



April 11, 2011

Mr. Tom Allen
Acme Fuels
P.O. Box 7009
Olympia, WA 98507

**Re: Summary Report of Additional Site Investigation Requested by the
Washington State Department of Ecology Related to Soil Remediation at
Benedict Property Heating Oil Tank Release Site
19223 Denmark Street SW, Rochester, Washington
Facility/Site No. 3995580, VCP Project No. SW 1100**

Dear Tom:

GeoScience Management, Inc. (GSM) has prepared this summary letter report summarizing the results of additional site investigation activities requested by the Washington State Department of Ecology (Ecology) related to Ecology's review of the site remediation report by GSM, dated January 23, 2010, for the above-referenced site. The remediation effort conducted by GSM from 2004 to 2009 was the result of a heating oil release, estimated to have been 300 gallons of heating oil, which occurred in May 2004. The release resulted from holes developing in the aboveground storage tank due to corrosion. A summary of the most recent environmental work, requested by Ecology's Voluntary Cleanup Program (VCP) Project Manager, Mr. Tom Middleton, are presented in the following Sections of this document.

Site Setting and Description of Fuel Release in May, 2004

The property is located at 19223 Denmark Street SW, Rochester, Washington. The property consists of approximately 8 acres, most of which is pasture land, with the residence situation near the southern edge of the property near the road. Land in the area is generally used for agriculture, and for raising farm animals. Housing density is low, with most of the surrounding area undeveloped. The area is underlain by thick gravel deposits from the Chehalis River, located approximately 1 mile to the northwest. Scatter Creek is located approximately 1,200 feet to the north. The inferred direction of groundwater flow is to the north toward Scatter Creek (Figure 1).

A 300-gallon aboveground heating oil storage tank (AST), was located against the back wall of the house exterior, and had recently been filled. The tank developed corrosion holes in the bottom, resulting in the release of approximately 300 gallons of heating oil to the soil. The release was discovered after the furnace stopped working and a service technician from Acme Fuels conducted a site visit. The property is owned by Mary Benedict.

Summary of Remediation Activities to Date

Approximately 10 cubic yards of soil were excavated from the release area, and disposed of off site. Soil borings indicated that diesel-range hydrocarbon contamination extended to approximately 20 feet. One groundwater monitoring well, designated MW-1, was installed 5 feet north of the impacted area in the assumed downgradient groundwater flow direction from the release. Samples from MW-1 generally did not indicate the presence of diesel fuel compounds, with three exceptions: one at a concentration of 0.280 mg/L, one at 0.560 mg/L and one at 0.210 mg/L on December 9, 2004, December 2, 2005, and February 19, 2007. Since that time, four consecutive groundwater samples have indicated that diesel compounds are not present in groundwater in Well MW-1 at or below the analytical method reporting limit.

The VES/Oxygenation system operated continuously, except for several short periods, from December 5, 2005, until approximately December 20, 2008, when the bearings in the blower seized and the system shut down. In September 2009, a confirmation soil boring was drilled and sampled in the release area, to a depth of approximately 25 feet. Retrieved soil samples did not exhibit a hydrocarbon-like odor until a depth of approximately 22 feet below ground was reached. Laboratory analysis of this 22-foot sample indicated the presence of 320 mg/kg diesel, well below the most stringent soil cleanup level under Method A of MTCA of 2,000 mg/kg.

As a result of these data, GSM concluded that soil and groundwater in the release area met the MTCA Method A cleanup levels, and submitted a request to Ecology in early 2010, for a No Further Action (NFA) Determination for the site under the VCP.

Results of Ecology's Review of the Site Under the Voluntary Cleanup Program

Mr. Tom Middleton, L.Hg., reviewed the site information submitted by GSM, and presented his review comments in a letter to Acme Fuels dated June 10, 2010. In summary, Mr. Middleton indicated that:

- 1) *Excavation confirmation soil samples collected following the limited soil removal identified contaminated soil above the MTCA Method A Cleanup Levels for TPH-Dx along the foundation of the building, the base of the excavation, and below a sewer pipe in the western bottom corner of the excavation. A VES follow-up boring (B-6) did not identify any impacted soils in the central base of the excavation down to the water table at approximately 20 feet bgs. Additional delineation of the impacted soils under the foundation of the building and in the western bottom corner near the sewer pipe is needed to define the extent of residual contamination in soils.*
- 2) *Only one boring was completed as a groundwater monitoring well. Although the direction of groundwater is inferred to be towards the north, the local direction of groundwater flow needs to be defined. Due to the highly permeable nature of the subsurface soils, the areal extent of contamination in groundwater also requires further definition. Ecology recommends that additional wells be installed to allow for the collection of depth to groundwater measurements and the preparation of groundwater contour maps. These wells can also be used to define the areal extent of contamination in the groundwater.*
- 3) *The water supply well for the house was sampled for the constituents of concern; however, details of the well construction are not known. This well may affect the local shallow groundwater flow directions. Please provide Ecology with the well construction details and pumping rates of this well.*

Mr. Middleton also stated that all site data must be submitted to Ecology in electronic format, by entering the data into Ecology's Electronic Information Management (EIM) database system.

