth of 12 feet bgs. The boring was advanced to a total depth of 12 feet bgs. Groundwater was encountered at approximately 4.5 feet bgs. Petroleum hydrocarbon impacts were observed from 4.5 to 12 feet bgs.

Soil Boring Nine (BH-6): The first 1-foot of soil was gravelly silt with some cobbles. Dry, fine, brown and black sand was encountered from 2 to 4 feet bgs. Below this, to a depth of 6 feet bgs was wet, gray, sandy silt. From 6 to 11 feet bgs, fine, wet, dark gray to black sand with silt was encountered. Below this was wet, gray, fine to medium, sand with some silt. A 2-inch interbed of stiff gray silt was present just below 10 feet bgs. The boring was advanced to a total depth of 11 feet bgs. Groundwater was first encountered at 4.5 feet bgs. Petroleum hydrocarbon impacts were observed from 4 to 11 feet bgs.

Soil Boring Ten (BH-7): The first 1.5 feet of soil was gravelly silt with some cobbles. Below this, dry, dark gray to grayish brown, fine, silty sand with grace coarse gravel was encountered to a depth of 4.5 feet. A 6-inch layer of dark gray, fine to medium sand was encountered below this. From 5 to 7.5 feet bgs, wet, blackish gray, fine sand was present. Below this, from 7.5 to 10 feet bgs, wet, gray, stiff silt was encountered. An interbed of swirling, light brown to cream colored, silt sized grains was observed at 11 feet bgs.

Soil Boring Eleven (BH-8): Dark brown silty fine sand and some coarse gravel was present in the first 6 feet of the boring. Below this was a 1-foot layer of wet, gray, stiff silt. From 7 to 9 feet bgs, wet, fine, loose gray, silty sand was encountered. Below this

was a 1- to 2-inch layer of stiff, gray silt. From 9 to 11.5 feet bgs wet, gray, fine silty sand was encountered. Below this was a 6-inch layer of wet, grayish brown, stiff silt. The boring was advanced to a total depth of 12 feet bgs. Groundwater was encountered at 4 feet bgs. Petroleum hydrocarbon impacts were observed form 3 to 12 feet bgs.

Soil Boring Twelve (BH-9): The first 3 feet bgs consisted of brown fine silty sand with some gravel. From 3 to 5 feet bgs was moist, brown fine sand with silt. Below this, wet dark gray silt with fine sand was encountered to a depth of 7 feet bgs. From 7 to 11 feet bgs was wet, dark, blackish gray silt with fine sand. An interbed of swirling, light brown to cream colored, silt sized grains was observed at 9 feet bgs. Below this was 1-foot of wet, dark gray, fine sand with silt. The boring was advanced to a total depth of 12 feet bgs. Groundwater was encountered at 4 feet bgs. Petroleum hydrocarbon impacts were observed from 5 to 12 feet bgs.

Soil Boring Thirteen (BH-10): From the surface to 3 feet bgs, dry, brown, stiff silt with trace angular gravel was encountered. From 3 to 6 feet bgs was fine to medium, brown sand with trace silt. Below this was a 1-foot layer of wet, gray, stiff silt. From 7 to 9.5 feet bgs, wet, gray, loose, fine silty sand was encountered. Below this was a 6-inch layer of wet, gray, stiff silt. From 10 to 12 feet bgs was wet, gray, stiff, fine silty sand coarsening with depth. The boring was advanced to a total depth of 12 feet bgs. Groundwater was encountered a 4 feet bgs. Petroleum hydrocarbon impacts were observed from 3 to 12 feet bgs.

Soil Boring Fourteen (BH-10a): The initial 4 feet of the boring consisted of brown fine sand with trace silt. Below this, wet, gray, loose, fine silty sand was encountered to a depth of 9 feet bgs. From 9 to 11 feet bgs was wet, gray, stiff silt with a 6-inch interbed of loose fine sand. Below this was 1 foot of wet, loose, fine sand with trace silt. The boring was advanced to a total depth of 12 feet bgs. Groundwater was encountered at 4 feet bgs. Petroleum hydrocarbon impacts were observed from 4 to 10 feet bgs.

Soil Boring Fifteen (BH-10b): From the surface to 3 feet bgs was dry, brown, stiff silt. Below this, to a depth of 5 feet bgs, dry, brown, fine silty sand was encountered. From 5 to 8 feet bgs was fine to medium sand. The boring was advanced to a depth of 8 feet bgs. Groundwater was encountered at 5 feet bgs. Petroleum hydrocarbon impacts were observed from 5 to 8 feet bgs.

Soil Boring Sixteen (BH-10c): From the surface to 7 feet bgs, brown, fine silty sand with trace fine gravel was encountered. Soil became gray with depth. The boring was

advanced to a total depth of 7 feet bgs. Groundwater was encountered at 5 feet bgs. Petroleum hydrocarbon impacts were observed from 5 to 7 feet bgs.

Soil Boring Seventeen (BH-10d): From the surface to 7 feet bgs, brown, fine silty sand with trace fine gravel was encountered. Soil became gray and increasingly silty with depth. The boring was advanced to a total depth of 7 feet bgs. Groundwater was encountered at 4 feet bgs. Petroleum hydrocarbon impacts were observed from 2 to 7 feet bgs.

Soil Boring Eighteen (BH-10e): From the surface to 7 feet bgs, brown, fine silty sand with trace fine gravel was encountered. Soil became gray and increasingly silty with depth. The boring was advanced to a total depth of 7 feet bgs. Groundwater was encountered at 4 feet bgs. Petroleum hydrocarbon impacts were observed from 4 to 7 feet bgs.

Soil Boring Nineteen (BH-10f): The initial 4 feet of the boring consisted of dry, brown, fine silty sand. Below this was a 6-inch bed of dry, stiff, brown silt. From 3.5 to 4.5 feet bgs was wet, gray, fine silty sand. Below this was wet, gray, stiff silt. The boring was advanced to a total depth of 7 feet bgs. Groundwater was encountered at 4 feet bgs. Petroleum hydrocarbon impacts were observed from 4 to 7 feet bgs.

Soil Boring Twenty (Bh-10g): From the surface to 8 feet bgs, brown fine silty sand with some gravel was encountered. An interbed of swirling, light brown to cream colored, silt-sized grains was observed at 6 feet bgs. From 8 to 16 feet bgs, wet, brown, fine silty sand with stiff silt interbeds was encountered. The boring was advanced to a depth of 16 feet bgs. Groundwater was encountered at 4 feet bgs. Petroleum hydrocarbon impacts were not observed at this boring location.

6.3.1 Soil Sample Collection and Analysis

Samples were collected using a continuous-drive (“Macro-Core®”) soil sampling system. The sampler used was a stainless-steel, 4-foot long, 1.5-inch diameter, piston-operated sampler with a positive release system. A polyvinyl chloride (PVC) liner was placed in the sample barrel prior to advancement. Soils were contained in the PVC liner for lithologic description (“logging”) and selection of soil samples for chemical analysis. The soils were logged over the entire length of the boring. Soils were described using ASTM D2487 – *Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)* and recorded on field boring logs.

Soil samples for chemical analysis were collected in a manner consistent with the ARCADIS *Surface and Subsurface Soil Sampling Using Manual Methods* standard operating procedure (SOP) (Attachment B). The collected soil cores were inspected and field-screened for the presence of petroleum hydrocarbons. Field screening was accomplished by hydrophobic dye testing according to the ARCADIS *Field Screening for NAPL using Hydrophobic Dyes* SOP (Attachment C) and inspection for volatile organic compounds (VOCs) via a photoionization detector (PID) instrument with a 10.2 eV lamp. The field screening observations, including PID readings and other pertinent data, were recorded on the boring logs.

Soil sample were collected based on field screening results. Samples were collected from the 1-foot interval containing soils with the most positive indication of petroleum hydrocarbons as based on field screening results or from the 1-foot interval directly above the water table (the "capillary fringe"). Soil samples for VOC analysis were collected and preserved using EPA Method 5035A - *Closed-System Purge-and-Trap and Extraction for Volatile Organics in Soil and Waste Samples*. Samples were placed in laboratory-provided containers and stored in an ice-chilled cooler prior to delivery to the analytical laboratory.

The soil samples were analyzed within allowable holding times for the following parameters:

- Gasoline range organics (GRO) by NWTPH-Gx method
- Diesel range organics (DRO) and heavy oil range organics (HRO) by NWTPH-Dx method
- Volatile petroleum hydrocarbons (VPH) by VPH method
- Extractable petroleum hydrocarbons (EPH) by EPH method
- Benzene, toluene, ethylbenzene, total xylenes, and naphthalene (BTEXN) by EPA Method 8260
- Polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270C
- Total organic carbon (TOC) by dichromate extraction (Walkley-Black method)
- Particle size analysis by ASTM D6913

- Soil Moisture Content by ASTM D2216

6.3.2 Soil Sample Analytical Results

A total of eight soil samples from five boring locations were submitted for laboratory analysis. Analytical results are as described below:

- BH-1b - A soil sample was collected at 3 feet bgs. COCs were not detected above laboratory method reporting limits (MRLs) for BTEX, naphthalene, DRO, HRO, or GRO.

- BH-3 - A soil sample was collected at 2.5 feet bgs. Benzene was detected above the MTCA Method A Soil Cleanup Level (CL) with a concentration of 0.140 milligram per kilogram (mg/kg). All other COCs were not detected above their respective MTCA Method A Soil CLs.

- BH-4 - A soil sample was collected at 3 feet bgs. Benzene and xylenes were detected above MTCA Method A soil CLs at concentrations of 0.574 and 150 mg/kg, respectively. GRO was also detected at 2,880 mg/kg. All other COCs were not detected above their respective MTCA Method A Soil CLs..

- BH-4a - A soil sample was collected at 2.5 feet bgs. BTEX were detected above MTCA Method A CLs in this sample. Benzene was detected at a concentration of 20.7 mg/kg, ethylbenzene at 51.2 mg/kg, toluene at 109 mg/kg, and xylenes at 523 mg/kg. GRO was also detected above the MTCA Method A CL at 6,430 mg/kg. All other COCs were not detected above their respective MTCA Method A Soil CLs.

- BH-7 - A soil sample was collected a 2 feet bgs. Benzene was detected above the MTCA Method A CL at 0.0571 mg/kg. GRO was also above the MTCA Method A CL at 35.1 mg/kg. All other COCs were not detected above their respective MTCA Method A Soil CLs.

- BH-10 - A soil sample was collected at 3 feet bgs. COCs were not detected above MTCA Method A CLs for BTEX, naphthalene, DRO, HRO, or GRO.

- BH-10c - A soil sample was collected at 2 feet bgs. Benzene was detected above the MTCA Method A CL at 0.195 mg/kg. All other COCs were not detected above their respective MTCA Method A Soil CLs.

- BH-10f - A soil sample was collected at 3 feet bgs. COCs were not detected above their respective MRLs for BTEX, naphthalene, DRO, HRO, or GRO.

Grain size analysis identified the subject soil and sandy silt to silty sand. Complete soil laboratory analytical results are included as **Appendix D**.

6.4 Groundwater Sample Collection and Analysis

Samples for evaluation of remediation through natural attenuation (RNA) were collected concurrent with the soil investigation. The RNA samples were collected from existing wells MW-1, MW-8 and MW-30. These wells were selected based on their proximity to the current LNAPL groundwater plume and lack of measureable LNAPL. The samples were collected as described in the ARCADIS *Standard Groundwater Sampling for Monitoring Wells* SOP (Attachment D). Samples were collected using low-flow purging and sampling techniques. One duplicate sample was collected for data quality control purposes. Dissolved samples were field-filtered using a 0.45-micron (µm) capsule filter. The following field parameters were measured at each well following completion of purging but prior to sampling using a Hanna HI 9828 portable multi-parameter water quality meter:

- pH
- Turbidity
- Specific conductance
- Temperature
- Oxidation-reduction potential (ORP)
- Dissolved oxygen

6.4.1 Groundwater Sample Analysis

Collected groundwater samples were submitted to an Ecology-certified laboratory for analysis. Chain-of-custody procedures were followed from the time the samples were collected until the time the samples were relinquished to the laboratory. The soil samples were analyzed within allowable holding times for the following parameters:

- GRO by NWTPH-Gx method
- DRO and HRO by NWTPH-Dx method
- VPH by NWTPH/VPH method
- EPH by NWTPH/EPH method
- BTEXN by EPA Method 8260
- PAHs by EPA Method 8270C
- Methane, ethane, and ethene by EPA Method RSK-175
- Dissolved chloride, nitrate, and sulfate by EPA Method 300.0
- Dissolved ferrous iron (Fe^{2+}) by Standard Method (SM) 3500 Fe D
- Dissolved total alkalinity by EPA Method 310.1

The laboratory will analyze method blanks in conjunction with the groundwater samples. The analytical laboratory will report the method detection limit (MDL) and MRL in conjunction with the sample analytical results. The laboratory will endeavor (as feasible) to ensure that the MRL is less than the analyzed constituent's respective MTCA Method A Cleanup Level for Groundwater (if codified).

6.4.2 Groundwater Sample Analytical Results

Groundwater was submitted for analysis from wells MW-1 and MW-8. GRO were detected in MW-1 above the MTCA Method A Cleanup Level for Ground Water at a concentration of 2,450 µg/L. All other COCs were not detected above their respective MTCA Method A groundwater CLs in MW-1. All COCs were below their respective MRLs in the groundwater sample collected from MW-8. Complete groundwater laboratory analytical results are included as **Appendix E**.

6.5 Management of Investigation Derived Wastes

Waste water generated during the field activities were contained in Department of Transportation-approved 55-gallon steel drums. The investigation-derived waste (IDW)

was appropriately labeled and stored on site pending disposal. Following receipt of laboratory analytical data, the soil and water IDW will be transported off site for proper disposal.

7. Timeline for Natural Attenuation

ARCADIS used the U.S. EPA BIOSCREEN Natural Attenuation Decision Support System Model (EPA BIOSCRN Version 1.4, 1997) to simulate transport and remediation through natural attenuation (RNA) of dissolved hydrocarbons at the site. The model is based on the Domenico analytical solute transport model and has the ability to simulate dominant biodegradation processes of advection, dispersion, adsorption, aerobic decay, and anaerobic reactions. The model is designed to simulate biodegradation by both aerobic and anaerobic reactions. BIOSCREEN uses an analytical solute transport model with two options for simulating in-situ biodegradation: (1) first-order decay and (2) instantaneous reaction. The model will predict the maximum extent of plume migration, which may then be compared to the distance to potential points of exposure.

Monitoring Well A1/VE1 was selected as the center of the “Source Area” for BIOSCREEN modeling purposes (**Figure 7**). Benzene was selected to be modeled as the Site’s primary constituent of concern (COC).

The BIOSCREEN model requires a data input set that is specific to a well location, in order to evaluate groundwater solute transport. Groundwater monitoring data for Source Area is not available as wells containing LNAPL are not sampled. The effective solubility of benzene was used to estimate the dissolved benzene concentrations in groundwater where LNAPL is present on the water table. Site monitoring wells without LNAPL did not contain benzene above detection limits; therefore, the MRL for benzene was assumed an appropriate concentration for these monitoring wells. The derived concentrations were used to (1) model the contaminant concentration in the Source Area and (2) provide field data for comparison to the model.

7.1 BIOSCREEN Model Parameters

7.1.1 Hydrogeology

- Hydraulic conductivity (K) of 1.7×10^{-3} centimeters per second (cm/s). This value is based on the results of hydraulic property testing at the site.

- Hydraulic gradient (i) of 0.01 ft/ft. This value is based the hydraulic gradients calculated from groundwater potentiometric contours developed as part of groundwater monitoring activities and reported in previous site reports.

- Effective porosity (n) of 0.3 (30 percent). This value is based on Site observations of the subsurface lithology and represents a typical value for silty sands.

- Seepage velocity (Vs) of 58.6 feet per year. This value is calculated by BIOSCREEN using the site-specific hydrogeologic parameters.

7.1.2 Dispersion

Dispersion is calculated by BIOSCREEN using a site groundwater plume length (Lp) of 420 feet. The plume length was calculated based on previous groundwater monitoring data for the Site and represents the approximate distance from the Source Area.

7.1.3 Adsorption

Retardation factor (R) values for the model were taken from the Practical Guide to Groundwater and Solute Transport Modeling (1996) presented below.

7.1.4 Biodegradation

A half-life (t-half) value for benzene was taken from Practical Guide to Groundwater and Solute Transport Modeling (1996) presented below.

7.1.5 Soluble Mass

The soluble mass of the LNAPL in the source area was calculated using depth and area of LNAPL observed in soil borings during site investigations. Using the volume of the source area, porosity of the source materials, and density of fuel, a source soluble mass of $1.3x10^5$ kilograms (kg) , or approximately 146 tons, was estimated.

7.1.6 General

The model length of 1,000 feet was based on the approximate distance between the Source Area and southwest limits of the Site. The model width of 700 feet is based on the distance between the Source Area and site monitoring wells. A model simulation time of 20 years is assumed. Under a seepage velocity of 58.6 feet per

year, dissolved solutes could not migrate more than 1,100 feet in 20 years. The BIOSCREEN model outputs and supporting data is presented in **Appendix F**.

8. Current Petroleum Hydrocarbon Impacts

8.1 Soil

During the site investigation petroleum hydrocarbon impacts were observed in soil borings. LNAPL was found to be present in 18 of the 20 borings advanced into the investigation area. Soil boring locations and the inferred impacted area is depicted in **Figure 4**.

8.2 Groundwater

Groundwater sampling conducted during the site investigation revealed petroleum hydrocarbon impacts to groundwater in MW-1. LNAPL is present on the groundwater table in the investigation area and extends to the southwest. **Figure 5** illustrates the potentiometric surface of the Manhole 34 Site as measured in February 2011. A LNAPL thickness contour map is included as **Figure 6** as measured in February 2011.

8.3 Surface Waters

Annual average rainfall is approximately 7 inches in Sunnyside, Washington. Surface water at the Site is limited to runoff from precipitation. The Site is predominantly paved; thus, infiltration of surface water into the groundwater table is unlikely. Surface water, surface drainage, floodplains, wetlands and area of sediment deposition are not applicable at this Site. Therefore, no known impacts to surface waters have occurred due to the past operation of the Site as a retail gasoline station.

8.4 Ecological and Natural Resources

The Site is located in a commercially developed area of Sunnyside, Washington. Because there are no contiguous undeveloped lands in the vicinity of the Site, this area is not considered to be suitable habitat to support native vegetation and/or wildlife. Furthermore, traffic corridors and similar features surrounding the Site further reduce the potential use of the area by wildlife.

8.5 Cultural and Archaeological Resources

There is no indication that cultural and/or archaeological resources are present at the Site. Therefore, no known impacts to cultural and archaeological resources have occurred due to retail gasoline station operations at the Site.

9. Conclusions

The site investigation performed by ARCADIS indicates the following:

- Range-of-influence testing determined that the amount of drawdown was directly related to the horizontal distance between the pumping well and the observation wells. Monitoring well MW-30 experienced the greatest drawdown effect, calculated to be 0.896 foot. Well MW-7 experienced 0.239 foot of drawdown, and MW-4 experienced 0.148 foot of drawdown. These results indicate a ROI with respect to dewatering capabilities to be nonlinear. The range of influence is best described logarithmically with respect to horizontal distance and vertical drawdown of the water table. Further, analysis of the distance-drawdown data for time equal to 76 minutes indicates that the ROI while extracting fluid from NT-A2 is approximately 88 feet. that extracting fluid from NT-A2 at 40 gpm

- Hydraulic property testing consisted of the analysis of drawdown data collected in MW-4 while extracting fluid from RW-1 at a discharge rate of 4.5 gpm. Analysis of the drawdown data resulted in a transmissivity of 104 $feet^2$ per day and a storativity of 2.3 $x10^{-3}$. Assuming an aquifer thickness of 13 feet based on the well log of MW-4, a hydraulic conductivity of 8.0 feet per day is calculated.

- Soil borings advanced into the investigation area revealed impacts along the western and southern boundaries of the investigation area. COC's are highest in concentration near the center of the investigation area (BH-4 & BH-4a). The depth of impacted soil was found to be from 3 to 11 feet bgs. Petroleum hydrocarbon impacts were not found along the northern portion of the western boundary (BH-10f).

- Groundwater monitoring performed during the Site investigation revealed petroleum hydrocarbon impacts in MW-1. Quarterly groundwater monitoring has shown LNAPL to be present in A1/VE1, MW-4, MW-5, MW-7, MW-10, MW-33 and DMW-3.

- Based on the transport and fate analysis conducted using the BIOSCREEN model, the contaminant mass of the source will only be reduced by 1.1 percent in 20 years. BIOSCREEN predicts the benzene concentrations (1000 feet downgradient) to be approximately 6.5 mg/L after the 20-year simulation period.

10. References

ARCADIS, U.S. (ARCADIS), 2011. Site Review Work Plan for Manhole 34 Facility, March 9.

SEACOR International, Inc. (SEACOR), 1994. *Interim Actions and Remedial Investigation/Feasibility Study, Manhole 34 Facility, Sunnyside Washington*; November 9.

Spitz, K., Moerno, J., 1996, *A Practical Guide to Groundwater and Solute Transport Modeling*.

The Washington State Department of Natural Resources Map *Geologic Map of the East Half of the Toppenish 1:10,0000 Quadrangle, Washington* compiled by J. Shuster in 1994.

Tables

ARCADIS

TABLE 1
Select Soil Analytical Data
Limited Site Investigation Report
Manhole 34 Facility
N 6th Street & Yakima Valley Highway, Sunnyside, WA

						Volatile Organic Hydrocarbons				
Sample ID	**Date**	**Depth [1]**	**GRO [2]**	**DRO [3]**	**HRO [4]**	**Benzene [5]**	**Toluene**	**Ethylbenzene**	**Xylenes (Total)**	**Napthalene**
BH-1b-3	5/9/2011	3.0	ND [8]	ND	ND	ND	ND	ND	ND	ND
Bh-3-2.5	5/9/2011	2.5	27.7	ND	ND	0.140	0.551	0.354	1.94	0.350
BH-4-3	5/10/2011	3.0	2880	840	69.4	0.574	2.78	1.47	150	ND
BH-4a-2.5	5/10/2011	2.5	6430	634	1390	20.7	109	51.2	523	ND
BH-7-2	5/10/2011	2.0	35.1	ND	ND	0.0571	ND	ND	ND	0.440
BH-10-3	5/11/2011	3.0	32.4	1140	61.7	ND	ND	ND	ND	ND
Bh-10c-2	5/11/2011	2.0	19.2	ND	ND	0.195	0.565	0.0265	1.44	ND
BH-10f-4.5	5/11/2011	4.5	ND	ND	ND	ND	ND	ND	ND	ND
MTCA Method A Soil Cleanup Levels[6]			**100[7]/30**	**2,000**	**2,000**	**0.03**	**7**	**6**	**9**	**5**

Notes:

(1) Depth of sample in feet below ground surface (bgs)
(2) GRO = Gasoline range organics by Method NWTPH-Gx
(3) DRO = Diesel range organics by Method NWTPH-Dx
(4) HRO = Heavy oil range organics by Method NWTPH-DX
(5) All concentrations are presented in milligrams per kilogram (mg/kg)
(6) Ecology Model Toxics Control Act (MTCA) Method A Soil Cleanup Levels for Unrestricted Land Uses, WAC Chapter 173-340-900, Table 740-1
(7) Soil Cleanup Level for gasoline mixtures (GRO) without benzene and the total of toluene, ethylbenzene, and xylenes are less than 1% of the gasoline mixture
(8) ND = Not detected at or above laboratory method reporting limit (MRL) for the given analysis

Indicates a concentration in excess of the respective MCTA Method A Soil Cleanup Level for Unrestricted Land Uses

Prepared By: LS Date: 9/20/2011

Checked By: TFM Date: 9/26/2011

TABLE 2
Soil Analytical Data
Polycyclic Aromatic Hydrocarbons
Manhole 34 Facility
North 6th Street and Yakima Valley Highway, Sunnyside, WA

Sample ID	Date	Depth [1]	Acenaphthene	Acenaphthylene	Anthracene	Benzo (a) anthracene	Benzo (a) pyrene	Benzo (b) fluoranthene	Benzo (ghl) perylene	Benzo (k) fluoranthene	Chrysene	Dibenzo (a,h) anthracene	Fluoranthene	Fluorene	Indeno)1,2,3-cd) pyrene	1-Methylnaphthalene	2-Methylnaphthalene	Naphthalene	Phenathrene	Pyrene
BH-1b-3	5/9/2011	3.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bh-3-2.5	5/9/2011	2.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0709	0.126	0.109	ND	ND
BH-4-3	5/10/2011	3.0	0.0218	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0133	ND	ND	5.77	10.9	12.5	0.188	ND
BH-4a-2.5	5/10/2011	2.5	0.0137	ND	ND	ND	ND	0.0169	0.0137	0.0169	0.0169	ND	0.0161	ND	ND	11.8	15.4	24.1	0.0540	0.0226
BH-7-2	5/10/2011	2.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0357	0.0531	0.0277	ND	ND
BH-10-3	5/11/2011	3.0	0.113	ND	0.219	0.0433	0.0170	0.0332	0.0116	ND	0.0286	ND	0.0749	0.206	ND	5.87	9.50	1.47	0.636	0.100
Bh-10c-2	5/11/2011	2.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BH-10f-4.5	5/11/2011	4.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MTCA Method A Soil Cleanup Levels [2]			— [3]	—	—	0.1	0.1	0.1	—	0.1	0.1	0.1	—	—	0.1	—	—	5	—	—

Notes:

(1) Depth of sample in feet below ground surface (bgs)

(2) Ecology Model Toxics Control Act (MTCA) Method A Soil Cleanup Levels for Unrestricted Land Uses, WAC Chapter 173-340-900, Table 740-1

(3) — No cleanup value established

Indicates a concentration in excess of the respective MCTA Method A Soil Cleanup Level for Unrestricted Land Uses

Prepared By: LS Date: 9/20/2011

TABLE 3
Soil Analytical Data
Volatile and Extractable Hydrocarbons
Manhole 34 Facility
North 6th Street and Yakima Valley Highway, Sunnyside, WA

			Volatile Petroleum Hydrocarbons								Extractable Petroleum Hydrocarbons						
Sample ID	Date	Depth [1]	C5-C6 Aliphatics	C6-C8 Aliphatics	C8-C10 Alphatics	C10-C12 Alphatics	C8-C10 Aromatics	C10-C12 Aromatics	C12-C13 Aromatics	Total VPH	C10-C12 Alphatics	C12-C16 Alphatics	C16-C-21 Alphatics	C21-C34 Alphatics	C12-C16 Aromatics	C16-C21 Aromatics	C21-C34 Aromatics
BH-1b-3	5/9/2011	3.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bh-3-2.5	5/9/2011	2.5	ND	ND	ND	ND	2.9	2.5	ND	ND	ND	ND	ND	ND	ND	ND	ND
BH-4-3	5/10/2011	3.0	ND	100	260	290	310	360	150	1500	39	39	26	6.2	34	6.5	ND
BH-4a-2.5	5/10/2011	2.5	47	180	310	310	740	510	210	2500	100	79	140	1100	110	45	480
BH-7-2	5/10/2011	2.0	ND	ND	ND	ND	7.2	4.5	ND	ND	ND	ND	ND	ND	ND	ND	ND
BH-10-3	5/11/2011	3.0	ND	ND	ND	ND	4.9	4.5	ND	ND	66	100	100	28	97	67	19
Bh-10c-2	5/11/2011	2.0	ND	ND	ND	ND	2.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BH-10f-4.5	5/11/2011	4.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:

(1) Depth of sample in feet below ground surface (bgs)

All concentrations are presented in milligrams per kilogram (mg/kg)

Prepared By: LS Date: 9/20/2011

Checked By: TFM Date: 9/26/2011

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TABLE 4
Select Groundwater Analytical Results
Limited Site Investigation Report
Manhole 34 Facility
N 6th Street & Yakima Valley Highway, Sunnyside, WA

Monitoring Well	Sample Date	GRO [1] (µg/L) [4]	DRO [2] (µg/L)	HO [3] (µg/L)	Volatile Organic Compounds						Alkalinity (mg/L)	Chloride (mg/L)	Nitrates (mg/L)	Sulfates (mg/L)	Methane (µg/L)
					Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (Total) (µg/L)	Napthalene (µg/L)	MTBE[8] (µg/L)					
MW-1	5/11/2011	2,450	1.27	ND	ND	ND	5.51	34.1	19.8	ND	500	54.6	5.8	148	0.68
MW-8	5/11/2011	ND	ND	ND	ND	ND	ND	ND	ND	ND	305	31.2	15.7	101	ND
MTCA Method A Cleanup Levels for Ground Water [6]		**800/ 1,000 [7]**	**500**	**500**	**5**	**1,000**	**700**	**1,000**	**160**	**20**	—	—	—	—	—

Notes:

(1) GRO - Gasoline Range Organics (GRO)
(2) DRO - Diesel Range Orgainc (DRO)
(3) HO - Heavy Oils (HRO)
(4) µg/L - micrograms per liter
(5) ND - Analyte not detected at or above the Method Detection Limit (MDL)
(6) Model Toxic Control Act (MTCA) Method A Cleanup Levels for Ground Water, WAC 173-340-900, Table 720-1
(7) GRO Cleanup Level of 1,000 µg/L when no detectable benzene is present in ground water

Prepared By: LS Date: 9/20/2011

Checked By: TFM Date: 9/26/2011

TABLE 5
Groundwater Analytical Data
Polycyclic Aromatic Hydrocarbons
Manhole 34 Facility
North 6th Street and Yakima Valley Highway, Sunnyside, WA

Sample ID	Date	Acenaphthene	Acenaphthylene	Anthracene	Benzo (a) anthracene	Benzo (a) pyrene	Benzo (b) fluoranthene	Benzo (ghl) perylene	Benzo (k) fluoranthene	Chrysene	Dibenzo (a,h) anthracene	Fluoranthene	Fluorene	Indeno)1,2,3-cd) pyrene	1-Methylnaphthalene	2-Methylnaphthalene	Naphthalene	Phenathrene	Pyrene
MW-1	5/11/2011	0.12	ND	0.012	0.059	0.042	0.067	0.030	0.022	0.057	ND	0.24	0.036	0.021	0.38	ND	0.74	ND	0.30
MW-8	5/11/2011	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.010	ND	ND	ND	0.032	ND	ND
MTCA Method A Groundwater Cleanup Levels[1]		—[2]	—	—	—	**0.1**	—	—	—	—	—	—	—	—	—	—	**160**	—	—

Notes:

(1) Ecology Model Toxics Control Act (MTCA) Method A Cleanup Levels for Groundwater, WAC Chapter 173-340-900, Table 720-1

(2) — No cleanup value established

(3) Analyzed by Method 8270C SIM

Prepared By: LS Date: 9/20/2011

Checked By: TFM Date: 9/26/2011

TABLE 6
Groundwater Analytical Data
Volatile and Extractable Hydrocarbons
Manhole 34 Facility
North 6th Street and Yakima Valley Highway, Sunnyside, WA

		Volatile Petroleum Hydrocarbons								Extractable Petroleum Hydrocarbons							
Sample ID	Date	C5-C6 Aliphatics	C6-C8 Aliphatics	C8-C10 Alphatics	C10-C12 Alphatics	C8-C10 Aromatics	C10-C12 Aromatics	C12-C13 Aromatics	Total VPH	C10-C12 Alphatics	C12-C16 Alphatics	C16-C-21 Alphatics	C21-C-34 Alphatics	C10-C12 Aromatics	C12-C16 Aromatics	C16-C21 Aromatics	C21-C34 Aromatics
MW-1	5/11/2011	230	570	150	440	120	390	110	2000	ND	ND	ND	ND	240	78	ND	ND
MW-8	5/11/2011	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:

All concentrations are presented in micrograms per liter (µg/L)

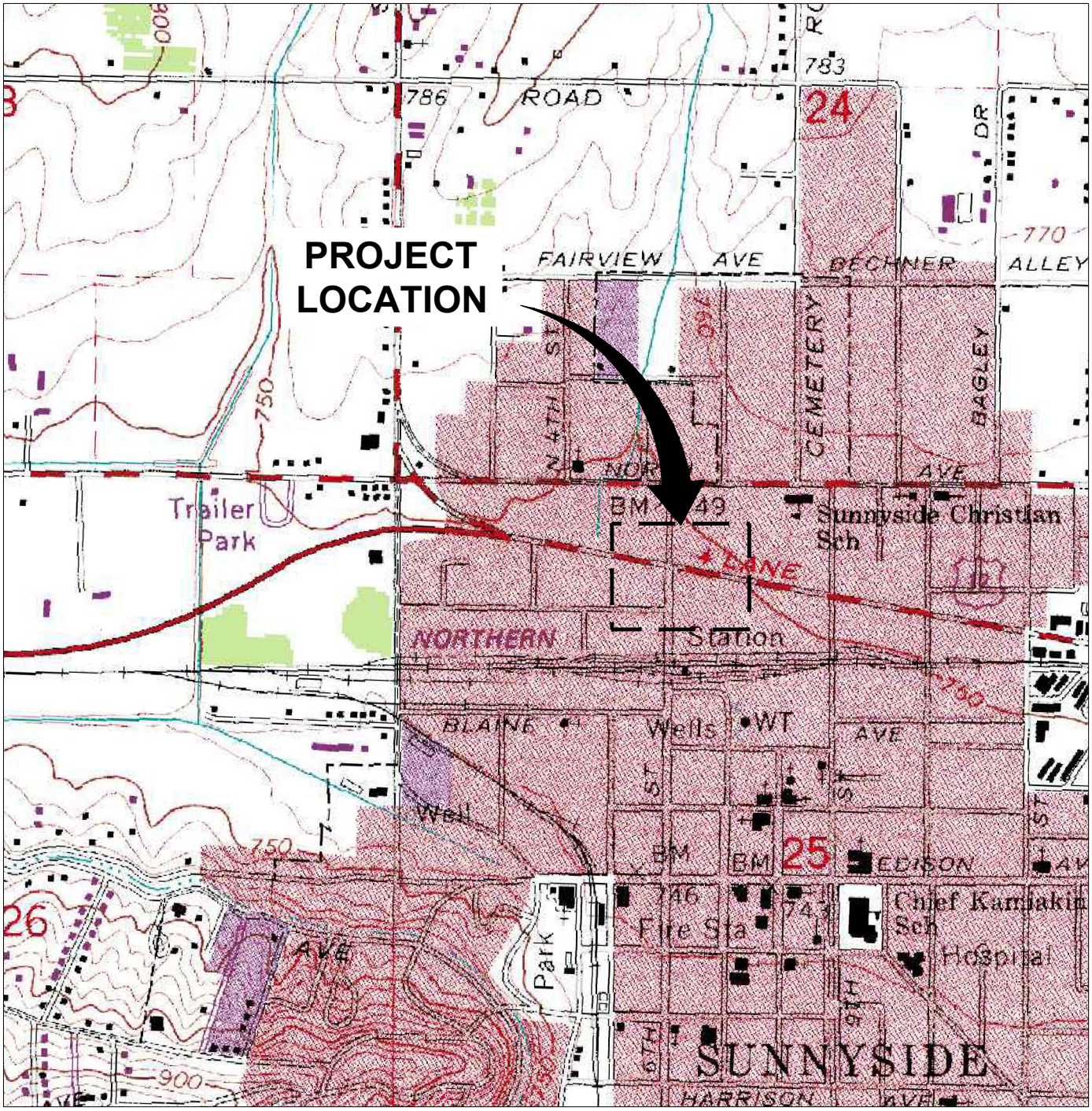
Analyzed by Methods NWTPH/VPH and NWTPH/EPH

ND = Not detected

Prepared By: LS Date: 9/20/2011

Checked By: TFM Date: 9/26/2011

Figures



REFERENCE: BASE MAP USGS 7.5. MIN. TOPO. QUAD. SUNNYSIDE, WA, 1978.

0 1000' 2000'

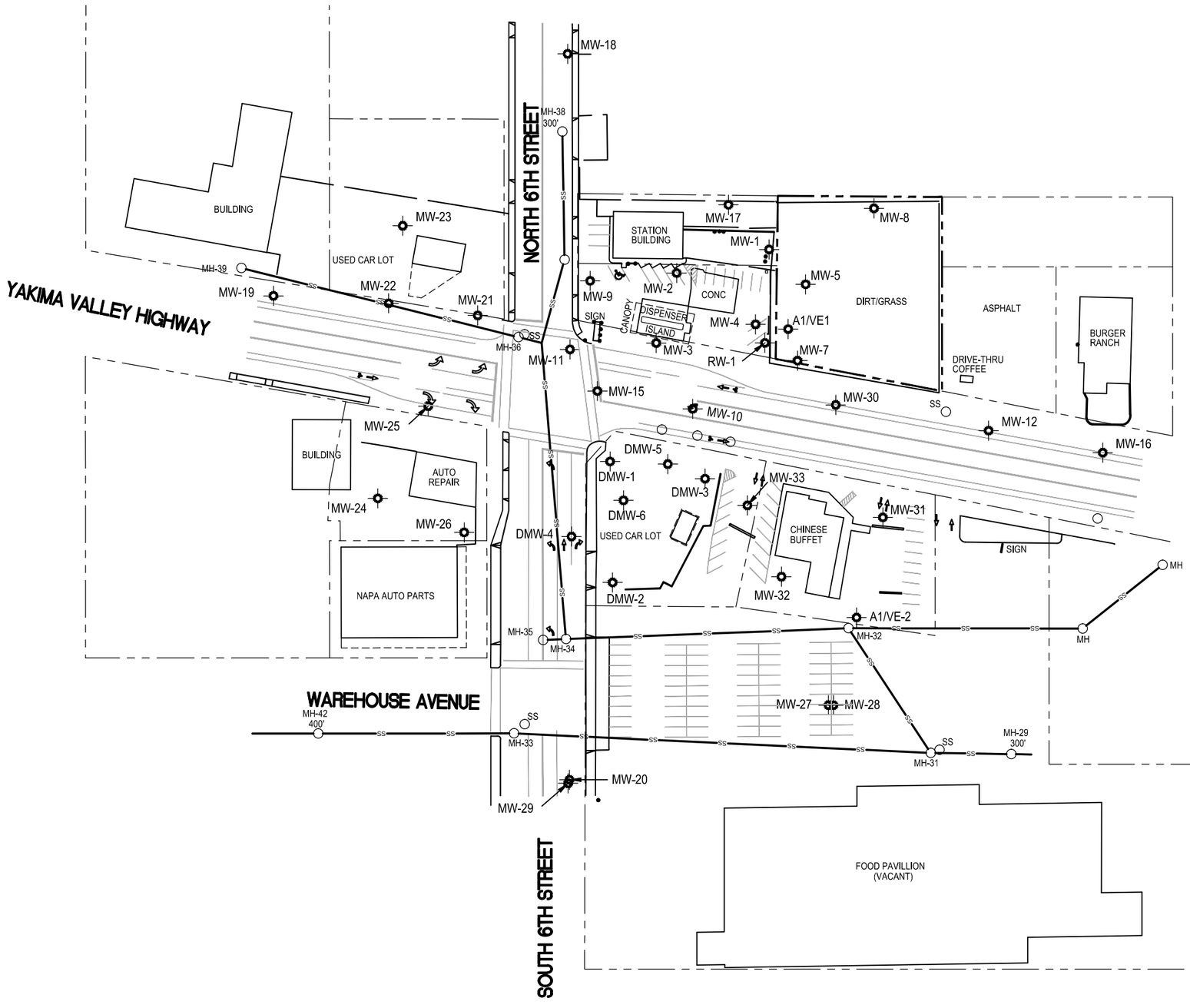
Approximate Scale: 1 in. = 2000 ft.