Work Plan to Address Ecology Concerns in June 10, 2010 Letter

GSM prepared a Work Plan addressing the issues raised by Ecology's site review letter. GSM's Work Plan, dated October 19, 2010, was submitted to Mr. Middleton on October 20, 2010, and included the following tasks:

- 1) Excavation and sampling of the three areas of the 2004 excavation where diesel results had indicated elevated concentrations in 2004:
 - A) Sample South Wall @ 3.5' on the south sidewall of the 2004 excavation;
 - B) Sample BTM @ 5', from the bottom of the 2004 excavation; and

- c) Sample WEST BTM @ 3.8', from the western bottom of the 2004 excavation beneath the sewer pipe.
- 2) Completing two new monitoring wells located to the west and north of the release area, and collecting groundwater samples from the existing well and the two new wells for laboratory analysis for benzene and for diesel and oil. Depths to groundwater were measured in all three wells and converted to relative groundwater elevations, to allow the development of a groundwater contour map for the site;
- 3) Sampling soil from the two new borings near the level of groundwater, and analyzing the soil samples for the potential pretense of diesel and oil.
- 4) Research the construction of the existing domestic water supply well (Pump House Well),
- 5) Entering all site data into Ecology's EIM database system.
- 6) Preparing a summary report documenting the findings of the additional site investigation work; and

Collection of Confirmation Soil Samples in November 2010

On November 17, 2010, GSM coordinated the excavation of soil from the area of the 2004 remedial excavation, to evaluate current soil conditions, and collect confirmation soil samples from the locations of the three 2004 soil samples which had diesel concentrations above the MTCA soil cleanup level of 2,000 mg/kg. During excavation, the screened PVC piping installed in the excavation in 2004 was encountered and removed. Soil excavated by hand beneath the foundation of the house, and extending approximately two feet laterally beneath the house. Very slight hydrocarbon-like odors were encountered sporadically during excavation. Two confirmation soil samples, designated South Wall -2 @ 3.5' and South Wall-3 @ 3.5' were collected in laboratory-provided glass jars. Samples were also collected from the bottom of the excavation, at a depth of 5.2 feet below ground surface, and from a depth of 3.8 feet below the sanitary sewer line, at the approximate locations shown on Figure 2. The location of the 2004 soil samples are also shown on Figure 2 for reference.

The soil samples were transported in a chilled cooler, under standard chain of custody protocols, to ESN Northwest Laboratories in Lacey, Washington, for analysis for diesel and oil fuel compounds using method NWTPH-Dx. The excavation was then backfilled with the excavated material, pending the results of the laboratory analysis.

Installation of Two New Monitoring Wells, Sampling and Monitoring in December 2010 and January 2011

Soil Borings and Soil Sampling. On December 3, 2010, two new groundwater monitoring wells were installed by Boart Longyear Drilling, Inc., using a sonic drill rig. The borings were continuously samples from the ground surface to depths of 25 feet below ground. Soil cuttings were logged by a licensed geologist from GSM. Soil samples were collected from the recovered soil from each boring immediately above the level of groundwater, approximately 19 feet below ground. Samples were placed into laboratory-provided glass jars, and transported in a chilled cooler to ESN, under standard chain of custody procedures, for chemical analysis for diesel and oil compounds.

Installation, Development and Sampling of New Monitoring Wells. Each boring was completed as a groundwater monitoring well. The wells were constructed of 2-inch diameter, flush-threaded, schedule 40 PVD with 10 feet of 20-slot PVC screen at the bottom, extending from 15 to 25 feet below ground. The upper portion of each boring was completed with blank PVC riser pipe with hydrated bentonite installed as an annular seal. The borings were completed at the surface with flush-mounted steel well monuments. Boring logs and as-built construction diagrams for the wells are included in Attachment A.

Each of the new wells was developed using a small, downhole pump, and stainless steel bailer. Approximately 15 gallons of water was pumped from each well during development. Purge water at the end of the development effort was clear, with little to no suspended sediment, and no hydrocarbon-like odors were noted.

Samples were collected for benzene, diesel and oil, from the two new wells (MW-2 and MW-3), the existing well (MW-1), and the Pump House well on December 15, 2010. However, the sample jars were inadvertently left in the cooler in the back of the locked field vehicle overnight, and the VOA jars froze and broke. The samples for diesel and oil were submitted to ESN for analysis on December 16, 2010. GSM sampled the wells and pump house again on January 14, 2011. VOA jars were submitted to ESN for analysis for benzene the same day as collection.

Wellhead Survey and Groundwater Contours. On January 14, 2011, the relative elevations of the three monitoring wells were surveyed to the nearest 0.01-foot using a survey level. Existing well MW-1 was selected as the reference elevation of 100.00, and the other two new wells were referenced to that elevation. Depths to water in all three wells were measured, prior to sample collection on January 14, 2011, using an electronic well probe, and ranged from 16.13 feet below ground surface in MW-1, to 17.37 feet below ground surface in MW-3. The depth to water measurements were converted to relative groundwater elevations, and are listed in Table 1.

A groundwater contour map of the water table aquifer present beneath the site was prepared using the January 14, 2011 data, and is presented on Figure 2. Groundwater flow was determined to be to the northwest, at an approximate gradient of approximately 0.03 feet/foot.

Laboratory Analytical Results

Laboratory analytical results are presented in Table 2, and also shown on Figure 2. Laboratory reports are contained in Attachment B.

2010 Confirmation Soil Samples from Release Area. A total of four confirmation soil samples were collected from the areas of the former remedial excavation from 2004, identified by Ecology as requiring additional confirmation sampling were:

- 1) **Soil Sample West Wall @ 3.5':** Two confirmation soil samples, designated West Wall-2 @ 3.5' and West Wall-3 @ 3.5' were collected on November 17, 2010, from beneath the house foundation, and submitted to ESN for analysis for diesel and oil using analytical method NWTPH-Dx. Laboratory results indicated that sample West Wall-2 @ 3.5' contained 390 mg/kg diesel, and that oil was not present at or above the method detection limit of 100 mg/kg. The mg/kg units approximate parts per million (ppm) concentrations. The results for sample West Wall-3 @ 3.5' indicated diesel at a concentration of 300 mg/kg, and that oil was not present at or above the method detection limit of 100 mg/kg.
- 2) **Soil Sample BTM @ 5':** One confirmation soil sample, designated West Bottom-2 @ 5.2' was collected on November 17, 2010, from the excavation bottom, and submitted to ESN for analysis for diesel and oil using analytical method NWTPH-Dx. Laboratory results indicated that sample West Bottom-2 @ 5.2' contained 120 mg/kg diesel, and that oil was not present at or above the method detection limit of 100 mg/kg.
- 3) **Soil Sample BTM @ 5':** One confirmation soil sample, designated West Bottom-3 @ 3.8' was collected from beneath the sanitary sewer line on November 17, 2010, and submitted to ESN for analysis for diesel and oil using analytical method NWTPH-Dx. Laboratory results indicated that sample West Bottom-3 @ 3.8' did not contain either diesel or oil concentrations at or above the method detection limits of 50 mg/kg, and 100 mg/kg, respectively.

Soil Borings. Two soil samples were collected from the soil borings; one from each boring at a depth of 19 feet below ground. The samples were submitted to ESN for analysis for diesel and oil by analytical method NWTPH-Dx. Laboratory results indicated that neither sample contained diesel or oil concentrations at or above the method detection limits of 50 mg/kg, and 100 mg/kg, respectively.

Groundwater Monitoring Wells and Pump House. Samples were collected from each of the three monitoring wells and the Pump House, and submitted to ESM for analysis for benzene (EPA Method 8260B) and diesel and oil (method NWTPH-Dx). Laboratory results indicated that all target analytes were below their respective method detection limits in all samples.

Domestic Water Supply Well Construction Information

Discussions with the property owner, Mary Benedict, indicated that the domestic water supply well for the property was installed before she purchased the property from a Mr. Bier. Ecology's water well records website contained a well log in the name of Ben and Hazel Bier, which indicates that the well was installed in 1945. The log appears to be a replication done in 1962 of the original log, as some of the information requested on the log form is not present. However, the log indicates the well is 6-inch diameter steel, and is completed to a depth of 49 feet below ground. The well does not appear to contain a perforated or screened section. Static water was measured to be 24 feet below ground on July 20, 1945. The well was originally completed with an aboveground pump system. Ms. Benedict indicated that she had the original pump replaced about 10 years ago with a downhole submersible pump, which pumps to an above-ground 40 gallon pressure tank located in the pump house. The well log is included as Attachment C.

Based on this information, it appears that the domestic water supply well is installed in the same unconfined gravel aquifer which is measured by the on-site monitoring wells. Although the domestic well is installed approximately 25 feet deeper than the monitoring wells, the static water levels appear similar. The domestic well has been sampled by GSM periodically since the site investigation and cleanup actions began in May 2004, and no indications of contamination have been detected. Mary Benedict indicated verbally that she has never noted any indication that water from the domestic supply well has been impacted (odors, discoloration or sheen).

Ms. Benedict stated she has no way of tracking or recording the volume of water used at the house. However, she indicated that three people live in the residence, there are two washing machines, no dishwasher, and that she waters the garden during the summer and waters two horses and a cow year round.

GSM researched typical household water use averages from three sources: 1) University of Kentucky, College of Agriculture and Natural Resources, Family Consumer Sciences, Rural and Economic Development, Publication ENRI-117, by Linda Heaton, Ph.D. (1999); 2) American Water Works Association, Water Use Statistics (2010, Website www.drinktap.org); and 3) Domestic Use of Water, by Nichole Abrashinsky, University of Wisconsin-Eau Claire, USA, Spring 2004). These sources indicated that the typical daily consumption of water is 74 gallons, 70 gallons and 69 gallons for each person in the household, which includes gardening. These sources also indicate that rural usage is slightly less than urban usage. Given that the Benedict household is in a rural area, they have two clothes washers, no dishwasher, and water three livestock, we estimate that the average water usage is likely between 70 and 80 gallons per person per day, or an average of 210 to 240 gallons per day, total.

Conclusions

GSM conducted additional investigation to address several issues raised by Ecology review of the VCP submittal information for the site. The work included sampling three locations identified in 2004 where diesel was present in soil at the limits of the remedial excavation, installing two new monitoring wells, collecting soil and groundwater samples, and evaluating depth to groundwater and groundwater flow downgradient of the release

area. Results of this work did not detect residual diesel contamination above MTCA Method A cleanup levels at any of the three 2004 sample locations. In addition, soil samples collected near the groundwater level in the two new borings. We conclude that the site meets the MTCA Method A cleanup level for diesel fuel of 2,000 mg/kg in soil.

Groundwater samples collected from all three wells and the Pump House well did not detect any of the target analytes at or above the analytical method detection limits. Groundwater was determined to be present at a depth of approximately 17 feet below ground in mid-January 2011, with a general flow direction to the northwest and an approximate gradient of 0.03 feet/foot. The new monitoring wells are located appropriately downgradient, such that if a contaminant plume was present, it would be encountered by the two new wells. Based on this data, there is no indication that a diesel plume in groundwater is present at the site.

Well construction data for the domestic water supply well indicates that the well was installed to a depth of 49 feet in 1945, is comprised of 6-inch diameter steel casing with a submersible downhole pump. The static water level measured in 1945 was 24 feet below ground, which suggests that the well is installed in the unconfined gravel aquifer which is currently being monitored by the on-site groundwater monitoring wells. Laboratory analysis of samples collected since 2004 from the domestic supply well, have not detected contamination above the analytical method detection limits, and Ms. Benedict has indicated she has not noticed any evidence of impacts to water from the well.

With this Additional Site Investigation Report, we have addressed the issues raised in Mr. Tom Middleton's June 10, 2011 VCP Site Review Letter, and determined that no soil or groundwater impacts are present downgradient of the release site, groundwater flow is to the west-northwest, and diesel impacts in the former excavation area and beneath the house foundation now meet MTCA Method A cleanup criteria.. Consequently, we respectfully request that a No Further Action (NFA) determination be made for the site, and that an NFA letter from Ecology be issued to Acme Fuels.

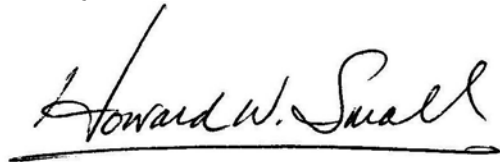
Limitations

The services described in this report were performed consistent with generally accepted professional consulting principles and practices at the time the work was performed. No other warranty, express or implied, is made. These services were performed consistent with our agreement with our client. This report is solely for the use and information of our client unless otherwise noted. Any reliance on this report by a third party is at such party's sole risk.