MANHOLE 34 FACILITY
NORTH 6TH STREET AND YAKIMA VALLEY HIGHWAY
SUNNYSIDE, WASHINGTON
LIMITED SITE INVESTIGATION REPORT

SITE LOCATION MAP

ARCADIS

FIGURE
1



LEGEND:

- PROPERTY LINE
- INVESTIGATION AREA (STC PROPERTY)
- MW-3 — GROUNDWATER MONITORING WELL LOCATION
- SS — UNDERGROUND SANITARY SEWER LINE
- MH — SANITARY SEWER MANHOLE

0 100' 200'

GRAPHIC SCALE

MANHOLE 34 FACILITY
NORTH 6TH STREET AND YAKIMA VALLEY HIGHWAY
SUNNYSIDE, WASHINGTON
LIMITED SITE INVESTIGATION REPORT

SITE PLAN WITH INVESTIGATION AREA

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FIGURE 2

STATION BUILDING

CONC

CANOPY

DISPENSER ISLAND

SIGN

BILLBOARD POSTS

DIRT/GRASS

ASPHALT

DRIVE-THRU COFFEE

SSMH

MW-1 MW-2 MW-3 MW-4 MW-5 MW-7 MW-8 MW-9 MW-10 MW-11 MW-12 MW-15 MW-17 MW-30

RW-1

BH-1 BH-1a BH-1b BH-2 BH-3 BH-4 BH-4a BH-5 BH-6 BH-7 BH-8 BH-9 BH-10 BH-10a BH-10b BH-10c BH-10d BH-10e BH-10f BH-10g

A1/VE1

LEGEND:

- PROPERTY LINE
- INVESTIGATION AREA
- MW-8 GROUNDWATER MONITORING WELL LOCATION
- BH-1a SOIL BORING LOCATION (MAY, 2011)
- UNDERGROUND SANITARY SEWER LINE
- SSMH SANITARY SEWER MANHOLE

0 25' 50'

GRAPHIC SCALE

MANHOLE 34 FACILITY
NORTH 6TH STREET AND YAKIMA VALLEY HIGHWAY
SUNNYSIDE, WASHINGTON
LIMITED SITE INVESTIGATION REPORT

BORING LOCATIONS (MAY 2011)

ARCADIS

FIGURE 3

STATION BUILDING

CONC

CANOPY

DISPENSER ISLAND

SIGN

BILLBOARD POSTS

DIRT/GRASS

ASPHALT

DRIVE-THRU COFFEE

SSMH

MW-1 MW-2 MW-3 MW-4 MW-5 MW-7 MW-8 MW-9 MW-10 MW-11 MW-12 MW-15 MW-17 MW-30

RW-1

BH-1 BH-1a BH-1b BH-2 BH-3 BH-4 BH-4a BH-5 BH-6 BH-7 BH-8 BH-9 BH-10 BH-10a BH-10b BH-10c BH-10d BH-10e BH-10f BH-10g A1/VE1

LEGEND:

- PROPERTY LINE
- INVESTIGATION AREA (STC PROPERTY)
- MW-8 GROUNDWATER MONITORING WELL LOCATION
- BH-1a SOIL BORING LOCATION (MAY, 2011)
- SS UNDERGROUND SANITARY SEWER LINE
- SSMH SANITARY SEWER MANHOLE
- INFERRED PETROLEUM HYDROCARBON IMPACTED AREA

0 25' 50'

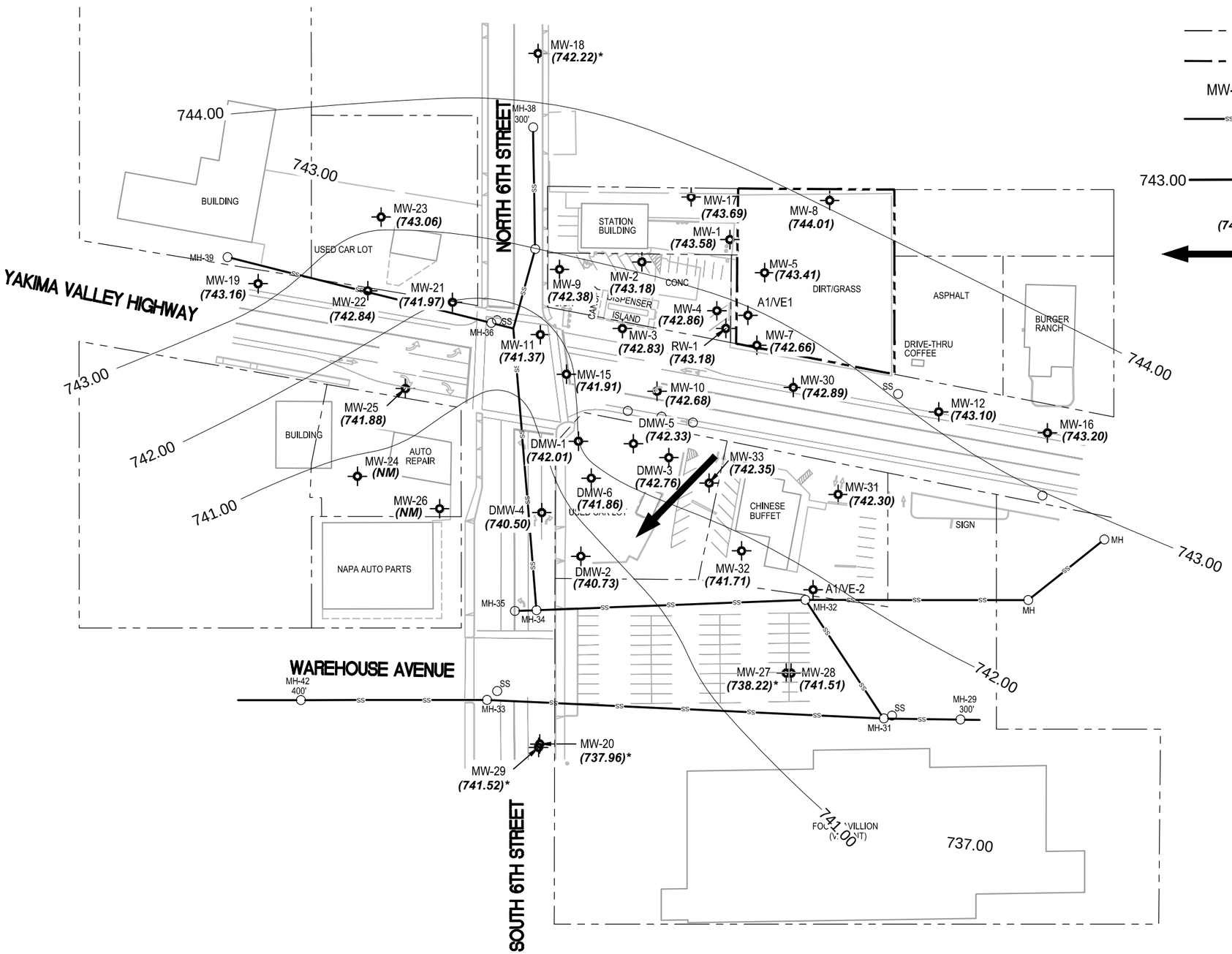
GRAPHIC SCALE

MANHOLE 34 FACILITY
NORTH 6TH STREET AND YAKIMA VALLEY HIGHWAY
SUNNYSIDE, WASHINGTON
LIMITED SITE INVESTIGATION REPORT

INFERRED PETROLEUM HYDROCARBON IMPACTED AREA

ARCADIS

FIGURE
4



LEGEND:

- PROPERTY LINE
- INVESTIGATION AREA (STC PROPERTY)
- MW-3 — GROUNDWATER MONITORING WELL LOCATION
- SS — UNDERGROUND SANITARY SEWER LINE
- MH — SANITARY SEWER MANHOLE
- 743.00 — GROUNDWATER SURFACE CONTOUR IN FEET ABOVE MEAN SEA LEVEL (MSL)
- (742.89) — GROUNDWATER SURFACE ELEVATION (MSL)
- INFERRED GROUNDWATER FLOW DIRECTION
- * DATA CONSIDERED ANOMALOUS (NOT USED IN CONTOURING)

0 100' 200'

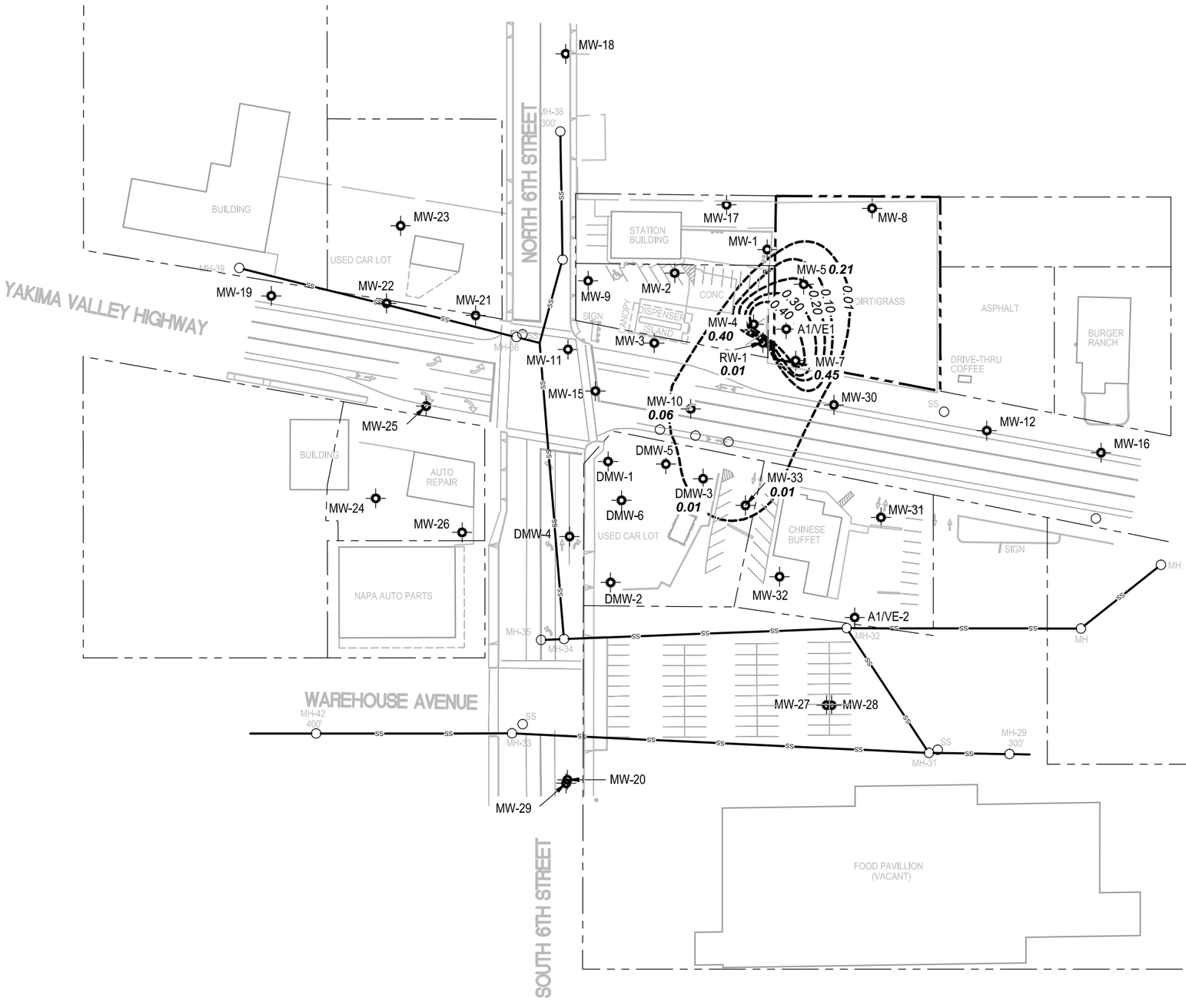
GRAPHIC SCALE

MANHOLE 34 FACILITY
NORTH 6TH STREET AND YAKIMA VALLEY HIGHWAY
SUNNYSIDE, WASHINGTON
LIMITED SITE INVESTIGATION REPORT

POTENTIOMETRIC SURFACE (FEBRUARY 15-17, 2010)

ARCADIS

FIGURE
5



LEGEND:

- PROPERTY BOUNDARY
- INVESTIGATION AREA (STC PROPERTY)
- MW-3 — GROUNDWATER MONITORING WELL LOCATION
- SS — UNDERGROUND SANITARY SEWER LINE
- MH — SANITARY SEWER MANHOLE
- LPH — LIQUID PHASE HYDROCARBONS
- 0.20 — LPH THICKNESS CONTOUR (FEET) (DASHED WHERE INFERRED)
- 0.04 — MEASURED LPH THICKNESS (FEET)

0 100' 200'

GRAPHIC SCALE

MANHOLE 34 FACILITY
NORTH 6TH STREET AND YAKIMA VALLEY HIGHWAY
SUNNYSIDE, WASHINGTON
LIMITED SITE INVESTIGATION REPORT

LPH THICKNESS CONTOUR MAP (FEBRUARY 15-17, 2011)

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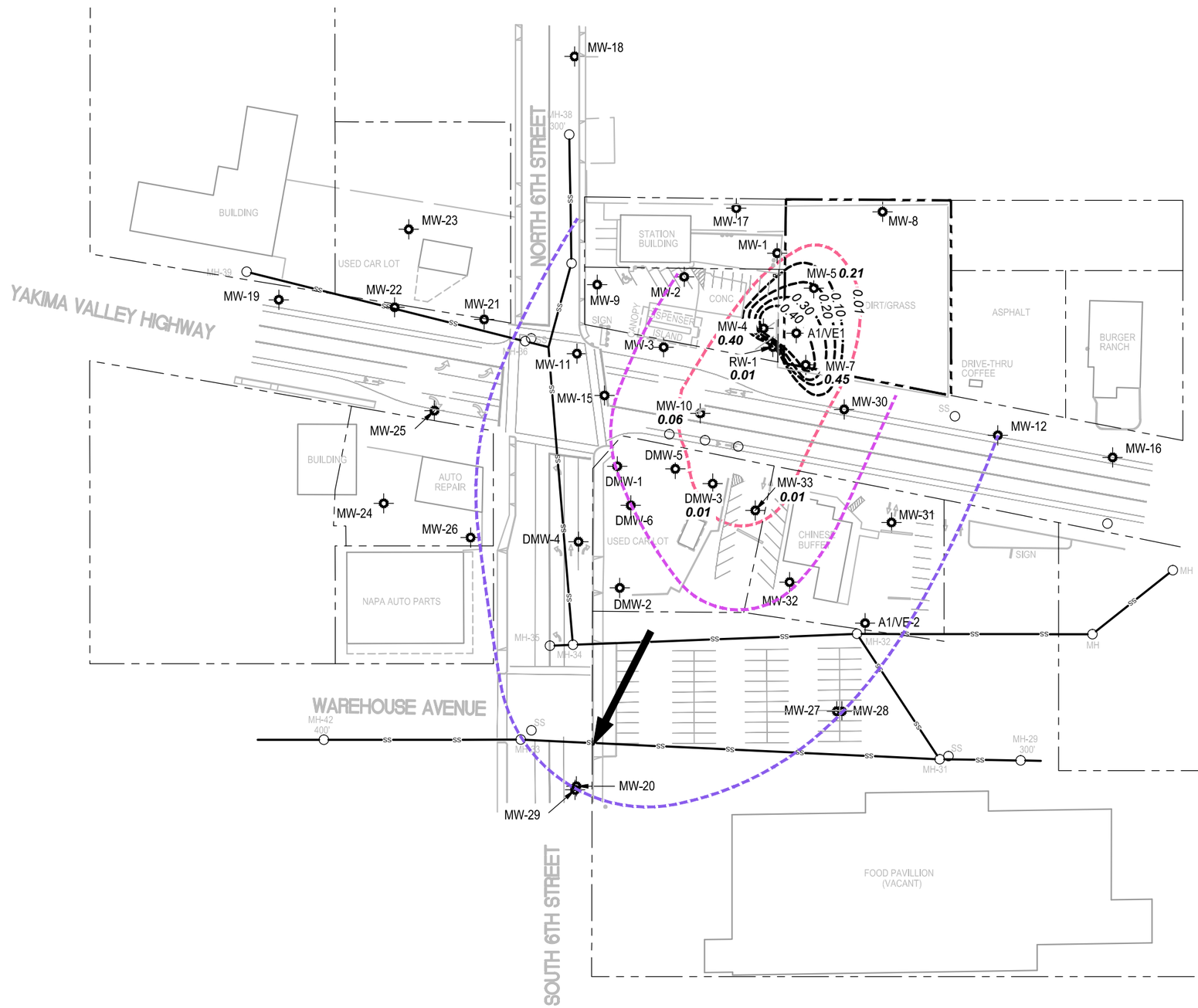
FIGURE 6



LEGEND:

- PROPERTY BOUNDARY
- INVESTIGATION AREA (STC PROPERTY)
- MW-3 — GROUNDWATER MONITORING WELL LOCATION
- SS — UNDERGROUND SANITARY SEWER LINE
- MH — SANITARY SEWER MANHOLE
- LPH — LIQUID PHASE HYDROCARBONS
- 0.20 — LPH THICKNESS CONTOUR (FEET) (DASHED WHERE INFERRED)
- 0.04 — MEASURED LPH THICKNESS (FEET)
- GROUNDWATER FLOW DIRECTION
- BENZENE 20.3 mg/L (BASED ON EPA SOLUBILITY OF BENZENE
- PQL = 0.20 mg/L
- ND <0.20 mg/L BENZENE

0 100' 200'

GRAPHIC SCALE

MANHOLE 34 FACILITY
NORTH 6TH STREET AND YAKIMA VALLEY HIGHWAY
SUNNYSIDE, WASHINGTON
LIMITED SITE INVESTIGATION REPORT

PLUME AND SOURCE AREA FOR BIOSCREEN CALCULATION

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FIGURE 7

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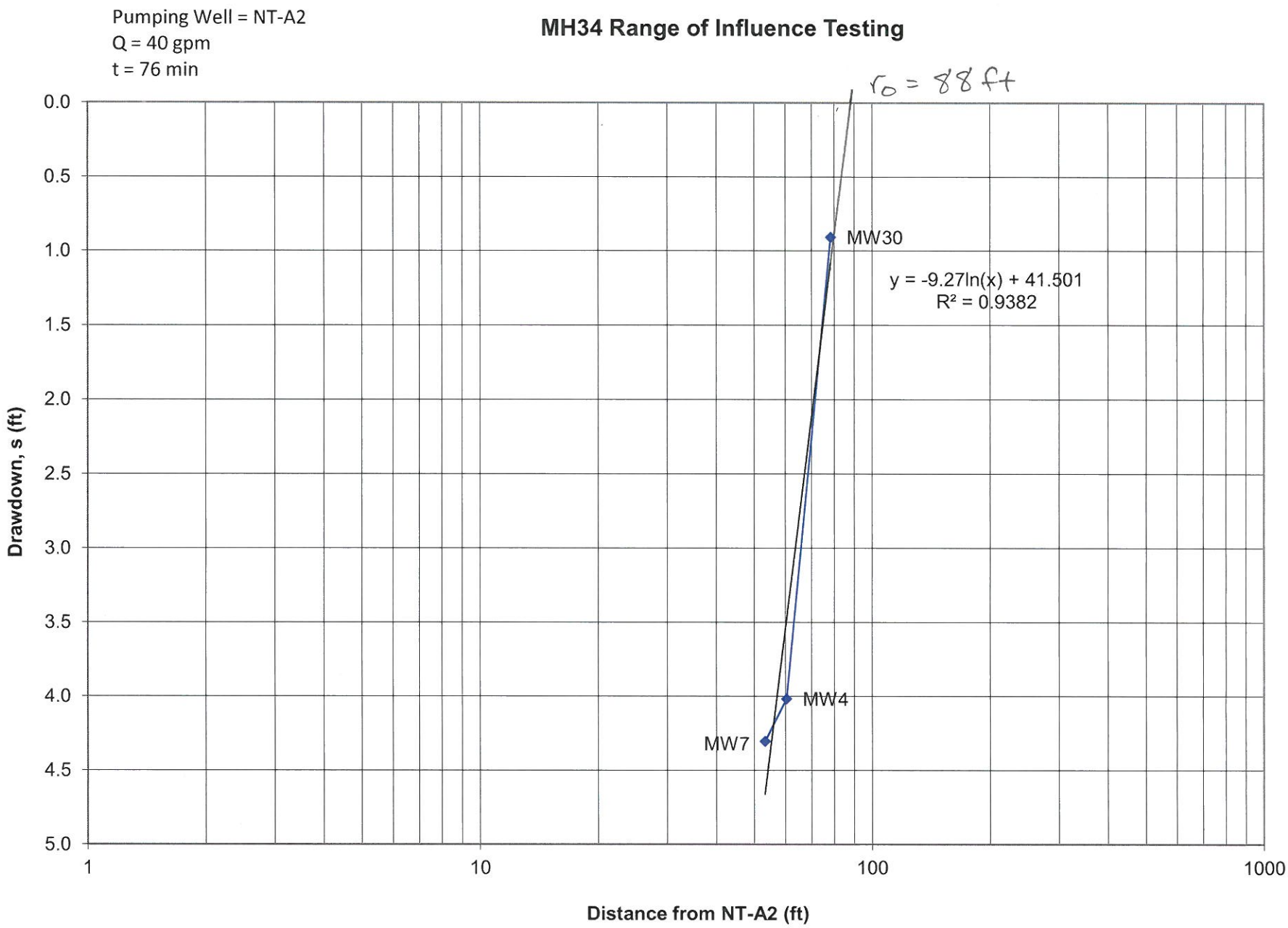
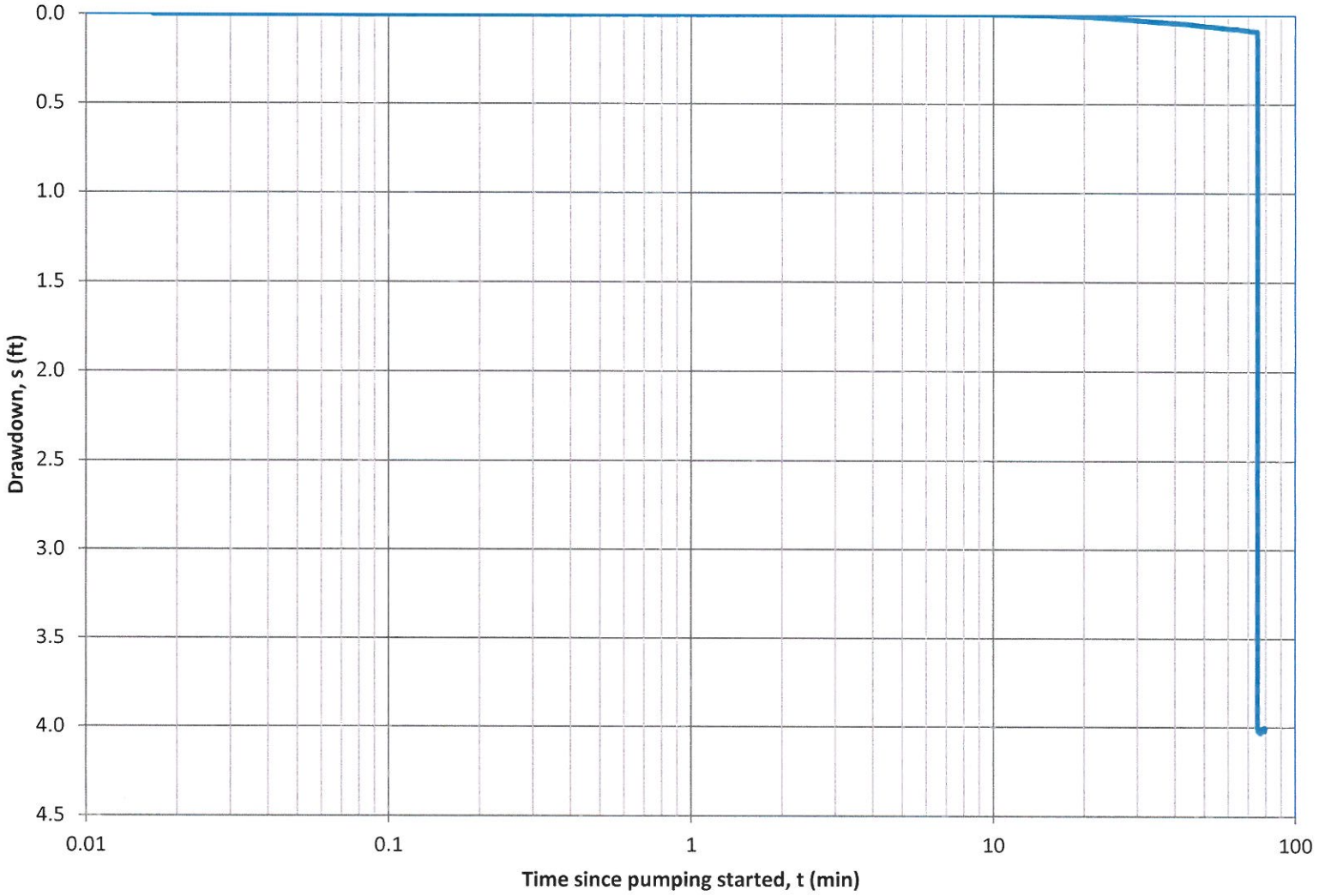
Appendix A

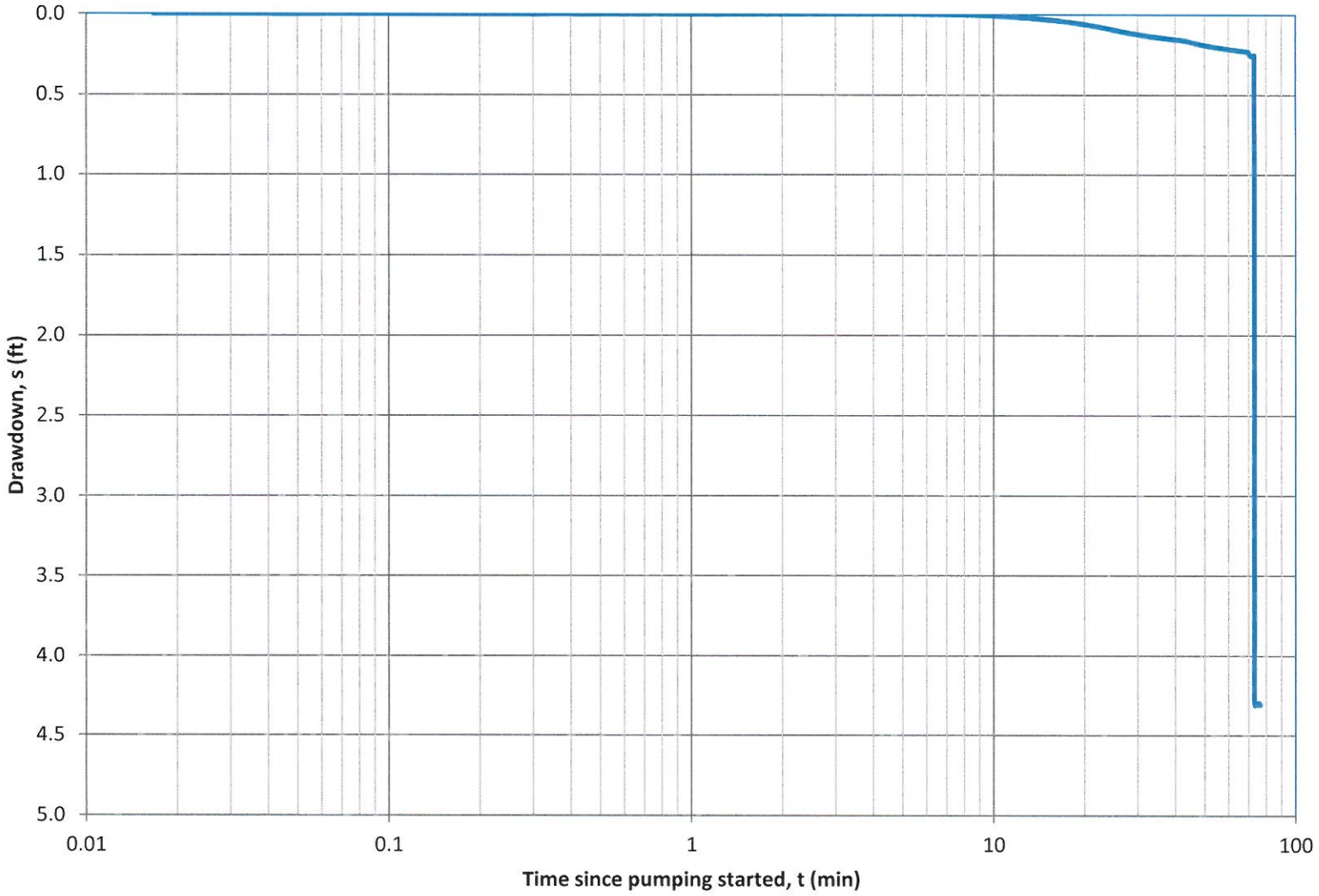
Range of Influence Testing Results and Field Data


Pumping Well = NT-A2
Q = 40 gpm
t = 76 min
MH34 Range of Influence Testing
r_o = 88 ft
MW30
y = -9.27ln(x) + 41.501
R² = 0.9382
MW4
MW7
Drawdown, s (ft)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
1
10
100
1000
Distance from NT-A2 (ft)

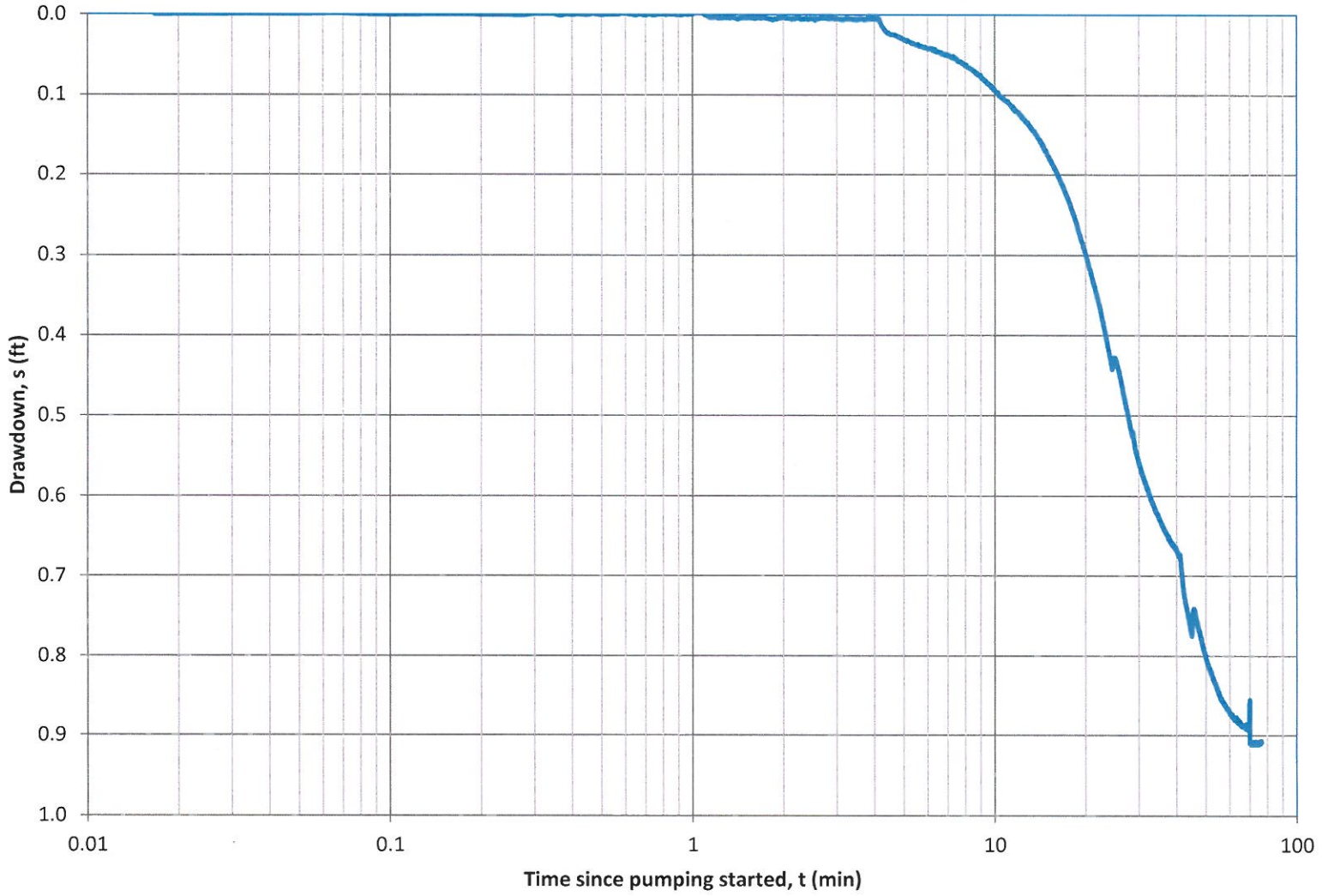
Range of Influence Testing
MW-4



Range of Influence Testing
MW-7



Range of Influence Testing
MW-30



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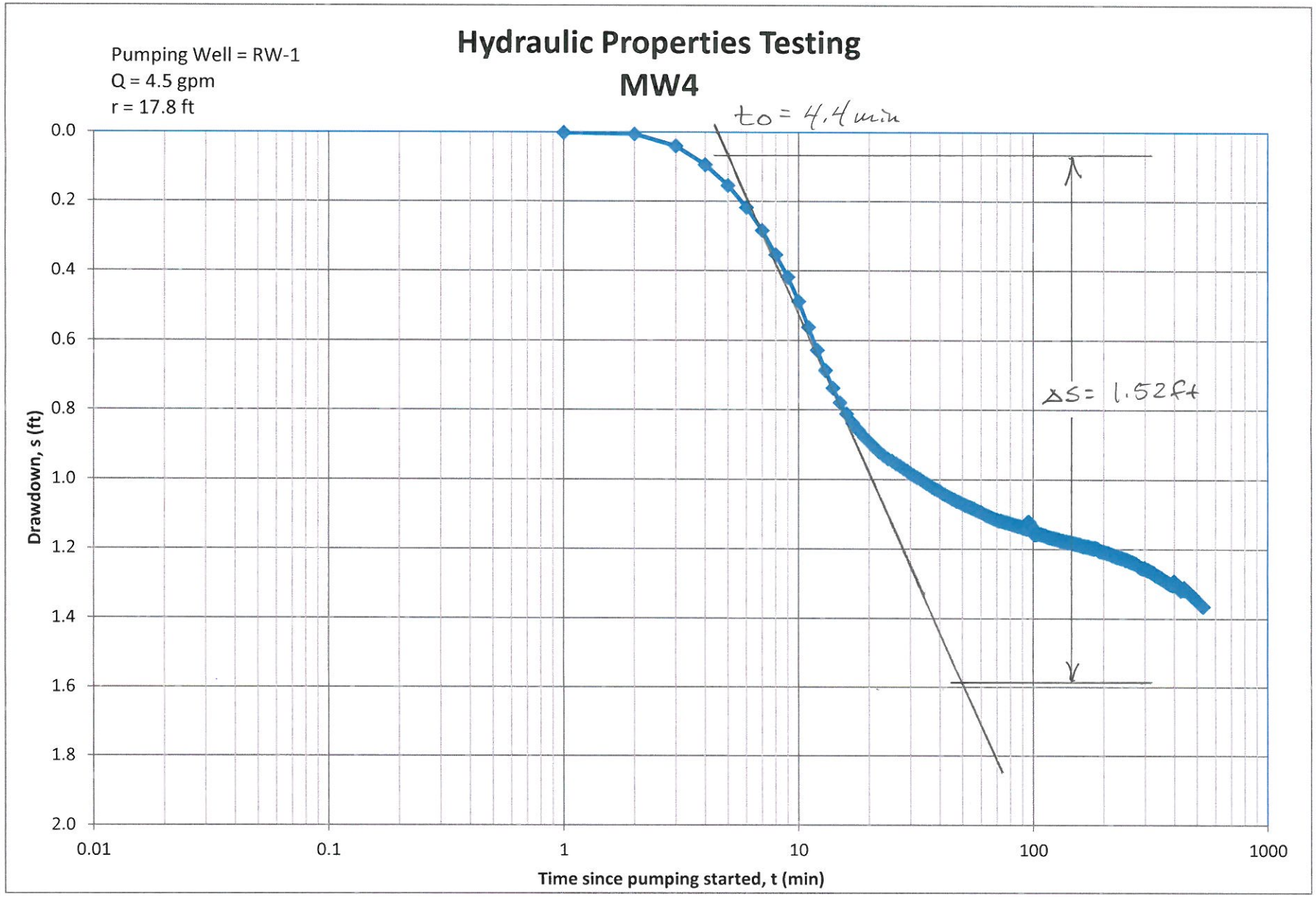
Appendix B

Hydraulic Property Testing Results and Field Data



$T = \frac{35Q}{\Delta s} = \frac{35(4.5)}{1.52} = 104 \text{ ft}^2/\text{dy}$

$S = \frac{T t_o}{640 r^2} = \frac{104(4.4)}{640(17.8)^2} = 2.3e^{-3}$

$K = T/b$

$= \frac{104 \text{ ft}^2/\text{dy}}{13 \text{ ft}} = 8 \text{ ft/dy}$

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Appendix C

Soil Boring Logs

Date Start/Finish: 5/9/2011
Drilling Company: Cascade Drilling, L.P.
Driller's Name: Frank
Drilling Method: Geoprobe
Bit Size:
Hole Diameter: 2 in
Rig Type:
Sampling Method: Geoprobe

Northing:
Easting:
Casing Elevation:

Borehole Depth: 16.5 ft
First Water: 8.5 ft

Description By: Kevin Knesek
Reviewed By: Kevin Freeman

Well/Boring ID: BH-1

Client: British Petroleum

Location: Manhole 34 Facility
North 6th Street and Yakima Valley Highway
Sunnyside, Washington

DEPTH	Sample Run Number	OVM (ppm)	Recovery (feet)	U.S.C.S.	Geologic Column	Stratigraphic Description	Well/Boring Construction
0				ML		Fine. Light Brown SILT. Soft. Dry. Trace rounded coarse gravel. Hand cleared to 4.5 ft.	
						Becomes dark brown.	
						Hydrocarbon odor.	
5		1817		ML/SM		Product saturated. SILT with trace coarse gravel. Kolor kut per trim for product.	
						Increasing sand. Sand is fine, black.	Bentonite Chip
		650					
10		1806				Black product and saturated silt. Stiff.	
				ML/SM		Black sandy SILT. Wet. LNAPL.	
						Brown sandy SILT. Wet. LNAPL.	
		178		SP		Brown, fine to medium SAND. Some silt. Wet.	
15							

Remarks: ft = feet; " = inch; bgs = below ground surface; msl = mean sea level; GP = Geoprobe; OD = Outer Diamer; NA = Not applicable / Available; PID = Photoionization Detector; PVC = Poly Vinyl Chloride, G=Grab Sample, SB=Split Barrel, TS=Top Soil, C=Concrete, AS=Asphalt

Date Start/Finish: 5/9/2011 **Drilling Company:** Cascade Drilling, L.P. **Driller's Name:** Frank **Drilling Method:** Geoprobe **Bit Size:** **Hole Diameter:** 2 in **Rig Type:** **Sampling Method:** Geoprobe	**Northing:** **Easting:** **Casing Elevation:** **Borehole Depth:** 16.5 ft **First Water:** 8.5 ft **Description By:** Kevin Knesek **Reviewed By:** Kevin Freeman	**Well/Boring ID:** BH-1 **Client:** British Petroleum **Location:** Manhole 34 Facility North 6th Street and Yakima Valley Highway Sunnyside, Washington

DEPTH	Sample Run Number	OVM (ppm)	Recovery (feet)	U.S.C.S.	Geologic Column	Stratigraphic Description	Well/Boring Construction
15		26.9		ML		Brown, stiff SILT. Wet. LNAPL.	
				SP		Brown, fine to medium SAND. Trace to some silt. Wet. LNAPL.	
15							

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Remarks: ft = feet; " = inch; bgs = below ground surface; msl = mean sea level; GP = Geoprobe; OD = Outer Diamer; NA = Not applicable / Available; PID = Photoionization Detector; PVC = Poly Vinyl Chloride, G=Grab Sample, SB=Split Barrel, TS=Top Soil, C=Concrete, AS=Asphalt

Date Start/Finish: 5/9/2011
Drilling Company: Cascade Drilling, L.P.
Driller's Name: Frank
Drilling Method: Geoprobe
Bit Size:
Hole Diameter: 2 in
Rig Type:
Sampling Method: Geoprobe

Northing:
Easting:
Casing Elevation:

Borehole Depth: 7 ft
First Water: 7 ft

Description By: Kevin Knesek
Reviewed By: Kevin Freeman

Well/Boring ID: BH-1a

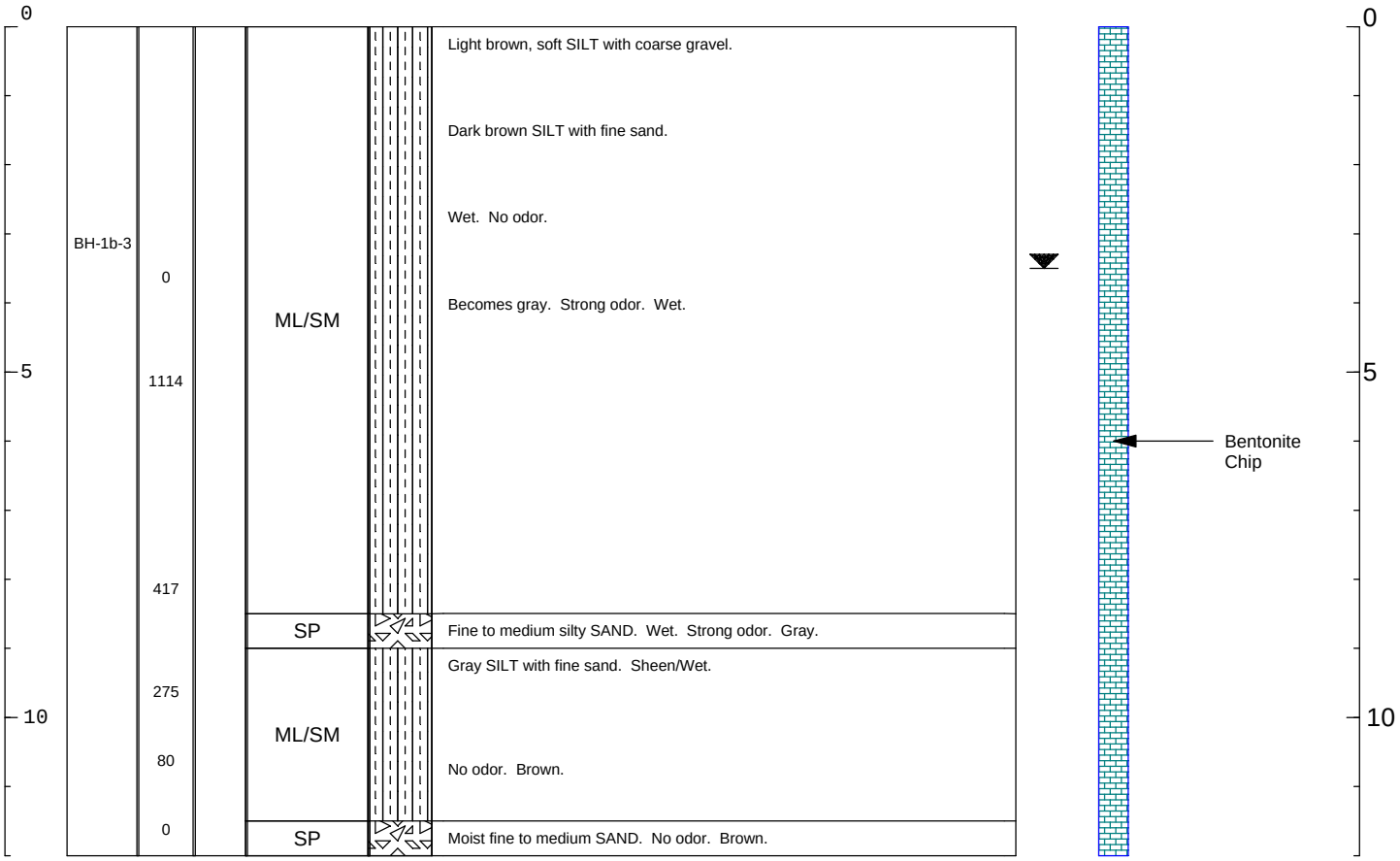
Client: British Petroleum

Location: Manhole 34 Facility
North 6th Street and Yakima Valley Highway
Sunnyside, Washington

DEPTH	Sample Run Number	OVM (ppm)	Recovery (feet)	U.S.C.S.	Geologic Column	Stratigraphic Description	Well/Boring Construction
0				ML/SM		Light brown, gravelly SILT. Soft. Hand cleared to 3 ft. Dark brown silt with fine sand and some coarse gravel. No odor.	Bentonite Chip
5		280 1060		ML		Strong odor. Product laden brown SILT with fine sand. Becomes gray color. Product laden.	

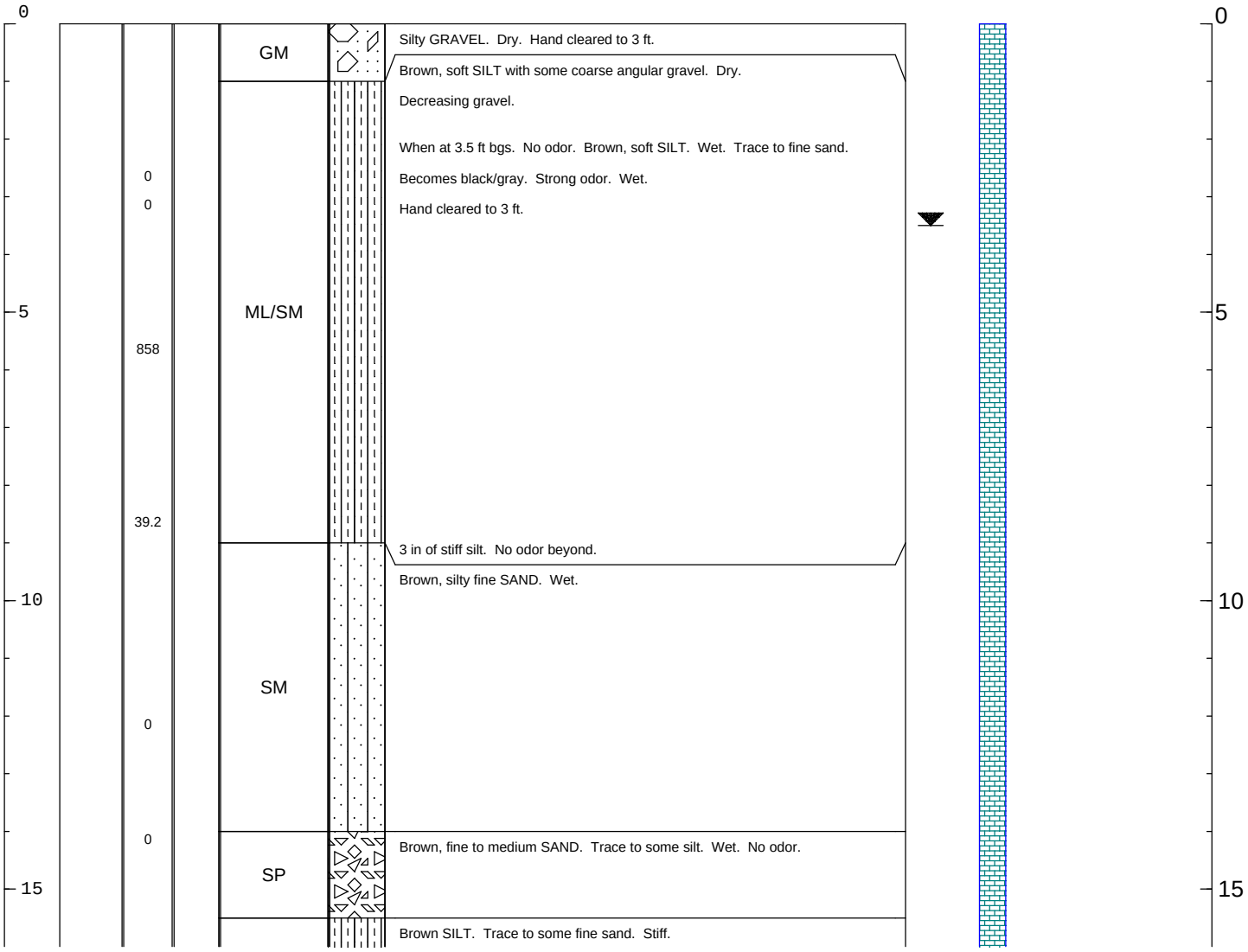
Remarks: ft = feet; " = inch; bgs = below ground surface; msl = mean sea level; GP = Geoprobe; OD = Outer Diamer; NA = Not applicable / Available; PID = Photoionization Detector; PVC = Poly Vinyl Chloride, G=Grab Sample, SB=Split Barrel, TS=Top Soil, C=Concrete, AS=Asphalt

Date Start/Finish: 5/9/2011 **Drilling Company:** Cascade Drilling, L.P. **Driller's Name:** Frank **Drilling Method:** Geoprobe **Bit Size:** **Hole Diameter:** 2 in **Rig Type:** **Sampling Method:** Geoprobe	**Northing:** **Easting:** **Casing Elevation:** **Borehole Depth:** 12 ft **First Water:** 3.5 - 4 ft **Description By:** Kevin Knesek **Reviewed By:** Kevin Freeman	**Well/Boring ID:** BH-1b **Client:** British Petroleum **Location:** Manhole 34 Facility North 6th Street and Yakima Valley Highway Sunnyside, Washington



Remarks: ft = feet; " = inch; bgs = below ground surface; msl = mean sea level; GP = Geoprobe; OD = Outer Diamer; NA = Not applicable / Available; PID = Photoionization Detector; PVC = Poly Vinyl Chloride, G=Grab Sample, SB=Split Barrel, TS=Top Soil, C=Concrete, AS=Asphalt

Date Start/Finish: 5/9/2011 **Drilling Company:** Cascade Drilling, L.P. **Driller's Name:** Frank **Drilling Method:** Geoprobe **Bit Size:** **Hole Diameter:** 2 in **Rig Type:** **Sampling Method:** Geoprobe	**Northing:** **Easting:** **Casing Elevation:** **Borehole Depth:** 36 ft **First Water:** 3.5 ft **Description By:** Kevin Knesek **Reviewed By:** Kevin Freeman	**Well/Boring ID:** BH-2 **Client:** British Petroleum **Location:** Manhole 34 Facility North 6th Street and Yakima Valley Highway Sunnyside, Washington



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Remarks: ft = feet; " = inch; bgs = below ground surface; msl = mean sea level; GP = Geoprobe; OD = Outer Diamer; NA = Not applicable / Available; PID = Photoionization Detector; PVC = Poly Vinyl Chloride, G=Grab Sample, SB=Split Barrel, TS=Top Soil, C=Concrete, AS=Asphalt

Date Start/Finish: 5/9/2011
Drilling Company: Cascade Drilling, L.P.
Driller's Name: Frank
Drilling Method: Geoprobe
Bit Size:
Hole Diameter: 2 in
Rig Type:
Sampling Method: Geoprobe

Northing:
Easting:
Casing Elevation:

Borehole Depth: 36 ft
First Water: 3.5 ft

Description By: Kevin Knesek
Reviewed By: Kevin Freeman

Well/Boring ID: BH-2

Client: British Petroleum

Location: Manhole 34 Facility
North 6th Street and Yakima Valley Highway
Sunnyside, Washington

DEPTH	Sample Run Number	OVM (ppm)	Recovery (feet)	U.S.C.S.	Geologic Column	Stratigraphic Description	Well/Boring Construction
20		0		ML/SM		Dark brown silt. Moist. Trace coarse subangular gravel. Brown silty sand and sandy silt. Sand is fine. Wet. Brown, stiff silt. Trace fine sand. Wet.	Bentonite Chip
25		0				Silty brown fine sand. Wet. Coarse. Brown, stiff silt with some fine sand. Wet.	
30		0		ML		Brown, stiff silt. Trace plant organics. Moist.	

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Remarks: ft = feet; " = inch; bgs = below ground surface; msl = mean sea level;
GP = Geoprobe; OD = Outer Diamer; NA = Not applicable / Available;
PID = Photoionization Detector; PVC = Poly Vinyl Chloride, G=Grab Sample,
SB=Split Barrel, TS=Top Soil, C=Concrete, AS=Asphalt

Date Start/Finish: 5/9/2011 **Drilling Company:** Cascade Drilling, L.P. **Driller's Name:** Frank **Drilling Method:** Geoprobe **Bit Size:** **Hole Diameter:** 2 in **Rig Type:** **Sampling Method:** Geoprobe	**Northing:** **Easting:** **Casing Elevation:** **Borehole Depth:** 36 ft **First Water:** 3.5 ft **Description By:** Kevin Knesek **Reviewed By:** Kevin Freeman	**Well/Boring ID:** BH-2 **Client:** British Petroleum **Location:** Manhole 34 Facility North 6th Street and Yakima Valley Highway Sunnyside, Washington

DEPTH	Sample Run Number	OVM (ppm)	Recovery (feet)	U.S.C.S.	Geologic Column	Stratigraphic Description	Well/Boring Construction
35				SP		Increasing fine to medium sand. Trace to some. Slightly moist. Trace, coarse subrounded gravel. Wet from 33 to 34.5 ft bgs, then dry to slightly moist. Brown, fine to medium SAND. Very hard. Subrounded 1.5 in diameter basalt cobble. Swirling cream colored hard material in sand. Refusal at 36 ft bgs.	35

Remarks: ft = feet; " = inch; bgs = below ground surface; msl = mean sea level; GP = Geoprobe; OD = Outer Diamer; NA = Not applicable / Available; PID = Photoionization Detector; PVC = Poly Vinyl Chloride, G=Grab Sample, SB=Split Barrel, TS=Top Soil, C=Concrete, AS=Asphalt

Date Start/Finish: 5/9/2011
Drilling Company: Cascade Drilling, L.P.
Driller's Name: Frank
Drilling Method: Geoprobe
Bit Size:
Hole Diameter: 2 in
Rig Type:
Sampling Method: Geoprobe

Northing:
Easting:
Casing Elevation:

Borehole Depth: 12 ft
First Water: 5.5 ft

Description By: Kevin Knesek
Reviewed By: Kevin Freeman

Well/Boring ID: BH-3

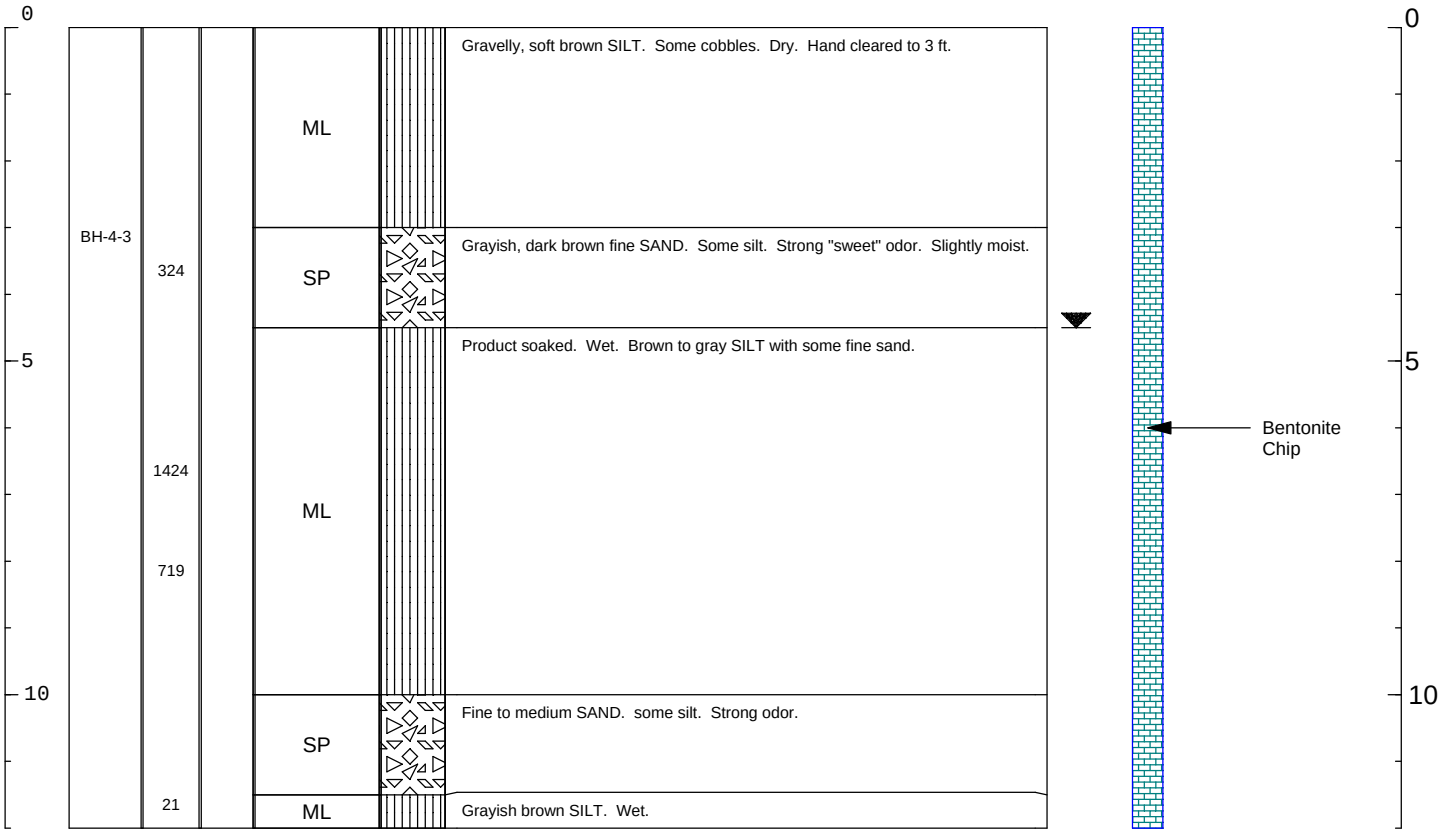
Client: British Petroleum

Location: Manhole 34 Facility
North 6th Street and Yakima Valley Highway
Sunnyside, Washington

DEPTH	Sample Run Number	OVM (ppm)	Recovery (feet)	U.S.C.S.	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	BH-3-2.5	750		GP		Gravelly sand and silt. Brown. Dry.	Bentonite Chip
				ML/SM		Black and dark gray fine sandy SILT with fine gravel. Strong hydrocarbon odor. Dry.	
						Slightly moist.	
5						Product at 4 - 7 ft bgs. Becomes gray.	
		636		ML		Dark gray SILT to some fine sand. Wet.	
		27.2		SM		Dark gray, fine SAND with silt. Trace subrounded gravel.	
10						Dark gray fine to medium sand with silt.	
		623		ML		Dark gray sandy SILT. Wet.	

Remarks: ft = feet; " = inch; bgs = below ground surface; msl = mean sea level; GP = Geoprobe; OD = Outer Diamer; NA = Not applicable / Available; PID = Photoionization Detector; PVC = Poly Vinyl Chloride, G=Grab Sample, SB=Split Barrel, TS=Top Soil, C=Concrete, AS=Asphalt

Date Start/Finish: 5/10/2011 **Drilling Company:** Cascade Drilling, L.P. **Driller's Name:** Frank **Drilling Method:** Geoprobe **Bit Size:** **Hole Diameter:** 2 in **Rig Type:** **Sampling Method:** Geoprobe	**Northing:** **Easting:** **Casing Elevation:** **Borehole Depth:** 12 ft **First Water:** 4.5 ft **Description By:** Kevin Knesek **Reviewed By:** Kevin Freeman	**Well/Boring ID:** BH-4 **Client:** British Petroleum **Location:** Manhole 34 Facility North 6th Street and Yakima Valley Highway Sunnyside, Washington



Remarks: ft = feet; " = inch; bgs = below ground surface; msl = mean sea level; GP = Geoprobe; OD = Outer Diamer; NA = Not applicable / Available; PID = Photoionization Detector; PVC = Poly Vinyl Chloride, G=Grab Sample, SB=Split Barrel, TS=Top Soil, C=Concrete, AS=Asphalt

Date Start/Finish: 5/10/2011
Drilling Company: Cascade Drilling, L.P.
Driller's Name: Frank
Drilling Method: Geoprobe
Bit Size:
Hole Diameter: 2 in
Rig Type:
Sampling Method: Geoprobe

Northing:
Easting:
Casing Elevation:

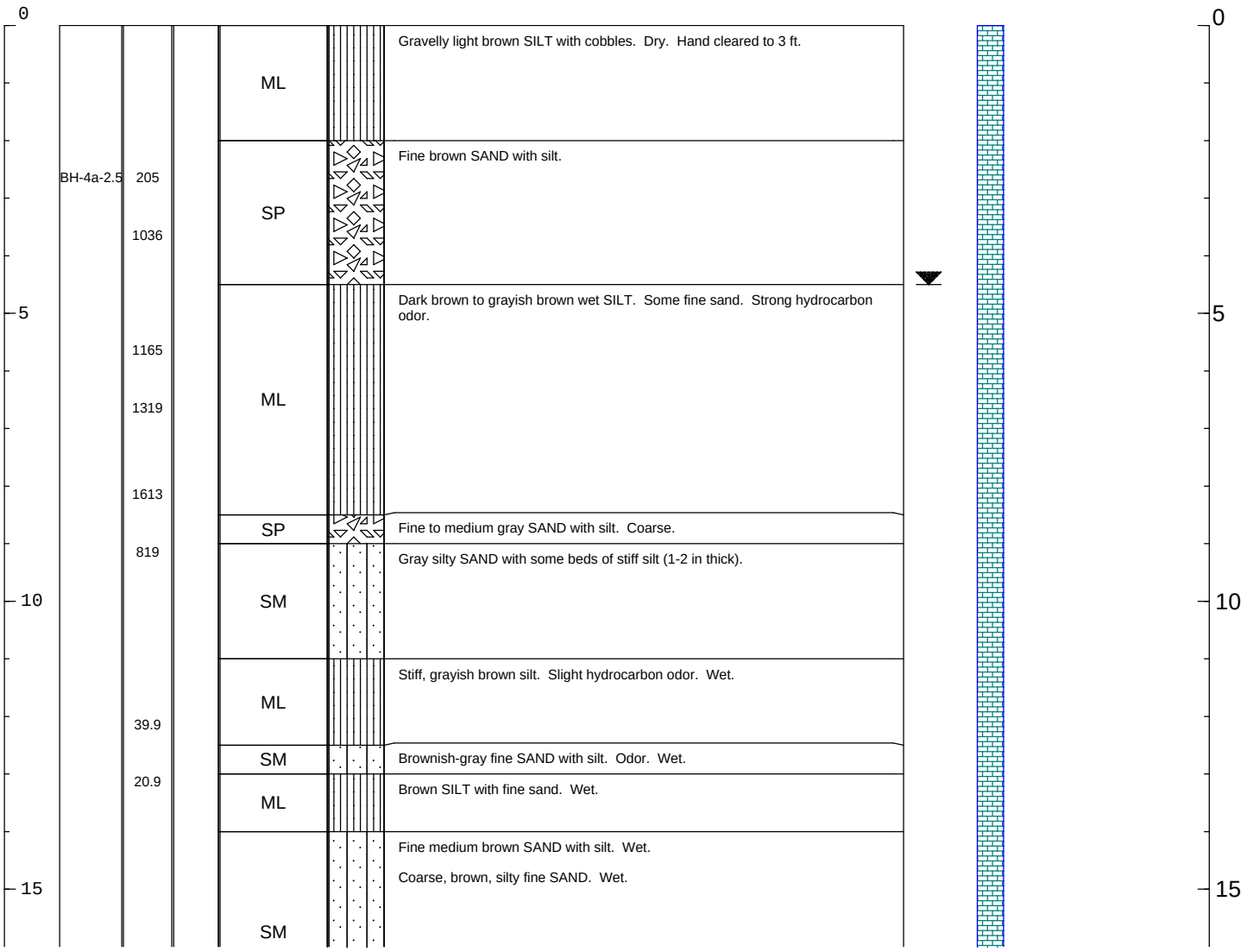
Borehole Depth: 36 ft
First Water: 4.5 ft

Description By: Kevin Knesek
Reviewed By: Kevin Freeman

Well/Boring ID: BH-4a

Client: British Petroleum

Location: Manhole 34 Facility
North 6th Street and Yakima Valley Highway
Sunnyside, Washington



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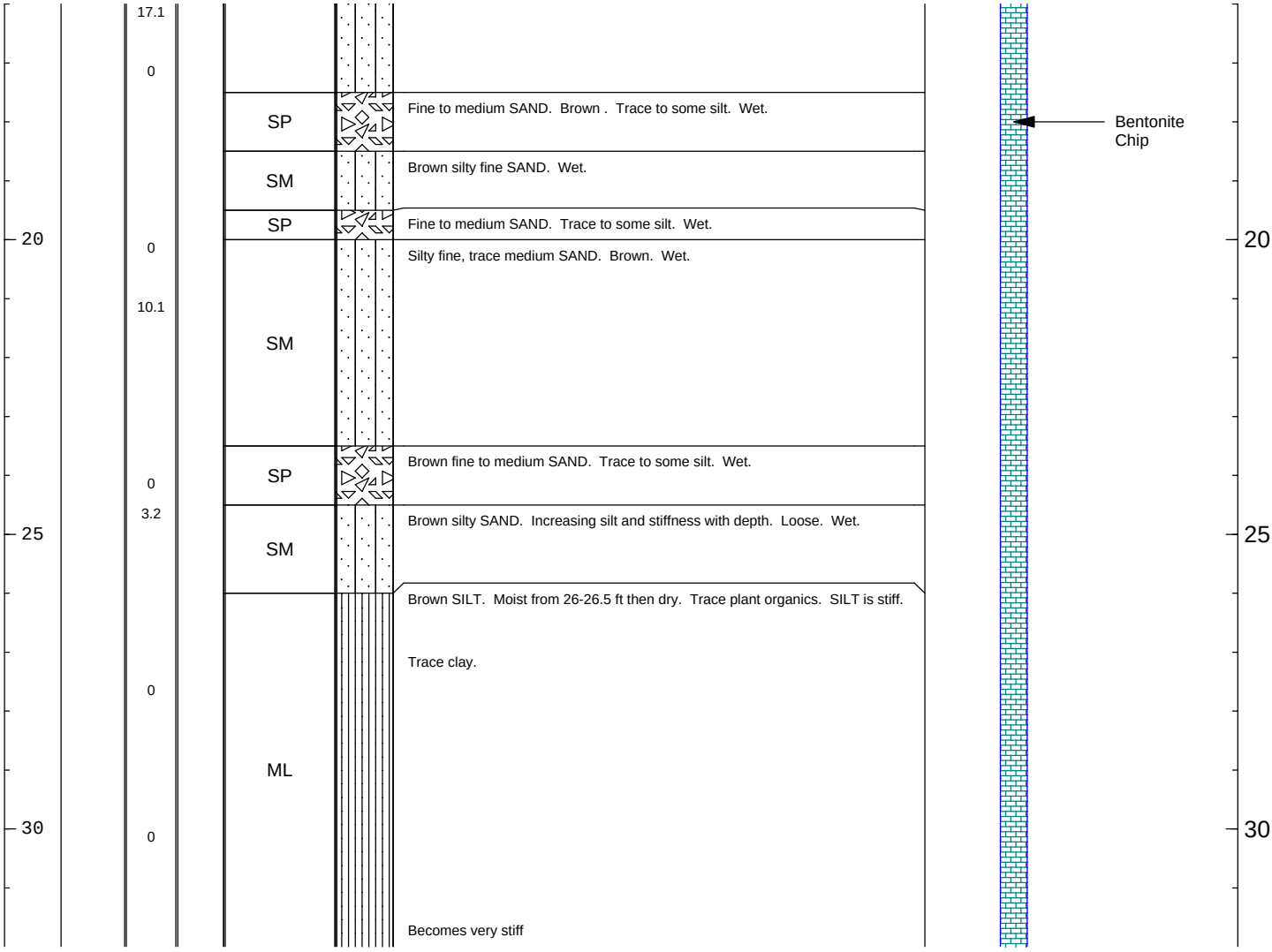
Remarks: ft = feet; " = inch; bgs = below ground surface; msl = mean sea level;
GP = Geoprobe; OD = Outer Diamer; NA = Not applicable / Available;
PID = Photoionization Detector; PVC = Poly Vinyl Chloride, G=Grab Sample,
SB=Split Barrel, TS=Top Soil, C=Concrete, AS=Asphalt

Date Start/Finish: 5/10/2011 **Drilling Company:** Cascade Drilling, L.P. **Driller's Name:** Frank **Drilling Method:** Geoprobe **Bit Size:** **Hole Diameter:** 2 in **Rig Type:** **Sampling Method:** Geoprobe	**Northing:** **Easting:** **Casing Elevation:** **Borehole Depth:** 36 ft **First Water:** 4.5 ft **Description By:** Kevin Knesek **Reviewed By:** Kevin Freeman	**Well/Boring ID:** BH-4a **Client:** British Petroleum **Location:** Manhole 34 Facility North 6th Street and Yakima Valley Highway Sunnyside, Washington



ARCADIS

Remarks: ft = feet; " = inch; bgs = below ground surface; msl = mean sea level; GP = Geoprobe; OD = Outer Diamer; NA = Not applicable / Available; PID = Photoionization Detector; PVC = Poly Vinyl Chloride, G=Grab Sample, SB=Split Barrel, TS=Top Soil, C=Concrete, AS=Asphalt

Date Start/Finish: 5/10/2011 **Drilling Company:** Cascade Drilling, L.P. **Driller's Name:** Frank **Drilling Method:** Geoprobe **Bit Size:** **Hole Diameter:** 2 in **Rig Type:** **Sampling Method:** Geoprobe	**Northing:** **Easting:** **Casing Elevation:** **Borehole Depth:** 36 ft **First Water:** 4.5 ft **Description By:** Kevin Knesek **Reviewed By:** Kevin Freeman	**Well/Boring ID:** BH-4a **Client:** British Petroleum **Location:** Manhole 34 Facility North 6th Street and Yakima Valley Highway Sunnyside, Washington

DEPTH	Sample Run Number	OVM (ppm)	Recovery (feet)	U.S.C.S.	Geologic Column	Stratigraphic Description	Well/Boring Construction
		0		SP		Brown, fine to medium SAND. Some silt. Trace coarse subrounded gravel.	
				-33.5		Brown silty fine SAND. Loose. Wet.	
35		0		SP		Fine to medium SAND. Trace to some silt. Wet to 35.5 ft then dry. Trace to some coarse subrounded gravel. Sand is reddish brown. Gravel is mostly basalt. Sand is very hard. Swirls of cream colored silt sized particles.	35

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Remarks: ft = feet; " = inch; bgs = below ground surface; msl = mean sea level;
GP = Geoprobe; OD = Outer Diamer; NA = Not applicable / Available;
PID = Photoionization Detector; PVC = Poly Vinyl Chloride, G=Grab Sample,
SB=Split Barrel, TS=Top Soil, C=Concrete, AS=Asphalt

Date Start/Finish: 5/10/2011 **Drilling Company:** Cascade Drilling, L.P. **Driller's Name:** Frank **Drilling Method:** Geoprobe **Bit Size:** **Hole Diameter:** 2 in **Rig Type:** **Sampling Method:** Geoprobe	**Northing:** **Easting:** **Casing Elevation:** **Borehole Depth:** 11.5 ft **First Water:** 4.5 ft **Description By:** Kevin Knesek **Reviewed By:** Kevin Freeman	**Well/Boring ID:** BH-5 **Client:** British Petroleum **Location:** Manhole 34 Facility North 6th Street and Yakima Valley Highway Sunnyside, Washington

DEPTH	Sample Run Number	OVM (ppm)	Recovery (feet)	U.S.C.S.	Geologic Column	Stratigraphic Description	Well/Boring Construction
0				ML		Gravelly SILT with cobbles. Hand cleared to 3 ft.	
		0		SM		Brown, silty fine SAND. Trace coarse gravel. Dry. No odor.	
		0					
5		360				Becomes gray. Strong hydrocarbon odor. Wet. LNAPL.	Bentonite Chip
		752					
10				ML		Gray stiff SILT. Hydrocarbon odor. Wet.	
		135		SP		Fine to medium gray SAND. Wet. Hydrocarbon odor.	

Remarks: ft = feet; " = inch; bgs = below ground surface; msl = mean sea level; GP = Geoprobe; OD = Outer Diamer; NA = Not applicable / Available; PID = Photoionization Detector; PVC = Poly Vinyl Chloride, G=Grab Sample, SB=Split Barrel, TS=Top Soil, C=Concrete, AS=Asphalt

Date Start/Finish: 5/10/2011
Drilling Company: Cascade Drilling, L.P.
Driller's Name: Frank
Drilling Method: Geoprobe
Bit Size:
Hole Diameter: 2 in
Rig Type:
Sampling Method: Geoprobe

Northing:
Easting:
Casing Elevation:

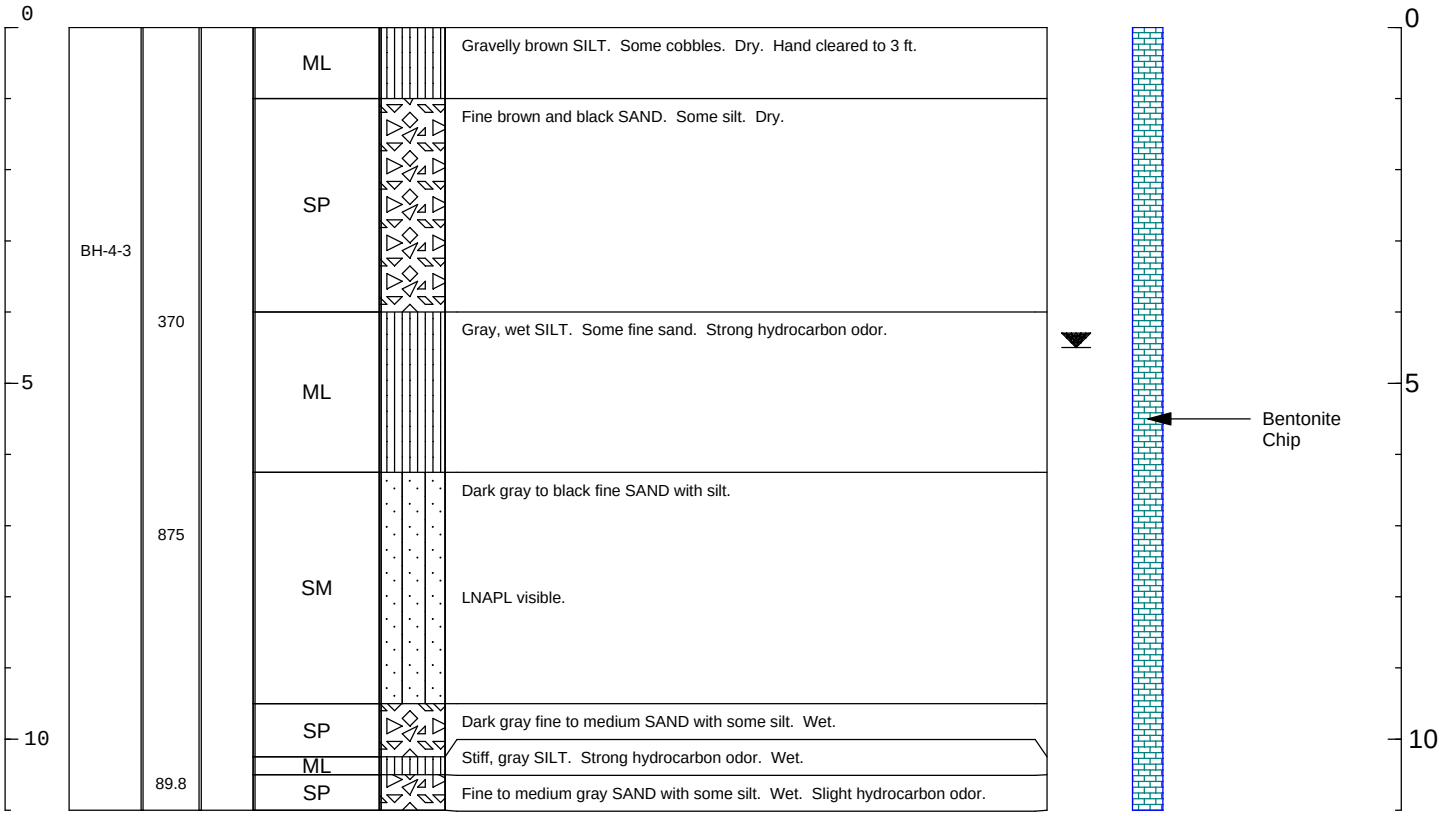
Borehole Depth: 11 ft
First Water:

Description By: Kevin Knesek
Reviewed By: Kevin Freeman

Well/Boring ID: BH-6

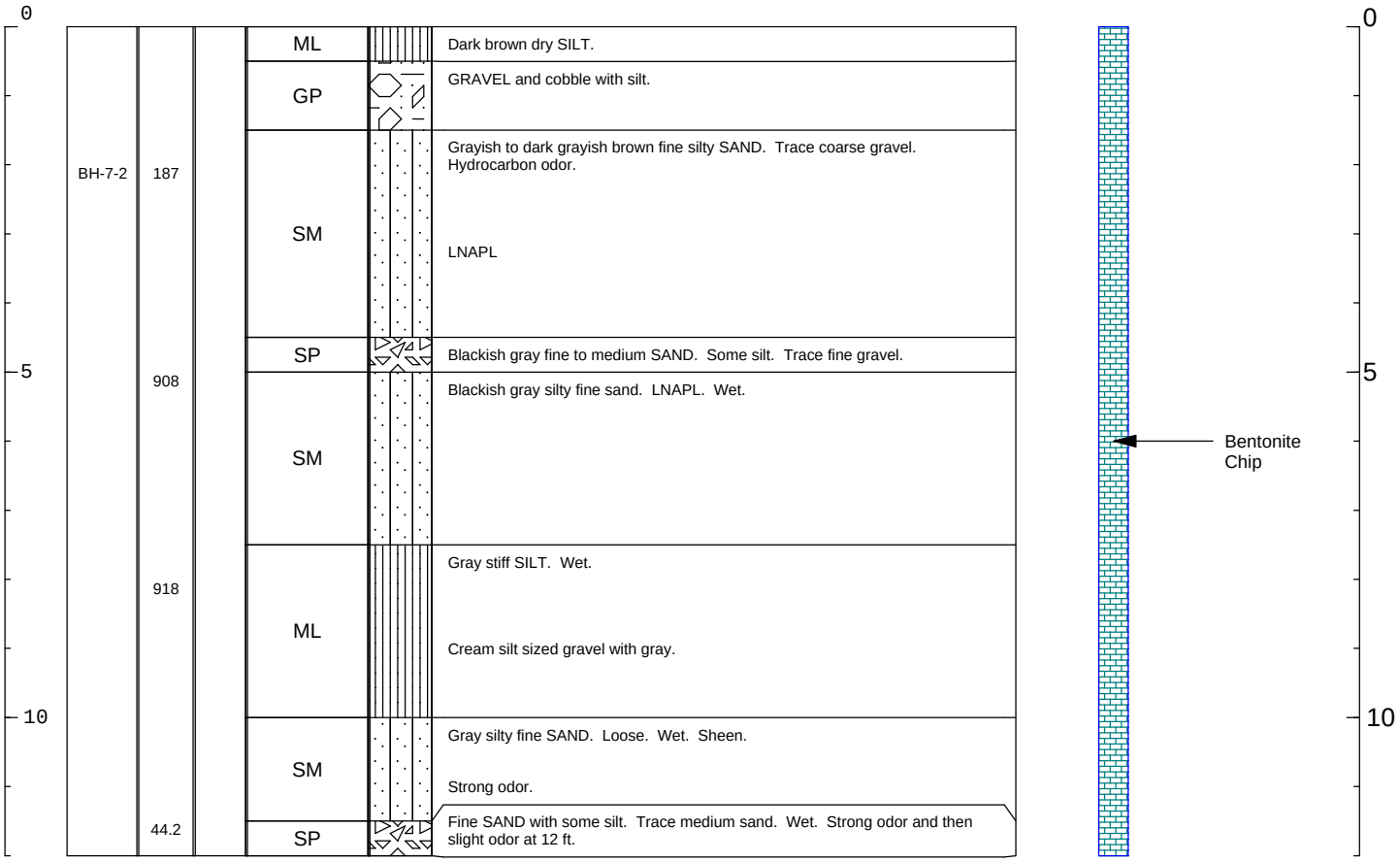
Client: British Petroleum

Location: Manhole 34 Facility
North 6th Street and Yakima Valley Highway
Sunnyside, Washington



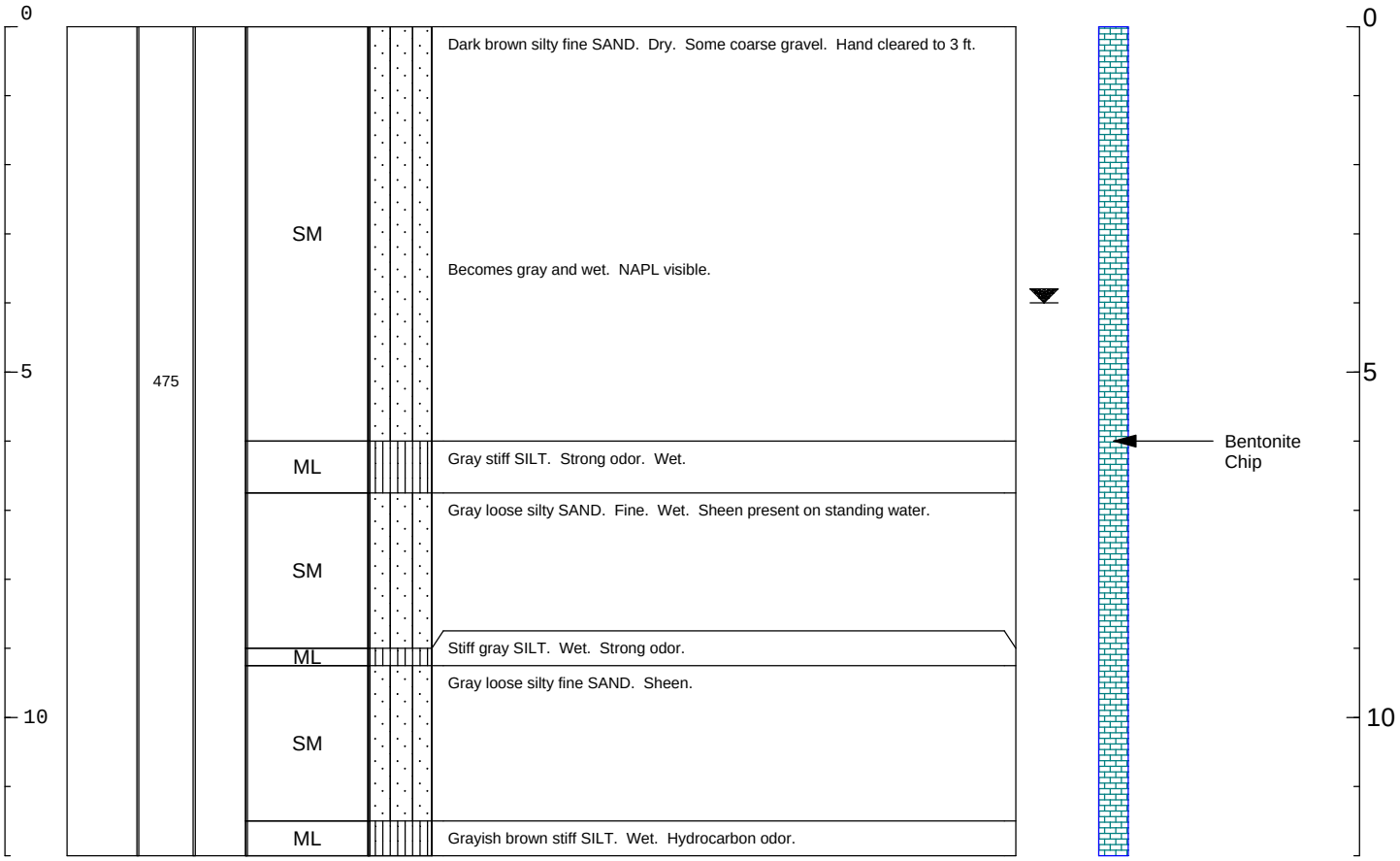
Remarks: ft = feet; " = inch; bgs = below ground surface; msl = mean sea level;
GP = Geoprobe; OD = Outer Diamer; NA = Not applicable / Available;
PID = Photoionization Detector; PVC = Poly Vinyl Chloride, G=Grab Sample,
SB=Split Barrel, TS=Top Soil, C=Concrete, AS=Asphalt

Date Start/Finish: 5/10/2011 **Drilling Company:** Cascade Drilling, L.P. **Driller's Name:** Frank **Drilling Method:** Geoprobe **Bit Size:** **Hole Diameter:** 2 in **Rig Type:** **Sampling Method:** Geoprobe	**Northing:** **Easting:** **Casing Elevation:** **Borehole Depth:** 12 ft **First Water:** **Description By:** Kevin Knesek **Reviewed By:** Kevin Freeman	**Well/Boring ID:** BH-7 **Client:** British Petroleum **Location:** Manhole 34 Facility North 6th Street and Yakima Valley Highway Sunnyside, Washington



Remarks: ft = feet; " = inch; bgs = below ground surface; msl = mean sea level; GP = Geoprobe; OD = Outer Diamer; NA = Not applicable / Available; PID = Photoionization Detector; PVC = Poly Vinyl Chloride, G=Grab Sample, SB=Split Barrel, TS=Top Soil, C=Concrete, AS=Asphalt

Date Start/Finish: 5/10/2011 **Drilling Company:** Cascade Drilling, L.P. **Driller's Name:** Frank **Drilling Method:** Geoprobe **Bit Size:** **Hole Diameter:** 2 in **Rig Type:** **Sampling Method:** Geoprobe	**Northing:** **Easting:** **Casing Elevation:** **Borehole Depth:** 12 ft **First Water:** 4 ft **Description By:** Kevin Knesek **Reviewed By:** Kevin Freeman	**Well/Boring ID:** BH-8 **Client:** British Petroleum **Location:** Manhole 34 Facility North 6th Street and Yakima Valley Highway Sunnyside, Washington



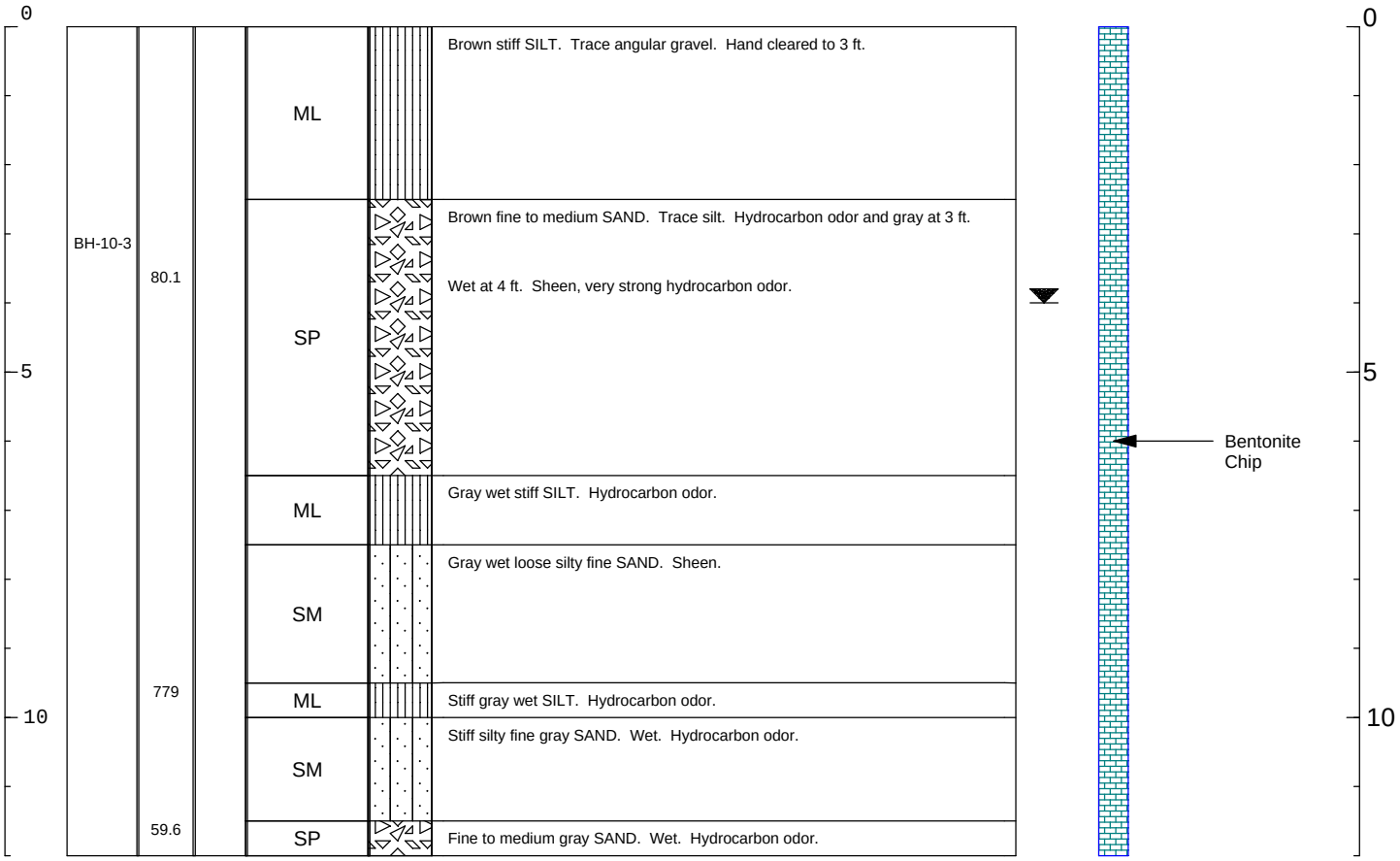
Remarks: ft = feet; " = inch; bgs = below ground surface; msl = mean sea level; GP = Geoprobe; OD = Outer Diamer; NA = Not applicable / Available; PID = Photoionization Detector; PVC = Poly Vinyl Chloride, G=Grab Sample, SB=Split Barrel, TS=Top Soil, C=Concrete, AS=Asphalt

Date Start/Finish: 5/10/2011 **Drilling Company:** Cascade Drilling, L.P. **Driller's Name:** Frank **Drilling Method:** Geoprobe **Bit Size:** **Hole Diameter:** 2 in **Rig Type:** **Sampling Method:** Geoprobe	**Northing:** **Easting:** **Casing Elevation:** **Borehole Depth:** 12 ft **First Water:** 4 ft **Description By:** Kevin Knesek **Reviewed By:** Kevin Freeman	**Well/Boring ID:** BH-9 **Client:** British Petroleum **Location:** Manhole 34 Facility North 6th Street and Yakima Valley Highway Sunnyside, Washington

DEPTH	Sample Run Number	OVM (ppm)	Recovery (feet)	U.S.C.S.	Geologic Column	Stratigraphic Description	Well/Boring Construction
0				GP		Coarse GRAVEL with silt.	
				SM		Fine grown silty SAND. No odor. Pieces of asphalt.	
		0		SM		Brown fine SAND with silt. Moist.	
5				ML		Dark gray SILT with fine sand. Wet. Odor and sheen.	Bentonite Chip
		1445		ML		Dark blackish gray SILT with fine sand. Wet. Odor. Light gray silt size ribbons. Black silt with sand.	
		434					
10				SM		Dark gray fine SAND with silt. Wet. Odor.	
		127					

Remarks: ft = feet; " = inch; bgs = below ground surface; msl = mean sea level; GP = Geoprobe; OD = Outer Diamer; NA = Not applicable / Available; PID = Photoionization Detector; PVC = Poly Vinyl Chloride, G=Grab Sample, SB=Split Barrel, TS=Top Soil, C=Concrete, AS=Asphalt