Opinions and recommendations contained in this report apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, nor the use of segregated portions of this report.

We hope the information presented in this report meets your current needs. Please call if you wish to discuss any of the information presented here, or we can be of further assistance.

Sincerely,



GeoScience Management, Inc.
Howard W. Small L.Hg. C.P.G.
Principal Geologist



HOWARD W. SMALL

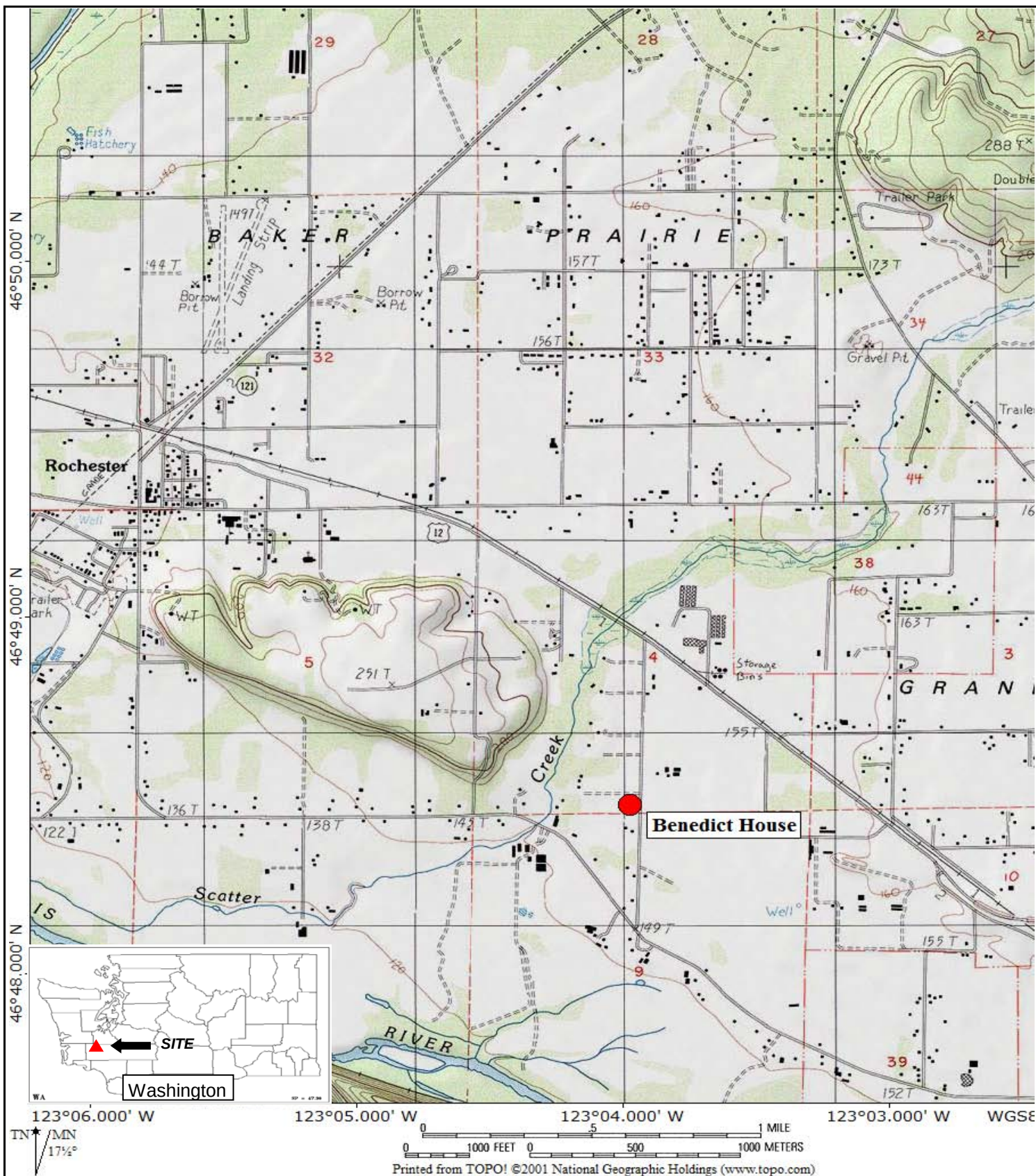
Attachments: Table 1 – Relative Groundwater Elevation Data
 Table 2 – Laboratory Analytical Results
 Figure 1 – Vicinity Map
 Figure 2 - Site Plan Showing Former Excavation Limits, New Soil Sampling Locations and New Monitoring Wells
 Attachment A – Boring Logs
 Attachment B – Laboratory Reports
 Attachment C - Well Log for On-site Domestic Well

Table 1
Relative Groundwater Elevations
Benedict Residence Heating Oil Release Site
19223 Denmark Street SW, Rochester, WA
Facility/Site No. 3995580, VCP Project No. SW1100

Sample Designation	Sample Date	Depth to Water (Feet btoc)	Relative Elevation of Top of Casing	Relative Groundwater Elevation
MW-1	1/14/2011	16.13	100.00	83.87
MW-2	1/14/2011	17.21	99.89	82.68
MW-3	1/14/2011	17.37	100.33	82.96
Notes: Top of the PVC casing on well MW-1 was selected as the site datum, and assigned and elevation of 100.00 feet.				