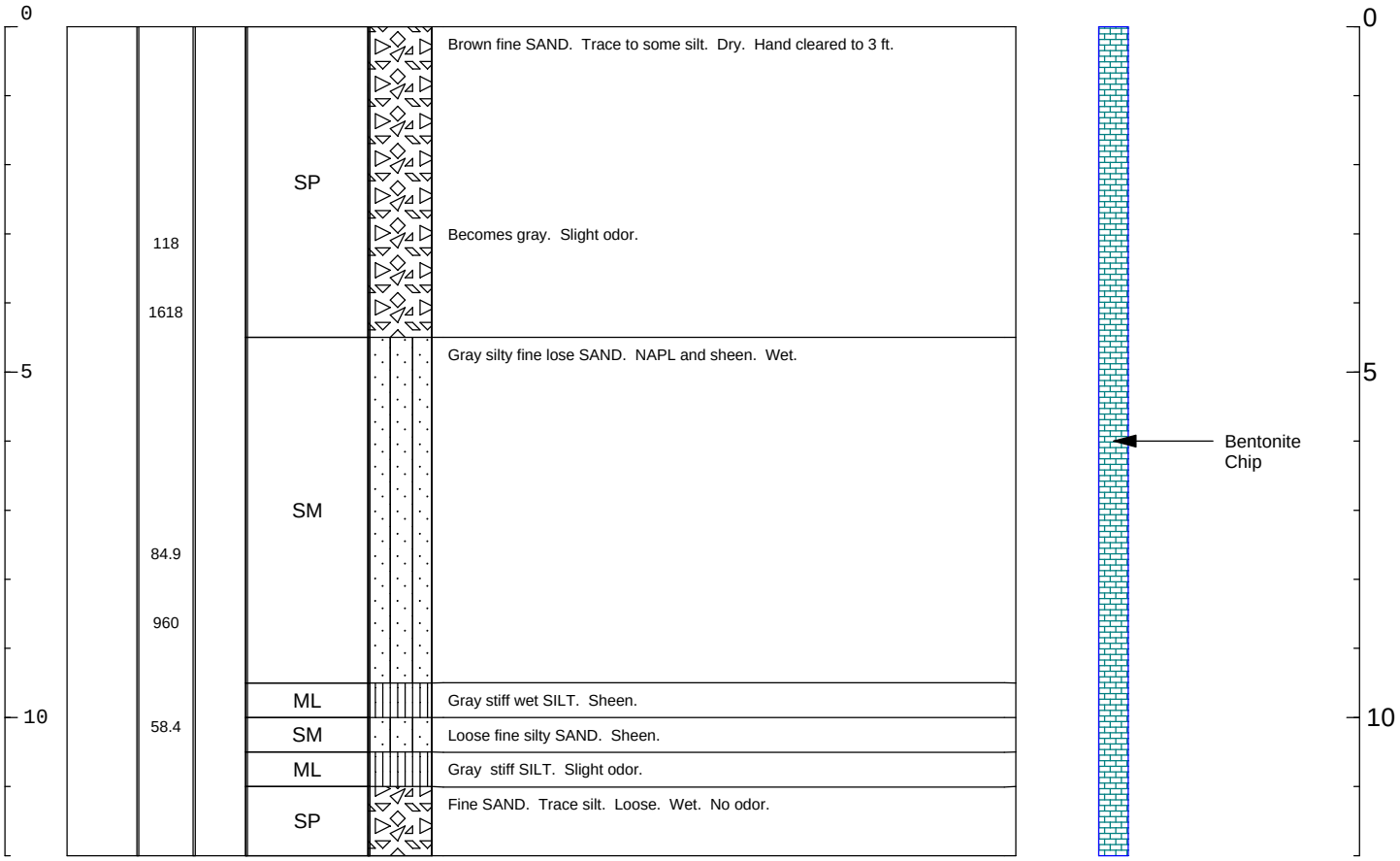
Date Start/Finish: 5/11/2011 **Drilling Company:** Cascade Drilling, L.P. **Driller's Name:** Frank **Drilling Method:** Geoprobe **Bit Size:** **Hole Diameter:** 2 in **Rig Type:** **Sampling Method:** Geoprobe	**Northing:** **Easting:** **Casing Elevation:** **Borehole Depth:** 12 ft **First Water:** 4 ft **Description By:** Kevin Knesek **Reviewed By:** Kevin Freeman	**Well/Boring ID:** BH-10 **Client:** British Petroleum **Location:** Manhole 34 Facility North 6th Street and Yakima Valley Highway Sunnyside, Washington



ARCADIS

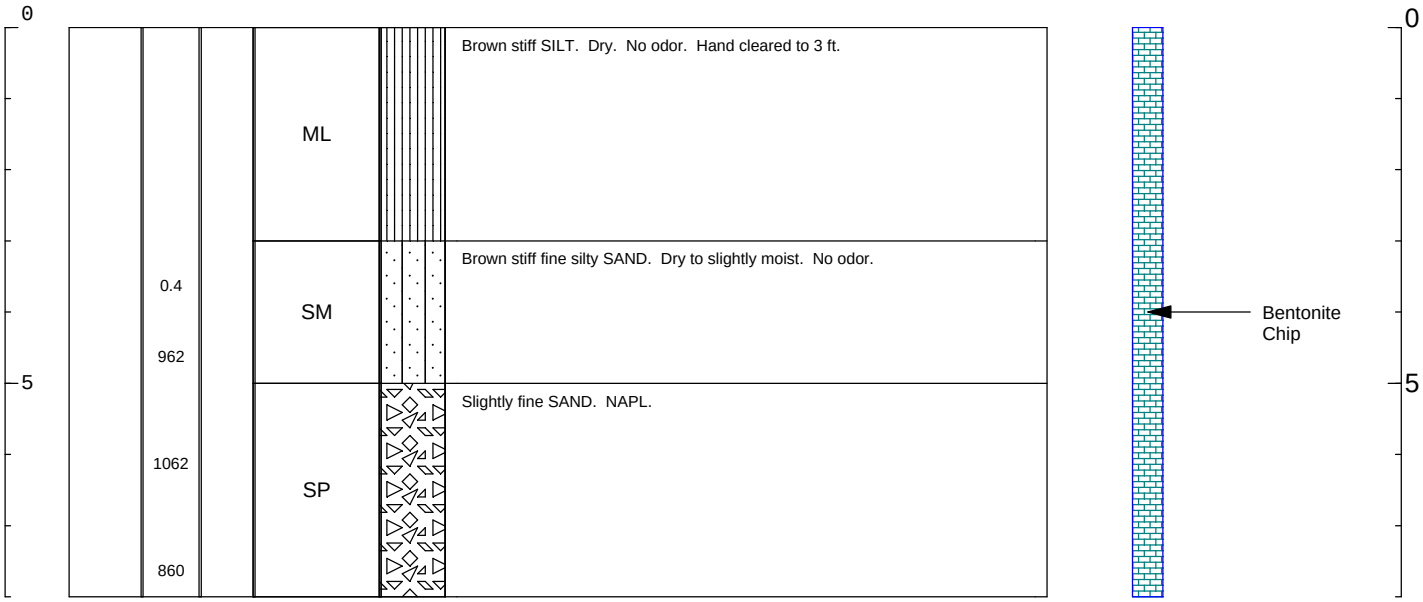
Remarks: ft = feet; " = inch; bgs = below ground surface; msl = mean sea level; GP = Geoprobe; OD = Outer Diamer; NA = Not applicable / Available; PID = Photoionization Detector; PVC = Poly Vinyl Chloride, G=Grab Sample, SB=Split Barrel, TS=Top Soil, C=Concrete, AS=Asphalt

Date Start/Finish: 5/11/2011 **Drilling Company:** Cascade Drilling, L.P. **Driller's Name:** Frank **Drilling Method:** Geoprobe **Bit Size:** **Hole Diameter:** 2 in **Rig Type:** **Sampling Method:** Geoprobe	**Northing:** **Easting:** **Casing Elevation:** **Borehole Depth:** 12 ft **First Water:** **Description By:** Kevin Knesek **Reviewed By:** Kevin Freeman	**Well/Boring ID:** BH-10a **Client:** British Petroleum **Location:** Manhole 34 Facility North 6th Street and Yakima Valley Highway Sunnyside, Washington



Remarks: ft = feet; " = inch; bgs = below ground surface; msl = mean sea level; GP = Geoprobe; OD = Outer Diamer; NA = Not applicable / Available; PID = Photoionization Detector; PVC = Poly Vinyl Chloride, G=Grab Sample, SB=Split Barrel, TS=Top Soil, C=Concrete, AS=Asphalt

Date Start/Finish: 5/10/2011 **Drilling Company:** Cascade Drilling, L.P. **Driller's Name:** Frank **Drilling Method:** Geoprobe **Bit Size:** **Hole Diameter:** 2 in **Rig Type:** **Sampling Method:** Geoprobe	**Northing:** **Easting:** **Casing Elevation:** **Borehole Depth:** 8 ft **First Water:** **Description By:** Kevin Knesek **Reviewed By:** Kevin Freeman	**Well/Boring ID:** BH-10b **Client:** British Petroleum **Location:** Manhole 34 Facility North 6th Street and Yakima Valley Highway Sunnyside, Washington



ARCADIS

Remarks: ft = feet; " = inch; bgs = below ground surface; msl = mean sea level; GP = Geoprobe; OD = Outer Diamer; NA = Not applicable / Available; PID = Photoionization Detector; PVC = Poly Vinyl Chloride, G=Grab Sample, SB=Split Barrel, TS=Top Soil, C=Concrete, AS=Asphalt

Date Start/Finish: 5/11/2011
Drilling Company: Cascade Drilling, L.P.
Driller's Name: Frank
Drilling Method: Geoprobe
Bit Size:
Hole Diameter: 2 in
Rig Type:
Sampling Method: Geoprobe

Northing:
Easting:
Casing Elevation:

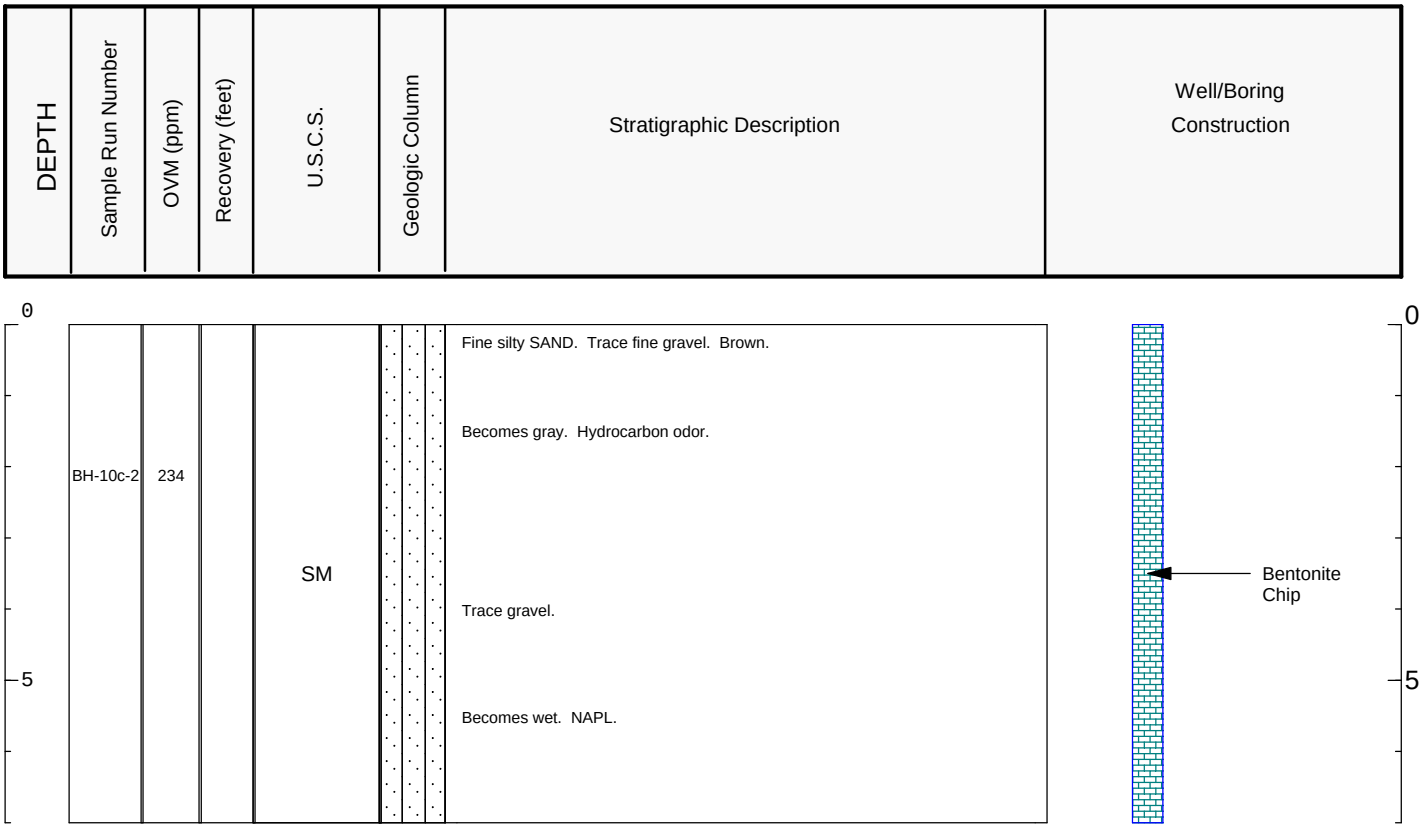
Borehole Depth: 7 ft
First Water:

Description By: Kevin Knesek
Reviewed By: Kevin Freeman

Well/Boring ID: BH-10c

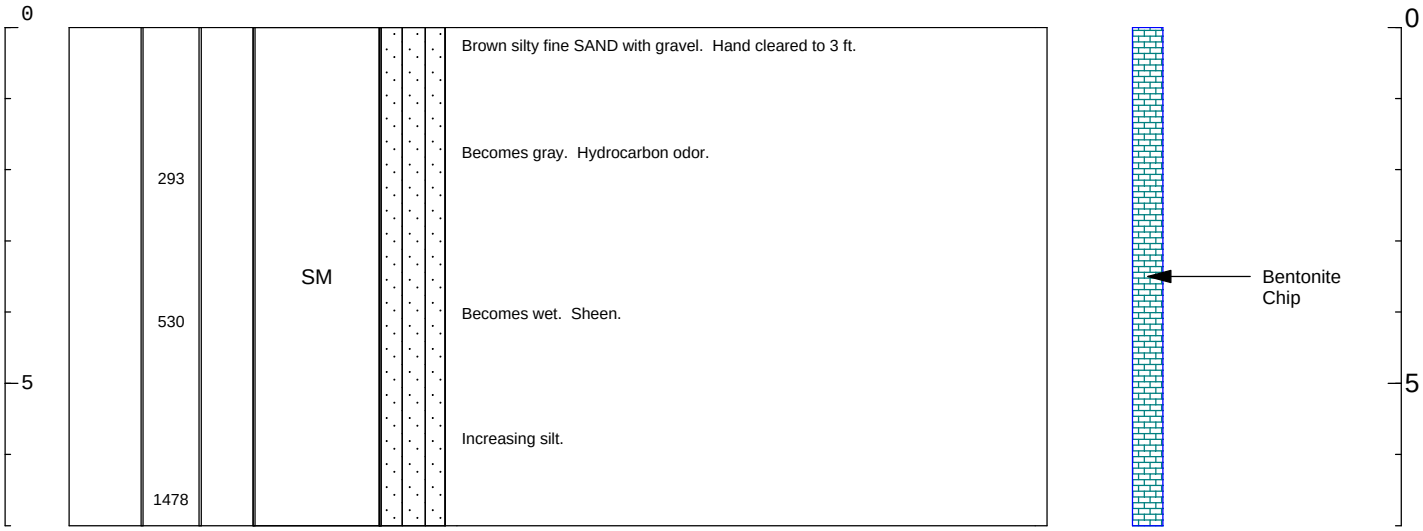
Client: British Petroleum

Location: Manhole 34 Facility
North 6th Street and Yakima Valley Highway
Sunnyside, Washington



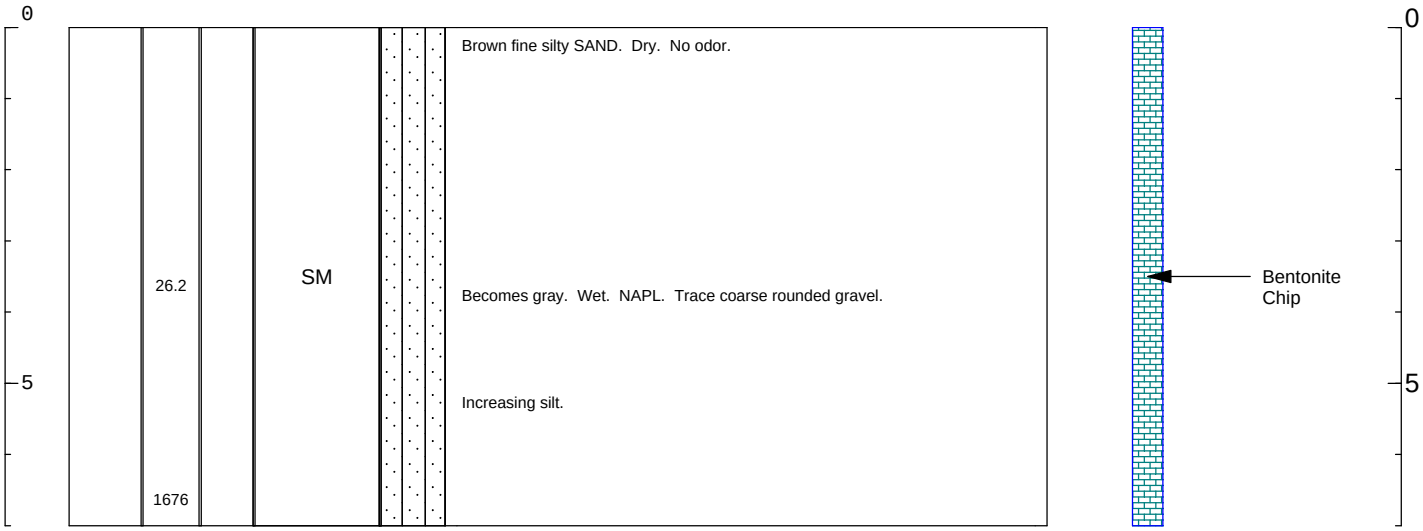
Remarks: ft = feet; " = inch; bgs = below ground surface; msl = mean sea level; GP = Geoprobe; OD = Outer Diamer; NA = Not applicable / Available; PID = Photoionization Detector; PVC = Poly Vinyl Chloride, G=Grab Sample, SB=Split Barrel, TS=Top Soil, C=Concrete, AS=Asphalt

Date Start/Finish: 5/11/2011 **Drilling Company:** Cascade Drilling, L.P. **Driller's Name:** Frank **Drilling Method:** Geoprobe **Bit Size:** **Hole Diameter:** 2 in **Rig Type:** **Sampling Method:** Geoprobe	**Northing:** **Easting:** **Casing Elevation:** **Borehole Depth:** 7 ft **First Water:** **Description By:** Kevin Knesek **Reviewed By:** Kevin Freeman	**Well/Boring ID:** BH-10d **Client:** British Petroleum **Location:** Manhole 34 Facility North 6th Street and Yakima Valley Highway Sunnyside, Washington



Remarks: ft = feet; " = inch; bgs = below ground surface; msl = mean sea level; GP = Geoprobe; OD = Outer Diamer; NA = Not applicable / Available; PID = Photoionization Detector; PVC = Poly Vinyl Chloride, G=Grab Sample, SB=Split Barrel, TS=Top Soil, C=Concrete, AS=Asphalt

Date Start/Finish: 5/11/2011 **Drilling Company:** Cascade Drilling, L.P. **Driller's Name:** Frank **Drilling Method:** Geoprobe **Bit Size:** **Hole Diameter:** 2 in **Rig Type:** **Sampling Method:** Geoprobe	**Northing:** **Easting:** **Casing Elevation:** **Borehole Depth:** 7 ft **First Water:** **Description By:** Kevin Knesek **Reviewed By:** Kevin Freeman	**Well/Boring ID:** BH-10e **Client:** British Petroleum **Location:** Manhole 34 Facility North 6th Street and Yakima Valley Highway Sunnyside, Washington



Remarks: ft = feet; " = inch; bgs = below ground surface; msl = mean sea level; GP = Geoprobe; OD = Outer Diamer; NA = Not applicable / Available; PID = Photoionization Detector; PVC = Poly Vinyl Chloride, G=Grab Sample, SB=Split Barrel, TS=Top Soil, C=Concrete, AS=Asphalt

MH34 BH-10e

Project: GP09BPNAWA59
Data File: MH34 BH-10

Template: Boring Long BP MH34
Date: 6/22/2011

Date Start/Finish: 5/11/2011
Drilling Company: Cascade Drilling, L.P.
Driller's Name: Frank
Drilling Method: Geoprobe
Bit Size:
Hole Diameter: 2 in
Rig Type:
Sampling Method: Geoprobe

Northing:
Easting:
Casing Elevation:

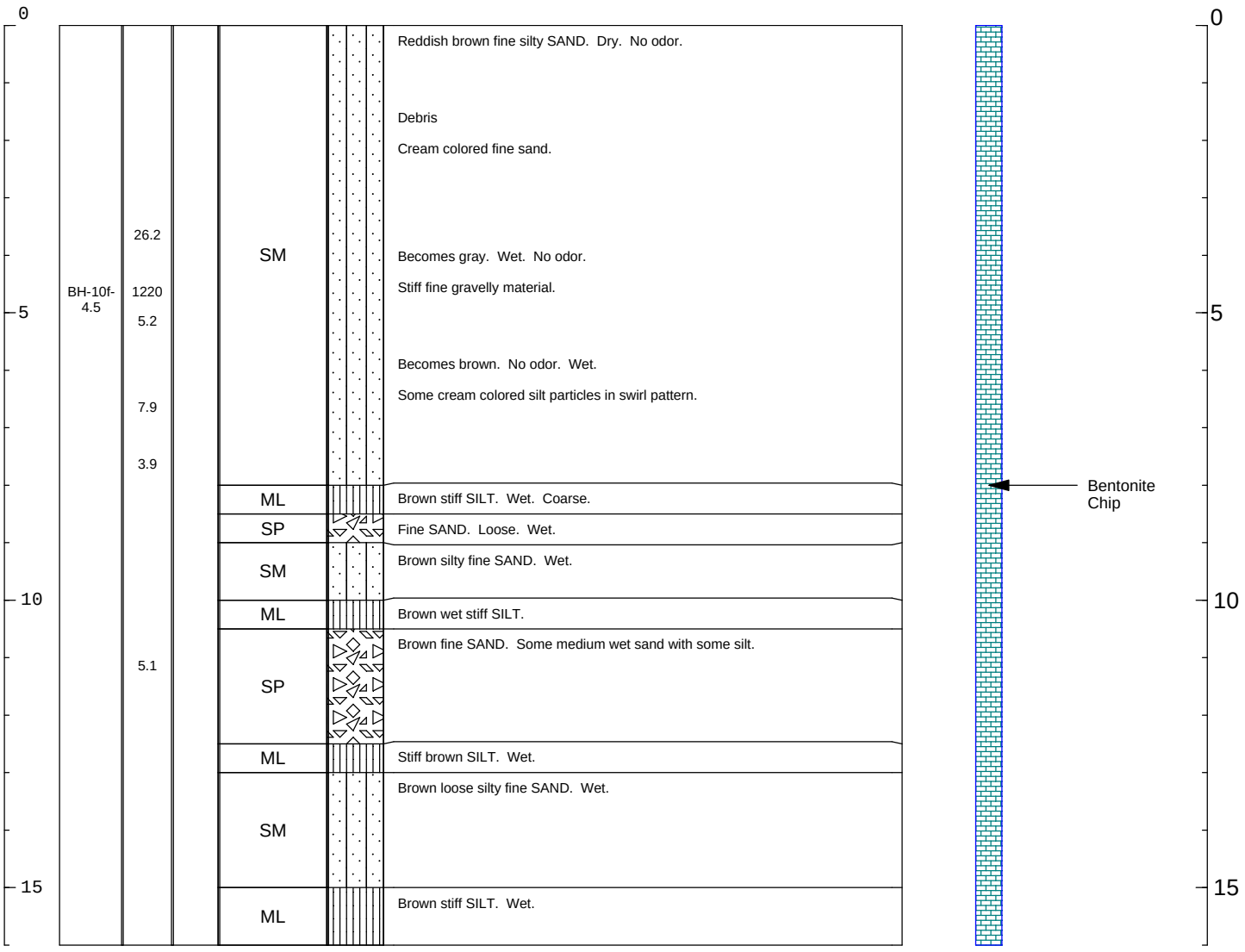
Borehole Depth: 16 ft
First Water:

Description By: Kevin Knesek
Reviewed By: Kevin Freeman

Well/Boring ID: BH-10f

Client: British Petroleum

Location: Manhole 34 Facility
North 6th Street and Yakima Valley Highway
Sunnyside, Washington



Remarks: ft = feet; " = inch; bgs = below ground surface; msl = mean sea level;
GP = Geoprobe; OD = Outer Diamer; NA = Not applicable / Available;
PID = Photoionization Detector; PVC = Poly Vinyl Chloride, G=Grab Sample,
SB=Split Barrel, TS=Top Soil, C=Concrete, AS=Asphalt

Date Start/Finish: 5/11/2011
Drilling Company: Cascade Drilling, L.P.
Driller's Name: Frank
Drilling Method: Geoprobe
Bit Size:
Hole Diameter: 2 in
Rig Type:
Sampling Method: Geoprobe

Northing:
Easting:
Casing Elevation:

Borehole Depth: 16 ft
First Water:

Description By: Kevin Knesek
Reviewed By: Kevin Freeman

Well/Boring ID: BH-10g

Client: British Petroleum

Location: Manhole 34 Facility
North 6th Street and Yakima Valley Highway
Sunnyside, Washington

DEPTH	Sample Run Number	OVM (ppm)	Recovery (feet)	U.S.C.S.	Geologic Column	Stratigraphic Description	Well/Boring Construction
0				SM		Brown fine silty SAND. No odor. Dry. Hand cleared to 3 ft.	
				ML		Brown stiff SILT. Dry.	
		50.1		SM		Fine gray silty SAND. Wet at 4 ft. Sheen visible.	Bentonite Chip
5		971		ML		Gray wet stiff SILT. Hydrocarbon odor.	5

Remarks: ft = feet; " = inch; bgs = below ground surface; msl = mean sea level; GP = Geoprobe; OD = Outer Diamer; NA = Not applicable / Available; PID = Photoionization Detector; PVC = Poly Vinyl Chloride, G=Grab Sample, SB=Split Barrel, TS=Top Soil, C=Concrete, AS=Asphalt

ARCADIS

Appendix D

Soil Analytical results

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Spokane
11922 East 1st. Avenue
Spokane, WA 99206
Tel: (509)924-9200

TestAmerica Job ID: SUE0077
Client Project/Site: GP09BPNA.WA59.00000
Client Project Description: WA59/MH-34

For:
ARCADIS U.S., Inc. - Liberty Lake
2310 N. Molter Rd. Suite 101
Liberty Lake, WA 99019

Attn: Kevin Knesek

Authorized for release by:
05/26/2011 10:39:03 AM

Randee Decker
Project Manager
Randee.Decker@testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

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QC Sample Results 24
Certification Summary 34
Method Summary 35
Chain of Custody 36

Job ID: SUE0077

Laboratory: TestAmerica Austin

Narrative

SUE0077

This report contains results for the samples received under chain-of-custody by TestAmerica Laboratories, Inc. 5/13/2011 8:45:00 AM .

These samples are associated with your **ARCADIS** project.

All samples were received in good condition and within temperature requirements.

All applicable quality control procedures met method specified acceptance criteria except where flagged on the result pages or noted in the case narrative.

If you should have any questions, please feel free to contact me at neal.salcher@testamericainc.com or (512) 310-5215.

Note that if this report contains tests performed for the following methods, the associated method deviations are applicable.
EPA 410.4, COD: Laboratory uses different analytical wavelength as specified by instrument manufacturer.
EPA 340.2, Fluoride: Preliminary Bellack distillation not performed.
EPA 624: The laboratory uses a different desorb time and purge volume than stated in the method.
Iowa OA1: Benzene, toluene, ethylbenzene and xylenes (BTEX) are not analyzed along with the Gasoline Range Organics if client does not require BTEX.
EPA TO-12: Samples not analyzed in duplicate.
EPA TO-14A and TO-15: Zero humidified nitrogen is used in place of air for method blanks.
SUE0077

Laboratory: TestAmerica Burlington

Narrative

CASE NARRATIVE

Client: TestAmerica Laboratories, Inc

Project: Liberty Lake

Report Number: 200-5162-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT
The samples were received on 05/13/2011; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 5.7 C.

Job ID: SUE0077 (Continued)

Laboratory: TestAmerica Burlington (Continued)

GRAIN SIZE

Samples SUE0077-02, SUE0077-03, SUE0077-04, SUE0077-05 and SUE0077-07 were analyzed for grain size in accordance with D422 grain size. The samples were analyzed on 05/17/2011.

No difficulties were encountered during the grain size analyses.

All quality control parameters were within the acceptance limits.

WATER CONTENT OF SOIL AND ROCK BY MASS

Samples SUE0077-01, SUE0077-02, SUE0077-03, SUE0077-04, SUE0077-05, SUE0077-06, SUE0077-07 and SUE0077-08 were analyzed for Water Content of Soil and Rock by Mass in accordance with ASTM D2216-90. The samples were analyzed on 05/17/2011.

No difficulties were encountered during the moisture content analyses.

All quality control parameters were within the acceptance limits.

Laboratory: TestAmerica Seattle

Narrative

Comments

No additional comments.

Receipt

All samples were received in good condition within temperature requirements.

GC/MS VOA - NWTPH/VPH

4-BFB surrogate recovery for the following sample was outside control limits: SUE0077-04 (580-26174-4) . Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed. The results have been "XI" flagged and reported.

The matrix spike duplicate (MSD) recoveries for sample SUE0077-02 (580-26174-2) in batch 86471 were outside control limits. The associated laboratory control sample (LCS) recovery met acceptance criteria. The results have been "F" flagged and reported.

No other analytical or quality issues were noted.

GC Semi VOA - NWTPH/EPH

The matrix spike / matrix spike duplicate (MS/MSD) recoveries for SUE0077-02 (580-26174-2) in batch 86069 were outside control limits. The associated laboratory control sample (LCS) recovery met acceptance criteria. The results have been "F" flagged and reported.

The laboratory control sample (LCS) for batch 86239 recovered below the control limits for the following analytes: Aromatic C10-C12. This failure is most likely attributed to human error during the extraction procedures. All associated samples have been analyzed for the VPH analysis, and the affected analyte range is reported from the VPH analysis.

No other analytical or quality issues were noted.

General Chemistry

No analytical or quality issues were noted.

Organic Prep - Method 3550B

Sample SUE0077-03 (580-26174-3) had about 1 mL of water in the KD tip along with the extract. Sodium sulfate was added to soak up the water. The extract was blown down by N-EVAP and vialed at 2 mL final volume. Method 3550B, EPH. Batch 86239.

No other analytical or quality issues were noted.

Sample Summary

Client: ARCADIS U.S., Inc. - Liberty Lake
Project/Site: GP09BPNA.WA59.00000

TestAmerica Job ID: SUE0077

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
SUE0077-01	BH-1b-3	Soil	05/09/11 12:22	05/12/11 12:07
SUE0077-02	BH-3-2.5	Soil	05/09/11 16:00	05/12/11 12:07
SUE0077-03	BH-4-3	Soil	05/10/11 08:15	05/12/11 12:07
SUE0077-04	BH-4a-2.5	Soil	05/10/11 09:05	05/12/11 12:07
SUE0077-05	BH-7-2	Soil	05/10/11 13:55	05/12/11 12:07
SUE0077-06	BH-10-3	Soil	05/11/11 08:45	05/12/11 12:07
SUE0077-07	BH-10c-2	Soil	05/11/11 10:35	05/12/11 12:07
SUE0077-08	BH-10f-4.5	Soil	05/11/11 12:20	05/12/11 12:07

Client: ARCADIS U.S., Inc. - Liberty Lake
Project/Site: GP09BPNA.WA59.00000

TestAmerica Job ID: SUE0077

Qualifiers

GCMS Volatiles

Qualifier	Qualifier Description
ZX	Due to sample matrix effects, the surrogate recovery was outside the acceptance limits.

Semivolatiles

Qualifier	Qualifier Description
Z2	Surrogate recovery was above the acceptance limits. Data not impacted.

GC VOA

Qualifier	Qualifier Description
F	MS or MSD exceeds the control limits
I	Indicates the presence of an interference, recovery is not calculated.
X	Surrogate is outside control limits

GC Volatiles

Qualifier	Qualifier Description
ZX	Due to sample matrix effects, the surrogate recovery was outside the acceptance limits.

GC Semi VOA

Qualifier	Qualifier Description
F	MS or MSD exceeds the control limits

Wet Chemistry

Qualifier	Qualifier Description
M1	The MS and/or MSD were outside the acceptance limits due to sample matrix interference. See Blank Spike (LCS).

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
☼	Listed under the "D" column to designate that the result is reported on a dry weight basis.
EPA	United States Environmental Protection Agency
ND	Not Detected above the reporting level.
MDL	Method Detection Limit
RL	Reporting Limit
RE, RE1 (etc.)	Indicates a Re-extraction or Reanalysis of the sample.
%R	Percent Recovery
RPD	Relative Percent Difference, a measure of the relative difference between two points.

Client Sample ID: BH-1b-3
Date Collected: 05/09/11 12:22
Date Received: 05/12/11 12:07

Lab Sample ID: SUE0077-01
Matrix: Soil
Percent Solids: 82.4

Method: EPA 8260B - Volatile Organic Compounds by EPA Method 8260B

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.0218		mg/kg dry	☼	05/20/11 09:49	05/20/11 12:03	1.00
Ethylbenzene	ND		0.145		mg/kg dry	☼	05/20/11 09:49	05/20/11 12:03	1.00
Toluene	ND		0.145		mg/kg dry	☼	05/20/11 09:49	05/20/11 12:03	1.00
o-Xylene	ND		0.290		mg/kg dry	☼	05/20/11 09:49	05/20/11 12:03	1.00
m,p-Xylene	ND		0.581		mg/kg dry	☼	05/20/11 09:49	05/20/11 12:03	1.00
Methyl tert-butyl ether	ND		0.0436		mg/kg dry	☼	05/20/11 09:49	05/20/11 12:03	1.00
Naphthalene	ND		0.290		mg/kg dry	☼	05/20/11 09:49	05/20/11 12:03	1.00

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8	*93.0*		*50.8 - 132*	*05/20/11 09:49*	*05/20/11 12:03*	*1.00*
4-bromofluorobenzene	*104*		*51 - 136*	*05/20/11 09:49*	*05/20/11 12:03*	*1.00*
Dibromofluoromethane	*98.2*		*42.7 - 151*	*05/20/11 09:49*	*05/20/11 12:03*	*1.00*

Method: EPA 8270 mod. - Polynuclear Aromatic Compounds by GC/MS with Selected Ion Monitoring

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 09:54	1.00
2-Methylnaphthalene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 09:54	1.00
1-Methylnapthalene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 09:54	1.00
Acenaphthylene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 09:54	1.00
Acenaphthene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 09:54	1.00
Fluorene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 09:54	1.00
Phenanthrene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 09:54	1.00
Anthracene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 09:54	1.00
Fluoranthene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 09:54	1.00
Pyrene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 09:54	1.00
Benzo (a) anthracene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 09:54	1.00
Chrysene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 09:54	1.00
Benzo (b) fluoranthene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 09:54	1.00
Benzo (k) fluoranthene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 09:54	1.00
Benzo (a) pyrene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 09:54	1.00
Indeno (1,2,3-cd) pyrene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 09:54	1.00
Dibenzo (a,h) anthracene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 09:54	1.00
Benzo (ghi) perylene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 09:54	1.00

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*67.8*		*30 - 140*	*05/20/11 09:28*	*05/23/11 09:54*	*1.00*
2-FBP	*63.2*		*30 - 140*	*05/20/11 09:28*	*05/23/11 09:54*	*1.00*
p-Terphenyl-d14	*150*		*30 - 150*	*05/20/11 09:28*	*05/23/11 09:54*	*1.00*

Method: NWTPH-Dx - Semivolatile Petroleum Products by NWTPH-Dx

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Hydrocarbons	ND		12.1		mg/kg dry	☼	05/19/11 07:03	05/19/11 10:15	1.00
Heavy Oil Range Hydrocarbons	ND		30.3		mg/kg dry	☼	05/19/11 07:03	05/19/11 10:15	1.00

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-FBP	*101*		*50 - 150*	*05/19/11 07:03*	*05/19/11 10:15*	*1.00*
p-Terphenyl-d14	*108*		*50 - 150*	*05/19/11 07:03*	*05/19/11 10:15*	*1.00*

Method: NWTPH/VPH - Northwest - Volatile Pertroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C5-C6 Aliphatics	ND		3.3		mg/Kg	☼	05/21/11 10:29	05/22/11 23:02	1
C6-C8 Aliphatics	ND		3.3		mg/Kg	☼	05/21/11 10:29	05/22/11 23:02	1

Client Sample ID: BH-1b-3

Lab Sample ID: SUE0077-01

Date Collected: 05/09/11 12:22
Matrix: Soil
Date Received: 05/12/11 12:07
Percent Solids: 78.3

Method: NWTPH/VPH - Northwest - Volatile Pertroleum Hydrocarbons (GC) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C8-C10 Aliphatics	ND		3.3		mg/Kg	☼	05/21/11 10:29	05/22/11 23:02	1
C10-C12 Aliphatics	ND		3.3		mg/Kg	☼	05/21/11 10:29	05/22/11 23:02	1
C8-C10 Aromatics	ND		3.3		mg/Kg	☼	05/21/11 10:29	05/22/11 23:02	1
C10-C12 Aromatics	ND		3.3		mg/Kg	☼	05/21/11 10:29	05/22/11 23:02	1
C12-C13 Aromatics	ND		3.3		mg/Kg	☼	05/21/11 10:29	05/22/11 23:02	1
Total VPH	ND		23		mg/Kg	☼	05/21/11 10:29	05/22/11 23:02	1

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*101*		*60 - 140*	*05/21/11 10:29*	*05/22/11 23:02*	*1*
BFB - PID	*103*		*60 - 140*	*05/21/11 10:29*	*05/22/11 23:02*	*1*

Method: NWTPH-Gx - Gasoline Hydrocarbons by NWTPH-Gx

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Hydrocarbons	ND		6.37		mg/kg dry	☼	05/20/11 13:03	05/20/11 15:37	1.00

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-BFB (FID)	*128*		*50 - 150*	*05/20/11 13:03*	*05/20/11 15:37*	*1.00*

Method: NWTPH/EPH - Northwest - Extractable Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C12 Aliphatics	ND		6.3		mg/Kg	☼	05/18/11 10:13	05/23/11 19:38	1
C12-C16 Aliphatics	ND		6.3		mg/Kg	☼	05/18/11 10:13	05/23/11 19:38	1
C16-C21 Aliphatics	ND		6.3		mg/Kg	☼	05/18/11 10:13	05/23/11 19:38	1
C21-C34 Aliphatics	ND		6.3		mg/Kg	☼	05/18/11 10:13	05/23/11 19:38	1
C12-C16 Aromatics	ND		6.3		mg/Kg	☼	05/18/11 10:13	05/23/11 19:38	1
C16-C21 Aromatics	ND		6.3		mg/Kg	☼	05/18/11 10:13	05/23/11 19:38	1
C21-C34 Aromatics	ND		6.3		mg/Kg	☼	05/18/11 10:13	05/23/11 19:38	1

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*83*		*60 - 140*	*05/18/11 10:13*	*05/23/11 19:38*	*1*
1-Chlorooctadecane	*82*		*60 - 140*	*05/18/11 10:13*	*05/23/11 19:38*	*1*

Method: MSA 29-3.5.2 - General Chemistry Parameters

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	ND		2480		mg/kg dry	☼	05/17/11 13:36	05/17/11 16:58	1.00

Method: D2216-90 - Water (Moisture) Content

Analyte	Result	Qualifier	NONE	NONE	Unit	D	Prepared	Analyzed	Dil Fac
Moisture Content	**26.5**				%			05/17/11 08:44	1

Client Sample ID: BH-3-2.5

Lab Sample ID: SUE0077-02

Date Collected: 05/09/11 16:00
Matrix: Soil
Date Received: 05/12/11 12:07
Percent Solids: 87.5

Method: EPA 8260B - Volatile Organic Compounds by EPA Method 8260B

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	**0.140**		0.0203		mg/kg dry	☼	05/20/11 09:49	05/20/11 12:31	1.00
Ethylbenzene	**0.354**		0.136		mg/kg dry	☼	05/20/11 09:49	05/20/11 12:31	1.00
Toluene	**0.551**		0.136		mg/kg dry	☼	05/20/11 09:49	05/20/11 12:31	1.00
o-Xylene	**0.483**		0.271		mg/kg dry	☼	05/20/11 09:49	05/20/11 12:31	1.00
m,p-Xylene	**1.46**		0.542		mg/kg dry	☼	05/20/11 09:49	05/20/11 12:31	1.00
Methyl tert-butyl ether	ND		0.0407		mg/kg dry	☼	05/20/11 09:49	05/20/11 12:31	1.00

Client Sample ID: BH-3-2.5
Date Collected: 05/09/11 16:00
Date Received: 05/12/11 12:07

Lab Sample ID: SUE0077-02
Matrix: Soil
Percent Solids: 87.5

Method: EPA 8260B - Volatile Organic Compounds by EPA Method 8260B (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	**0.350**		0.271		mg/kg dry	☼	05/20/11 09:49	05/20/11 12:31	1.00

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8	*97.6*		*50.8 - 132*	*05/20/11 09:49*	*05/20/11 12:31*	*1.00*
4-bromofluorobenzene	*112*		*51 - 136*	*05/20/11 09:49*	*05/20/11 12:31*	*1.00*
Dibromofluoromethane	*92.4*		*42.7 - 151*	*05/20/11 09:49*	*05/20/11 12:31*	*1.00*

Method: EPA 8270 mod. - Polynuclear Aromatic Compounds by GC/MS with Selected Ion Monitoring

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	**0.109**		0.0114		mg/kg dry	☼	05/20/11 09:28	05/23/11 10:20	1.00
2-Methylnaphthalene	**0.126**		0.0114		mg/kg dry	☼	05/20/11 09:28	05/23/11 10:20	1.00
1-Methylnapthalene	**0.0709**		0.0114		mg/kg dry	☼	05/20/11 09:28	05/23/11 10:20	1.00
Acenaphthylene	ND		0.0114		mg/kg dry	☼	05/20/11 09:28	05/23/11 10:20	1.00
Acenaphthene	ND		0.0114		mg/kg dry	☼	05/20/11 09:28	05/23/11 10:20	1.00
Fluorene	ND		0.0114		mg/kg dry	☼	05/20/11 09:28	05/23/11 10:20	1.00
Phenanthrene	ND		0.0114		mg/kg dry	☼	05/20/11 09:28	05/23/11 10:20	1.00
Anthracene	ND		0.0114		mg/kg dry	☼	05/20/11 09:28	05/23/11 10:20	1.00
Fluoranthene	ND		0.0114		mg/kg dry	☼	05/20/11 09:28	05/23/11 10:20	1.00
Pyrene	ND		0.0114		mg/kg dry	☼	05/20/11 09:28	05/23/11 10:20	1.00
Benzo (a) anthracene	ND		0.0114		mg/kg dry	☼	05/20/11 09:28	05/23/11 10:20	1.00
Chrysene	ND		0.0114		mg/kg dry	☼	05/20/11 09:28	05/23/11 10:20	1.00
Benzo (b) fluoranthene	ND		0.0114		mg/kg dry	☼	05/20/11 09:28	05/23/11 10:20	1.00
Benzo (k) fluoranthene	ND		0.0114		mg/kg dry	☼	05/20/11 09:28	05/23/11 10:20	1.00
Benzo (a) pyrene	ND		0.0114		mg/kg dry	☼	05/20/11 09:28	05/23/11 10:20	1.00
Indeno (1,2,3-cd) pyrene	ND		0.0114		mg/kg dry	☼	05/20/11 09:28	05/23/11 10:20	1.00
Dibenzo (a,h) anthracene	ND		0.0114		mg/kg dry	☼	05/20/11 09:28	05/23/11 10:20	1.00
Benzo (ghi) perylene	ND		0.0114		mg/kg dry	☼	05/20/11 09:28	05/23/11 10:20	1.00