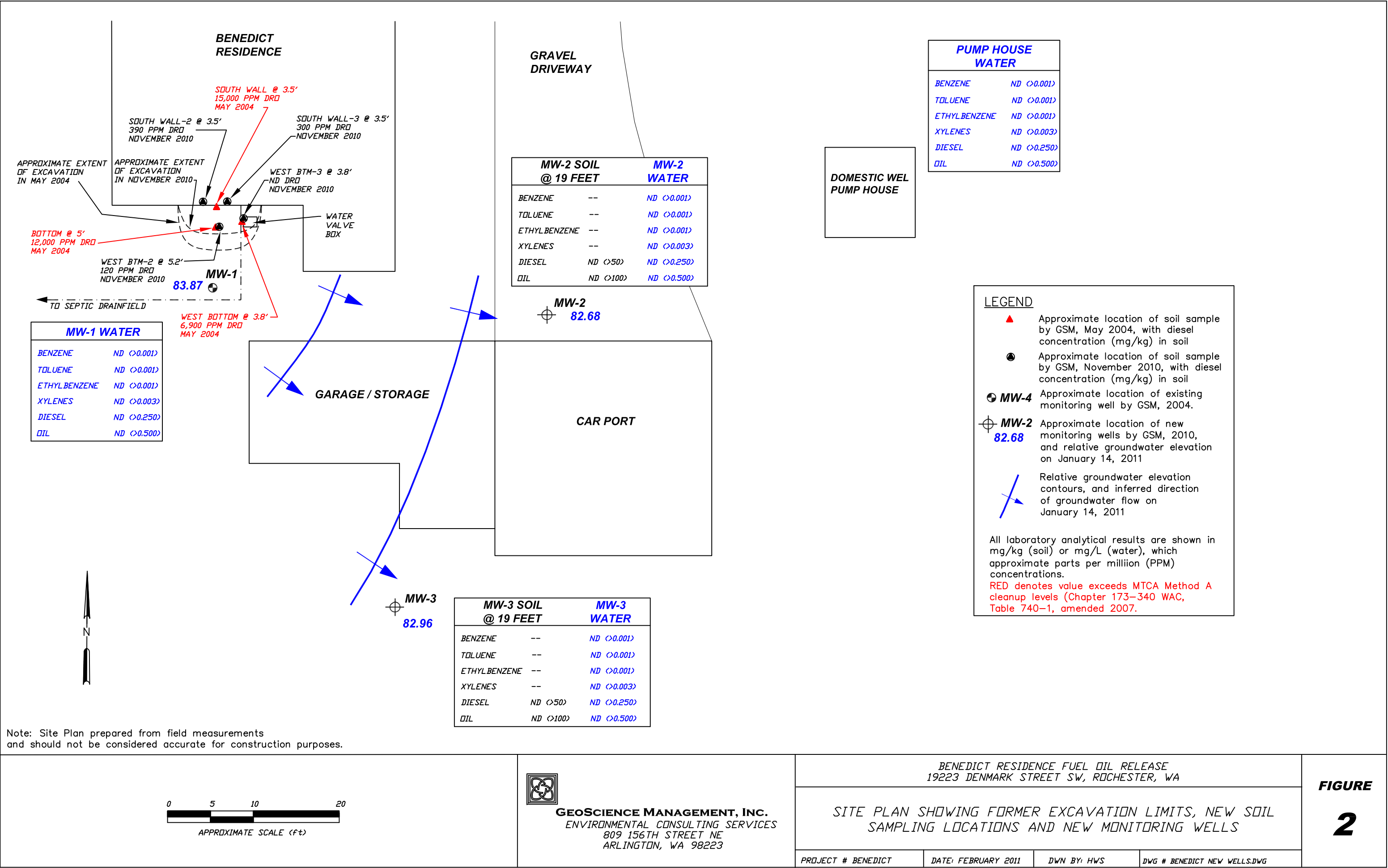
Table 2
Laboratory Analytical Results
Soil Excavations in 2004 and 2010, and Groundwater in 2011
Benedict Residence Heating Oil Release Site
19223 Denmark Street SW, Rochester, WA
Facility/Site No. 3995580, VCP Project No. SW1100

Sample ID	Approximate Sample Location	Date Sampled	Approximate Depth (feet)	Benzene (mg/kg)	Diesel (mg/kg)	Oil (mg/kg)
Soil Samples - Soil Excavation on May 25, 2004						
South Wall@3.5'	Sidewall	5/25/2004	3.5	--	15,000	ND(<500)
BTM@5'	Bottom	5/25/2004	5	--	12,000	ND(<500)
WEST BTM@3.8'	Sidewall	5/25/2004	3.8	--	6,900	ND(<250)
Soil Samples - Soil Excavation on November 17, 2010						
South Wall-2 @ 3.5'	Sidewall beneath house foundation by South Wall @ 3.5' sample from 2004	11/17/2010	3.5	--	390	ND (>100)
South Wall-3 @ 3.5'	Sidewall beneath house foundation by South Wall @ 3.5' sample from 2004	11/17/2010	3.5	--	300	ND (>100)
WEST BTM-2 @ 5.2'	Excavation Bottom by BTM @ 5' sample from 2004	11/17/2010	5.2	--	120	ND (>100)
WEST BTM-3 @ 3.8'	Sidewall below Water Valve Box by West BTM @ 3.8' sample from 2004	11/17/2010	3.8	--	ND (>50)	ND (>100)
Soil Samples - Drilling on December 3, 2010						
MW-2-19	Boring for New Well MW-2	12/3/2010	19	--	ND(<50)	ND(<100)
MW-3-19	Boring for New Well MW-3	12/3/2010	19	--	ND(<50)	ND(<100)
Groundwater Samples		Date Sampled		Benzene (mg/L)	Diesel (mg/L)	Oil (mg/L)
MW-1	Existing Well Installed by GSM, 2004	12/16/2010	N/A	--	ND (>0.250)	ND (>0.500)
MW-1	Existing Well Installed by GSM, 2004	1/14/2011	N/A	ND (>0.001)	--	--
MW-2	New Well Installed by GSM, December 2010	12/16/2010	N/A	--	ND (>0.250)	ND (>0.500)
MW-2	New Well Installed by GSM, December 2010	1/14/2011	N/A	ND (>0.001)	--	--
MW-3	New Well Installed by GSM, December 2010	12/16/2010	N/A	--	ND (>0.250)	ND (>0.500)
MW-3	New Well Installed by GSM, December 2010	1/14/2011	N/A	ND (>0.001)	--	--
Pump House	Existing Domestic Water Supply Well	12/16/2010	N/A	--	ND (>0.250)	ND (>0.500)
Pump House	Existing Domestic Water Supply Well	1/14/2011	N/A	ND (>0.001)	--	--
Notes: ND indicates that the analyte was not detected at the analytical method reporting limit. -- indicates that the sample was not analyzed for a particular constituent. Bold red indicates that the result is above the MTCA Method A Cleanup level. Benzene using EPA Method 8021/8260B. Diesel-, and Oil-range hydrocarbons using Method NWTPH-Dx. MTCA Method A cleanup levels for Diesel and Oil in Soil is 2,000 mg/kg, and 0.5 mg/L in groundwater, "Model Toxics Control Act (MTCA), WAC 173-340. Data in mg/kg (soil) and mg/L (water) which approximates parts per million (ppm) concentrations.						



GEOSCIENCE MANAGEMENT, INC.
 Environmental Consulting Services
 809 156th Street NE
 Arlington, WA 98223

FIGURE 1
VICINITY MAP
BENEDICT PROPERTY
19223 DENMARK STREET SW
ROCHESTER, WA 98579



Note: Site Plan prepared from field measurements and should not be considered accurate for construction purposes.

APPENDIX A

BORING LOGS

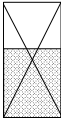
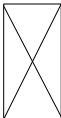
BORING & WELL CONSTRUCTION LEGEND



GEO SCIENCE MANAGEMENT, INC.
ENVIRONMENTAL CONSULTING SERVICES
809 156TH STREET NE
ARLINGTON, WA 98223

CLIENT: Acme Fuels
Benedict Heating Oil Release

PROJECT: 19223 Denmark Street SW,
Rochester, WA

MAJOR DIVISIONS			SYMBOL	GROUP NAME
COARSE-GRAINED SOILS MORE THAN 50 PERCENT RETAINED ON NO. 200 SIEVE	GRAVELS 50 percent or more of coarse fraction retained on No. 4 sieve	CLEAN GRAVELS	GW	Well-graded gravel Well-graded gravel with sand
			GP	Poorly-graded gravel Poorly-graded gravel with sand
		GRAVELS WITH FINES	GM	Silty gravel Silty gravel with sand
			GC	Clayey gravel Clayey gravel with sand
	SANDS 50 percent or more of coarse fraction passes No. 4 sieve	CLEAN SANDS	SW	Well-graded sand Well-graded sand with gravel
			SP	Poorly-graded sand Poorly-graded sand with gravel
		SANDS WITH FINES	SM	Silty sand Silty sand with gravel
			SC	Clayey sand Clayey sand with gravel
FINE-GRAINED SOILS 50 PERCENT OR MORE PASSES NO. 200 SIEVE	SILTS AND CLAYS Liquid Limit 50 percent or less		ML	Silt – Silt with sand or gravel Sandy Silt - Sandy silt with gravel Clayey Silt - Clayey silt with gravel
			CL	Lean clay – Lean clay with sand or gravel Sandy lean clay - Sandy lean clay with gravel Gravelly lean clay – Gravelly lean clay with sand
			OL	Organic silts or organic clays of low plasticity
	SILTS AND CLAYS Liquid Limit greater than 50 percent		MH	Elastic silt – Elastic silt with sand or gravel Sandy elastic silt - Sandy elastic silt with gravel Gravelly elastic silt – Gravelly elastic silt with sand
			CH	Fat clay – Fat clay with sand or gravel Sandy fat clay - Sandy fat clay with gravel Gravelly fat clay – Gravelly fat clay with sand
			OH	Organic clays or organic silts of medium to high plasticity
HIGHLY ORGANIC SOILS			PT	Peat, mulch, or other highly organic soils
 SPLIT-SPOON OR SAMPLED INTERVAL. SHADING INDICATES SAMPLE RECOVERY.  8 12 24 BLOW-COUNTS PER 6-INCH SAMPLING INTERVAL. BLOW COUNTS DO NOT INDICATE SPT VALUES UNLESS NOTED.  ATD 3/19/2009 DEPTH TO WATER MEASURED AT TIME OF DRILLING (ATD), OR ON INDICATED DATE.			<u>DEFINITIONS OF SOIL DESCRIPTIONS</u> TRACE – ESTIMATED 0 TO 5% FINES SLIGHTLY – ESTIMATED 5 TO 15% FINES MODIFIER (SILTY, SANDY, GRAVELLY) – ESTIMATED 15 TO 35% FINES VERY – ESTIMATED 35 TO 50% FINES	
			 CONTACT OBSERVED IN SAMPLE INTERVAL.  CONTACT OCCURRED BETWEEN SAMPLE INTERVALS AND IS INFERRED.  CONTACT IS GRADUAL OVER INTERVAL INDICATED. PHOTOIONIZATION DETECTOR (PID) READINGS ARE REPORTED IN PARTS PER MILLION CONCENTRATIONS AGAINST AN ISOBUTYLENE STANDARD.	

BORING MW-2



DRILLING METHOD
Sonic Rig

SAMPLING METHOD
6-in. O.D. Solid Barrel Sampler

SURFACE COMPLETION
Flush-mount Steel Monument

Elevation Ground: Not Measured
Elevation TOC: 99.89
Total Boring Depth: 25 Feet
Depth to Water ATD: Approx. 19 Feet



Construction Notes: Groundwater monitoring well installed.

BORING MW-2 (CONTINUED)

Construction Notes: Groundwater monitoring well installed.