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*87.0*		*30 - 140*	*05/20/11 09:28*	*05/23/11 10:20*	*1.00*
2-FBP	*93.2*		*30 - 140*	*05/20/11 09:28*	*05/23/11 10:20*	*1.00*
p-Terphenyl-d14	*118*		*30 - 150*	*05/20/11 09:28*	*05/23/11 10:20*	*1.00*

Method: NWTPH-Dx - Semivolatile Petroleum Products by NWTPH-Dx

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Hydrocarbons	ND		11.4		mg/kg dry	☼	05/19/11 07:03	05/19/11 11:01	1.00
Heavy Oil Range Hydrocarbons	ND		28.6		mg/kg dry	☼	05/19/11 07:03	05/19/11 11:01	1.00

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-FBP	*101*		*50 - 150*	*05/19/11 07:03*	*05/19/11 11:01*	*1.00*
p-Terphenyl-d14	*110*		*50 - 150*	*05/19/11 07:03*	*05/19/11 11:01*	*1.00*

Method: NWTPH/VPH - Northwest - Volatile Pertroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C5-C6 Aliphatics	ND		2.4		mg/Kg	☼	05/21/11 10:29	05/23/11 00:21	1
C6-C8 Aliphatics	ND		2.4		mg/Kg	☼	05/21/11 10:29	05/23/11 00:21	1
C8-C10 Aliphatics	ND		2.4		mg/Kg	☼	05/21/11 10:29	05/23/11 00:21	1
C10-C12 Aliphatics	ND		2.4		mg/Kg	☼	05/21/11 10:29	05/23/11 00:21	1
C8-C10 Aromatics	**2.9**		2.4		mg/Kg	☼	05/21/11 10:29	05/23/11 00:21	1
C10-C12 Aromatics	**2.5**		2.4		mg/Kg	☼	05/21/11 10:29	05/23/11 00:21	1
C12-C13 Aromatics	ND		2.4		mg/Kg	☼	05/21/11 10:29	05/23/11 00:21	1
Total VPH	ND		17		mg/Kg	☼	05/21/11 10:29	05/23/11 00:21	1

Client Sample ID: BH-3-2.5
Date Collected: 05/09/11 16:00
Date Received: 05/12/11 12:07

Lab Sample ID: SUE0077-02
Matrix: Soil
Percent Solids: 84.3

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*104*		*60 - 140*	*05/21/11 10:29*	*05/23/11 00:21*	*1*
BFB - PID	*101*		*60 - 140*	*05/21/11 10:29*	*05/23/11 00:21*	*1*

Method: NWTPH-Gx - Gasoline Hydrocarbons by NWTPH-Gx

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Hydrocarbons	**27.7**		7.33		mg/kg dry	☼	05/20/11 13:03	05/20/11 16:02	1.00

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-BFB (FID)	*124*		*50 - 150*	*05/20/11 13:03*	*05/20/11 16:02*	*1.00*

Method: NWTPH/EPH - Northwest - Extractable Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C12 Aliphatics	ND		5.9		mg/Kg	☼	05/18/11 10:13	05/23/11 20:02	1
C12-C16 Aliphatics	ND		5.9		mg/Kg	☼	05/18/11 10:13	05/23/11 20:02	1
C16-C21 Aliphatics	ND		5.9		mg/Kg	☼	05/18/11 10:13	05/23/11 20:02	1
C21-C34 Aliphatics	ND		5.9		mg/Kg	☼	05/18/11 10:13	05/23/11 20:02	1
C12-C16 Aromatics	ND		5.9		mg/Kg	☼	05/18/11 10:13	05/23/11 20:02	1
C16-C21 Aromatics	ND		5.9		mg/Kg	☼	05/18/11 10:13	05/23/11 20:02	1
C21-C34 Aromatics	ND		5.9		mg/Kg	☼	05/18/11 10:13	05/23/11 20:02	1

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*88*		*60 - 140*	*05/18/11 10:13*	*05/23/11 20:02*	*1*
1-Chlorooctadecane	*86*		*60 - 140*	*05/18/11 10:13*	*05/23/11 20:02*	*1*

Method: MSA 29-3.5.2 - General Chemistry Parameters

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	**2970**		2390		mg/kg dry	☼	05/17/11 13:36	05/17/11 16:58	1.00

Method: D2216-90 - Water (Moisture) Content

Analyte	Result	Qualifier	NONE	NONE	Unit	D	Prepared	Analyzed	Dil Fac
Moisture Content	**34.1**				%			05/17/11 08:44	1

Method: D422 - Grain Size

Analyte	Result	Qualifier	NONE	NONE	Unit	D	Prepared	Analyzed	Dil Fac
Gravel	**0.0**				%			05/17/11 08:48	1
Sieve Size 3 inch - Percent Finer	**100.0**				% Passing			05/17/11 08:48	1
Sand	**37.5**				%			05/17/11 08:48	1
Sieve Size 2 inch - Percent Finer	**100.0**				% Passing			05/17/11 08:48	1
Coarse Sand	**0.2**				%			05/17/11 08:48	1
Sieve Size 1.5 inch - Percent Finer	**100.0**				% Passing			05/17/11 08:48	1
Medium Sand	**1.8**				%			05/17/11 08:48	1
Sieve Size 1 inch - Percent Finer	**100.0**				% Passing			05/17/11 08:48	1
Fine Sand	**35.5**				%			05/17/11 08:48	1
Sieve Size 0.75 inch - Percent Finer	**100.0**				% Passing			05/17/11 08:48	1
Sieve Size 0.375 inch - Percent Finer	**100.0**				% Passing			05/17/11 08:48	1
Silt	**53.7**				%			05/17/11 08:48	1
Clay	**8.8**				%			05/17/11 08:48	1
Sieve Size #4 - Percent Finer	**100.0**				% Passing			05/17/11 08:48	1
Sieve Size #10 - Percent Finer	**99.8**				% Passing			05/17/11 08:48	1
Sieve Size #20 - Percent Finer	**99.1**				% Passing			05/17/11 08:48	1
Sieve Size #40 - Percent Finer	**98.0**				% Passing			05/17/11 08:48	1
Sieve Size #60 - Percent Finer	**95.4**				% Passing			05/17/11 08:48	1

Client Sample ID: BH-3-2.5

Lab Sample ID: SUE0077-02

Date Collected: 05/09/11 16:00

Matrix: Soil

Date Received: 05/12/11 12:07

Method: D422 - Grain Size (Continued)

Analyte	Result	Qualifier	NONE	NONE	Unit	D	Prepared	Analyzed	Dil Fac
Sieve Size #80 - Percent Finer	92.0				% Passing			05/17/11 08:48	1
Sieve Size #100 - Percent Finer	88.9				% Passing			05/17/11 08:48	1
Sieve Size #200 - Percent Finer	62.5				% Passing			05/17/11 08:48	1

Client Sample ID: BH-4-3

Lab Sample ID: SUE0077-03

Date Collected: 05/10/11 08:15

Matrix: Soil

Date Received: 05/12/11 12:07

Percent Solids: 85.5

Method: EPA 8260B - Volatile Organic Compounds by EPA Method 8260B

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.574		0.0185		mg/kg dry	☼	05/20/11 09:49	05/20/11 12:59	1.00
Ethylbenzene	1.47		0.123		mg/kg dry	☼	05/20/11 09:49	05/20/11 12:59	1.00
Toluene	2.78		0.123		mg/kg dry	☼	05/20/11 09:49	05/20/11 12:59	1.00
o-Xylene	145		24.7		mg/kg dry	☼	05/20/11 09:49	05/20/11 16:13	100
m,p-Xylene	4.71		0.494		mg/kg dry	☼	05/20/11 09:49	05/20/11 12:59	1.00
Methyl tert-butyl ether	ND		0.0370		mg/kg dry	☼	05/20/11 09:49	05/20/11 12:59	1.00
Naphthalene	ND		0.247		mg/kg dry	☼	05/20/11 09:49	05/20/11 12:59	1.00

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8	*109*		*50.8 - 132*	*05/20/11 09:49*	*05/20/11 12:59*	*1.00*
4-bromofluorobenzene	*358*	*ZX*	*51 - 136*	*05/20/11 09:49*	*05/20/11 12:59*	*1.00*
Dibromofluoromethane	*90.2*		*42.7 - 151*	*05/20/11 09:49*	*05/20/11 12:59*	*1.00*

Method: EPA 8270 mod. - Polynuclear Aromatic Compounds by GC/MS with Selected Ion Monitoring

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	12.5		0.585		mg/kg dry	☼	05/20/11 09:28	05/23/11 14:19	50.0
2-Methylnaphthalene	10.9		0.585		mg/kg dry	☼	05/20/11 09:28	05/23/11 14:19	50.0
1-Methylnapthalene	5.77		0.585		mg/kg dry	☼	05/20/11 09:28	05/23/11 14:19	50.0
Acenaphthylene	ND		0.0117		mg/kg dry	☼	05/20/11 09:28	05/23/11 15:11	1.00
Acenaphthene	0.0218		0.0117		mg/kg dry	☼	05/20/11 09:28	05/23/11 15:11	1.00
Fluorene	ND		0.0117		mg/kg dry	☼	05/20/11 09:28	05/23/11 15:11	1.00
Phenanthrene	0.188		0.0117		mg/kg dry	☼	05/20/11 09:28	05/23/11 15:11	1.00
Anthracene	ND		0.0117		mg/kg dry	☼	05/20/11 09:28	05/23/11 15:11	1.00
Fluoranthene	0.0133		0.0117		mg/kg dry	☼	05/20/11 09:28	05/23/11 15:11	1.00
Pyrene	ND		0.0117		mg/kg dry	☼	05/20/11 09:28	05/23/11 15:11	1.00
Benzo (a) anthracene	ND		0.0117		mg/kg dry	☼	05/20/11 09:28	05/23/11 15:11	1.00
Chrysene	ND		0.0117		mg/kg dry	☼	05/20/11 09:28	05/23/11 15:11	1.00
Benzo (b) fluoranthene	ND		0.0117		mg/kg dry	☼	05/20/11 09:28	05/23/11 15:11	1.00
Benzo (k) fluoranthene	ND		0.0117		mg/kg dry	☼	05/20/11 09:28	05/23/11 15:11	1.00
Benzo (a) pyrene	ND		0.0117		mg/kg dry	☼	05/20/11 09:28	05/23/11 15:11	1.00
Indeno (1,2,3-cd) pyrene	ND		0.0117		mg/kg dry	☼	05/20/11 09:28	05/23/11 15:11	1.00
Dibenzo (a,h) anthracene	ND		0.0117		mg/kg dry	☼	05/20/11 09:28	05/23/11 15:11	1.00
Benzo (ghi) perylene	ND		0.0117		mg/kg dry	☼	05/20/11 09:28	05/23/11 15:11	1.00

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*80.0*		*30 - 140*	*05/20/11 09:28*	*05/23/11 14:19*	*50.0*
2-FBP	*58.4*		*30 - 140*	*05/20/11 09:28*	*05/23/11 15:11*	*1.00*
p-Terphenyl-d14	*109*		*30 - 150*	*05/20/11 09:28*	*05/23/11 15:11*	*1.00*

Client Sample ID: BH-4-3
Date Collected: 05/10/11 08:15
Date Received: 05/12/11 12:07

Lab Sample ID: SUE0077-03
Matrix: Soil
Percent Solids: 85.5

Method: NWTPH-Dx - Semivolatile Petroleum Products by NWTPH-Dx

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Hydrocarbons	840		11.7		mg/kg dry	☼	05/19/11 07:03	05/19/11 11:46	1.00
Heavy Oil Range Hydrocarbons	69.4		29.2		mg/kg dry	☼	05/19/11 07:03	05/19/11 11:46	1.00

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-FBP	*128*		*50 - 150*	*05/19/11 07:03*	*05/19/11 11:46*	*1.00*
p-Terphenyl-d14	*111*		*50 - 150*	*05/19/11 07:03*	*05/19/11 11:46*	*1.00*

Method: NWTPH/VPH - Northwest - Volatile Pertroleum Hydrocarbons (GC) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C5-C6 Aliphatics	ND		53		mg/Kg	☼	05/21/11 10:29	05/23/11 05:37	25
C6-C8 Aliphatics	100		53		mg/Kg	☼	05/21/11 10:29	05/23/11 05:37	25
C8-C10 Aliphatics	260		53		mg/Kg	☼	05/21/11 10:29	05/23/11 05:37	25
C10-C12 Aliphatics	290		53		mg/Kg	☼	05/21/11 10:29	05/23/11 05:37	25
C8-C10 Aromatics	310		53		mg/Kg	☼	05/21/11 10:29	05/23/11 05:37	25
C10-C12 Aromatics	360		53		mg/Kg	☼	05/21/11 10:29	05/23/11 05:37	25
C12-C13 Aromatics	150		53		mg/Kg	☼	05/21/11 10:29	05/23/11 05:37	25
Total VPH	1500		370		mg/Kg	☼	05/21/11 10:29	05/23/11 05:37	25

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*131*		*60 - 140*	*05/21/11 10:29*	*05/23/11 05:37*	*25*
BFB - PID	*113*		*60 - 140*	*05/21/11 10:29*	*05/23/11 05:37*	*25*

Method: NWTPH-Gx - Gasoline Hydrocarbons by NWTPH-Gx

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Hydrocarbons	2880		305		mg/kg dry	☼	05/20/11 13:03	05/23/11 15:46	50.0

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-BFB (FID)	*167*	*ZX*	*50 - 150*	*05/20/11 13:03*	*05/23/11 15:46*	*50.0*

Method: NWTPH/EPH - Northwest - Extractable Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C12 Aliphatics	39		5.8		mg/Kg	☼	05/18/11 10:13	05/23/11 21:15	1
C12-C16 Aliphatics	39		5.8		mg/Kg	☼	05/18/11 10:13	05/23/11 21:15	1
C16-C21 Aliphatics	26		5.8		mg/Kg	☼	05/18/11 10:13	05/23/11 21:15	1
C21-C34 Aliphatics	6.2		5.8		mg/Kg	☼	05/18/11 10:13	05/23/11 21:15	1
C12-C16 Aromatics	34		5.8		mg/Kg	☼	05/18/11 10:13	05/23/11 21:15	1
C16-C21 Aromatics	6.5		5.8		mg/Kg	☼	05/18/11 10:13	05/23/11 21:15	1
C21-C34 Aromatics	ND		5.8		mg/Kg	☼	05/18/11 10:13	05/23/11 21:15	1

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*72*		*60 - 140*	*05/18/11 10:13*	*05/23/11 21:15*	*1*
1-Chlorooctadecane	*70*		*60 - 140*	*05/18/11 10:13*	*05/23/11 21:15*	*1*

Method: MSA 29-3.5.2 - General Chemistry Parameters

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	7320		2340		mg/kg dry	☼	05/17/11 13:36	05/17/11 16:58	1.00

Method: D2216-90 - Water (Moisture) Content

Analyte	Result	Qualifier	NONE	NONE	Unit	D	Prepared	Analyzed	Dil Fac
Moisture Content	14.8				%			05/17/11 08:44	1

Client Sample ID: BH-4-3

Lab Sample ID: SUE0077-03

Date Collected: 05/10/11 08:15

Matrix: Soil

Date Received: 05/12/11 12:07

Method: D422 - Grain Size

Analyte	Result	Qualifier	NONE	NONE	Unit	D	Prepared	Analyzed	Dil Fac
Gravel	1.5				%			05/17/11 08:51	1
Sieve Size 3 inch - Percent Finer	100.0				% Passing			05/17/11 08:51	1
Sand	46.7				%			05/17/11 08:51	1
Sieve Size 2 inch - Percent Finer	100.0				% Passing			05/17/11 08:51	1
Coarse Sand	1.4				%			05/17/11 08:51	1
Sieve Size 1.5 inch - Percent Finer	100.0				% Passing			05/17/11 08:51	1
Medium Sand	3.2				%			05/17/11 08:51	1
Sieve Size 1 inch - Percent Finer	100.0				% Passing			05/17/11 08:51	1
Fine Sand	42.1				%			05/17/11 08:51	1
Sieve Size 0.75 inch - Percent Finer	100.0				% Passing			05/17/11 08:51	1
Sieve Size 0.375 inch - Percent Finer	100.0				% Passing			05/17/11 08:51	1
Silt	41.8				%			05/17/11 08:51	1
Clay	10.0				%			05/17/11 08:51	1
Sieve Size #4 - Percent Finer	98.5				% Passing			05/17/11 08:51	1
Sieve Size #10 - Percent Finer	97.1				% Passing			05/17/11 08:51	1
Sieve Size #20 - Percent Finer	95.6				% Passing			05/17/11 08:51	1
Sieve Size #40 - Percent Finer	93.9				% Passing			05/17/11 08:51	1
Sieve Size #60 - Percent Finer	88.8				% Passing			05/17/11 08:51	1
Sieve Size #80 - Percent Finer	82.5				% Passing			05/17/11 08:51	1
Sieve Size #100 - Percent Finer	78.1				% Passing			05/17/11 08:51	1
Sieve Size #200 - Percent Finer	51.8				% Passing			05/17/11 08:51	1

Client Sample ID: BH-4a-2.5

Lab Sample ID: SUE0077-04

Date Collected: 05/10/11 09:05

Matrix: Soil

Date Received: 05/12/11 12:07

Percent Solids: 82.7

Method: EPA 8260B - Volatile Organic Compounds by EPA Method 8260B

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	20.7		2.88		mg/kg dry	☼	05/20/11 09:49	05/20/11 16:41	100
Ethylbenzene	51.2		19.2		mg/kg dry	☼	05/20/11 09:49	05/20/11 16:41	100
Toluene	109		19.2		mg/kg dry	☼	05/20/11 09:49	05/20/11 16:41	100
o-Xylene	323		38.3		mg/kg dry	☼	05/20/11 09:49	05/20/11 16:41	100
m,p-Xylene	200		76.7		mg/kg dry	☼	05/20/11 09:49	05/20/11 16:41	100
Methyl tert-butyl ether	ND		5.75		mg/kg dry	☼	05/20/11 09:49	05/20/11 13:26	100
Naphthalene	ND		38.3		mg/kg dry	☼	05/20/11 09:49	05/20/11 13:26	100

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8	*106*		*50.8 - 132*	*05/20/11 09:49*	*05/20/11 13:26*	*100*
4-bromofluorobenzene	*197*	*ZX*	*51 - 136*	*05/20/11 09:49*	*05/20/11 13:26*	*100*
Dibromofluoromethane	*91.4*		*42.7 - 151*	*05/20/11 09:49*	*05/20/11 13:26*	*100*

Method: EPA 8270 mod. - Polynuclear Aromatic Compounds by GC/MS with Selected Ion Monitoring

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	24.1		0.242		mg/kg dry	☼	05/20/11 09:28	05/23/11 11:13	20.0
2-Methylnaphthalene	15.4		0.242		mg/kg dry	☼	05/20/11 09:28	05/23/11 11:13	20.0
1-Methylnapthalene	11.8		0.242		mg/kg dry	☼	05/20/11 09:28	05/23/11 11:13	20.0
Acenaphthylene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 15:38	1.00
Acenaphthene	0.0137		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 15:38	1.00
Fluorene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 15:38	1.00
Phenanthrene	0.0540		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 15:38	1.00

Client Sample ID: BH-4a-2.5
Date Collected: 05/10/11 09:05
Date Received: 05/12/11 12:07

Lab Sample ID: SUE0077-04
Matrix: Soil
Percent Solids: 82.7

Method: EPA 8270 mod. - Polynuclear Aromatic Compounds by GC/MS with Selected Ion Monitoring (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Anthracene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 15:38	1.00
Fluoranthene	**0.0161**		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 15:38	1.00
Pyrene	**0.0226**		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 15:38	1.00
Benzo (a) anthracene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 15:38	1.00
Chrysene	**0.0169**		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 15:38	1.00
Benzo (b) fluoranthene	**0.0169**		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 15:38	1.00
Benzo (k) fluoranthene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 15:38	1.00
Benzo (a) pyrene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 15:38	1.00
Indeno (1,2,3-cd) pyrene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 15:38	1.00
Dibenzo (a,h) anthracene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 15:38	1.00
Benzo (ghi) perylene	**0.0137**		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 15:38	1.00

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*102*		*30 - 140*	*05/20/11 09:28*	*05/23/11 15:38*	*1.00*
2-FBP	*58.6*		*30 - 140*	*05/20/11 09:28*	*05/23/11 15:38*	*1.00*
p-Terphenyl-d14	*107*		*30 - 150*	*05/20/11 09:28*	*05/23/11 15:38*	*1.00*

Method: NWTPH-Dx - Semivolatile Petroleum Products by NWTPH-Dx

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Hydrocarbons	**634**		60.5		mg/kg dry	☼	05/19/11 07:03	05/19/11 13:17	5.00
Heavy Oil Range Hydrocarbons	**1390**		151		mg/kg dry	☼	05/19/11 07:03	05/19/11 13:17	5.00

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-FBP	*101*		*50 - 150*	*05/19/11 07:03*	*05/19/11 13:17*	*5.00*
p-Terphenyl-d14	*119*		*50 - 150*	*05/19/11 07:03*	*05/19/11 13:17*	*5.00*

Method: NWTPH/VPH - Northwest - Volatile Pertroleum Hydrocarbons (GC) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C5-C6 Aliphatics	**47**		30		mg/Kg	☼	05/21/11 10:29	05/23/11 04:44	10
C12-C13 Aromatics	**210**		30		mg/Kg	☼	05/21/11 10:29	05/23/11 04:44	10

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*174*	*I X*	*60 - 140*	*05/21/11 10:29*	*05/23/11 04:44*	*10*
BFB - PID	*101*		*60 - 140*	*05/21/11 10:29*	*05/23/11 04:44*	*10*

Method: NWTPH/VPH - Northwest - Volatile Pertroleum Hydrocarbons (GC) - DL2

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C6-C8 Aliphatics	**180**		75		mg/Kg	☼	05/23/11 14:19	05/23/11 20:45	25
C8-C10 Aliphatics	**310**		75		mg/Kg	☼	05/23/11 14:19	05/23/11 20:45	25
C10-C12 Aliphatics	**310**		75		mg/Kg	☼	05/23/11 14:19	05/23/11 20:45	25
C8-C10 Aromatics	**740**		75		mg/Kg	☼	05/23/11 14:19	05/23/11 20:45	25
C10-C12 Aromatics	**510**		75		mg/Kg	☼	05/23/11 14:19	05/23/11 20:45	25
Total VPH	**2500**		530		mg/Kg	☼	05/23/11 14:19	05/23/11 20:45	25

Method: NWTPH-Gx - Gasoline Hydrocarbons by NWTPH-Gx

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Hydrocarbons	**6430**		154		mg/kg dry	☼	05/20/11 13:03	05/20/11 17:17	10.0

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-BFB (FID)	*314*	*ZX*	*50 - 150*	*05/20/11 13:03*	*05/20/11 17:17*	*10.0*

Client Sample ID: BH-4a-2.5

Lab Sample ID: SUE0077-04

Date Collected: 05/10/11 09:05

Matrix: Soil

Date Received: 05/12/11 12:07

Percent Solids: 88.3

Method: NWTPH/EPH - Northwest - Extractable Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C12 Aliphatics	100		23		mg/Kg	☼	05/18/11 10:13	05/23/11 21:39	1
C12-C16 Aliphatics	79		23		mg/Kg	☼	05/18/11 10:13	05/23/11 21:39	1
C16-C21 Aliphatics	140		23		mg/Kg	☼	05/18/11 10:13	05/23/11 21:39	1
C21-C34 Aliphatics	1100		23		mg/Kg	☼	05/18/11 10:13	05/23/11 21:39	1
C12-C16 Aromatics	110		23		mg/Kg	☼	05/18/11 10:13	05/23/11 21:39	1
C16-C21 Aromatics	45		23		mg/Kg	☼	05/18/11 10:13	05/23/11 21:39	1
C21-C34 Aromatics	480		23		mg/Kg	☼	05/18/11 10:13	05/23/11 21:39	1

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*80*		*60 - 140*	*05/18/11 10:13*	*05/23/11 21:39*	*1*
1-Chlorooctadecane	*86*		*60 - 140*	*05/18/11 10:13*	*05/23/11 21:39*	*1*

Method: MSA 29-3.5.2 - General Chemistry Parameters

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	22700		2320		mg/kg dry	☼	05/17/11 13:36	05/17/11 16:58	1.00

Method: D2216-90 - Water (Moisture) Content

Analyte	Result	Qualifier	NONE	NONE	Unit	D	Prepared	Analyzed	Dil Fac
Moisture Content	12.3				%			05/17/11 08:44	1

Method: D422 - Grain Size

Analyte	Result	Qualifier	NONE	NONE	Unit	D	Prepared	Analyzed	Dil Fac
Gravel	6.7				%			05/17/11 08:53	1
Sieve Size 3 inch - Percent Finer	100.0				% Passing			05/17/11 08:53	1
Sand	61.3				%			05/17/11 08:53	1
Sieve Size 2 inch - Percent Finer	100.0				% Passing			05/17/11 08:53	1
Coarse Sand	4.2				%			05/17/11 08:53	1
Sieve Size 1.5 inch - Percent Finer	100.0				% Passing			05/17/11 08:53	1
Medium Sand	5.4				%			05/17/11 08:53	1
Sieve Size 1 inch - Percent Finer	100.0				% Passing			05/17/11 08:53	1
Fine Sand	51.7				%			05/17/11 08:53	1
Sieve Size 0.75 inch - Percent Finer	100.0				% Passing			05/17/11 08:53	1
Sieve Size 0.375 inch - Percent Finer	96.4				% Passing			05/17/11 08:53	1
Silt	25.5				%			05/17/11 08:53	1
Clay	6.5				%			05/17/11 08:53	1
Sieve Size #4 - Percent Finer	93.3				% Passing			05/17/11 08:53	1
Sieve Size #10 - Percent Finer	89.1				% Passing			05/17/11 08:53	1
Sieve Size #20 - Percent Finer	85.9				% Passing			05/17/11 08:53	1
Sieve Size #40 - Percent Finer	83.7				% Passing			05/17/11 08:53	1
Sieve Size #60 - Percent Finer	78.7				% Passing			05/17/11 08:53	1
Sieve Size #80 - Percent Finer	71.6				% Passing			05/17/11 08:53	1
Sieve Size #100 - Percent Finer	65.8				% Passing			05/17/11 08:53	1
Sieve Size #200 - Percent Finer	32.0				% Passing			05/17/11 08:53	1

Client Sample ID: BH-7-2

Lab Sample ID: SUE0077-05

Date Collected: 05/10/11 13:55

Matrix: Soil

Date Received: 05/12/11 12:07

Percent Solids: 84.1

Method: EPA 8260B - Volatile Organic Compounds by EPA Method 8260B

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.0571		0.0225		mg/kg dry	☼	05/20/11 09:49	05/20/11 17:09	1.00

Client Sample ID: BH-7-2
Date Collected: 05/10/11 13:55
Date Received: 05/12/11 12:07

Lab Sample ID: SUE0077-05
Matrix: Soil
Percent Solids: 84.1

Method: EPA 8260B - Volatile Organic Compounds by EPA Method 8260B (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethylbenzene	ND		0.150		mg/kg dry	☼	05/20/11 09:49	05/20/11 17:09	1.00
Toluene	ND		0.150		mg/kg dry	☼	05/20/11 09:49	05/20/11 17:09	1.00
o-Xylene	ND		0.300		mg/kg dry	☼	05/20/11 09:49	05/20/11 17:09	1.00
m,p-Xylene	ND		0.601		mg/kg dry	☼	05/20/11 09:49	05/20/11 17:09	1.00
Methyl tert-butyl ether	ND		0.0450		mg/kg dry	☼	05/20/11 09:49	05/20/11 17:09	1.00
Naphthalene	**0.444**		0.300		mg/kg dry	☼	05/20/11 09:49	05/20/11 17:09	1.00

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8	*106*		*50.8 - 132*	*05/20/11 09:49*	*05/20/11 17:09*	*1.00*
4-bromofluorobenzene	*136*		*51 - 136*	*05/20/11 09:49*	*05/20/11 17:09*	*1.00*
Dibromofluoromethane	*95.0*		*42.7 - 151*	*05/20/11 09:49*	*05/20/11 17:09*	*1.00*

Method: EPA 8270 mod. - Polynuclear Aromatic Compounds by GC/MS with Selected Ion Monitoring

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	**0.0277**		0.0119		mg/kg dry	☼	05/20/11 09:28	05/23/11 11:40	1.00
2-Methylnaphthalene	**0.0531**		0.0119		mg/kg dry	☼	05/20/11 09:28	05/23/11 11:40	1.00
1-Methylnapthalene	**0.0357**		0.0119		mg/kg dry	☼	05/20/11 09:28	05/23/11 11:40	1.00
Acenaphthylene	ND		0.0119		mg/kg dry	☼	05/20/11 09:28	05/23/11 11:40	1.00
Acenaphthene	ND		0.0119		mg/kg dry	☼	05/20/11 09:28	05/23/11 11:40	1.00
Fluorene	ND		0.0119		mg/kg dry	☼	05/20/11 09:28	05/23/11 11:40	1.00
Phenanthrene	ND		0.0119		mg/kg dry	☼	05/20/11 09:28	05/23/11 11:40	1.00
Anthracene	ND		0.0119		mg/kg dry	☼	05/20/11 09:28	05/23/11 11:40	1.00
Fluoranthene	ND		0.0119		mg/kg dry	☼	05/20/11 09:28	05/23/11 11:40	1.00
Pyrene	ND		0.0119		mg/kg dry	☼	05/20/11 09:28	05/23/11 11:40	1.00
Benzo (a) anthracene	ND		0.0119		mg/kg dry	☼	05/20/11 09:28	05/23/11 11:40	1.00
Chrysene	ND		0.0119		mg/kg dry	☼	05/20/11 09:28	05/23/11 11:40	1.00
Benzo (b) fluoranthene	ND		0.0119		mg/kg dry	☼	05/20/11 09:28	05/23/11 11:40	1.00
Benzo (k) fluoranthene	ND		0.0119		mg/kg dry	☼	05/20/11 09:28	05/23/11 11:40	1.00
Benzo (a) pyrene	ND		0.0119		mg/kg dry	☼	05/20/11 09:28	05/23/11 11:40	1.00
Indeno (1,2,3-cd) pyrene	ND		0.0119		mg/kg dry	☼	05/20/11 09:28	05/23/11 11:40	1.00
Dibenzo (a,h) anthracene	ND		0.0119		mg/kg dry	☼	05/20/11 09:28	05/23/11 11:40	1.00
Benzo (ghi) perylene	ND		0.0119		mg/kg dry	☼	05/20/11 09:28	05/23/11 11:40	1.00

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*78.4*		*30 - 140*	*05/20/11 09:28*	*05/23/11 11:40*	*1.00*
2-FBP	*87.6*		*30 - 140*	*05/20/11 09:28*	*05/23/11 11:40*	*1.00*
p-Terphenyl-d14	*120*		*30 - 150*	*05/20/11 09:28*	*05/23/11 11:40*	*1.00*

Method: NWTPH-Dx - Semivolatile Petroleum Products by NWTPH-Dx

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Hydrocarbons	ND		11.9		mg/kg dry	☼	05/19/11 07:03	05/19/11 13:33	1.00
Heavy Oil Range Hydrocarbons	ND		29.7		mg/kg dry	☼	05/19/11 07:03	05/19/11 13:33	1.00

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-FBP	*86.6*		*50 - 150*	*05/19/11 07:03*	*05/19/11 13:33*	*1.00*
p-Terphenyl-d14	*106*		*50 - 150*	*05/19/11 07:03*	*05/19/11 13:33*	*1.00*

Method: NWTPH/VPH - Northwest - Volatile Pertroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C5-C6 Aliphatics	ND		3.4		mg/Kg	☼	05/21/11 10:29	05/22/11 23:54	1
C6-C8 Aliphatics	ND		3.4		mg/Kg	☼	05/21/11 10:29	05/22/11 23:54	1
C8-C10 Aliphatics	ND		3.4		mg/Kg	☼	05/21/11 10:29	05/22/11 23:54	1

Client Sample ID: BH-7-2
Date Collected: 05/10/11 13:55
Date Received: 05/12/11 12:07

Lab Sample ID: SUE0077-05
Matrix: Soil
Percent Solids: 81.3

Method: NWTPH/VPH - Northwest - Volatile Pertroleum Hydrocarbons (GC) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C12 Aliphatics	ND		3.4		mg/Kg	☼	05/21/11 10:29	05/22/11 23:54	1
C8-C10 Aromatics	**7.2**		3.4		mg/Kg	☼	05/21/11 10:29	05/22/11 23:54	1
C10-C12 Aromatics	**4.5**		3.4		mg/Kg	☼	05/21/11 10:29	05/22/11 23:54	1
C12-C13 Aromatics	ND		3.4		mg/Kg	☼	05/21/11 10:29	05/22/11 23:54	1
Total VPH	ND		24		mg/Kg	☼	05/21/11 10:29	05/22/11 23:54	1

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*102*		*60 - 140*	*05/21/11 10:29*	*05/22/11 23:54*	*1*
BFB - PID	*102*		*60 - 140*	*05/21/11 10:29*	*05/22/11 23:54*	*1*

Method: NWTPH-Gx - Gasoline Hydrocarbons by NWTPH-Gx

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Hydrocarbons	**35.1**		12.1		mg/kg dry	☼	05/20/11 13:03	05/20/11 17:42	1.00

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-BFB (FID)	*112*		*50 - 150*	*05/20/11 13:03*	*05/20/11 17:42*	*1.00*

Method: NWTPH/EPH - Northwest - Extractable Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C12 Aliphatics	ND		6.0		mg/Kg	☼	05/18/11 10:13	05/23/11 22:03	1
C12-C16 Aliphatics	ND		6.0		mg/Kg	☼	05/18/11 10:13	05/23/11 22:03	1
C16-C21 Aliphatics	ND		6.0		mg/Kg	☼	05/18/11 10:13	05/23/11 22:03	1
C21-C34 Aliphatics	ND		6.0		mg/Kg	☼	05/18/11 10:13	05/23/11 22:03	1
C12-C16 Aromatics	ND		6.0		mg/Kg	☼	05/18/11 10:13	05/23/11 22:03	1
C16-C21 Aromatics	ND		6.0		mg/Kg	☼	05/18/11 10:13	05/23/11 22:03	1
C21-C34 Aromatics	ND		6.0		mg/Kg	☼	05/18/11 10:13	05/23/11 22:03	1

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*79*		*60 - 140*	*05/18/11 10:13*	*05/23/11 22:03*	*1*
1-Chlorooctadecane	*81*		*60 - 140*	*05/18/11 10:13*	*05/23/11 22:03*	*1*

Method: MSA 29-3.5.2 - General Chemistry Parameters

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	**11300**		2460		mg/kg dry	☼	05/17/11 13:36	05/17/11 16:58	1.00

Method: D2216-90 - Water (Moisture) Content

Analyte	Result	Qualifier	NONE	NONE	Unit	D	Prepared	Analyzed	Dil Fac
Moisture Content	**17.5**				%			05/17/11 08:44	1

Method: D422 - Grain Size

Analyte	Result	Qualifier	NONE	NONE	Unit	D	Prepared	Analyzed	Dil Fac
Gravel	**0.0**				%			05/17/11 08:56	1
Sieve Size 3 inch - Percent Finer	**100.0**				% Passing			05/17/11 08:56	1
Sand	**30.9**				%			05/17/11 08:56	1
Sieve Size 2 inch - Percent Finer	**100.0**				% Passing			05/17/11 08:56	1
Coarse Sand	**0.3**				%			05/17/11 08:56	1
Sieve Size 1.5 inch - Percent Finer	**100.0**				% Passing			05/17/11 08:56	1
Medium Sand	**1.9**				%			05/17/11 08:56	1
Sieve Size 1 inch - Percent Finer	**100.0**				% Passing			05/17/11 08:56	1
Fine Sand	**28.7**				%			05/17/11 08:56	1
Sieve Size 0.75 inch - Percent Finer	**100.0**				% Passing			05/17/11 08:56	1
Sieve Size 0.375 inch - Percent Finer	**100.0**				% Passing			05/17/11 08:56	1

Client Sample ID: BH-7-2

Lab Sample ID: SUE0077-05

Date Collected: 05/10/11 13:55

Matrix: Soil

Date Received: 05/12/11 12:07

Method: D422 - Grain Size (Continued)

Analyte	Result	Qualifier	NONE	NONE	Unit	D	Prepared	Analyzed	Dil Fac
Silt	**62.6**				%			05/17/11 08:56	1
Clay	**6.6**				%			05/17/11 08:56	1
Sieve Size #4 - Percent Finer	**100.0**				% Passing			05/17/11 08:56	1
Sieve Size #10 - Percent Finer	**99.7**				% Passing			05/17/11 08:56	1
Sieve Size #20 - Percent Finer	**99.0**				% Passing			05/17/11 08:56	1
Sieve Size #40 - Percent Finer	**97.8**				% Passing			05/17/11 08:56	1
Sieve Size #60 - Percent Finer	**94.4**				% Passing			05/17/11 08:56	1
Sieve Size #80 - Percent Finer	**89.8**				% Passing			05/17/11 08:56	1
Sieve Size #100 - Percent Finer	**86.3**				% Passing			05/17/11 08:56	1
Sieve Size #200 - Percent Finer	**69.1**				% Passing			05/17/11 08:56	1

Client Sample ID: BH-10-3

Lab Sample ID: SUE0077-06

Date Collected: 05/11/11 08:45

Matrix: Soil

Date Received: 05/12/11 12:07

Percent Solids: 86.3

Method: EPA 8260B - Volatile Organic Compounds by EPA Method 8260B

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.0214		mg/kg dry	☼	05/20/11 09:49	05/20/11 14:22	1.00
Ethylbenzene	ND		0.143		mg/kg dry	☼	05/20/11 09:49	05/20/11 14:22	1.00
Toluene	ND		0.143		mg/kg dry	☼	05/20/11 09:49	05/20/11 14:22	1.00
o-Xylene	ND		0.285		mg/kg dry	☼	05/20/11 09:49	05/20/11 14:22	1.00
m,p-Xylene	ND		0.571		mg/kg dry	☼	05/20/11 09:49	05/20/11 14:22	1.00
Methyl tert-butyl ether	ND		0.0428		mg/kg dry	☼	05/20/11 09:49	05/20/11 14:22	1.00
Naphthalene	ND		0.285		mg/kg dry	☼	05/20/11 09:49	05/20/11 14:22	1.00

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8	*105*		*50.8 - 132*	*05/20/11 09:49*	*05/20/11 14:22*	*1.00*
4-bromofluorobenzene	*155*	*ZX*	*51 - 136*	*05/20/11 09:49*	*05/20/11 14:22*	*1.00*
Dibromofluoromethane	*92.0*		*42.7 - 151*	*05/20/11 09:49*	*05/20/11 14:22*	*1.00*

Method: EPA 8270 mod. - Polynuclear Aromatic Compounds by GC/MS with Selected Ion Monitoring

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	**1.47**		0.290		mg/kg dry	☼	05/20/11 09:28	05/23/11 16:16	25.0
2-Methylnaphthalene	**9.50**		0.290		mg/kg dry	☼	05/20/11 09:28	05/23/11 16:16	25.0
1-Methylnapthalene	**5.87**		0.290		mg/kg dry	☼	05/20/11 09:28	05/23/11 16:16	25.0
Acenaphthylene	ND		0.0116		mg/kg dry	☼	05/20/11 09:28	05/23/11 12:06	1.00
Acenaphthene	**0.113**		0.0116		mg/kg dry	☼	05/20/11 09:28	05/23/11 12:06	1.00
Fluorene	**0.206**		0.0116		mg/kg dry	☼	05/20/11 09:28	05/23/11 12:06	1.00
Phenanthrene	**0.636**		0.0116		mg/kg dry	☼	05/20/11 09:28	05/23/11 12:06	1.00
Anthracene	**0.219**		0.0116		mg/kg dry	☼	05/20/11 09:28	05/23/11 12:06	1.00
Fluoranthene	**0.0749**		0.0116		mg/kg dry	☼	05/20/11 09:28	05/23/11 12:06	1.00
Pyrene	**0.100**		0.0116		mg/kg dry	☼	05/20/11 09:28	05/23/11 12:06	1.00
Benzo (a) anthracene	**0.0433**		0.0116		mg/kg dry	☼	05/20/11 09:28	05/23/11 12:06	1.00
Chrysene	**0.0286**		0.0116		mg/kg dry	☼	05/20/11 09:28	05/23/11 12:06	1.00
Benzo (b) fluoranthene	**0.0332**		0.0116		mg/kg dry	☼	05/20/11 09:28	05/23/11 12:06	1.00
Benzo (k) fluoranthene	ND		0.0116		mg/kg dry	☼	05/20/11 09:28	05/23/11 12:06	1.00
Benzo (a) pyrene	**0.0170**		0.0116		mg/kg dry	☼	05/20/11 09:28	05/23/11 12:06	1.00
Indeno (1,2,3-cd) pyrene	ND		0.0116		mg/kg dry	☼	05/20/11 09:28	05/23/11 12:06	1.00
Dibenzo (a,h) anthracene	ND		0.0116		mg/kg dry	☼	05/20/11 09:28	05/23/11 12:06	1.00
Benzo (ghi) perylene	**0.0116**		0.0116		mg/kg dry	☼	05/20/11 09:28	05/23/11 12:06	1.00

Client Sample ID: BH-10-3
Date Collected: 05/11/11 08:45
Date Received: 05/12/11 12:07

Lab Sample ID: SUE0077-06
Matrix: Soil
Percent Solids: 86.3

Surrogate	% Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Nitrobenzene-d5	95.0		30 - 140	05/20/11 09:28	05/23/11 16:16	25.0
2-FBP	51.2		30 - 140	05/20/11 09:28	05/23/11 12:06	1.00
p-Terphenyl-d14	113		30 - 150	05/20/11 09:28	05/23/11 12:06	1.00

Method: NWTPH-Dx - Semivolatile Petroleum Products by NWTPH-Dx

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Hydrocarbons	1140		11.6		mg/kg dry	☼	05/19/11 07:03	05/19/11 12:32	1.00
Heavy Oil Range Hydrocarbons	61.7		29.0		mg/kg dry	☼	05/19/11 07:03	05/19/11 12:32	1.00

Surrogate	% Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-FBP	134		50 - 150	05/19/11 07:03	05/19/11 12:32	1.00
p-Terphenyl-d14	107		50 - 150	05/19/11 07:03	05/19/11 12:32	1.00

Method: NWTPH/VPH - Northwest - Volatile Pertroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C5-C6 Aliphatics	ND		2.6		mg/Kg	☼	05/21/11 10:29	05/23/11 03:51	1
C6-C8 Aliphatics	ND		2.6		mg/Kg	☼	05/21/11 10:29	05/23/11 03:51	1
C8-C10 Aliphatics	ND		2.6		mg/Kg	☼	05/21/11 10:29	05/23/11 03:51	1
C10-C12 Aliphatics	ND		2.6		mg/Kg	☼	05/21/11 10:29	05/23/11 03:51	1
C8-C10 Aromatics	4.9		2.6		mg/Kg	☼	05/21/11 10:29	05/23/11 03:51	1
C10-C12 Aromatics	4.5		2.6		mg/Kg	☼	05/21/11 10:29	05/23/11 03:51	1
C12-C13 Aromatics	ND		2.6		mg/Kg	☼	05/21/11 10:29	05/23/11 03:51	1
Total VPH	ND		18		mg/Kg	☼	05/21/11 10:29	05/23/11 03:51	1