BORING & WELL CONSTRUCTION LOG

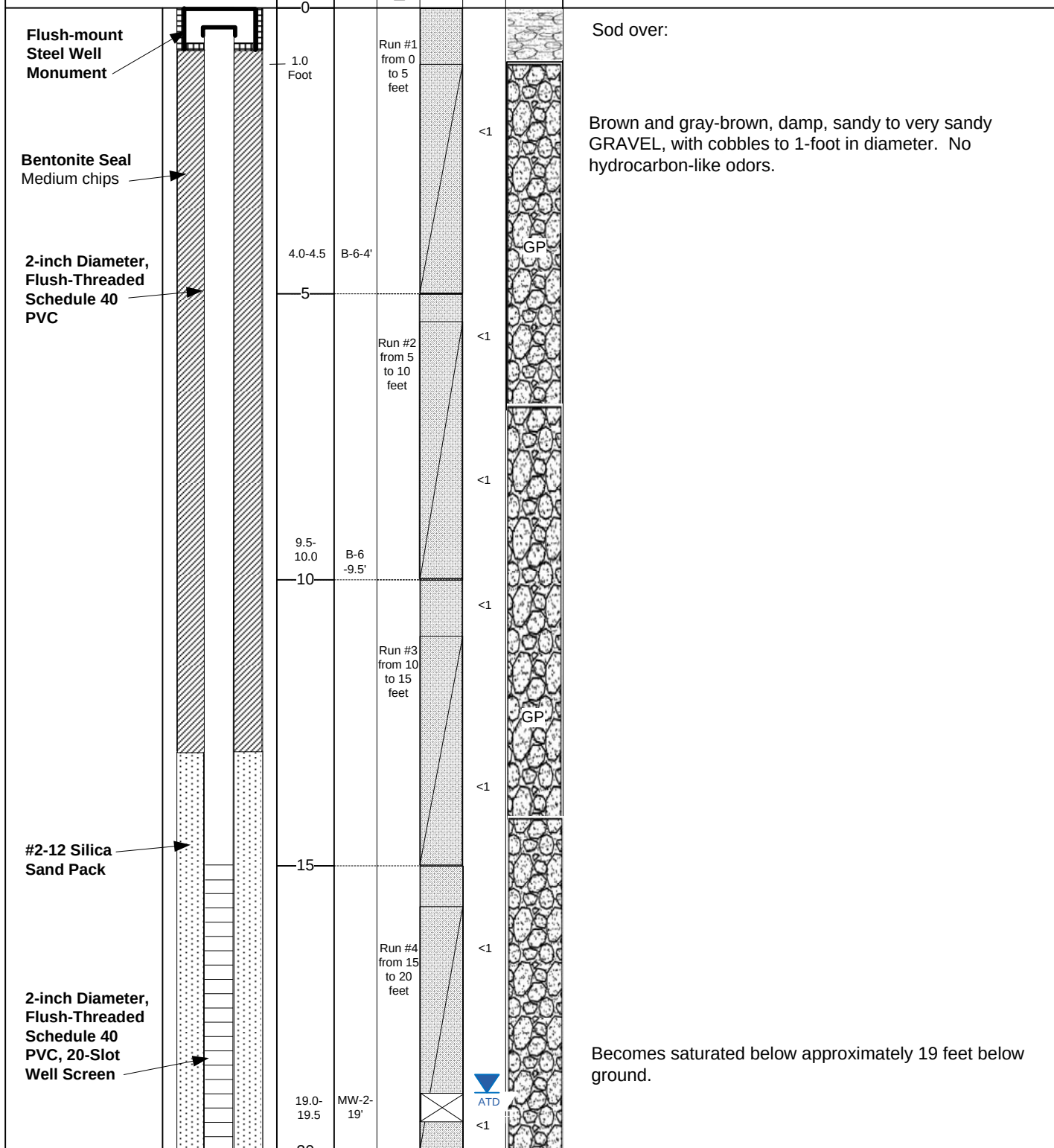
BORING MW-3



GEOSCIENCE MANAGEMENT, INC.
ENVIRONMENTAL CONSULTING SERVICES
809 156TH STREET NE
ARLINGTON, WA 98223

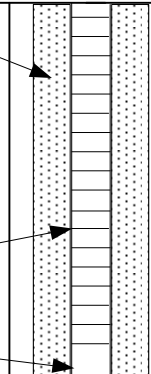
PROJECT
Benedict Heating Oil Release
CLIENT
Acme Fuels
DRILLING COMPANY
Boart Longyear
GEOLOGIST
H. W. Small, L.Hg.
START DATE 12/03/2010 **END DATE** 12/03/2010

DRILLING METHOD
Sonic Rig
SAMPLING METHOD
6-in. O.D. Solid Barrel Sampler
SURFACE COMPLETION
Flush-mount Steel Monument
Elevation Ground: Not Measured
Elevation TOC: 100.33
Total Boring Depth: 25 Feet
Depth to Water ATD: Approx. 19 Feet



Construction Notes: Groundwater monitoring well installed.

BORING MW-3 (CONTINUED)

 GEO SCIENCE MANAGEMENT, INC. ENVIRONMENTAL CONSULTING SERVICES 809 156TH STREET NE ARLINGTON, WA 98223		DEPTH (FEET)	SAMPLE ID	DEPTH DRILLED	SAMPLE INTERVAL AND RECOVERY	PID READINGS (PPM)	USCS	PROJECT Benedict Heating Oil Release CLIENT Acme Fuels DRILLING COMPANY Boart Longyear GEOLOGIST H. W. Small, L.Hg. START DATE END DATE 12/03/2010 12/03/2010 DRILLING METHOD Sonic Rig SAMPLING METHOD 6-in. O.D. Solid Barrel Sampler SURFACE COMPLETION Flush-mount Steel Monument Elevation Ground: Not Measured Elevation TOC: 100.33 Total Boring Depth: 25 Feet Depth to Water ATD: Approx. 19 Feet
#2-12 Silica Sand Pack 2-inch Diameter, Flush-Threaded Schedule 40 PVC, 20-Slot Well Screen Threaded Bottom Cap 		20			Run #5 from 20 to 25 feet	<1 		

APPENDIX B

LABORATORY REPORTS

ESN NORTHWEST CHEMISTRY LABORATORY

GSM
BENEDICT HEATING OIL RELEASE PROJECT
Washington

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

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

Sample Number	Date Prepared	Date Analyzed	Surrogate Recovery (%)	Diesel Range Organics (mg/kg)	Lube Oil Range Organics (mg/kg)
Method Blank	12/20/2010	12/20/2010	77%	nd	nd
MW-2-19	12/20/2010	12/20/2010	63%	nd	nd
MW-3-19	12/20/2010	12/20/2010	55%	nd	nd
MW-3-19 Dup	12/20/2010	12/20/2010	61%	nd	nd
Reporting Limits				50	100

"nd" Indicates not detected at the listed detection limits.