Surrogate	% Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	107		60 - 140	05/21/11 10:29	05/23/11 03:51	1
BFB - PID	103		60 - 140	05/21/11 10:29	05/23/11 03:51	1

Method: NWTPH-Gx - Gasoline Hydrocarbons by NWTPH-Gx

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Hydrocarbons	32.4		6.72		mg/kg dry	☼	05/20/11 13:03	05/20/11 18:07	1.00

Surrogate	% Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-BFB (FID)	103		50 - 150	05/20/11 13:03	05/20/11 18:07	1.00

Method: NWTPH/EPH - Northwest - Extractable Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C12 Aliphatics	66		5.6		mg/Kg	☼	05/18/11 10:13	05/23/11 22:27	1
C12-C16 Aliphatics	100		5.6		mg/Kg	☼	05/18/11 10:13	05/23/11 22:27	1
C16-C21 Aliphatics	100		5.6		mg/Kg	☼	05/18/11 10:13	05/23/11 22:27	1
C21-C34 Aliphatics	28		5.6		mg/Kg	☼	05/18/11 10:13	05/23/11 22:27	1
C12-C16 Aromatics	97		5.6		mg/Kg	☼	05/18/11 10:13	05/23/11 22:27	1
C16-C21 Aromatics	67		5.6		mg/Kg	☼	05/18/11 10:13	05/23/11 22:27	1
C21-C34 Aromatics	19		5.6		mg/Kg	☼	05/18/11 10:13	05/23/11 22:27	1

Surrogate	% Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	94		60 - 140	05/18/11 10:13	05/23/11 22:27	1
1-Chlorooctadecane	84		60 - 140	05/18/11 10:13	05/23/11 22:27	1

Method: D2216-90 - Water (Moisture) Content

Analyte	Result	Qualifier	NONE	NONE	Unit	D	Prepared	Analyzed	Dil Fac
Moisture Content	13.3				%			05/17/11 08:44	1

Client Sample ID: BH-10c-2
Date Collected: 05/11/11 10:35
Date Received: 05/12/11 12:07

Lab Sample ID: SUE0077-07
Matrix: Soil
Percent Solids: 82.4

Method: EPA 8260B - Volatile Organic Compounds by EPA Method 8260B

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	**0.195**		0.0190		mg/kg dry	☼	05/20/11 09:49	05/20/11 14:50	1.00
Ethylbenzene	**0.265**		0.127		mg/kg dry	☼	05/20/11 09:49	05/20/11 14:50	1.00
Toluene	**0.565**		0.127		mg/kg dry	☼	05/20/11 09:49	05/20/11 14:50	1.00
o-Xylene	**0.437**		0.253		mg/kg dry	☼	05/20/11 09:49	05/20/11 14:50	1.00
m,p-Xylene	**0.998**		0.507		mg/kg dry	☼	05/20/11 09:49	05/20/11 14:50	1.00
Methyl tert-butyl ether	ND		0.0380		mg/kg dry	☼	05/20/11 09:49	05/20/11 14:50	1.00
Naphthalene	ND		0.253		mg/kg dry	☼	05/20/11 09:49	05/20/11 14:50	1.00

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8	*108*		*50.8 - 132*	*05/20/11 09:49*	*05/20/11 14:50*	*1.00*
4-bromofluorobenzene	*139*	*ZX*	*51 - 136*	*05/20/11 09:49*	*05/20/11 14:50*	*1.00*
Dibromofluoromethane	*88.8*		*42.7 - 151*	*05/20/11 09:49*	*05/20/11 14:50*	*1.00*

Method: EPA 8270 mod. - Polynuclear Aromatic Compounds by GC/MS with Selected Ion Monitoring

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 12:33	1.00
2-Methylnaphthalene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 12:33	1.00
1-Methylnapthalene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 12:33	1.00
Acenaphthylene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 12:33	1.00
Acenaphthene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 12:33	1.00
Fluorene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 12:33	1.00
Phenanthrene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 12:33	1.00
Anthracene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 12:33	1.00
Fluoranthene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 12:33	1.00
Pyrene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 12:33	1.00
Benzo (a) anthracene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 12:33	1.00
Chrysene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 12:33	1.00
Benzo (b) fluoranthene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 12:33	1.00
Benzo (k) fluoranthene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 12:33	1.00
Benzo (a) pyrene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 12:33	1.00
Indeno (1,2,3-cd) pyrene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 12:33	1.00
Dibenzo (a,h) anthracene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 12:33	1.00
Benzo (ghi) perylene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 12:33	1.00

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*77.8*		*30 - 140*	*05/20/11 09:28*	*05/23/11 12:33*	*1.00*
2-FBP	*86.4*		*30 - 140*	*05/20/11 09:28*	*05/23/11 12:33*	*1.00*
p-Terphenyl-d14	*129*		*30 - 150*	*05/20/11 09:28*	*05/23/11 12:33*	*1.00*

Method: NWTPH-Dx - Semivolatile Petroleum Products by NWTPH-Dx

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Hydrocarbons	ND		12.1		mg/kg dry	☼	05/19/11 07:03	05/19/11 12:47	1.00
Heavy Oil Range Hydrocarbons	ND		30.3		mg/kg dry	☼	05/19/11 07:03	05/19/11 12:47	1.00

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-FBP	*103*		*50 - 150*	*05/19/11 07:03*	*05/19/11 12:47*	*1.00*
p-Terphenyl-d14	*112*		*50 - 150*	*05/19/11 07:03*	*05/19/11 12:47*	*1.00*

Method: NWTPH/VPH - Northwest - Volatile Pertroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C5-C6 Aliphatics	ND		2.6		mg/Kg	☼	05/21/11 10:29	05/23/11 04:18	1
C6-C8 Aliphatics	ND		2.6		mg/Kg	☼	05/21/11 10:29	05/23/11 04:18	1

Client Sample ID: BH-10c-2
Date Collected: 05/11/11 10:35
Date Received: 05/12/11 12:07

Lab Sample ID: SUE0077-07
Matrix: Soil
Percent Solids: 81.6

Method: NWTPH/VPH - Northwest - Volatile Pertroleum Hydrocarbons (GC) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C8-C10 Aliphatics	ND		2.6		mg/Kg	☼	05/21/11 10:29	05/23/11 04:18	1
C10-C12 Aliphatics	ND		2.6		mg/Kg	☼	05/21/11 10:29	05/23/11 04:18	1
C8-C10 Aromatics	**2.8**		2.6		mg/Kg	☼	05/21/11 10:29	05/23/11 04:18	1
C10-C12 Aromatics	ND		2.6		mg/Kg	☼	05/21/11 10:29	05/23/11 04:18	1
C12-C13 Aromatics	ND		2.6		mg/Kg	☼	05/21/11 10:29	05/23/11 04:18	1
Total VPH	ND		18		mg/Kg	☼	05/21/11 10:29	05/23/11 04:18	1

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*106*		*60 - 140*	*05/21/11 10:29*	*05/23/11 04:18*	*1*
BFB - PID	*102*		*60 - 140*	*05/21/11 10:29*	*05/23/11 04:18*	*1*

Method: NWTPH-Gx - Gasoline Hydrocarbons by NWTPH-Gx

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Hydrocarbons	**19.2**		6.96		mg/kg dry	☼	05/20/11 13:03	05/20/11 18:57	1.00

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-BFB (FID)	*105*		*50 - 150*	*05/20/11 13:03*	*05/20/11 18:57*	*1.00*

Method: NWTPH/EPH - Northwest - Extractable Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C12 Aliphatics	ND		6.1		mg/Kg	☼	05/18/11 10:13	05/23/11 23:38	1
C12-C16 Aliphatics	ND		6.1		mg/Kg	☼	05/18/11 10:13	05/23/11 23:38	1
C16-C21 Aliphatics	ND		6.1		mg/Kg	☼	05/18/11 10:13	05/23/11 23:38	1
C21-C34 Aliphatics	ND		6.1		mg/Kg	☼	05/18/11 10:13	05/23/11 23:38	1
C12-C16 Aromatics	ND		6.1		mg/Kg	☼	05/18/11 10:13	05/23/11 23:38	1
C16-C21 Aromatics	ND		6.1		mg/Kg	☼	05/18/11 10:13	05/23/11 23:38	1
C21-C34 Aromatics	ND		6.1		mg/Kg	☼	05/18/11 10:13	05/23/11 23:38	1

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*85*		*60 - 140*	*05/18/11 10:13*	*05/23/11 23:38*	*1*
1-Chlorooctadecane	*80*		*60 - 140*	*05/18/11 10:13*	*05/23/11 23:38*	*1*

Method: D2216-90 - Water (Moisture) Content

Analyte	Result	Qualifier	NONE	NONE	Unit	D	Prepared	Analyzed	Dil Fac
Moisture Content	**20.9**				%			05/17/11 08:44	1

Method: D422 - Grain Size

Analyte	Result	Qualifier	NONE	NONE	Unit	D	Prepared	Analyzed	Dil Fac
Gravel	**0.5**				%			05/17/11 09:01	1
Sieve Size 3 inch - Percent Finer	**100.0**				% Passing			05/17/11 09:01	1
Sand	**21.1**				%			05/17/11 09:01	1
Sieve Size 2 inch - Percent Finer	**100.0**				% Passing			05/17/11 09:01	1
Coarse Sand	**0.7**				%			05/17/11 09:01	1
Sieve Size 1.5 inch - Percent Finer	**100.0**				% Passing			05/17/11 09:01	1
Medium Sand	**2.9**				%			05/17/11 09:01	1
Sieve Size 1 inch - Percent Finer	**100.0**				% Passing			05/17/11 09:01	1
Fine Sand	**17.5**				%			05/17/11 09:01	1
Sieve Size 0.75 inch - Percent Finer	**100.0**				% Passing			05/17/11 09:01	1
Sieve Size 0.375 inch - Percent Finer	**100.0**				% Passing			05/17/11 09:01	1
Silt	**65.3**				%			05/17/11 09:01	1
Clay	**13.1**				%			05/17/11 09:01	1
Sieve Size #4 - Percent Finer	**99.5**				% Passing			05/17/11 09:01	1

Client Sample ID: BH-10c-2

Lab Sample ID: SUE0077-07

Date Collected: 05/11/11 10:35

Matrix: Soil

Date Received: 05/12/11 12:07

Method: D422 - Grain Size (Continued)

Analyte	Result	Qualifier	NONE	NONE	Unit	D	Prepared	Analyzed	Dil Fac
Sieve Size #10 - Percent Finer	98.8				% Passing			05/17/11 09:01	1
Sieve Size #20 - Percent Finer	97.5				% Passing			05/17/11 09:01	1
Sieve Size #40 - Percent Finer	95.9				% Passing			05/17/11 09:01	1
Sieve Size #60 - Percent Finer	94.1				% Passing			05/17/11 09:01	1
Sieve Size #80 - Percent Finer	92.6				% Passing			05/17/11 09:01	1
Sieve Size #100 - Percent Finer	91.3				% Passing			05/17/11 09:01	1
Sieve Size #200 - Percent Finer	78.4				% Passing			05/17/11 09:01	1

Client Sample ID: BH-10f-4.5

Lab Sample ID: SUE0077-08

Date Collected: 05/11/11 12:20

Matrix: Soil

Date Received: 05/12/11 12:07

Percent Solids: 82.9

Method: EPA 8260B - Volatile Organic Compounds by EPA Method 8260B

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.0220		mg/kg dry	☼	05/20/11 09:49	05/20/11 15:17	1.00
Ethylbenzene	ND		0.147		mg/kg dry	☼	05/20/11 09:49	05/20/11 15:17	1.00
Toluene	ND		0.147		mg/kg dry	☼	05/20/11 09:49	05/20/11 15:17	1.00
o-Xylene	ND		0.294		mg/kg dry	☼	05/20/11 09:49	05/20/11 15:17	1.00
m,p-Xylene	ND		0.587		mg/kg dry	☼	05/20/11 09:49	05/20/11 15:17	1.00
Methyl tert-butyl ether	ND		0.0440		mg/kg dry	☼	05/20/11 09:49	05/20/11 15:17	1.00
Naphthalene	ND		0.294		mg/kg dry	☼	05/20/11 09:49	05/20/11 15:17	1.00

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8	*107*		*50.8 - 132*	*05/20/11 09:49*	*05/20/11 15:17*	*1.00*
4-bromofluorobenzene	*124*		*51 - 136*	*05/20/11 09:49*	*05/20/11 15:17*	*1.00*
Dibromofluoromethane	*90.4*		*42.7 - 151*	*05/20/11 09:49*	*05/20/11 15:17*	*1.00*

Method: EPA 8270 mod. - Polynuclear Aromatic Compounds by GC/MS with Selected Ion Monitoring

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 13:52	1.00
2-Methylnaphthalene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 13:52	1.00
1-Methylnapthalene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 13:52	1.00
Acenaphthylene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 13:52	1.00
Acenaphthene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 13:52	1.00
Fluorene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 13:52	1.00
Phenanthrene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 13:52	1.00
Anthracene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 13:52	1.00
Fluoranthene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 13:52	1.00
Pyrene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 13:52	1.00
Benzo (a) anthracene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 13:52	1.00
Chrysene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 13:52	1.00
Benzo (b) fluoranthene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 13:52	1.00
Benzo (k) fluoranthene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 13:52	1.00
Benzo (a) pyrene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 13:52	1.00
Indeno (1,2,3-cd) pyrene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 13:52	1.00
Dibenzo (a,h) anthracene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 13:52	1.00
Benzo (ghi) perylene	ND		0.0121		mg/kg dry	☼	05/20/11 09:28	05/23/11 13:52	1.00

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*89.0*		*30 - 140*	*05/20/11 09:28*	*05/23/11 13:52*	*1.00*
2-FBP	*103*		*30 - 140*	*05/20/11 09:28*	*05/23/11 13:52*	*1.00*

Client Sample ID: BH-10f-4.5
Date Collected: 05/11/11 12:20
Date Received: 05/12/11 12:07

Lab Sample ID: SUE0077-08
Matrix: Soil
Percent Solids: 82.9

Method: EPA 8270 mod. - Polynuclear Aromatic Compounds by GC/MS with Selected Ion Monitoring (Continued)

Surrogate	% Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
p-Terphenyl-d14	*132*		*30 - 150*	*05/20/11 09:28*	*05/23/11 13:52*	*1.00*

Method: NWTPH-Dx - Semivolatile Petroleum Products by NWTPH-Dx

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Hydrocarbons	ND		12.1		mg/kg dry	☼	05/19/11 07:03	05/19/11 13:02	1.00
Heavy Oil Range Hydrocarbons	ND		30.2		mg/kg dry	☼	05/19/11 07:03	05/19/11 13:02	1.00

Surrogate	% Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-FBP	*93.1*		*50 - 150*	*05/19/11 07:03*	*05/19/11 13:02*	*1.00*
p-Terphenyl-d14	*105*		*50 - 150*	*05/19/11 07:03*	*05/19/11 13:02*	*1.00*

Method: NWTPH/VPH - Northwest - Volatile Pertroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C5-C6 Aliphatics	ND		2.4		mg/Kg	☼	05/21/11 10:43	05/22/11 23:28	1
C6-C8 Aliphatics	ND		2.4		mg/Kg	☼	05/21/11 10:43	05/22/11 23:28	1
C8-C10 Aliphatics	ND		2.4		mg/Kg	☼	05/21/11 10:43	05/22/11 23:28	1
C10-C12 Aliphatics	ND		2.4		mg/Kg	☼	05/21/11 10:43	05/22/11 23:28	1
C8-C10 Aromatics	ND		2.4		mg/Kg	☼	05/21/11 10:43	05/22/11 23:28	1
C10-C12 Aromatics	ND		2.4		mg/Kg	☼	05/21/11 10:43	05/22/11 23:28	1
C12-C13 Aromatics	ND		2.4		mg/Kg	☼	05/21/11 10:43	05/22/11 23:28	1
Total VPH	ND		17		mg/Kg	☼	05/21/11 10:43	05/22/11 23:28	1

Surrogate	% Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	*103*		*60 - 140*	*05/21/11 10:43*	*05/22/11 23:28*	*1*
BFB - PID	*103*		*60 - 140*	*05/21/11 10:43*	*05/22/11 23:28*	*1*

Method: NWTPH-Gx - Gasoline Hydrocarbons by NWTPH-Gx

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Hydrocarbons	ND		7.34		mg/kg dry	☼	05/20/11 13:03	05/20/11 19:22	1.00

Surrogate	% Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-BFB (FID)	*89.1*		*50 - 150*	*05/20/11 13:03*	*05/20/11 19:22*	*1.00*

Method: NWTPH/EPH - Northwest - Extractable Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C12 Aliphatics	ND		5.9		mg/Kg	☼	05/18/11 10:13	05/24/11 00:01	1
C12-C16 Aliphatics	ND		5.9		mg/Kg	☼	05/18/11 10:13	05/24/11 00:01	1
C16-C21 Aliphatics	ND		5.9		mg/Kg	☼	05/18/11 10:13	05/24/11 00:01	1
C21-C34 Aliphatics	ND		5.9		mg/Kg	☼	05/18/11 10:13	05/24/11 00:01	1
C12-C16 Aromatics	ND		5.9		mg/Kg	☼	05/18/11 10:13	05/24/11 00:01	1
C16-C21 Aromatics	ND		5.9		mg/Kg	☼	05/18/11 10:13	05/24/11 00:01	1
C21-C34 Aromatics	ND		5.9		mg/Kg	☼	05/18/11 10:13	05/24/11 00:01	1

Surrogate	% Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	*81*		*60 - 140*	*05/18/11 10:13*	*05/24/11 00:01*	*1*
1-Chlorooctadecane	*79*		*60 - 140*	*05/18/11 10:13*	*05/24/11 00:01*	*1*

Method: D2216-90 - Water (Moisture) Content

Analyte	Result	Qualifier	NONE	NONE	Unit	D	Prepared	Analyzed	Dil Fac
Moisture Content	**19.3**				%			05/17/11 08:44	1

Method: EPA 8260B - Volatile Organic Compounds by EPA Method 8260B

Lab Sample ID: 11E0112-BLK1
Matrix: Soil
Analysis Batch: 11E0112

Client Sample ID: 11E0112-BLK1
Prep Type: Total
Prep Batch: 11E0112_P

Analyte	Blank Result	Blank Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.0150		mg/kg wet		05/20/11 09:49	05/20/11 11:08	1.00
Ethylbenzene	ND		0.100		mg/kg wet		05/20/11 09:49	05/20/11 11:08	1.00
Toluene	ND		0.100		mg/kg wet		05/20/11 09:49	05/20/11 11:08	1.00
o-Xylene	ND		0.200		mg/kg wet		05/20/11 09:49	05/20/11 11:08	1.00
m,p-Xylene	ND		0.400		mg/kg wet		05/20/11 09:49	05/20/11 11:08	1.00
Methyl tert-butyl ether	ND		0.0300		mg/kg wet		05/20/11 09:49	05/20/11 11:08	1.00
Naphthalene	ND		0.200		mg/kg wet		05/20/11 09:49	05/20/11 11:08	1.00

Surrogate	*Blank % Recovery*	*Blank Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8	*86.6*		*50.8 - 132*	*05/20/11 09:49*	*05/20/11 11:08*	*1.00*
4-bromofluorobenzene	*90.8*		*51 - 136*	*05/20/11 09:49*	*05/20/11 11:08*	*1.00*
Dibromofluoromethane	*96.4*		*42.7 - 151*	*05/20/11 09:49*	*05/20/11 11:08*	*1.00*

Lab Sample ID: 11E0112-BS1
Matrix: Soil
Analysis Batch: 11E0112

Client Sample ID: 11E0112-BS1
Prep Type: Total
Prep Batch: 11E0112_P

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	% Rec	% Rec. Limits
Benzene	1.00	1.01		mg/kg wet		101	50 - 150
Ethylbenzene	1.00	0.929		mg/kg wet		92.9	50 - 150
Toluene	1.00	0.989		mg/kg wet		98.9	50 - 150
o-Xylene	1.00	1.06		mg/kg wet		106	50 - 150
m,p-Xylene	2.00	2.05		mg/kg wet		102	50 - 150
Methyl tert-butyl ether	1.00	0.856		mg/kg wet		85.6	50 - 150
Naphthalene	1.00	0.872		mg/kg wet		87.2	50 - 150

Surrogate	*LCS % Recovery*	*LCS Qualifier*	*Limits*
Toluene-d8	*93.8*		*50.8 - 132*
4-bromofluorobenzene	*113*		*51 - 136*
Dibromofluoromethane	*112*		*42.7 - 151*

Lab Sample ID: 11E0112-BSD1
Matrix: Soil
Analysis Batch: 11E0112

Client Sample ID: 11E0112-BSD1
Prep Type: Total
Prep Batch: 11E0112_P

Analyte	Spike Added	LCS Dup Result	LCS Dup Qualifier	Unit	D	% Rec	% Rec. Limits	RPD	RPD Limit
Benzene	1.00	0.977		mg/kg wet		97.7	50 - 150	3.32	25
Ethylbenzene	1.00	1.02		mg/kg wet		102	50 - 150	9.73	25
Toluene	1.00	1.06		mg/kg wet		106	50 - 150	6.84	25
o-Xylene	1.00	1.17		mg/kg wet		117	50 - 150	10.1	25
m,p-Xylene	2.00	2.07		mg/kg wet		103	50 - 150	1.02	25
Methyl tert-butyl ether	1.00	0.966		mg/kg wet		96.6	50 - 150	12.1	25
Naphthalene	1.00	1.10		mg/kg wet		110	50 - 150	22.9	25

Surrogate	*LCS Dup % Recovery*	*LCS Dup Qualifier*	*Limits*
Toluene-d8	*99.0*		*50.8 - 132*
4-bromofluorobenzene	*131*		*51 - 136*
Dibromofluoromethane	*95.6*		*42.7 - 151*

Client: ARCADIS U.S., Inc. - Liberty Lake
Project/Site: GP09BPNA.WA59.00000

TestAmerica Job ID: SUE0077

Method: EPA 8270 mod. - Polynuclear Aromatic Compounds by GC/MS with Selected Ion Monitoring

Lab Sample ID: 11E0111-BLK1
Matrix: Soil
Analysis Batch: 11E0111

Client Sample ID: 11E0111-BLK1
Prep Type: Total
Prep Batch: 11E0111_P

Analyte	Blank Result	Blank Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	ND		0.0100		mg/kg wet		05/20/11 09:28	05/23/11 09:01	1.00
2-Methylnaphthalene	ND		0.0100		mg/kg wet		05/20/11 09:28	05/23/11 09:01	1.00
1-Methylnapthalene	ND		0.0100		mg/kg wet		05/20/11 09:28	05/23/11 09:01	1.00
Acenaphthylene	ND		0.0100		mg/kg wet		05/20/11 09:28	05/23/11 09:01	1.00
Acenaphthene	ND		0.0100		mg/kg wet		05/20/11 09:28	05/23/11 09:01	1.00
Fluorene	ND		0.0100		mg/kg wet		05/20/11 09:28	05/23/11 09:01	1.00
Phenanthrene	ND		0.0100		mg/kg wet		05/20/11 09:28	05/23/11 09:01	1.00
Anthracene	ND		0.0100		mg/kg wet		05/20/11 09:28	05/23/11 09:01	1.00
Fluoranthene	ND		0.0100		mg/kg wet		05/20/11 09:28	05/23/11 09:01	1.00
Pyrene	ND		0.0100		mg/kg wet		05/20/11 09:28	05/23/11 09:01	1.00
Benzo (a) anthracene	ND		0.0100		mg/kg wet		05/20/11 09:28	05/23/11 09:01	1.00
Chrysene	ND		0.0100		mg/kg wet		05/20/11 09:28	05/23/11 09:01	1.00
Benzo (b) fluoranthene	ND		0.0100		mg/kg wet		05/20/11 09:28	05/23/11 09:01	1.00
Benzo (k) fluoranthene	ND		0.0100		mg/kg wet		05/20/11 09:28	05/23/11 09:01	1.00
Benzo (a) pyrene	ND		0.0100		mg/kg wet		05/20/11 09:28	05/23/11 09:01	1.00
Indeno (1,2,3-cd) pyrene	ND		0.0100		mg/kg wet		05/20/11 09:28	05/23/11 09:01	1.00
Dibenzo (a,h) anthracene	ND		0.0100		mg/kg wet		05/20/11 09:28	05/23/11 09:01	1.00
Benzo (ghi) perylene	ND		0.0100		mg/kg wet		05/20/11 09:28	05/23/11 09:01	1.00

Surrogate	*Blank % Recovery*	*Blank Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*77.2*		*30 - 140*	*05/20/11 09:28*	*05/23/11 09:01*	*1.00*
2-FBP	*98.0*		*30 - 140*	*05/20/11 09:28*	*05/23/11 09:01*	*1.00*
p-Terphenyl-d14	*151*	*Z2*	*30 - 150*	*05/20/11 09:28*	*05/23/11 09:01*	*1.00*

Lab Sample ID: 11E0111-BS1
Matrix: Soil
Analysis Batch: 11E0111

Client Sample ID: 11E0111-BS1
Prep Type: Total
Prep Batch: 11E0111_P

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	% Rec	% Rec. Limits
Naphthalene	0.133	0.121		mg/kg wet		90.5	40 - 120
Fluorene	0.133	0.123		mg/kg wet		92.0	40 - 130
Chrysene	0.133	0.128		mg/kg wet		96.0	41 - 130
Indeno (1,2,3-cd) pyrene	0.133	0.130		mg/kg wet		97.5	40 - 130

Surrogate	*LCS % Recovery*	*LCS Qualifier*	*Limits*
Nitrobenzene-d5	*96.8*		*30 - 140*
2-FBP	*105*		*30 - 140*
p-Terphenyl-d14	*111*		*30 - 150*

Lab Sample ID: 11E0111-MS1
Matrix: Soil
Analysis Batch: 11E0111

Client Sample ID: BH-10c-2
Prep Type: Total
Prep Batch: 11E0111_P

Analyte	Sample Result	Sample Qualifier	Spike Added	Matrix Spike Result	Matrix Spike Qualifier	Unit	D	% Rec	% Rec. Limits
Naphthalene	0.00728		0.162	0.145		mg/kg dry	☼	85.0	30 - 120
Fluorene	ND		0.162	0.155		mg/kg dry	☼	95.5	30 - 140
Chrysene	ND		0.162	0.155		mg/kg dry	☼	96.0	30 - 133
Indeno (1,2,3-cd) pyrene	ND		0.162	0.146		mg/kg dry	☼	90.0	30 - 140

Method: EPA 8270 mod. - Polynuclear Aromatic Compounds by GC/MS with Selected Ion Monitoring (Continued)

Lab Sample ID: 11E0111-MS1
Matrix: Soil
Analysis Batch: 11E0111

Client Sample ID: BH-10c-2
Prep Type: Total
Prep Batch: 11E0111_P

Surrogate	*Matrix Spike % Recovery*	*Matrix Spike Qualifier*	*Limits*
Nitrobenzene-d5	*84.4*		*30 - 140*
2-FBP	*92.2*		*30 - 140*
p-Terphenyl-d14	*107*		*30 - 150*

Lab Sample ID: 11E0111-MSD1
Matrix: Soil
Analysis Batch: 11E0111

Client Sample ID: BH-10c-2
Prep Type: Total
Prep Batch: 11E0111_P

Analyte	Sample Result	Sample Qualifier	Spike Added	Matrix Spike Dup Result	Matrix Spike Dup Qualifier	Unit	D	% Rec	% Rec. Limits	RPD	RPD Limit
Naphthalene	0.00728		0.162	0.149		mg/kg dry	☼	87.5	30 - 120	2.75	35
Fluorene	ND		0.162	0.155		mg/kg dry	☼	96.0	30 - 140	0.522	35
Chrysene	ND		0.162	0.153		mg/kg dry	☼	94.5	30 - 133	1.57	35
Indeno (1,2,3-cd) pyrene	ND		0.162	0.161		mg/kg dry	☼	99.5	30 - 140	10.0	35

Surrogate	*Matrix Spike Dup % Recovery*	*Matrix Spike Dup Qualifier*	*Limits*
Nitrobenzene-d5	*87.6*		*30 - 140*
2-FBP	*94.0*		*30 - 140*
p-Terphenyl-d14	*104*		*30 - 150*

Method: NWTPH-Dx - Semivolatile Petroleum Products by NWTPH-Dx

Lab Sample ID: 11E0102-BLK1
Matrix: Soil
Analysis Batch: 11E0102

Client Sample ID: 11E0102-BLK1
Prep Type: Total
Prep Batch: 11E0102_P

Analyte	Blank Result	Blank Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Hydrocarbons	ND		10.0		mg/kg wet		05/19/11 07:03	05/19/11 09:45	1.00
Heavy Oil Range Hydrocarbons	ND		25.0		mg/kg wet		05/19/11 07:03	05/19/11 09:45	1.00

Surrogate	*Blank % Recovery*	*Blank Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-FBP	*109*		*50 - 150*	*05/19/11 07:03*	*05/19/11 09:45*	*1.00*
p-Terphenyl-d14	*117*		*50 - 150*	*05/19/11 07:03*	*05/19/11 09:45*	*1.00*

Lab Sample ID: 11E0102-BS1
Matrix: Soil
Analysis Batch: 11E0102

Client Sample ID: 11E0102-BS1
Prep Type: Total
Prep Batch: 11E0102_P

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	% Rec	% Rec. Limits
Diesel Range Hydrocarbons	83.3	82.5		mg/kg wet		99.1	73 - 133

Surrogate	*LCS % Recovery*	*LCS Qualifier*	*Limits*
2-FBP	*109*		*50 - 150*
p-Terphenyl-d14	*109*		*50 - 150*

Method: NWTPH-Dx - Semivolatile Petroleum Products by NWTPH-Dx (Continued)

Lab Sample ID: 11E0102-MS1 — **Client Sample ID: BH-1b-3**
Matrix: Soil — **Prep Type: Total**
Analysis Batch: 11E0102 — **Prep Batch: 11E0102_P**

Analyte	Sample Result	Sample Qualifier	Spike Added	Matrix Spike Result	Matrix Spike Qualifier	Unit	D	% Rec	% Rec. Limits
Diesel Range Hydrocarbons	ND		101	98.7		mg/kg dry	☼	97.6	70.1 - 139

Surrogate	*Matrix Spike % Recovery*	*Matrix Spike Qualifier*	*Limits*
2-FBP	*106*		*50 - 150*
p-Terphenyl-d14	*108*		*50 - 150*

Lab Sample ID: 11E0102-DUP1 — **Client Sample ID: BH-1b-3**
Matrix: Soil — **Prep Type: Total**
Analysis Batch: 11E0102 — **Prep Batch: 11E0102_P**

Analyte	Sample Result	Sample Qualifier	Duplicate Result	Duplicate Qualifier	Unit	D	RPD	RPD Limit
Diesel Range Hydrocarbons	ND		ND		mg/kg dry	☼		40
Heavy Oil Range Hydrocarbons	ND		ND		mg/kg dry	☼		40

Surrogate	*Duplicate % Recovery*	*Duplicate Qualifier*	*Limits*
2-FBP	*90.6*		*50 - 150*
p-Terphenyl-d14	*102*		*50 - 150*

Method: NWTPH/VPH - Northwest - Volatile Pertroleum Hydrocarbons (GC)

Lab Sample ID: MB 580-86463/1-A — **Client Sample ID: MB 580-86463/1-A**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 86471 — **Prep Batch: 86463**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C5-C6 Aliphatics	ND		2.0		mg/Kg		05/21/11 10:29	05/22/11 21:43	1
C6-C8 Aliphatics	ND		2.0		mg/Kg		05/21/11 10:29	05/22/11 21:43	1
C8-C10 Aliphatics	ND		2.0		mg/Kg		05/21/11 10:29	05/22/11 21:43	1
C10-C12 Aliphatics	ND		2.0		mg/Kg		05/21/11 10:29	05/22/11 21:43	1
C8-C10 Aromatics	ND		2.0		mg/Kg		05/21/11 10:29	05/22/11 21:43	1
C10-C12 Aromatics	ND		2.0		mg/Kg		05/21/11 10:29	05/22/11 21:43	1
C12-C13 Aromatics	ND		2.0		mg/Kg		05/21/11 10:29	05/22/11 21:43	1
Total VPH	ND		14		mg/Kg		05/21/11 10:29	05/22/11 21:43	1

Surrogate	*MB % Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*103*		*60 - 140*	*05/21/11 10:29*	*05/22/11 21:43*	*1*
a,a,a-Trifluorotoluene (fid)	*106*			*05/21/11 10:29*	*05/22/11 21:43*	*1*
a,a,a-Trifluorotoluene (pid)	*105*			*05/21/11 10:29*	*05/22/11 21:43*	*1*
BFB - PID	*103*		*60 - 140*	*05/21/11 10:29*	*05/22/11 21:43*	*1*

Lab Sample ID: LCS 580-86463/2-A — **Client Sample ID: LCS 580-86463/2-A**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 86471 — **Prep Batch: 86463**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	% Rec	% Rec. Limits
C5-C6 Aliphatics	8.00	7.68		mg/Kg		96	70 - 130
C6-C8 Aliphatics	4.00	3.83		mg/Kg		96	70 - 130
C8-C10 Aliphatics	8.00	8.77		mg/Kg		110	70 - 130

Method: NWTPH/VPH - Northwest - Volatile Petroleum Hydrocarbons (GC) (Continued)

Lab Sample ID: LCS 580-86463/2-A
Matrix: Solid
Analysis Batch: 86471

Client Sample ID: LCS 580-86463/2-A
Prep Type: Total/NA
Prep Batch: 86463

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	% Rec	% Rec. Limits		
C10-C12 Aliphatics			4.00	3.71		mg/Kg		93	70 - 130		
C8-C10 Aromatics			16.0	15.3		mg/Kg		96	70 - 130		
C10-C12 Aromatics			4.00	3.71		mg/Kg		93	70 - 130		
C12-C13 Aromatics			8.00	7.39		mg/Kg		92	70 - 130		

Surrogate	*LCS % Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene	*104*		*60 - 140*
a,a,a-Trifluorotoluene (fid)	*100*		
a,a,a-Trifluorotoluene (pid)	*95*		
BFB - PID	*101*		*60 - 140*

Lab Sample ID: 580-26174-2 MS
Matrix: Solid
Analysis Batch: 86471

Client Sample ID: SUE0077-02
Prep Type: Total/NA
Prep Batch: 86463

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	% Rec	% Rec. Limits		
C5-C6 Aliphatics	ND		11.3	12.2		mg/Kg	☼	100	70 - 130		
C6-C8 Aliphatics	ND		5.63	8.67		mg/Kg	☼	114	70 - 130		
C8-C10 Aliphatics	ND		11.3	14.5		mg/Kg	☼	122	70 - 130		
C10-C12 Aliphatics	ND		5.63	8.38		mg/Kg	☼	126	70 - 130		
C8-C10 Aromatics	2.9		22.5	24.0		mg/Kg	☼	94	70 - 130		
C10-C12 Aromatics	2.5		5.63	8.11		mg/Kg	☼	99	70 - 130		
C12-C13 Aromatics	ND		11.3	10.2		mg/Kg	☼	78	70 - 130		

Surrogate	*MS % Recovery*	*MS Qualifier*	*Limits*
4-Bromofluorobenzene	*104*		*60 - 140*
BFB - PID	*95*		*60 - 140*

Lab Sample ID: 580-26174-2 MSD
Matrix: Solid
Analysis Batch: 86471

Client Sample ID: SUE0077-02
Prep Type: Total/NA
Prep Batch: 86463

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	% Rec	% Rec. Limits	RPD	RPD Limit
C5-C6 Aliphatics	ND		11.3	12.9		mg/Kg	☼	107	70 - 130	6	25
C6-C8 Aliphatics	ND		5.63	9.32		mg/Kg	☼	126	70 - 130	7	25
C8-C10 Aliphatics	ND		11.3	16.3	F	mg/Kg	☼	138	70 - 130	11	25
C10-C12 Aliphatics	ND		5.63	9.43	F	mg/Kg	☼	144	70 - 130	12	25
C8-C10 Aromatics	2.9		22.5	24.5		mg/Kg	☼	96	70 - 130	2	25
C10-C12 Aromatics	2.5		5.63	8.42		mg/Kg	☼	105	70 - 130	4	25
C12-C13 Aromatics	ND		11.3	11.4		mg/Kg	☼	89	70 - 130	12	25
Naphthalene	0.35		5.63	5.65		mg/Kg	☼	94		12	
Benzene	0.15		5.63	5.54		mg/Kg	☼	96	70 - 130	1	25
Ethylbenzene	0.23		5.63	5.59		mg/Kg	☼	95	70 - 130	2	25
m-Xylene & p-Xylene	0.94		11.3	11.6		mg/Kg	☼	95	70 - 130	2	25
Methyl tert-butyl ether	ND		5.63	5.19		mg/Kg	☼	92	70 - 130	3	25
o-Xylene	0.29		5.63	5.56		mg/Kg	☼	94	70 - 130	2	25
Toluene	0.39		5.63	5.81		mg/Kg	☼	96	70 - 130	2	25

Method: NWTPH/VPH - Northwest - Volatile Petroleum Hydrocarbons (GC) (Continued)

Lab Sample ID: 580-26174-2 MSD
Matrix: Solid
Analysis Batch: 86471

Client Sample ID: SUE0077-02
Prep Type: Total/NA
Prep Batch: 86463

Surrogate	MSD % Recovery	MSD Qualifier	Limits
4-Bromofluorobenzene	*106*		*60 - 140*
BFB - PID	*95*		*60 - 140*

Lab Sample ID: LCS 580-86536/2-A
Matrix: Solid
Analysis Batch: 86551

Client Sample ID: LCS 580-86536/2-A
Prep Type: Total/NA
Prep Batch: 86536

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	% Rec	% Rec. Limits
C5-C6 Aliphatics	8.00	9.31		mg/Kg		116	70 - 130
C6-C8 Aliphatics	4.00	4.60		mg/Kg		115	70 - 130
C8-C10 Aliphatics	8.00	10.1		mg/Kg		127	70 - 130
C10-C12 Aliphatics	4.00	4.71		mg/Kg		118	70 - 130
C8-C10 Aromatics	16.0	16.0		mg/Kg		100	70 - 130
C10-C12 Aromatics	4.00	3.76		mg/Kg		94	70 - 130
C12-C13 Aromatics	8.00	6.53		mg/Kg		82	70 - 130
C8-C10	24.0	26.1		mg/Kg		109	70 - 130

Surrogate	LCS % Recovery	LCS Qualifier	Limits
4-Bromofluorobenzene	*105*		*60 - 140*
a,a,a-Trifluorotoluene (fid)	*112*		
a,a,a-Trifluorotoluene (pid)	*106*		
BFB - PID	*99*		*60 - 140*

Lab Sample ID: 580-26123-A-17-C MS
Matrix: Solid
Analysis Batch: 86551

Client Sample ID: 580-26123-A-17-C MS
Prep Type: Total/NA
Prep Batch: 86536

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	% Rec	% Rec. Limits
C5-C6 Aliphatics	ND		7.25	8.63		mg/Kg	☼	112	70 - 130
C6-C8 Aliphatics	6.2		3.63	10.2		mg/Kg	☼	111	70 - 130
C8-C10 Aliphatics	7.8		7.25	17.4	F	mg/Kg	☼	133	70 - 130
C10-C12 Aliphatics	5.5		3.63	10.1		mg/Kg	☼	126	70 - 130
C8-C10 Aromatics	3.9		14.5	17.4		mg/Kg	☼	93	70 - 130
C10-C12 Aromatics	4.7		3.63	7.67		mg/Kg	☼	82	70 - 130
C12-C13 Aromatics	2.9		7.25	8.76		mg/Kg	☼	81	70 - 130

Surrogate	MS % Recovery	MS Qualifier	Limits
4-Bromofluorobenzene	*137*		*60 - 140*
BFB - PID	*99*		*60 - 140*

Lab Sample ID: 580-26123-A-17-D MSD
Matrix: Solid
Analysis Batch: 86551

Client Sample ID: 580-26123-A-17-D MSD
Prep Type: Total/NA
Prep Batch: 86536

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	% Rec	% Rec. Limits	RPD	RPD Limit
C5-C6 Aliphatics	ND		7.25	8.78		mg/Kg	☼	115	70 - 130	2	25
C6-C8 Aliphatics	6.2		3.63	10.3		mg/Kg	☼	113	70 - 130	0	25
C8-C10 Aliphatics	7.8		7.25	17.6	F	mg/Kg	☼	136	70 - 130	1	25
C10-C12 Aliphatics	5.5		3.63	9.94		mg/Kg	☼	123	70 - 130	1	25

Method: NWTPH/VPH - Northwest - Volatile Pertroleum Hydrocarbons (GC) (Continued)

Lab Sample ID: 580-26123-A-17-D MSD
Matrix: Solid
Analysis Batch: 86551

Client Sample ID: 580-26123-A-17-D MSD
Prep Type: Total/NA
Prep Batch: 86536

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	% Rec	% Rec. Limits	RPD	RPD Limit
C8-C10 Aromatics	3.9		14.5	17.2		mg/Kg	☼	91	70 - 130	1	25
C10-C12 Aromatics	4.7		3.63	7.44		mg/Kg	☼	75	70 - 130	3	25
C12-C13 Aromatics	2.9		7.25	8.20		mg/Kg	☼	73	70 - 130	7	25

Surrogate	*MSD % Recovery*	*MSD Qualifier*	*Limits*
4-Bromofluorobenzene	*136*		*60 - 140*
BFB - PID	*97*		*60 - 140*

Lab Sample ID: MB 580-86551/5
Matrix: Solid
Analysis Batch: 86551

Client Sample ID: MB 580-86551/5
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C5-C6 Aliphatics	ND		0.050		mg/Kg			05/23/11 15:29	1
C6-C8 Aliphatics	ND		0.050		mg/Kg			05/23/11 15:29	1
C8-C10 Aliphatics	ND		0.050		mg/Kg			05/23/11 15:29	1
C10-C12 Aliphatics	ND		0.050		mg/Kg			05/23/11 15:29	1
C8-C10 Aromatics	ND		0.050		mg/Kg			05/23/11 15:29	1
C10-C12 Aromatics	ND		0.050		mg/Kg			05/23/11 15:29	1
C12-C13 Aromatics	ND		0.050		mg/Kg			05/23/11 15:29	1
Total VPH	ND		0.35		mg/Kg			05/23/11 15:29	1
C8-C10	ND		0.050		mg/Kg			05/23/11 15:29	1

Surrogate	*MB % Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*107*		*60 - 140*		*05/23/11 15:29*	*1*
a,a,a-Trifluorotoluene (fid)					*05/23/11 15:29*	*1*
a,a,a-Trifluorotoluene (pid)					*05/23/11 15:29*	*1*
BFB - PID	*105*		*60 - 140*		*05/23/11 15:29*	*1*

Method: NWTPH-Gx - Gasoline Hydrocarbons by NWTPH-Gx

Lab Sample ID: 11E0114-BLK1
Matrix: Soil
Analysis Batch: 11E0114

Client Sample ID: 11E0114-BLK1
Prep Type: Total
Prep Batch: 11E0114_P

Analyte	Blank Result	Blank Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Hydrocarbons	ND		5.00		mg/kg wet		05/20/11 13:03	05/20/11 20:37	1.00

Surrogate	*Blank % Recovery*	*Blank Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-BFB (FID)	*81.8*		*50 - 150*	*05/20/11 13:03*	*05/20/11 20:37*	*1.00*

Lab Sample ID: 11E0114-BS1
Matrix: Soil
Analysis Batch: 11E0114

Client Sample ID: 11E0114-BS1
Prep Type: Total
Prep Batch: 11E0114_P

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	% Rec	% Rec. Limits
Gasoline Range Hydrocarbons	25.0	24.8		mg/kg wet		99.3	74.4 - 124

Method: NWTPH-Gx - Gasoline Hydrocarbons by NWTPH-Gx (Continued)

Lab Sample ID: 11E0114-BS1
Matrix: Soil
Analysis Batch: 11E0114

Client Sample ID: 11E0114-BS1
Prep Type: Total
Prep Batch: 11E0114_P

Surrogate	LCS % Recovery	LCS Qualifier	Limits
4-BFB (FID)	113		50 - 150

Lab Sample ID: 11E0114-BSD1
Matrix: Soil
Analysis Batch: 11E0114

Client Sample ID: 11E0114-BSD1
Prep Type: Total
Prep Batch: 11E0114_P

Analyte			Spike Added	LCS Dup Result	LCS Dup Qualifier	Unit	D	% Rec	% Rec. Limits	RPD	RPD Limit
Gasoline Range Hydrocarbons			25.0	24.0		mg/kg wet		96.2	74.4 - 124	3.17	20

Surrogate	LCS Dup % Recovery	LCS Dup Qualifier	Limits
4-BFB (FID)	109		50 - 150

Lab Sample ID: 11E0114-DUP1
Matrix: Soil
Analysis Batch: 11E0114

Client Sample ID: BH-10-3
Prep Type: Total
Prep Batch: 11E0114_P

Analyte	Sample Result	Sample Qualifier		Duplicate Result	Duplicate Qualifier	Unit	D			RPD	RPD Limit
Gasoline Range Hydrocarbons	32.4			31.6		mg/kg dry	☼			2.48	32.3

Surrogate	Duplicate % Recovery	Duplicate Qualifier	Limits
4-BFB (FID)	103		50 - 150

Method: NWTPH/EPH - Northwest - Extractable Petroleum Hydrocarbons (GC)

Lab Sample ID: MB 580-86239/1-B
Matrix: Solid
Analysis Batch: 86477

Client Sample ID: MB 580-86239/1-B
Prep Type: Total/NA
Prep Batch: 86239

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C12 Aliphatics	ND		5.0		mg/Kg		05/18/11 10:13	05/23/11 18:49	1
C12-C16 Aliphatics	ND		5.0		mg/Kg		05/18/11 10:13	05/23/11 18:49	1
C16-C21 Aliphatics	ND		5.0		mg/Kg		05/18/11 10:13	05/23/11 18:49	1
C21-C34 Aliphatics	ND		5.0		mg/Kg		05/18/11 10:13	05/23/11 18:49	1
C12-C16 Aromatics	ND		5.0		mg/Kg		05/18/11 10:13	05/23/11 18:49	1
C16-C21 Aromatics	ND		5.0		mg/Kg		05/18/11 10:13	05/23/11 18:49	1
C21-C34 Aromatics	ND		5.0		mg/Kg		05/18/11 10:13	05/23/11 18:49	1

Surrogate	MB % Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	79		60 - 140	05/18/11 10:13	05/23/11 18:49	1
1-Chlorooctadecane	84		60 - 140	05/18/11 10:13	05/23/11 18:49	1

Lab Sample ID: LCS 580-86239/2-B
Matrix: Solid
Analysis Batch: 86477

Client Sample ID: LCS 580-86239/2-B
Prep Type: Total/NA
Prep Batch: 86239

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	% Rec	% Rec. Limits		
C12-C16 Aromatics			10.0	7.73		mg/Kg		77	70 - 130		
C16-C21 Aromatics			20.0	15.3		mg/Kg		76	70 - 130		

Method: NWTPH/EPH - Northwest - Extractable Petroleum Hydrocarbons (GC) (Continued)

Lab Sample ID: LCS 580-86239/2-B
Matrix: Solid
Analysis Batch: 86477

Client Sample ID: LCS 580-86239/2-B
Prep Type: Total/NA
Prep Batch: 86239

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	% Rec	% Rec. Limits		
C21-C34 Aromatics			26.7	26.8		mg/Kg		101	70 - 130		

Surrogate	*LCS % Recovery*	*LCS Qualifier*	*Limits*
o-Terphenyl	*80*		*60 - 140*

Lab Sample ID: LCS 580-86239/2-B
Matrix: Solid
Analysis Batch: 86567

Client Sample ID: LCS 580-86239/2-B
Prep Type: Total/NA
Prep Batch: 86239

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	% Rec	% Rec. Limits		
C10-C12 Aliphatics			3.33	ND		mg/Kg		82	70 - 130		
C12-C16 Aliphatics			6.67	5.65		mg/Kg		85	70 - 130		
C16-C21 Aliphatics			10.0	9.14		mg/Kg		91	70 - 130		
C21-C34 Aliphatics			20.0	17.1		mg/Kg		85	70 - 130		

Surrogate	*LCS % Recovery*	*LCS Qualifier*	*Limits*
1-Chlorooctadecane	*87*		*60 - 140*

Lab Sample ID: 580-26174-2 MS
Matrix: Solid
Analysis Batch: 86477

Client Sample ID: SUE0077-02
Prep Type: Total/NA
Prep Batch: 86239

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	% Rec	% Rec. Limits		
C10-C12 Aliphatics	ND		3.88	ND	F	mg/Kg	☼	67	70 - 130		
C12-C16 Aliphatics	ND		7.76	6.14		mg/Kg	☼	79	70 - 130		
C16-C21 Aliphatics	ND		11.6	10.3		mg/Kg	☼	88	70 - 130		
C21-C34 Aliphatics	ND		23.3	20.0		mg/Kg	☼	86	70 - 130		
C12-C16 Aromatics	ND		11.6	11.2		mg/Kg	☼	96	70 - 130		
C16-C21 Aromatics	ND		23.3	19.8		mg/Kg	☼	85	70 - 130		
C21-C34 Aromatics	ND		31.0	34.3		mg/Kg	☼	110	70 - 130		

Surrogate	*MS % Recovery*	*MS Qualifier*	*Limits*
o-Terphenyl	*89*		*60 - 140*
1-Chlorooctadecane	*82*		*60 - 140*

Lab Sample ID: 580-26174-2 MSD
Matrix: Solid
Analysis Batch: 86477

Client Sample ID: SUE0077-02
Prep Type: Total/NA
Prep Batch: 86239

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	% Rec	% Rec. Limits	RPD	RPD Limit
C10-C12 Aliphatics	ND		3.87	ND		mg/Kg	☼	71	70 - 130	5	25
C12-C16 Aliphatics	ND		7.74	6.32		mg/Kg	☼	82	70 - 130	3	25
C16-C21 Aliphatics	ND		11.6	10.6		mg/Kg	☼	91	70 - 130	3	25
C21-C34 Aliphatics	ND		23.2	20.3		mg/Kg	☼	87	70 - 130	2	25
C12-C16 Aromatics	ND		11.6	10.8		mg/Kg	☼	93	70 - 130	3	25
C16-C21 Aromatics	ND		23.2	19.5		mg/Kg	☼	84	70 - 130	2	25
C21-C34 Aromatics	ND		30.9	33.0		mg/Kg	☼	107	70 - 130	4	25

Method: NWTPH/EPH - Northwest - Extractable Petroleum Hydrocarbons (GC) (Continued)

Lab Sample ID: 580-26174-2 MSD
Matrix: Solid
Analysis Batch: 86477

Client Sample ID: SUE0077-02
Prep Type: Total/NA
Prep Batch: 86239

Surrogate	MSD % Recovery	MSD Qualifier	Limits
o-Terphenyl	*87*		*60 - 140*
1-Chlorooctadecane	*81*		*60 - 140*

Method: MSA 29-3.5.2 - General Chemistry Parameters

Lab Sample ID: 11E0192-BLK1
Matrix: Solid
Analysis Batch: 11E0192

Client Sample ID: 11E0192-BLK1
Prep Type: Total
Prep Batch: 11E0192_P

Analyte	Blank Result	Blank Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	ND		2000		mg/kg wet		05/17/11 13:36	05/17/11 16:58	1.00

Lab Sample ID: 11E0192-BS1
Matrix: Solid
Analysis Batch: 11E0192

Client Sample ID: 11E0192-BS1
Prep Type: Total
Prep Batch: 11E0192_P

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	% Rec	% Rec. Limits
Total Organic Carbon	6480	6650		mg/kg		103	80 - 120

Lab Sample ID: 11E0192-MS1
Matrix: Solid
Analysis Batch: 11E0192

Client Sample ID: AUE0050-02
Prep Type: Total
Prep Batch: 11E0192_P

Analyte	Sample Result	Sample Qualifier	Spike Added	Matrix Spike Result	Matrix Spike Qualifier	Unit	D	% Rec	% Rec. Limits
Total Organic Carbon	5670		5000	9000	M1	mg/kg wet		66	75 - 125

Lab Sample ID: 11E0192-MSD1
Matrix: Solid
Analysis Batch: 11E0192

Client Sample ID: AUE0050-02
Prep Type: Total
Prep Batch: 11E0192_P

Analyte	Sample Result	Sample Qualifier	Spike Added	Matrix Spike Dup Result	Matrix Spike Dup Qualifier	Unit	D	% Rec	% Rec. Limits	RPD	RPD Limit
Total Organic Carbon	5670		5000	9780		mg/kg wet		82	75 - 125	8	20

Lab Sample ID: 11E0108-DUP1
Matrix: Soil
Analysis Batch: 11E0192

Client Sample ID: BH-10f-4.5
Prep Type: Total
Prep Batch: 11E0192_P

Analyte	Sample Result	Sample Qualifier	Duplicate Result	Duplicate Qualifier	Unit	D	RPD	RPD Limit
Total Organic Carbon			5100		mg/kg dry	☼		

Lab Sample ID: 11E0114-DUP1
Matrix: Soil
Analysis Batch: 11E0192

Client Sample ID: BH-10-3
Prep Type: Total
Prep Batch: 11E0192_P

Analyte	Sample Result	Sample Qualifier	Duplicate Result	Duplicate Qualifier	Unit	D	RPD	RPD Limit
Total Organic Carbon			4530		mg/kg dry	☼		

Certification Summary

Client: ARCADIS U.S., Inc. - Liberty Lake
Project/Site: GP09BPNA.WA59.00000

TestAmerica Job ID: SUE0077

Laboratory	Authority	Program	EPA Region	Certification ID
TestAmerica Spokane	Alaska	Alaska UST	10	UST-071
TestAmerica Spokane	Washington	State Program	10	C569
TestAmerica Austin		USDA		P330-08-00046
TestAmerica Austin	Arkansas	State Program	6	88-0685
TestAmerica Austin	California	State Program	9	2411
TestAmerica Austin	Kansas	NELAC	7	E-10165
TestAmerica Austin	Louisiana	NELAC	6	30736
TestAmerica Austin	North Carolina	North Carolina DENR	4	302
TestAmerica Austin	Oklahoma	State Program	6	8720
TestAmerica Austin	Pennsylvania	NELAC	3	68-04085
TestAmerica Austin	South Carolina	State Program	4	82003
TestAmerica Austin	Texas	NELAC	6	T104704217-10-6
TestAmerica Burlington		USDA		P330-11-00093
TestAmerica Burlington	ACLASS	DoD ELAP	0	ADE-1492
TestAmerica Burlington	Connecticut	State Program	1	PH-0751
TestAmerica Burlington	Delaware	Delaware DNREC	3	NA
TestAmerica Burlington	Maine	State Program	1	VT00008
TestAmerica Burlington	Minnesota	State Program	5	050-999-436
TestAmerica Burlington	New Hampshire	NELAC	1	200610
TestAmerica Burlington	New Jersey	NELAC	2	VT972
TestAmerica Burlington	New York	NELAC	2	10391
TestAmerica Burlington	Pennsylvania	NELAC	3	68-00489
TestAmerica Burlington	Rhode Island	State Program	1	LAO00298
TestAmerica Burlington	Vermont	State Program	1	VT-4000
TestAmerica Seattle		USDA		P330-11-00222
TestAmerica Seattle	Alaska	Alaska UST	10	UST-022
TestAmerica Seattle	California	NELAC	9	1115CA
TestAmerica Seattle	Florida	NELAC	4	E871074
TestAmerica Seattle	L-A-B	DoD ELAP	0	L2236
TestAmerica Seattle	L-A-B	ISO/IEC 17025	0	L2236
TestAmerica Seattle	Louisiana	NELAC	6	05016
TestAmerica Seattle	Montana	MT DEQ UST	8	N/A
TestAmerica Seattle	Oregon	NELAC	10	WA100007
TestAmerica Seattle	Washington	State Program	10	C553

Accreditation may not be offered or required for all methods and analytes reported in this package. Please contact your project manager for the laboratory's current list of certified methods and analytes.

Method Summary

Client: ARCADIS U.S., Inc. - Liberty Lake
Project/Site: GP09BPNA.WA59.00000

TestAmerica Job ID: SUE0077

Method	Method Description	Protocol	Laboratory
EPA 8260B	Volatile Organic Compounds by EPA Method 8260B		TAL SPK
EPA 8270 mod.	Polynuclear Aromatic Compounds by GC/MS with Selected Ion Monitoring		TAL SPK
NWTPH-Dx	Semivolatile Petroleum Products by NWTPH-Dx		TAL SPK
NWTPH/VPH	Northwest - Volatile Pertroleum Hydrocarbons (GC)	NWTPH	TAL SEA
NWTPH-Gx	Gasoline Hydrocarbons by NWTPH-Gx		TAL SPK
NWTPH/EPH	Northwest - Extractable Petroleum Hydrocarbons (GC)	NWTPH	TAL SEA
Moisture	Percent Moisture	EPA	TAL SEA
TA SOP	Conventional Chemistry Parameters by APHA/EPA Methods		TAL SPK
ASTM D2216-90	General Chemistry Parameters		TAL AUS
MSA 29-3.5.2	General Chemistry Parameters		TAL AUS
D2216-90	Water (Moisture) Content	ASTM	TAL BUR
D422	Grain Size	ASTM	TAL BUR

Protocol References:

ASTM = ASTM International

EPA = US Environmental Protection Agency

NWTPH = Northwest Total Petroleum Hydrocarbon

Laboratory References:

TAL AUS = TestAmerica Austin, 14050 Summit Drive, Suite A100, Austin, TX 78728, TEL 512-244-0855

TAL BUR = TestAmerica Burlington, 30 Community Drive, Suite 11, South Burlington, VT 05403, TEL (802)660-1990

TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

TAL SPK = TestAmerica Spokane, 11922 East 1st. Avenue, Spokane, WA 99206, TEL (509)924-9200

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

11720 North Creek Pkwy N Suite 400, Bothell, WA 98011-8244 425-420-9200 FAX 420-9210
11922 E. First Ave, Spokane, WA 99206-5302 509-924-9200 FAX 924-9290
9405 SW Nimbus Ave,Beaverton, OR 97008-7145 503-906-9200 FAX 906-9210
2000 W International Airport Rd Ste A10, Anchorage, AK 99502-1119 907-563-9200 FAX 563-9210

CHAIN OF CUSTODY REPORT

Work Order #: SUE0077

CLIENT: ARCADIS-US
INVOICE TO: ARCADIS-US
REPORT TO: KEVIN KNESEK
ADDRESS: 2310 N. Molter Rd #101, Liberty Lake WA 99019
PHONE: 509-535-7225 FAX:
P.O. NUMBER:
PROJECT NAME: WA59 / MH-34
PROJECT NUMBER: GP09BPNA.WA59.C0000
SAMPLED BY: K. Knesek + L. Sebastz

TURNAROUND REQUEST in Business Days *
Organic & Inorganic Analyses: 10 STD. | 7 | 5 | 4 | 3 | 2 | 1 | <1
Petroleum Hydrocarbon Analyses: 5 STD. | 4 | 3 | 2 | 1 | <1
OTHER Specify:
* Turnaround Requests less than standard may incur Rush Charges.

PRESERVATIVE

REQUESTED ANALYSES

	CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	GRO	DRO	HRO	VPH	EPH	BTEXN	PAHs	TOC	Particle Size	Soil Moisture				MATRIX (W, S, O)	# OF CONT.	LOCATION/ COMMENTS	TA WO ID
1	BH-16-3	5-9-11 / 1222	X	X	X	X	X	X	X	X	X	X				S	7		
2	BH-3-2.5	5-9-11 / 1600														S	9		
3	BH-4-3	5-10-11 / 0815														S	9		
4	BH-4a-2.5	5-10-11 / 0905														S	9		
5	BH-7-2	5-10-11 / 1355														S	9		
6	BH-10-3	5-11-11 / 0845														S	7		
7	BH-10c-2	5-11-11 / 1035														S	9		
8	BH-10f-4.5	5-11-11 / 1220														S	9		
9																			
10																			

RELEASED BY: Kevin Knesek — DATE: 5/12/2011 — TIME: 1207
PRINT NAME: Kevin Knesek — FIRM: ARCADIS
RECEIVED BY: Kandee Deeke — DATE: 5/12/11 — TIME: 1207
PRINT NAME: Kandee Deeke — FIRM: TestAmerica
RELEASED BY: — DATE: — TIME:
PRINT NAME: — FIRM:
RECEIVED BY: — DATE: — TIME:
PRINT NAME: — FIRM:

ADDITIONAL REMARKS:

TEMP: 3.4°C

TAL-1000(0408)

TestAmerica Spokane
Sample Receipt Form

Work Order #: SUE0077	Client: Arcadis	Project: WA59 / MH-34
Date/Time Received: 5-12-11 12:07	By: RD	

Samples Delivered By: ☐Shipping Service ☐Courier ☑Client ☐Other:_____

List Air Bill Number(s) or Attach a photocopy of the Air Bill:

Receipt Phase	Yes	No	NA	Comments
Were samples received in a cooler:	X			
Custody Seals are present and intact:		X		
Are CoC documents present:	X			
Necessary signatures:	X			

Thermal Preservation Type: ☐Blue Ice ☐Gel Ice ☒Real Ice ☐Dry Ice ☐None ☐Other:_____

Temperature by IR Gun: 3.4 °C Thermometer Serial #81500 (acceptance criteria 0-6 °C)

Temperature out of range: ☐Not enough ice ☐Ice melted ☐w/in 4hrs of collection ☐NA ☐Other:_____

Log-in Phase Date/Time: 5-12-11 13:20 By: CS	Yes	No	NA	Comments
Are sample labels affixed and completed for each container	X			
Samples containers were received intact:	X			
Do sample IDs match the CoC	X			
Appropriate sample containers were received for tests requested	X	RPS 5/12/11		
Are sample volumes adequate for tests requested	X	X		samples -01, -02 + -09 - not enough volume for Grain Size.
Appropriate preservatives were used for the tests requested	X			
pH of inorganic samples checked and is within method specification			X	
Are VOC samples free of bubbles >6mm (1/4" diameter)			X	
Are dissolved parameters field filtered			X	
Do any samples need to be filtered or preserved by the lab		X		
Does this project require quick turnaround analysis		X		
Are there any short hold time tests (see chart below)		X		
Are any samples within 2 days of or past expiration		X		
Was the CoC scanned	X			
Were there Non-conformance issues at login	X	X	RPS 5/12/11	
If yes, was a CAR generated #	X		X	

24 hours or less	48 hours	7 days
Coliform Bacteria	BOD, Color, MBAS	TDS, TSS, VDS, FDS
Chromium +6	Nitrate/Nitrite	Sulfide
	Orthophosphate	Aqueous Organic Prep

ARCADIS

Appendix E

Groundwater Analytical Results

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Spokane
11922 East 1st. Avenue
Spokane, WA 99206
Tel: (509)924-9200

TestAmerica Job ID: SUE0076
Client Project/Site: GP09BPNA.WA59.00000
Client Project Description: WA59/MH-34

For:
ARCADIS U.S., Inc. - Liberty Lake
2310 N. Molter Rd. Suite 101
Liberty Lake, WA 99019

Attn: Kevin Knesek

Authorized for release by:
05/26/2011 01:34:17 PM

Randee Decker
Project Manager
Randee.Decker@testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

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Job ID: SUE0076

Laboratory: TestAmerica Denver

Narrative

CASE NARRATIVE

Client: TestAmerica Laboratories, Inc

Project: Arcadis-Liberty Lake

Report Number: 280-15829-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

The samples were received on 05/13/2011; the samples arrived in good condition and on ice. The temperature of the cooler at receipt was 1.2ºC.

DISSOLVED GASES - METHOD RSK-175

Matrix Spike / Matrix Spike Duplicate (MS/MSD) samples were not requested and could not be performed due to insufficient sample volume. Method precision and accuracy have been verified by the acceptable LCS/LCSD analysis.

No other difficulties were encountered.

Laboratory: TestAmerica Seattle

Narrative

Comments

No additional comments.

Receipt

The following samples were improperly preserved in the field. Ambers of both samples for EPH required adjustment with HCl from lot 50267.

All other samples were received in good condition within temperature requirements.

GC/MS VOA

No analytical or quality issues were noted.

GC/MS Semi VOA

No analytical or quality issues were noted.

GC Semi VOA

No analytical or quality issues were noted.

Organic Prep

No analytical or quality issues were noted.

Sample Summary

Client: ARCADIS U.S., Inc. - Liberty Lake
Project/Site: GP09BPNA.WA59.00000

TestAmerica Job ID: SUE0076

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
SUE0076-01	MW-1	Water	05/11/11 16:10	05/12/11 12:07
SUE0076-02	MW-8	Water	05/11/11 15:00	05/12/11 12:07

Client: ARCADIS U.S., Inc. - Liberty Lake
Project/Site: GP09BPNA.WA59.00000

TestAmerica Job ID: SUE0076

Qualifiers

GCMS Volatiles

Qualifier	Qualifier Description
M7	The MS and/or MSD were above the acceptance limits. See Blank Spike (LCS).
ZX	Due to sample matrix effects, the surrogate recovery was outside the acceptance limits.

GC VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

GC Volatiles

Qualifier	Qualifier Description
ZX	Due to sample matrix effects, the surrogate recovery was outside the acceptance limits.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
☼	Listed under the "D" column to designate that the result is reported on a dry weight basis.
EPA	United States Environmental Protection Agency
ND	Not Detected above the reporting level.
MDL	Method Detection Limit
RL	Reporting Limit
RE, RE1 (etc.)	Indicates a Re-extraction or Reanalysis of the sample.
%R	Percent Recovery
RPD	Relative Percent Difference, a measure of the relative difference between two points.

Client Sample ID: MW-1

Lab Sample ID: SUE0076-01

Date Collected: 05/11/11 16:10

Matrix: Water

Date Received: 05/12/11 12:07

Method: EPA 8260B - Volatile Organic Compounds by EPA Method 8260B

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.200		ug/l		05/13/11 10:47	05/16/11 14:11	1.00
Ethylbenzene	**5.51**		1.00		ug/l		05/13/11 10:47	05/16/11 14:11	1.00
Toluene	ND		1.00		ug/l		05/13/11 10:47	05/16/11 14:11	1.00
o-Xylene	**22.2**		1.00		ug/l		05/13/11 10:47	05/16/11 14:11	1.00
m,p-Xylene	**11.9**		2.00		ug/l		05/13/11 10:47	05/16/11 14:11	1.00
Naphthalene	**19.8**		2.00		ug/l		05/13/11 10:47	05/16/11 14:11	1.00
Methyl tert-butyl ether	ND		1.00		ug/l		05/13/11 10:47	05/16/11 14:11	1.00

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8	*101*		*68.9 - 112*	*05/13/11 10:47*	*05/16/11 14:11*	*1.00*
4-bromofluorobenzene	*136*	*ZX*	*69.7 - 129*	*05/13/11 10:47*	*05/16/11 14:11*	*1.00*
Dibromofluoromethane	*116*		*88.8 - 135*	*05/13/11 10:47*	*05/16/11 14:11*	*1.00*

Method: 8270C SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	**0.74**		0.010		ug/L		05/16/11 14:08	05/17/11 20:48	1
2-Methylnaphthalene	ND		0.013		ug/L		05/16/11 14:08	05/17/11 20:48	1
1-Methylnaphthalene	**0.38**		0.010		ug/L		05/16/11 14:08	05/17/11 20:48	1
Acenaphthylene	ND		0.010		ug/L		05/16/11 14:08	05/17/11 20:48	1
Acenaphthene	**0.12**		0.010		ug/L		05/16/11 14:08	05/17/11 20:48	1
Fluorene	**0.036**		0.010		ug/L		05/16/11 14:08	05/17/11 20:48	1
Phenanthrene	ND		0.010		ug/L		05/16/11 14:08	05/17/11 20:48	1
Anthracene	**0.012**		0.010		ug/L		05/16/11 14:08	05/17/11 20:48	1
Fluoranthene	**0.24**		0.010		ug/L		05/16/11 14:08	05/17/11 20:48	1
Pyrene	**0.30**		0.010		ug/L		05/16/11 14:08	05/17/11 20:48	1
Benzo[a]anthracene	**0.059**		0.010		ug/L		05/16/11 14:08	05/17/11 20:48	1
Chrysene	**0.057**		0.010		ug/L		05/16/11 14:08	05/17/11 20:48	1
Benzo[a]pyrene	**0.042**		0.020		ug/L		05/16/11 14:08	05/17/11 20:48	1
Indeno[1,2,3-cd]pyrene	**0.021**		0.010		ug/L		05/16/11 14:08	05/17/11 20:48	1
Dibenz(a,h)anthracene	ND		0.010		ug/L		05/16/11 14:08	05/17/11 20:48	1
Benzo[g,h,i]perylene	**0.030**		0.010		ug/L		05/16/11 14:08	05/17/11 20:48	1
Benzo[b]fluoranthene	**0.067**		0.010		ug/L		05/16/11 14:08	05/17/11 20:48	1
Benzo[k]fluoranthene	**0.022**		0.010		ug/L		05/16/11 14:08	05/17/11 20:48	1

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Terphenyl-d14	*68*		*20 - 150*	*05/16/11 14:08*	*05/17/11 20:48*	*1*

Method: NWTPH-Dx - Semivolatile Petroleum Products by NWTPH-Dx

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Hydrocarbons	**1.27**		1.04		mg/l		05/18/11 07:54	05/18/11 12:09	1.00
Heavy Oil Range Hydrocarbons	ND		2.07		mg/l		05/18/11 07:54	05/18/11 12:09	1.00

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-FBP	*91.7*		*50 - 150*	*05/18/11 07:54*	*05/18/11 12:09*	*1.00*
p-Terphenyl-d14	*103*		*50 - 150*	*05/18/11 07:54*	*05/18/11 12:09*	*1.00*

Method: NWTPH/VPH - Northwest - Volatile Pertroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C12 Aliphatics	**440**		50		ug/L			05/24/11 02:01	1
C10-C12 Aromatics	**390**		50		ug/L			05/24/11 02:01	1
C12-C13 Aromatics	**110**		50		ug/L			05/24/11 02:01	1
C8-C10 Aliphatics	**150**		50		ug/L			05/24/11 02:01	1

Client Sample ID: MW-1
Date Collected: 05/11/11 16:10
Date Received: 05/12/11 12:07

Lab Sample ID: SUE0076-01
Matrix: Water

Method: NWTPH/VPH - Northwest - Volatile Pertroleum Hydrocarbons (GC) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C8-C10 Aromatics	120		50		ug/L			05/24/11 02:01	1
C5-C6 Aliphatics	230		50		ug/L			05/24/11 02:01	1
C6-C8 Aliphatics	570		50		ug/L			05/24/11 02:01	1
Total VPH	2000		350		ug/L			05/24/11 02:01	1

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
BFB - PID	*81*		*60 - 140*		*05/24/11 02:01*	*1*
4-Bromofluorobenzene	*132*		*60 - 140*		*05/24/11 02:01*	*1*

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methane	0.68	J	5.0	0.22	ug/L			05/18/11 14:07	1
Ethylene	ND		5.0	0.40	ug/L			05/18/11 14:07	1
Ethane	ND		5.0	0.57	ug/L			05/18/11 14:07	1

Method: NWTPH-Gx - Gasoline Hydrocarbons by NWTPH-Gx

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Hydrocarbons	2450		100		ug/l		05/18/11 17:12	05/18/11 20:46	1.00

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-BFB (FID)	*179*	*ZX*	*37.9 - 162*	*05/18/11 17:12*	*05/18/11 20:46*	*1.00*

Method: NWTPH/EPH - Northwest - Extractable Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C12 Aliphatics	ND		60		ug/L		05/16/11 12:37	05/23/11 17:37	1
C10-C12 Aromatics	240		60		ug/L		05/16/11 12:37	05/23/11 17:37	1
C12-C16 Aliphatics	ND		60		ug/L		05/16/11 12:37	05/23/11 17:37	1
C12-C16 Aromatics	78		60		ug/L		05/16/11 12:37	05/23/11 17:37	1
C16-C21 Aliphatics	ND		60		ug/L		05/16/11 12:37	05/23/11 17:37	1
C16-C21 Aromatics	ND		60		ug/L		05/16/11 12:37	05/23/11 17:37	1
C21-C34 Aliphatics	ND		60		ug/L		05/16/11 12:37	05/23/11 17:37	1
C21-C34 Aromatics	ND		60		ug/L		05/16/11 12:37	05/23/11 17:37	1

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*76*		*60 - 140*	*05/16/11 12:37*	*05/23/11 17:37*	*1*
1-Chlorooctadecane	*75*		*60 - 140*	*05/16/11 12:37*	*05/23/11 17:37*	*1*

Method: EPA 300.0 - Anions by EPA Method 300.0

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	54.6		16.0		mg/l		05/16/11 14:00	05/16/11 16:23	20.0
Nitrate-Nitrogen	5.80		0.500		mg/l		05/12/11 14:10	05/12/11 17:15	1.00
Sulfate	148		10.0		mg/l		05/16/11 14:00	05/16/11 16:23	20.0

Method: SM 2320B - Conventional Chemistry Parameters by APHA/EPA Methods

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Alkalinity	500		4.00		mg/l		05/19/11 07:02	05/19/11 15:22	1.00

Client Sample ID: MW-8
Date Collected: 05/11/11 15:00
Date Received: 05/12/11 12:07

Lab Sample ID: SUE0076-02
Matrix: Water

Method: EPA 8260B - Volatile Organic Compounds by EPA Method 8260B

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.200		ug/l		05/13/11 10:47	05/13/11 20:04	1.00
Ethylbenzene	ND		1.00		ug/l		05/13/11 10:47	05/13/11 20:04	1.00
Toluene	ND		1.00		ug/l		05/13/11 10:47	05/13/11 20:04	1.00
o-Xylene	ND		1.00		ug/l		05/13/11 10:47	05/13/11 20:04	1.00
m,p-Xylene	ND		2.00		ug/l		05/13/11 10:47	05/13/11 20:04	1.00
Naphthalene	ND		2.00		ug/l		05/13/11 10:47	05/13/11 20:04	1.00
Methyl tert-butyl ether	ND		1.00		ug/l		05/13/11 10:47	05/13/11 20:04	1.00

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8	*79.8*		*68.9 - 112*	*05/13/11 10:47*	*05/13/11 20:04*	*1.00*
4-bromofluorobenzene	*80.2*		*69.7 - 129*	*05/13/11 10:47*	*05/13/11 20:04*	*1.00*
Dibromofluoromethane	*129*		*88.8 - 135*	*05/13/11 10:47*	*05/13/11 20:04*	*1.00*

Method: 8270C SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	**0.032**		0.0097		ug/L		05/16/11 14:08	05/17/11 21:07	1
2-Methylnaphthalene	ND		0.013		ug/L		05/16/11 14:08	05/17/11 21:07	1
1-Methylnaphthalene	ND		0.0097		ug/L		05/16/11 14:08	05/17/11 21:07	1
Acenaphthylene	ND		0.0097		ug/L		05/16/11 14:08	05/17/11 21:07	1
Acenaphthene	ND		0.0097		ug/L		05/16/11 14:08	05/17/11 21:07	1
Fluorene	**0.010**		0.0097		ug/L		05/16/11 14:08	05/17/11 21:07	1
Phenanthrene	ND		0.0097		ug/L		05/16/11 14:08	05/17/11 21:07	1
Anthracene	ND		0.0097		ug/L		05/16/11 14:08	05/17/11 21:07	1
Fluoranthene	ND		0.0097		ug/L		05/16/11 14:08	05/17/11 21:07	1
Pyrene	ND		0.0097		ug/L		05/16/11 14:08	05/17/11 21:07	1
Benzo[a]anthracene	ND		0.0097		ug/L		05/16/11 14:08	05/17/11 21:07	1
Chrysene	ND		0.0097		ug/L		05/16/11 14:08	05/17/11 21:07	1
Benzo[a]pyrene	ND		0.019		ug/L		05/16/11 14:08	05/17/11 21:07	1
Indeno[1,2,3-cd]pyrene	ND		0.0097		ug/L		05/16/11 14:08	05/17/11 21:07	1
Dibenz(a,h)anthracene	ND		0.0097		ug/L		05/16/11 14:08	05/17/11 21:07	1
Benzo[g,h,i]perylene	ND		0.0097		ug/L		05/16/11 14:08	05/17/11 21:07	1
Benzo[b]fluoranthene	ND		0.0097		ug/L		05/16/11 14:08	05/17/11 21:07	1
Benzo[k]fluoranthene	ND		0.0097		ug/L		05/16/11 14:08	05/17/11 21:07	1

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Terphenyl-d14	*62*		*20 - 150*	*05/16/11 14:08*	*05/17/11 21:07*	*1*

Method: NWTPH-Dx - Semivolatile Petroleum Products by NWTPH-Dx

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Hydrocarbons	ND		0.992		mg/l		05/18/11 07:54	05/18/11 12:24	1.00
Heavy Oil Range Hydrocarbons	ND		1.98		mg/l		05/18/11 07:54	05/18/11 12:24	1.00

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-FBP	*93.1*		*50 - 150*	*05/18/11 07:54*	*05/18/11 12:24*	*1.00*
p-Terphenyl-d14	*102*		*50 - 150*	*05/18/11 07:54*	*05/18/11 12:24*	*1.00*

Method: NWTPH/VPH - Northwest - Volatile Pertroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C12 Aliphatics	ND		50		ug/L			05/24/11 02:27	1
C10-C12 Aromatics	ND		50		ug/L			05/24/11 02:27	1
C12-C13 Aromatics	ND		50		ug/L			05/24/11 02:27	1
C8-C10 Aliphatics	ND		50		ug/L			05/24/11 02:27	1

Client Sample ID: MW-8
Date Collected: 05/11/11 15:00
Date Received: 05/12/11 12:07

Lab Sample ID: SUE0076-02
Matrix: Water

Method: NWTPH/VPH - Northwest - Volatile Petroleum Hydrocarbons (GC) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C8-C10 Aromatics	ND		50		ug/L			05/24/11 02:27	1
C5-C6 Aliphatics	ND		50		ug/L			05/24/11 02:27	1
C6-C8 Aliphatics	ND		50		ug/L			05/24/11 02:27	1
Total VPH	ND		350		ug/L			05/24/11 02:27	1

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
BFB - PID	*106*		*60 - 140*		*05/24/11 02:27*	*1*
4-Bromofluorobenzene	*107*		*60 - 140*		*05/24/11 02:27*	*1*

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methane	ND		5.0	0.22	ug/L			05/18/11 14:21	1
Ethylene	ND		5.0	0.40	ug/L			05/18/11 14:21	1
Ethane	ND		5.0	0.57	ug/L			05/18/11 14:21	1

Method: NWTPH-Gx - Gasoline Hydrocarbons by NWTPH-Gx

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Hydrocarbons	ND		100		ug/l		05/18/11 17:12	05/18/11 21:11	1.00

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-BFB (FID)	*83.8*		*37.9 - 162*	*05/18/11 17:12*	*05/18/11 21:11*	*1.00*

Method: NWTPH/EPH - Northwest - Extractable Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C12 Aliphatics	ND		59		ug/L		05/16/11 12:37	05/23/11 18:01	1
C10-C12 Aromatics	ND		59		ug/L		05/16/11 12:37	05/23/11 18:01	1
C12-C16 Aliphatics	ND		59		ug/L		05/16/11 12:37	05/23/11 18:01	1
C12-C16 Aromatics	ND		59		ug/L		05/16/11 12:37	05/23/11 18:01	1
C16-C21 Aliphatics	ND		59		ug/L		05/16/11 12:37	05/23/11 18:01	1
C16-C21 Aromatics	ND		59		ug/L		05/16/11 12:37	05/23/11 18:01	1
C21-C34 Aliphatics	ND		59		ug/L		05/16/11 12:37	05/23/11 18:01	1
C21-C34 Aromatics	ND		59		ug/L		05/16/11 12:37	05/23/11 18:01	1

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*78*		*60 - 140*	*05/16/11 12:37*	*05/23/11 18:01*	*1*
1-Chlorooctadecane	*74*		*60 - 140*	*05/16/11 12:37*	*05/23/11 18:01*	*1*

Method: EPA 300.0 - Anions by EPA Method 300.0

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**31.2**		16.0		mg/l		05/16/11 14:00	05/16/11 16:41	20.0
Nitrate-Nitrogen	**15.7**		0.500		mg/l		05/12/11 14:10	05/12/11 17:33	1.00
Sulfate	**101**		10.0		mg/l		05/16/11 14:00	05/16/11 16:41	20.0

Method: SM 2320B - Conventional Chemistry Parameters by APHA/EPA Methods

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Alkalinity	**305**		4.00		mg/l		05/19/11 07:02	05/19/11 15:22	1.00

Method: EPA 8260B - Volatile Organic Compounds by EPA Method 8260B

Lab Sample ID: 11E0069-BLK1
Matrix: Water
Analysis Batch: 11E0069

Client Sample ID: 11E0069-BLK1
Prep Type: Total
Prep Batch: 11E0069_P

Analyte	Blank Result	Blank Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.200		ug/l		05/13/11 10:47	05/13/11 12:39	1.00
Ethylbenzene	ND		1.00		ug/l		05/13/11 10:47	05/13/11 12:39	1.00
Toluene	ND		1.00		ug/l		05/13/11 10:47	05/13/11 12:39	1.00
o-Xylene	ND		1.00		ug/l		05/13/11 10:47	05/13/11 12:39	1.00
m,p-Xylene	ND		2.00		ug/l		05/13/11 10:47	05/13/11 12:39	1.00
Naphthalene	ND		2.00		ug/l		05/13/11 10:47	05/13/11 12:39	1.00
Methyl tert-butyl ether	ND		1.00		ug/l		05/13/11 10:47	05/13/11 12:39	1.00

Surrogate	*Blank % Recovery*	*Blank Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8	*80.6*		*68.9 - 112*	*05/13/11 10:47*	*05/13/11 12:39*	*1.00*
4-bromofluorobenzene	*82.0*		*69.7 - 129*	*05/13/11 10:47*	*05/13/11 12:39*	*1.00*
Dibromofluoromethane	*122*		*88.8 - 135*	*05/13/11 10:47*	*05/13/11 12:39*	*1.00*

Lab Sample ID: 11E0069-BS1
Matrix: Water
Analysis Batch: 11E0069

Client Sample ID: 11E0069-BS1
Prep Type: Total
Prep Batch: 11E0069_P

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	% Rec	% Rec. Limits
Benzene	10.0	10.8		ug/l		108	72.9 - 120
Ethylbenzene	10.0	9.79		ug/l		97.9	79.5 - 124
Toluene	10.0	11.1		ug/l		111	72.4 - 132
o-Xylene	10.0	9.78		ug/l		97.8	80 - 120
m,p-Xylene	20.0	22.4		ug/l		112	79.6 - 133
Naphthalene	10.0	9.93		ug/l		99.3	47.1 - 150
Methyl tert-butyl ether	10.0	12.0		ug/l		120	47.6 - 150

Surrogate	*LCS % Recovery*	*LCS Qualifier*	*Limits*
Toluene-d8	*76.6*		*68.9 - 112*
4-bromofluorobenzene	*89.8*		*69.7 - 129*
Dibromofluoromethane	*120*		*88.8 - 135*

Lab Sample ID: 11E0069-MS1
Matrix: Water
Analysis Batch: 11E0069

Client Sample ID: SUE0062-02
Prep Type: Total
Prep Batch: 11E0069_P

Analyte	Sample Result	Sample Qualifier	Spike Added	Matrix Spike Result	Matrix Spike Qualifier	Unit	D	% Rec	% Rec. Limits
Benzene	0.960		10.0	12.3		ug/l		114	72.3 - 120
Ethylbenzene	1.68		10.0	11.2		ug/l		94.9	71.2 - 128
Toluene	0.650		10.0	11.2		ug/l		106	62.7 - 137
o-Xylene	1.20		10.0	11.3		ug/l		101	78.5 - 120
m,p-Xylene	4.13		20.0	26.0		ug/l		110	70 - 134
Naphthalene	2.34		10.0	18.0	M7	ug/l		156	45.4 - 150
Methyl tert-butyl ether	1.50		10.0	16.8	M7	ug/l		154	44.3 - 150

Surrogate	*Matrix Spike % Recovery*	*Matrix Spike Qualifier*	*Limits*
Toluene-d8	*71.2*		*68.9 - 112*
4-bromofluorobenzene	*84.4*		*69.7 - 129*
Dibromofluoromethane	*129*		*88.8 - 135*

Method: EPA 8260B - Volatile Organic Compounds by EPA Method 8260B (Continued)

Lab Sample ID: 11E0069-MSD1
Matrix: Water
Analysis Batch: 11E0069

Client Sample ID: SUE0062-02
Prep Type: Total
Prep Batch: 11E0069_P

Analyte	Sample Result	Sample Qualifier	Spike Added	Matrix Spike Dup Result	Matrix Spike Dup Qualifier	Unit	D	% Rec	% Rec. Limits	RPD	RPD Limit
Benzene	0.960		10.0	12.0		ug/l		110	72.3 - 120	2.88	10.7
Ethylbenzene	1.68		10.0	11.2		ug/l		95.0	71.2 - 128	0.08	13.4
Toluene	0.650		10.0	10.9		ug/l		102	62.7 - 137	95 3.08	13
o-Xylene	1.20		10.0	11.0		ug/l		97.6	78.5 - 120	3.05	13.1
m,p-Xylene	4.13		20.0	25.8		ug/l		108	70 - 134	1.00	14
Naphthalene	2.34		10.0	18.6	M7	ug/l		162	45.4 - 150	3.50	14.9
Methyl tert-butyl ether	1.50		10.0	16.4		ug/l		149	44.3 - 150	2.65	15.7

Surrogate	*Matrix Spike Dup % Recovery*	*Matrix Spike Dup Qualifier*	*Limits*
Toluene-d8	*71.2*		*68.9 - 112*
4-bromofluorobenzene	*85.6*		*69.7 - 129*
Dibromofluoromethane	*126*		*88.8 - 135*

Method: 8270C SIM - Semivolatile Organic Compounds (GC/MS SIM)

Lab Sample ID: MB 580-86086/1-A
Matrix: Water
Analysis Batch: 86171

Client Sample ID: MB 580-86086/1-A
Prep Type: Total/NA
Prep Batch: 86086

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	ND		0.010		ug/L		05/16/11 14:08	05/17/11 19:49	1
2-Methylnaphthalene	ND		0.013		ug/L		05/16/11 14:08	05/17/11 19:49	1
1-Methylnaphthalene	ND		0.010		ug/L		05/16/11 14:08	05/17/11 19:49	1
Acenaphthylene	ND		0.010		ug/L		05/16/11 14:08	05/17/11 19:49	1
Acenaphthene	ND		0.010		ug/L		05/16/11 14:08	05/17/11 19:49	1
Fluorene	ND		0.010		ug/L		05/16/11 14:08	05/17/11 19:49	1
Phenanthrene	ND		0.010		ug/L		05/16/11 14:08	05/17/11 19:49	1
Anthracene	ND		0.010		ug/L		05/16/11 14:08	05/17/11 19:49	1
Fluoranthene	ND		0.010		ug/L		05/16/11 14:08	05/17/11 19:49	1
Pyrene	ND		0.010		ug/L		05/16/11 14:08	05/17/11 19:49	1
Benzo[a]anthracene	ND		0.010		ug/L		05/16/11 14:08	05/17/11 19:49	1
Chrysene	ND		0.010		ug/L		05/16/11 14:08	05/17/11 19:49	1
Benzo[a]pyrene	ND		0.020		ug/L		05/16/11 14:08	05/17/11 19:49	1
Indeno[1,2,3-cd]pyrene	ND		0.010		ug/L		05/16/11 14:08	05/17/11 19:49	1
Dibenz(a,h)anthracene	ND		0.010		ug/L		05/16/11 14:08	05/17/11 19:49	1
Benzo[g,h,i]perylene	ND		0.010		ug/L		05/16/11 14:08	05/17/11 19:49	1
Benzo[b]fluoranthene	ND		0.010		ug/L		05/16/11 14:08	05/17/11 19:49	1
Benzo[k]fluoranthene	ND		0.010		ug/L		05/16/11 14:08	05/17/11 19:49	1

Surrogate	*MB % Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Terphenyl-d14	*68*		*20 - 150*	*05/16/11 14:08*	*05/17/11 19:49*	*1*

Lab Sample ID: LCS 580-86086/2-A
Matrix: Water
Analysis Batch: 86171

Client Sample ID: LCS 580-86086/2-A
Prep Type: Total/NA
Prep Batch: 86086

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	% Rec	% Rec. Limits		
Naphthalene			1.00	0.762		ug/L		76	50 - 125		

Method: 8270C SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Lab Sample ID: LCS 580-86086/2-A
Matrix: Water
Analysis Batch: 86171

Client Sample ID: LCS 580-86086/2-A
Prep Type: Total/NA
Prep Batch: 86086

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	% Rec	% Rec. Limits
2-Methylnaphthalene	1.00	0.767		ug/L		77	60 - 130
1-Methylnaphthalene	1.00	0.734		ug/L		73	50 - 125
Acenaphthylene	0.999	0.835		ug/L		84	60 - 140
Acenaphthene	1.00	0.715		ug/L		71	60 - 125
Fluorene	1.00	0.772		ug/L		77	65 - 125
Phenanthrene	1.00	0.831		ug/L		83	60 - 125
Anthracene	1.00	0.722		ug/L		72	60 - 130
Fluoranthene	1.00	0.850		ug/L		85	70 - 140
Pyrene	1.00	0.808		ug/L		81	65 - 130
Benzo[a]anthracene	1.00	0.862		ug/L		86	65 - 125
Chrysene	1.00	0.924		ug/L		92	65 - 125
Benzo[a]pyrene	1.00	0.711		ug/L		71	65 - 130
Indeno[1,2,3-cd]pyrene	1.00	0.835		ug/L		84	55 - 140
Dibenz(a,h)anthracene	0.999	0.859		ug/L		86	55 - 135
Benzo[g,h,i]perylene	1.00	0.796		ug/L		80	55 - 130
Benzo[b]fluoranthene	1.00	0.887		ug/L		89	65 - 130
Benzo[k]fluoranthene	1.00	0.711		ug/L		71	65 - 130

Surrogate	*LCS % Recovery*	*LCS Qualifier*	*Limits*
Terphenyl-d14	*69*		*20 - 150*

Lab Sample ID: LCSD 580-86086/3-A
Matrix: Water
Analysis Batch: 86171

Client Sample ID: LCSD 580-86086/3-A
Prep Type: Total/NA
Prep Batch: 86086

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	% Rec	% Rec. Limits	RPD	RPD Limit
Naphthalene	1.00	0.734		ug/L		73	50 - 125	4	20
2-Methylnaphthalene	1.00	0.744		ug/L		74	60 - 130	3	20
1-Methylnaphthalene	1.00	0.704		ug/L		70	50 - 125	4	20
Acenaphthylene	0.999	0.803		ug/L		80	60 - 140	4	20
Acenaphthene	1.00	0.685		ug/L		68	60 - 125	4	20
Fluorene	1.00	0.731		ug/L		73	65 - 125	6	20
Phenanthrene	1.00	0.809		ug/L		81	60 - 125	3	20
Anthracene	1.00	0.733		ug/L		73	60 - 130	1	20
Fluoranthene	1.00	0.832		ug/L		83	70 - 140	2	20
Pyrene	1.00	0.804		ug/L		80	65 - 130	0	20
Benzo[a]anthracene	1.00	0.826		ug/L		83	65 - 125	4	20
Chrysene	1.00	0.881		ug/L		88	65 - 125	5	20
Benzo[a]pyrene	1.00	0.717		ug/L		72	65 - 130	1	20
Indeno[1,2,3-cd]pyrene	1.00	0.801		ug/L		80	55 - 140	4	20
Dibenz(a,h)anthracene	0.999	0.819		ug/L		82	55 - 135	5	20
Benzo[g,h,i]perylene	1.00	0.760		ug/L		76	55 - 130	5	20
Benzo[b]fluoranthene	1.00	0.855		ug/L		85	65 - 130	4	20
Benzo[k]fluoranthene	1.00	0.704		ug/L		70	65 - 130	1	20

Surrogate	*LCSD % Recovery*	*LCSD Qualifier*	*Limits*
Terphenyl-d14	*67*		*20 - 150*

Client: ARCADIS U.S., Inc. - Liberty Lake
Project/Site: GP09BPNA.WA59.00000

TestAmerica Job ID: SUE0076

Method: NWTPH-Dx - Semivolatile Petroleum Products by NWTPH-Dx

Lab Sample ID: 11E0089-BLK1 | **Client Sample ID: 11E0089-BLK1**
Matrix: Water | **Prep Type: Total**
Analysis Batch: 11E0089 | **Prep Batch: 11E0089_P**

Analyte	Blank Result	Blank Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Hydrocarbons	ND		0.250		mg/l		05/18/11 07:54	05/18/11 10:53	1.00
Heavy Oil Range Hydrocarbons	ND		0.500		mg/l		05/18/11 07:54	05/18/11 10:53	1.00

Surrogate	*Blank % Recovery*	*Blank Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-FBP	*90.1*		*50 - 150*	*05/18/11 07:54*	*05/18/11 10:53*	*1.00*
p-Terphenyl-d14	*101*		*50 - 150*	*05/18/11 07:54*	*05/18/11 10:53*	*1.00*

Lab Sample ID: 11E0089-BS1 | **Client Sample ID: 11E0089-BS1**
Matrix: Water | **Prep Type: Total**
Analysis Batch: 11E0089 | **Prep Batch: 11E0089_P**

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	% Rec	% Rec. Limits		
Diesel Range Hydrocarbons			2.50	2.13		mg/l		85.2	54.5 - 136		

Surrogate	*LCS % Recovery*	*LCS Qualifier*	*Limits*
2-FBP	*89.3*		*50 - 150*
p-Terphenyl-d14	*98.5*		*50 - 150*

Lab Sample ID: 11E0089-BSD1 | **Client Sample ID: 11E0089-BSD1**
Matrix: Water | **Prep Type: Total**
Analysis Batch: 11E0089 | **Prep Batch: 11E0089_P**

Analyte			Spike Added	LCS Dup Result	LCS Dup Qualifier	Unit	D	% Rec	% Rec. Limits	RPD	RPD Limit
Diesel Range Hydrocarbons			2.50	2.23		mg/l		89.2	54.5 - 136	4.57	32.5

Surrogate	*LCS Dup % Recovery*	*LCS Dup Qualifier*	*Limits*
2-FBP	*95.7*		*50 - 150*
p-Terphenyl-d14	*99.9*		*50 - 150*

Method: NWTPH/VPH - Northwest - Volatile Pertroleum Hydrocarbons (GC)

Lab Sample ID: MB 580-86601/24 | **Client Sample ID: MB 580-86601/24**
Matrix: Water | **Prep Type: Total/NA**
Analysis Batch: 86601

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C12 Aliphatics	ND		50		ug/L			05/23/11 23:49	1
C10-C12 Aromatics	ND		50		ug/L			05/23/11 23:49	1
C12-C13 Aromatics	ND		50		ug/L			05/23/11 23:49	1
C8-C10 Aliphatics	ND		50		ug/L			05/23/11 23:49	1
C8-C10 Aromatics	ND		50		ug/L			05/23/11 23:49	1
C5-C6 Aliphatics	ND		50		ug/L			05/23/11 23:49	1
C6-C8 Aliphatics	ND		50		ug/L			05/23/11 23:49	1
Total VPH	ND		350		ug/L			05/23/11 23:49	1

Surrogate	*MB % Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
BFB - PID	*104*		*60 - 140*		*05/23/11 23:49*	*1*
4-Bromofluorobenzene	*106*		*60 - 140*		*05/23/11 23:49*	*1*

Method: NWTPH/VPH - Northwest - Volatile Pertroleum Hydrocarbons (GC) (Continued)

Lab Sample ID: LCS 580-86601/25
Matrix: Water
Analysis Batch: 86601

Client Sample ID: LCS 580-86601/25
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	% Rec	% Rec. Limits
C10-C12 Aliphatics	100	93.4		ug/L		93	70 - 130
C10-C12 Aromatics	100	90.3		ug/L		90	70 - 130
C12-C13 Aromatics	200	181		ug/L		91	70 - 130
C8-C10 Aliphatics	200	232		ug/L		116	70 - 130
C8-C10 Aromatics	400	393		ug/L		98	70 - 130
C5-C6 Aliphatics	200	202		ug/L		101	70 - 130
C6-C8 Aliphatics	100	105		ug/L		105	70 - 130
Total VPH	1600	1590		ug/L		99	70 - 130

Surrogate	*LCS % Recovery*	*LCS Qualifier*	*Limits*
BFB - PID	*100*		*60 - 140*
4-Bromofluorobenzene	*106*		*60 - 140*

Lab Sample ID: LCSD 580-86601/27
Matrix: Water
Analysis Batch: 86601

Client Sample ID: LCSD 580-86601/27
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	% Rec	% Rec. Limits	RPD	RPD Limit
C10-C12 Aliphatics	100	95.3		ug/L		95	70 - 130	2	25
C10-C12 Aromatics	100	91.6		ug/L		92	70 - 130	1	25
C12-C13 Aromatics	200	197		ug/L		98	70 - 130	8	25
C8-C10 Aliphatics	200	222		ug/L		111	70 - 130	4	25
C8-C10 Aromatics	400	394		ug/L		99	70 - 130	0	25
C5-C6 Aliphatics	200	193		ug/L		97	70 - 130	4	25
C6-C8 Aliphatics	100	97.3		ug/L		97	70 - 130	7	25
Total VPH	1600	1590		ug/L		99	70 - 130	0	25

Surrogate	*LCSD % Recovery*	*LCSD Qualifier*	*Limits*
BFB - PID	*101*		*60 - 140*
4-Bromofluorobenzene	*105*		*60 - 140*

Method: RSK-175 - Dissolved Gases (GC)

Lab Sample ID: MB 280-67984/4
Matrix: Water
Analysis Batch: 67984

Client Sample ID: MB 280-67984/4
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methane	ND		5.0	0.22	ug/L			05/18/11 12:32	1
Ethylene	ND		5.0	0.40	ug/L			05/18/11 12:32	1
Ethane	ND		5.0	0.57	ug/L			05/18/11 12:32	1

Lab Sample ID: LCS 280-67984/2
Matrix: Water
Analysis Batch: 67984

Client Sample ID: LCS 280-67984/2
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	% Rec	% Rec. Limits
Methane	73.2	68.7		ug/L		94	75 - 125
Ethylene	128	121		ug/L		95	75 - 125

Method: RSK-175 - Dissolved Gases (GC) (Continued)

Lab Sample ID: LCS 280-67984/2
Matrix: Water
Analysis Batch: 67984

Client Sample ID: LCS 280-67984/2
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	% Rec	% Rec. Limits
Ethane	137	131		ug/L		96	75 - 125

Lab Sample ID: LCSD 280-67984/3
Matrix: Water
Analysis Batch: 67984

Client Sample ID: LCSD 280-67984/3
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	% Rec	% Rec. Limits	RPD	RPD Limit
Methane	73.2	66.7		ug/L		91	75 - 125	3	20
Ethylene	128	120		ug/L		94	75 - 125	1	20
Ethane	137	127		ug/L		93	75 - 125	3	20

Method: NWTPH-Gx - Gasoline Hydrocarbons by NWTPH-Gx

Lab Sample ID: 11E0100-BLK1
Matrix: Water
Analysis Batch: 11E0100

Client Sample ID: 11E0100-BLK1
Prep Type: Total
Prep Batch: 11E0100_P

Analyte	Blank Result	Blank Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Hydrocarbons	ND		100		ug/l		05/18/11 17:12	05/18/11 23:15	1.00

Surrogate	*Blank % Recovery*	*Blank Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-BFB (FID)	*85.7*		*37.9 - 162*	*05/18/11 17:12*	*05/18/11 23:15*	*1.00*

Lab Sample ID: 11E0100-BS1
Matrix: Water
Analysis Batch: 11E0100

Client Sample ID: 11E0100-BS1
Prep Type: Total
Prep Batch: 11E0100_P

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	% Rec	% Rec. Limits
Gasoline Range Hydrocarbons	1000	822		ug/l		82.2	80 - 120

Surrogate	*LCS % Recovery*	*LCS Qualifier*	*Limits*
4-BFB (FID)	*102*		*37.9 - 162*

Lab Sample ID: 11E0100-BSD1
Matrix: Water
Analysis Batch: 11E0100

Client Sample ID: 11E0100-BSD1
Prep Type: Total
Prep Batch: 11E0100_P

Analyte	Spike Added	LCS Dup Result	LCS Dup Qualifier	Unit	D	% Rec	% Rec. Limits	RPD	RPD Limit
Gasoline Range Hydrocarbons	1000	972		ug/l		97.2	80 - 120	16.8	20

Surrogate	*LCS Dup % Recovery*	*LCS Dup Qualifier*	*Limits*
4-BFB (FID)	*110*		*37.9 - 162*

Lab Sample ID: 11E0100-DUP1
Matrix: Water
Analysis Batch: 11E0100

Client Sample ID: SUE0071-14
Prep Type: Total
Prep Batch: 11E0100_P

Analyte	Sample Result	Sample Qualifier	Duplicate Result	Duplicate Qualifier	Unit	D	RPD	RPD Limit
Gasoline Range Hydrocarbons	ND		ND		ug/l			35

Method: NWTPH-Gx - Gasoline Hydrocarbons by NWTPH-Gx (Continued)

Lab Sample ID: 11E0100-DUP1
Matrix: Water
Analysis Batch: 11E0100

Client Sample ID: SUE0071-14
Prep Type: Total
Prep Batch: 11E0100_P

Surrogate	Duplicate % Recovery	Duplicate Qualifier	Limits
4-BFB (FID)	*87.0*		*37.9 - 162*

Method: NWTPH/EPH - Northwest - Extractable Petroleum Hydrocarbons (GC)

Lab Sample ID: MB 580-86069/1-B
Matrix: Water
Analysis Batch: 86477

Client Sample ID: MB 580-86069/1-B
Prep Type: Total/NA
Prep Batch: 86069

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C12 Aliphatics	ND		50		ug/L		05/16/11 12:37	05/23/11 15:37	1
C10-C12 Aromatics	ND		50		ug/L		05/16/11 12:37	05/23/11 15:37	1
C12-C16 Aliphatics	ND		50		ug/L		05/16/11 12:37	05/23/11 15:37	1
C12-C16 Aromatics	ND		50		ug/L		05/16/11 12:37	05/23/11 15:37	1
C16-C21 Aliphatics	ND		50		ug/L		05/16/11 12:37	05/23/11 15:37	1
C16-C21 Aromatics	ND		50		ug/L		05/16/11 12:37	05/23/11 15:37	1
C21-C34 Aliphatics	ND		50		ug/L		05/16/11 12:37	05/23/11 15:37	1
C21-C34 Aromatics	ND		50		ug/L		05/16/11 12:37	05/23/11 15:37	1

Surrogate	MB % Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	*80*		*60 - 140*	*05/16/11 12:37*	*05/23/11 15:37*	*1*
1-Chlorooctadecane	*90*		*60 - 140*	*05/16/11 12:37*	*05/23/11 15:37*	*1*

Lab Sample ID: LCS 580-86069/17-B
Matrix: Water
Analysis Batch: 86477

Client Sample ID: LCS 580-86069/17-B
Prep Type: Total/NA
Prep Batch: 86069

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	% Rec	% Rec. Limits
C10-C12 Aromatics	100	85.6		ug/L		86	70 - 130
C12-C16 Aromatics	300	256		ug/L		85	70 - 130
C16-C21 Aromatics	600	491		ug/L		82	70 - 130
C21-C34 Aromatics	800	885		ug/L		111	70 - 130

Surrogate	LCS % Recovery	LCS Qualifier	Limits
o-Terphenyl	*88*		*60 - 140*

Lab Sample ID: LCS 580-86069/17-B
Matrix: Water
Analysis Batch: 86567

Client Sample ID: LCS 580-86069/17-B
Prep Type: Total/NA
Prep Batch: 86069

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	% Rec	% Rec. Limits
C10-C12 Aliphatics	100	85.0		ug/L		85	70 - 130
C12-C16 Aliphatics	200	176		ug/L		88	70 - 130
C16-C21 Aliphatics	300	287		ug/L		96	70 - 130
C21-C34 Aliphatics	600	511		ug/L		85	70 - 130

Surrogate	LCS % Recovery	LCS Qualifier	Limits
1-Chlorooctadecane	*93*		*60 - 140*

Method: NWTPH/EPH - Northwest - Extractable Petroleum Hydrocarbons (GC) (Continued)

Lab Sample ID: LCSD 580-86069/18-B — **Client Sample ID: LCSD 580-86069/18-B**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 86477 — **Prep Batch: 86069**

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	% Rec	% Rec. Limits	RPD	RPD Limit
C10-C12 Aromatics			100	76.0		ug/L		76	70 - 130	12	25
C12-C16 Aromatics			300	238		ug/L		79	70 - 130	7	25
C16-C21 Aromatics			600	470		ug/L		78	70 - 130	4	25
C21-C34 Aromatics			800	838		ug/L		105	70 - 130	5	25

Surrogate	*LCSD % Recovery*	*LCSD Qualifier*	*Limits*
o-Terphenyl	*83*		*60 - 140*

Lab Sample ID: LCSD 580-86069/18-B — **Client Sample ID: LCSD 580-86069/18-B**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 86567 — **Prep Batch: 86069**

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	% Rec	% Rec. Limits	RPD	RPD Limit
C10-C12 Aliphatics			100	83.4		ug/L		83	70 - 130	2	25
C12-C16 Aliphatics			200	174		ug/L		87	70 - 130	1	25
C16-C21 Aliphatics			300	287		ug/L		96	70 - 130	0	25
C21-C34 Aliphatics			600	529		ug/L		88	70 - 130	4	25

Surrogate	*LCSD % Recovery*	*LCSD Qualifier*	*Limits*
1-Chlorooctadecane	*87*		*60 - 140*

Method: EPA 300.0 - Anions by EPA Method 300.0

Lab Sample ID: 11E0059-BLK1 — **Client Sample ID: 11E0059-BLK1**
Matrix: Water — **Prep Type: Total**
Analysis Batch: 11E0059 — **Prep Batch: 11E0059_P**

Analyte	Blank Result	Blank Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate-Nitrogen	ND		0.500		mg/l		05/12/11 11:45	05/12/11 14:15	1.00

Lab Sample ID: 11E0059-BS1 — **Client Sample ID: 11E0059-BS1**
Matrix: Water — **Prep Type: Total**
Analysis Batch: 11E0059 — **Prep Batch: 11E0059_P**

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	% Rec	% Rec. Limits		
Nitrate-Nitrogen			5.00	4.91		mg/l		98.2	90 - 110		

Lab Sample ID: 11E0059-MS1 — **Client Sample ID: SUE0070-03**
Matrix: Water — **Prep Type: Total**
Analysis Batch: 11E0059 — **Prep Batch: 11E0059_P**

Analyte	Sample Result	Sample Qualifier	Spike Added	Matrix Spike Result	Matrix Spike Qualifier	Unit	D	% Rec	% Rec. Limits		
Nitrate-Nitrogen	10.3		5.00	14.6		mg/l		86.8	80 - 120		

Method: EPA 300.0 - Anions by EPA Method 300.0 (Continued)

Lab Sample ID: 11E0059-MSD1 — **Client Sample ID: SUE0070-03**
Matrix: Water — **Prep Type: Total**
Analysis Batch: 11E0059 — **Prep Batch: 11E0059_P**

Analyte	Sample Result	Sample Qualifier	Spike Added	Matrix Spike Dup Result	Matrix Spike Dup Qualifier	Unit	D	% Rec	% Rec. Limits	RPD	RPD Limit
Nitrate-Nitrogen	10.3		5.00	14.6		mg/l		87.0	80 - 120	0.0683	12.1

Lab Sample ID: 11E0059-DUP1 — **Client Sample ID: SUE0070-03**
Matrix: Water — **Prep Type: Total**
Analysis Batch: 11E0059 — **Prep Batch: 11E0059_P**

Analyte	Sample Result	Sample Qualifier	Duplicate Result	Duplicate Qualifier	Unit	D	RPD	RPD Limit
Nitrate-Nitrogen	10.3		10.3		mg/l		0.194	13.1

Lab Sample ID: 11E0066-BLK1 — **Client Sample ID: 11E0066-BLK1**
Matrix: Water — **Prep Type: Total**
Analysis Batch: 11E0066 — **Prep Batch: 11E0066_P**

Analyte	Blank Result	Blank Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.800		mg/l		05/16/11 14:00	05/16/11 16:59	1.00
Sulfate	ND		0.500		mg/l		05/16/11 14:00	05/16/11 16:59	1.00

Lab Sample ID: 11E0066-BS1 — **Client Sample ID: 11E0066-BS1**
Matrix: Water — **Prep Type: Total**
Analysis Batch: 11E0066 — **Prep Batch: 11E0066_P**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	% Rec	% Rec. Limits
Chloride	5.00	5.44		mg/l		109	90 - 110
Sulfate	5.00	5.12		mg/l		102	90 - 110

Lab Sample ID: 11E0066-MS1 — **Client Sample ID: MW-8**
Matrix: Water — **Prep Type: Total**
Analysis Batch: 11E0066 — **Prep Batch: 11E0066_P**

Analyte	Sample Result	Sample Qualifier	Spike Added	Matrix Spike Result	Matrix Spike Qualifier	Unit	D	% Rec	% Rec. Limits
Chloride	31.2		100	147		mg/l		116	80 - 120
Sulfate	101		100	195		mg/l		93.6	80 - 120

Lab Sample ID: 11E0066-MSD1 — **Client Sample ID: MW-8**
Matrix: Water — **Prep Type: Total**
Analysis Batch: 11E0066 — **Prep Batch: 11E0066_P**

Analyte	Sample Result	Sample Qualifier	Spike Added	Matrix Spike Dup Result	Matrix Spike Dup Qualifier	Unit	D	% Rec	% Rec. Limits	RPD	RPD Limit
Chloride	31.2		100	142		mg/l		110	80 - 120	4.01	10
Sulfate	101		100	193		mg/l		92.4	80 - 120	0.619	10

Lab Sample ID: 11E0066-DUP1 — **Client Sample ID: MW-8**
Matrix: Water — **Prep Type: Total**
Analysis Batch: 11E0066 — **Prep Batch: 11E0066_P**

Analyte	Sample Result	Sample Qualifier	Duplicate Result	Duplicate Qualifier	Unit	D	RPD	RPD Limit
Chloride	31.2		30.6		mg/l		1.94	18.8
Sulfate	101		104		mg/l		2.73	15.7

Method: SM 2320B - Conventional Chemistry Parameters by APHA/EPA Methods

Lab Sample ID: 11E0101-BLK1 — **Client Sample ID: 11E0101-BLK1**
Matrix: Water — **Prep Type: Total**
Analysis Batch: 11E0101 — **Prep Batch: 11E0101_P**

Analyte	Blank Result	Blank Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity	ND		4.00		mg/l		05/19/11 07:02	05/19/11 15:22	1.00
Carbonate Alkalinity	ND		4.00		mg/l		05/19/11 07:02	05/19/11 15:22	1.00
Total Alkalinity	ND		4.00		mg/l		05/19/11 07:02	05/19/11 15:22	1.00

Lab Sample ID: 11E0101-BS1 — **Client Sample ID: 11E0101-BS1**
Matrix: Water — **Prep Type: Total**
Analysis Batch: 11E0101 — **Prep Batch: 11E0101_P**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	% Rec	% Rec. Limits
Bicarbonate Alkalinity	500	475		mg/l		95.0	90 - 110
Total Alkalinity	500	475		mg/l		95.0	90 - 110

Lab Sample ID: 11E0101-DUP1 — **Client Sample ID: MW-1**
Matrix: Water — **Prep Type: Total**
Analysis Batch: 11E0101 — **Prep Batch: 11E0101_P**

Analyte	Sample Result	Sample Qualifier	Duplicate Result	Duplicate Qualifier	Unit	D	RPD	RPD Limit
Bicarbonate Alkalinity	498		503		mg/l		0.999	10
Carbonate Alkalinity	ND		1.88		mg/l			10
Total Alkalinity	500		505		mg/l		0.995	10

Certification Summary

Client: ARCADIS U.S., Inc. - Liberty Lake
Project/Site: GP09BPNA.WA59.00000

TestAmerica Job ID: SUE0076

Laboratory	Authority	Program	EPA Region	Certification ID
TestAmerica Spokane	Alaska	Alaska UST	10	UST-071
TestAmerica Spokane	Washington	State Program	10	C569
TestAmerica Denver		USDA		P330-08-00036
TestAmerica Denver	A2LA	DoD ELAP	0	2907.01
TestAmerica Denver	A2LA	ISO/IEC 17025	0	2907.01
TestAmerica Denver	Alabama	State Program	4	
TestAmerica Denver	Alaska	Alaska UST	10	UST-30
TestAmerica Denver	Arizona	State Program	9	AZ0713
TestAmerica Denver	Arkansas	State Program	6	88-0687
TestAmerica Denver	California	State Program	9	2513
TestAmerica Denver	Colorado	State Program	8	N/A
TestAmerica Denver	Connecticut	State Program	1	PH-0686
TestAmerica Denver	Florida	NELAC	4	E87667
TestAmerica Denver	Georgia	State Program	4	N/A
TestAmerica Denver	Idaho	State Program	10	CO00026
TestAmerica Denver	Illinois	NELAC	5	200017
TestAmerica Denver	Iowa	State Program	7	370
TestAmerica Denver	Louisiana	NELAC	6	30785
TestAmerica Denver	Maine	State Program	1	CO0002
TestAmerica Denver	Maryland	State Program	3	268
TestAmerica Denver	Minnesota	NELAC	5	8-999-405
TestAmerica Denver	Nevada	State Program	9	CO0026
TestAmerica Denver	New Hampshire	NELAC	1	205310
TestAmerica Denver	New Jersey	NELAC	2	CO004
TestAmerica Denver	New Mexico	State Program	6	N/A
TestAmerica Denver	New York	NELAC	2	11964
TestAmerica Denver	North Carolina	North Carolina DENR	4	358
TestAmerica Denver	North Dakota	State Program	8	R-034
TestAmerica Denver	Oklahoma	State Program	6	8614
TestAmerica Denver	Oregon	NELAC	10	CO200001
TestAmerica Denver	Pennsylvania	NELAC	3	68-00664
TestAmerica Denver	South Carolina	State Program	4	72002
TestAmerica Denver	Tennessee	State Program	4	TN02944
TestAmerica Denver	Texas	NELAC	6	T104704183-08-TX
TestAmerica Denver	Utah	NELAC	8	QUAN5
TestAmerica Denver	Washington	State Program	10	C1284
TestAmerica Denver	West Virginia	West Virginia DEP	3	354
TestAmerica Denver	Wisconsin	State Program	5	999615430
TestAmerica Seattle		USDA		P330-11-00222
TestAmerica Seattle	Alaska	Alaska UST	10	UST-022
TestAmerica Seattle	California	NELAC	9	1115CA
TestAmerica Seattle	Florida	NELAC	4	E871074
TestAmerica Seattle	L-A-B	DoD ELAP	0	L2236
TestAmerica Seattle	L-A-B	ISO/IEC 17025	0	L2236
TestAmerica Seattle	Louisiana	NELAC	6	05016
TestAmerica Seattle	Montana	MT DEQ UST	8	N/A
TestAmerica Seattle	Oregon	NELAC	10	WA100007
TestAmerica Seattle	Washington	State Program	10	C553

Accreditation may not be offered or required for all methods and analytes reported in this package. Please contact your project manager for the laboratory's current list of certified methods and analytes.

Method Summary

Client: ARCADIS U.S., Inc. - Liberty Lake
Project/Site: GP09BPNA.WA59.00000

TestAmerica Job ID: SUE0076

Method	Method Description	Protocol	Laboratory
EPA 8260B	Volatile Organic Compounds by EPA Method 8260B		TAL SPK
8270C SIM	Semivolatile Organic Compounds (GC/MS SIM)	SW846	TAL SEA
NWTPH-Dx	Semivolatile Petroleum Products by NWTPH-Dx		TAL SPK
NWTPH/VPH	Northwest - Volatile Pertroleum Hydrocarbons (GC)	NWTPH	TAL SEA
RSK-175	Dissolved Gases (GC)	RSK	TAL DEN
NWTPH-Gx	Gasoline Hydrocarbons by NWTPH-Gx		TAL SPK
NWTPH/EPH	Northwest - Extractable Petroleum Hydrocarbons (GC)	NWTPH	TAL SEA
EPA 300.0	Anions by EPA Method 300.0		TAL SPK
SM 2320B	Conventional Chemistry Parameters by APHA/EPA Methods		TAL SPK

Protocol References:

NWTPH = Northwest Total Petroleum Hydrocarbon

RSK = Sample Prep And Calculations For Dissolved Gas Analysis In Water Samples Using A GC Headspace Equilibration Technique, RSKSOP-175, Rev. 0, 8/11/94, USEPA Research Lab

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

TAL SPK = TestAmerica Spokane, 11922 East 1st. Avenue, Spokane, WA 99206, TEL (509)924-9200

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

11720 North Creek Pkwy N Suite 400, Bothell, WA 98011-8244 425-420-9200 FAX 420-9210
11922 E. First Ave, Spokane, WA 99206-5302 509-924-9200 FAX 924-9290
9405 SW Nimbus Ave,Beaverton, OR 97008-7145 503-906-9200 FAX 906-9210
2000 W International Airport Rd Ste A10, Anchorage, AK 99502-1119 907-563-9200 FAX 563-9210

CHAIN OF CUSTODY REPORT

Work Order #: 11E0076

CLIENT: ARCADIS

REPORT TO: Kevin Kneisel

ADDRESS: 2310 N. Molter Rd
Liberty Lake, WA 99019

PHONE: (509) 535-7225 FAX:

INVOICE TO: ARCADIS-US

P.O. NUMBER:

PROJECT NAME: MH-34

PROJECT NUMBER: GP09BPNAWA59

SAMPLED BY: K. Kneisel L. Sebastian

TURNAROUND REQUEST in Business Days *

Organic & Inorganic Analyses: 10 STD. | 7 | 5 | 4 | 3 | 2 | 1 | <1

Petroleum Hydrocarbon Analyses: 5 STD. | 4 | 3 | 2 | 1 | <1

OTHER Specify:

* Turnaround Requests less than standard may incur Rush Charges.

	CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	PRESERVATIVE	NWTPH-Gx 8260	NWTPH-Dx D20	PAHs 8270C	ALKALINITY TOTAL	Chloride	N. trate	Sulfate	BTEXN	Methanol, ethanol, ethene RSK-175	EDB	VPH	MATRIX (W, S, O)	# OF CONT.	LOCATION/ COMMENTS	TA WO ID
1	MW-1	5/11/2011 1610		X	X	X	X	X	X	X	X	X	X	X	W	11		
2	MW-8	5/11/2011 1500		X	X	X	X	X	X	X	X	X	X	X	W	11		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		

REQUESTED ANALYSES

RELEASED BY: PRINT NAME: Kevin Kneisel FIRM: ARCADIS DATE: 5/12/2011 TIME: 1207 RECEIVED BY: PRINT NAME: Sandra Decker FIRM: TestAmerica DATE: 5/12/11 TIME: 1207

RELEASED BY: PRINT NAME: FIRM: DATE: TIME: RECEIVED BY: PRINT NAME: FIRM: DATE: TIME:

ADDITIONAL REMARKS:

TEMP: 3.4°C

PAGE 1 OF 1

TAL-1000(0408)

TestAmerica Spokane
Sample Receipt Form

Work Order #: SUE0076	Client: Amedis	Project: MH34
Date/Time Received: 5-12-11 12:07	By: RD	

Samples Delivered By: ☐Shipping Service ☐Courier ☒Client ☐Other:_____

List Air Bill Number(s) or Attach a photocopy of the Air Bill:

Receipt Phase	Yes	No	NA	Comments
Were samples received in a cooler:	X			
Custody Seals are present and intact:		X		
Are CoC documents present:	X			
Necessary signatures:	X			

Thermal Preservation Type: ☐Blue Ice ☐Gel Ice ☒Real Ice ☐Dry Ice ☐None ☐Other:_____

Temperature by IR Gun: 3.4 °C Thermometer Serial #81500 (acceptance criteria 0-6 °C)

Temperature out of range: ☐Not enough ice ☐Ice melted ☐w/in 4hrs of collection ☐NA ☐Other:_____

Log-in Phase Date/Time: 5-12-11 13:40 By:	Yes	No	NA	Comments
Are sample labels affixed and completed for each container	X			
Samples containers were received intact:	X			
Do sample IDs match the CoC	X			
Appropriate sample containers were received for tests requested	X			
Are sample volumes adequate for tests requested	X			
Appropriate preservatives were used for the tests requested	X			
pH of inorganic samples checked and is within method specification	X			
Are VOC samples free of bubbles >6mm (1/4" diameter)	X			
Are dissolved parameters field filtered			X	
Do any samples need to be filtered or preserved by the lab			X	
Does this project require quick turnaround analysis		X		
Are there any short hold time tests (see chart below)				
Are any samples within 2 days of or past expiration				
Was the CoC scanned				
Were there Non-conformance issues at login				
If yes, was a CAR generated #				

24 hours or less	48 hours	7 days
Coliform Bacteria	BOD, Color, MBAS	TDS, TSS, VDS, FDS
Chromium +6	Nitrate/Nitrite	Sulfide
	Orthophosphate	Aqueous Organic Prep

ARCADIS

Appendix F

Bioscreen Outputs and Supporting Data

BIOSCREEN Natural Attenuation Decision Support System

Air Force Center for Environmental Excellence — *Version 1.4*

MH34
North Trench
Run Name

Data Input Instructions:

115 → 1. Enter value directly....or
or
0.02 → 2. Calculate by filling in grey cells below. (To restore formulas, hit button below).

Variable* → Data used directly in model.
20 → Value calculated by model. (Don't enter any data).

1. HYDROGEOLOGY

Seepage Velocity*	*Vs*	58.6	*(ft/yr)*
or		*or*	
Hydraulic Conductivity	*K*	1.7E-03	*(cm/sec)*
Hydraulic Gradient	*i*	0.01	*(ft/ft)*
Porosity	*n*	0.3	*(-)*

2. DISPERSION

Longitudinal Dispersivity*	*alpha x*	16.5	*(ft)*
Transverse Dispersivity*	*alpha y*	1.6	*(ft)*
Vertical Dispersivity*	*alpha z*	0.0	*(ft)*
or		*or*	
Estimated Plume Length	*Lp*	420	*(ft)*

3. ADSORPTION

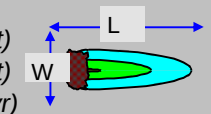
Retardation Factor*	*R*	1.0	*(-)*
or		*or*	
Soil Bulk Density	*rho*	1.7	*(kg/l)*
Partition Coefficient	*Koc*	61	*(L/kg)*
FractionOrganicCarbon	*foc*	5.7E-5	*(-)*

4. BIODEGRADATION

1st Order Decay Coeff*	*lambda*	4.3E+0	*(per yr)*
or		*or*	
Solute Half-Life	*t-half*	0.16	*(year)*
or Instantaneous Reaction Model			
Delta Oxygen*	*DO*	1.65	*(mg/L)*
Delta Nitrate*	*NO3*	0.7	*(mg/L)*
Observed Ferrous Iron*	*Fe2+*	16.6	*(mg/L)*
Delta Sulfate*	*SO4*	22.4	*(mg/L)*
Observed Methane*	*CH4*	6.6	*(mg/L)*

5. GENERAL

Modeled Area Length*	1000	*(ft)*
Modeled Area Width*	700	*(ft)*
Simulation Time*	20	*(yr)*



6. SOURCE DATA

Source Thickness in Sat.Zone* 20 *(ft)*

Source Zones:

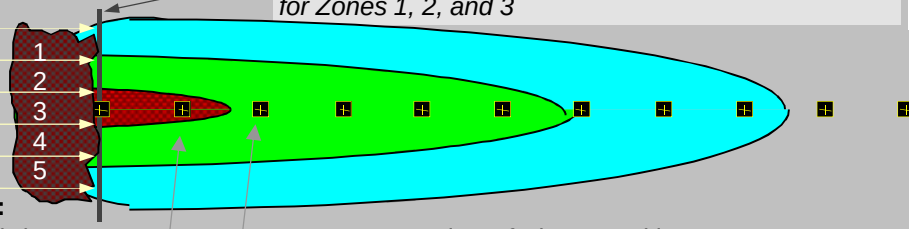
	Width* (ft)	Conc. (mg/L)*
1	100	0.1
2	50	0.2
3	100	20.3
4	50	0.2
5	100	0.1

Source Halflife (see Help):

>1000	>1000	*(yr)*
Inst. React.	1st Order	

Soluble Mass 132460 *(Kg)*
In Source NAPL, Soil

Vertical Plane Source: Look at Plume Cross-Section and Input Concentrations & Widths for Zones 1, 2, and 3



View of Plume Looking Down

Observed Centerline Concentrations at Monitoring Wells
If No Data Leave Blank or Enter "0"

7. FIELD DATA FOR COMPARISON

Concentration (mg/L)	20.3	20.3	.2	.1							
Dist. from Source (ft)	0	100	200	300	400	500	600	700	800	900	1000

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE — **View Output**

RUN ARRAY — **View Output**

Help

Recalculate This Sheet

Paste Example Dataset

Restore Formulas for Vs, Dispersivities, R, lambda, other

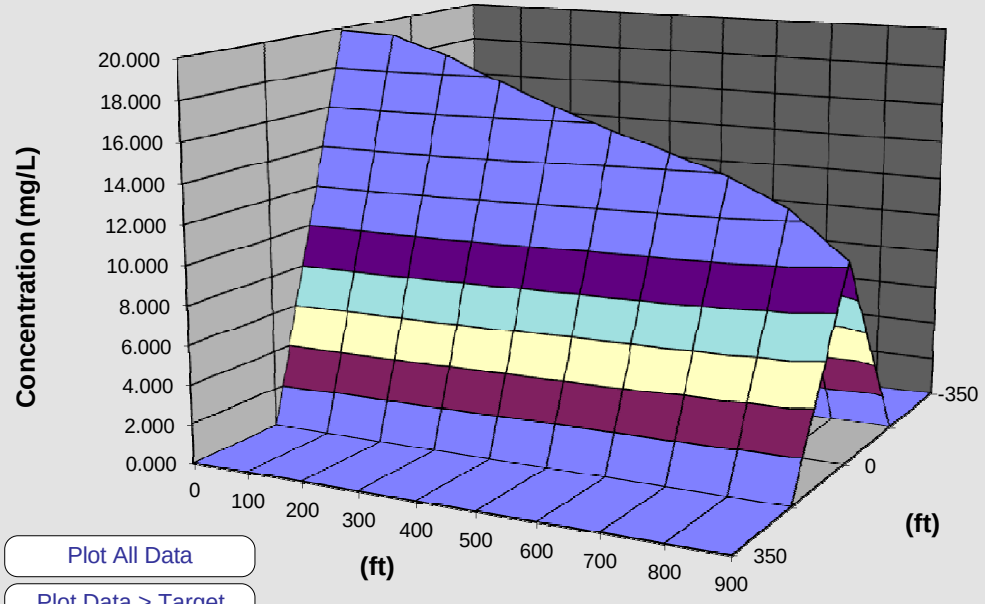
DISSOLVED HYDROCARBON CONCENTRATIONS IN PLUME (mg/L at Z=0)

Transverse Distance (ft) ↓ / Distance from Source (ft)	0	100	200	300	400	500	600	700	800	900	1000
350	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
175	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0	19.887	19.806	18.936	17.770	16.672	15.703	14.821	13.880	12.542	10.263	6.539
-175	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
-350	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MASS FLUX (mg/day)	5.6E+4	9.5E+4	9.0E+4	8.5E+4	8.0E+4	7.5E+4	7.1E+4	6.6E+4	6.0E+4	4.9E+4	3.1E+4

Model to Display:

- *No Degradation Model*
- *1st Order Decay Model*
- *Instantaneous Reaction Model*

Time: **20 Years** Target Level: **0.005** mg/L Displayed Model: **Inst. Reaction**



Plot All Data

Plot Data > Target

Plume and Source Masses (Order-of-Magnitude Accuracy)

Plume Mass if No Biodegradation	1570.1	*(Kg)*
- Actual Plume Mass	457.1	*(Kg)*
= Plume Mass Removed by Biodeg	**1113.0**	*(Kg)* (71 %)

Change in Electron Acceptor/Byproduct Masses:

Oxygen	*Nitrate*	*Iron II*	*Sulfate*	*Methane*	
-125.3	-53.2	+1260.5	-1700.9	+501.2	*(Kg)*

Contam. Mass in Source (t=0 Years)	132460.0	*(Kg)*
Contam. Mass in Source Now (t=20Years)	130889.9	*(Kg)*
Current Volume of Groundwater in Plume	26.5	*(ac-ft)*
Flowrate of Water Through Source Zone	3.230	*(ac-ft/yr)*

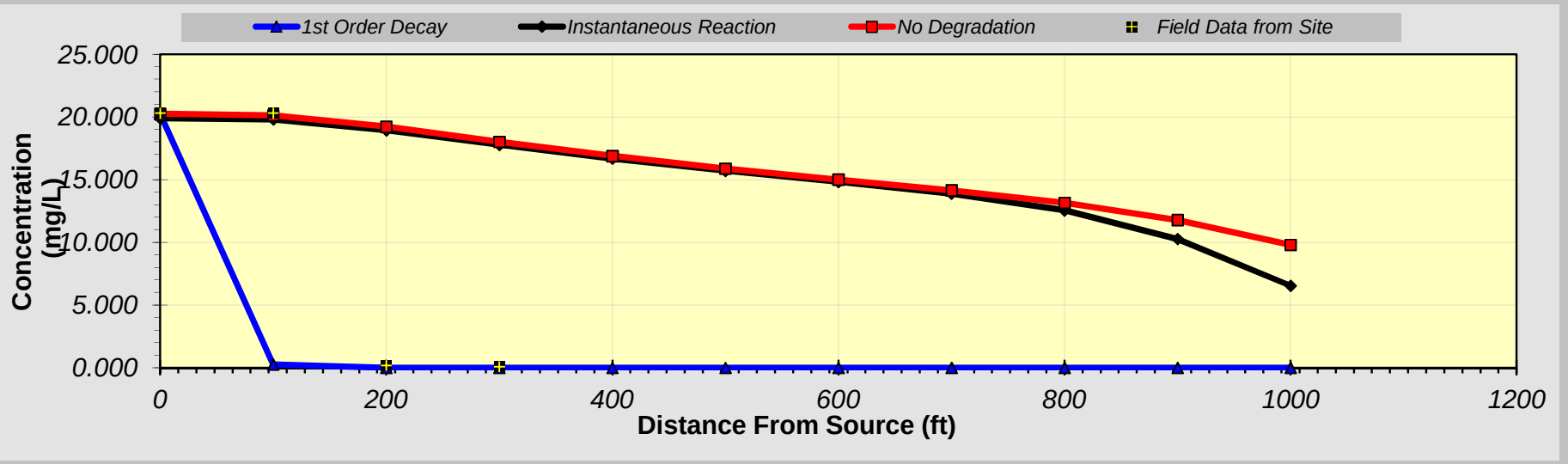
Mass HELP

Recalculate

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

Distance from Source (ft)

TYPE OF MODEL	0	100	200	300	400	500	600	700	800	900	1000
No Degradation	20.237	20.125	19.218	18.015	16.882	15.886	15.002	14.148	13.158	11.781	9.805
1st Order Decay	20.237	0.253	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Inst. Reaction	19.887	19.806	18.936	17.770	16.672	15.703	14.821	13.880	12.542	10.263	6.539
Field Data from Site	20.300	20.300	0.200	0.100							



Calculate Animation

Time: 20 Years

Return to Input

Recalculate This Sheet