"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE : 50% TO 150%

ESN NORTHWEST CHEMISTRY LABORATORY

GSM
BENEDICT HEATING OIL RELEASE PROJECT
Washington

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

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

Sample Number	Date Prepared	Date Analyzed	Surrogate Recovery (%)	Diesel Range Organics (ug/L)	Lube Oil Range Organics (ug/L)
Method Blank	12/20/2010	12/20/2010	80%	nd	nd
MW-1	12/20/2010	12/20/2010	68%	nd	nd
MW-1 Dup	12/20/2010	12/20/2010	109%	nd	nd
MW-2	12/20/2010	12/20/2010	62%	nd	nd
MW-3	12/20/2010	12/20/2010	69%	nd	nd
Pump House	12/20/2010	12/20/2010	103%	nd	nd
Reporting Limits				250	500

"nd" Indicates not detected at the listed detection limits.

"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE : 50% TO 150%

809 156th Street NE, Arlington, WA 98223

Phone: (206) 730-0228

Fax: (360) 335-6425

Environmental Consulting Services

email: hwsmaill@gsmenviro.com

Client Name/Account #: GeoScience Management, Inc.

Page: 1 of 1

Address: 809 - 156th Street NE

Date: 12/15/2010

City/State/Zip: Arlington, WA 98223

Report To: GSM

Project Manager: Howard W. Small

Invoice To: GSM

Telephone Number: 206.730-0228

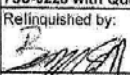
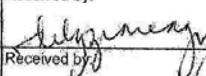
Lab Quote #:

Sampler Name: (Print) Ben Small

Project ID: Benedict Heating Oil Release

Sampler Signature: Beynon Smith

Project #: Benedict Heating Oil Release

Sample ID / Description	Date Sampled	Time Sampled	No. of Containers Shipped	Grab, Sampler, Pump	Composite	Field Filtered	Preservative							Matrix				Analyze For:		RUSH TAT (Pre-Schedule)	Standard TAT	Email Results	Send QC with report		
							Ice	HNO ₃	HCl	NaOH	H ₂ SO ₄ Plastic	H ₂ SO ₄ Glass	None	Other (Specify)	Groundwater	Waste water	Drinking Water	Sludge	Soil					Other (specify):	NWTPH-GX BTEX
MW-1	12/15/10	12:28	3	P		No	X									X							X	X	X
MW-2	12/15/10	13:42	3	P		No	X									X							X	X	X
MW-3	12/15/10	14:10	3	P		No	X									X							X	X	X
Pump House	12/15/10	14:51	3	P		No	X									X							X	X	X
MW-2-19	12/3/10	11:30	2	S		No	X							X		X							X	X	X
MW-3-19	12/3/10	14:30	2	S		No	X							X		X							X	X	X
Special Instructions: Coord. with Howard Small at (206) 730-0228 with Questions	Email results when available to hwsmaill@gsmenviro.com. Thanks! Method of Shipment: UPS																Laboratory Comments: Temperature Upon Receipt: VOCs Free of Headspace? Y N								
Relinquished by: 	Date 12/14/10	Time 1:00	Received by: 				Date 12/14/10	Time 1:00																	
Relinquished by:	Date	Time	Received by:				Date	Time																	

ESN NORTHWEST CHEMISTRY LABORATORY

GSM
BENEDICT PROPERTY PROJECT
Washington

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

Analyses of BTEX in Water by Method 8260

Sample Number	Date Analyzed	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Xylenes (ug/L)	Surrogate Recovery (%)
Method Blank	1/20/2011	nd	nd	nd	nd	98%
LCS	1/20/2011	86%	77%	79%	82%	98%
MW-1	1/20/2011	nd	nd	nd	nd	124%
MW-2	1/20/2011	nd	nd	nd	nd	*138%
MW-3	1/20/2011	nd	nd	nd	nd	123%
		1.0	1.0	1.0	3.0	

*Sample MW-2 yielded recovery for 4-bromofluorobenzene that exceeded the control limit. Because there were no hits detected, no further action was taken.

"nd" Indicates not detected at the listed detection limits.

"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (4-Bromofluorobenzene) & LCS : 65% TO 135%

CLIENT: GSM DATE: 1/14/2011 PAGE 1 OF 1

ADDRESS: 809 15th St NE Arlington, WA 98223 PROJECT NAME: Benedict

PHONE: (206) 730-0228 LOCATION: _____

CLIENT PROJECT #: _____ COLLECTOR: _____ DATE OF COLLECTION: _____

PROJECT MANAGER: Howard Small

Sample Number	Depth	Time	Sample Type	Container Type	ANALYSES	TPH - DIESEL & OIL	TPH - GASOLINE	VOC 8260CL	VOC 8260	Semivol 8270	PCBs 8270	PCBs 8082	RCRA 8 Metals	MTCA 5 Metals	Pb	Asbestos-PLM	GRO Suite	DRO Suite	WFO Suite	NOTES	Total Number of Containers	Laboratory Note Number
1. MW-1		10:14	Water				X														3	
2. MW-2		8:42	Water				X														3	
3. MW-3		9:21	Water				X														3	
4.																						
5.																						
6.																						
7.																						
8.																						
9.																						
10.																						
11.																						
12.																						
13.																						
14.																						
15.																						
16.																						
17.																						
18.																						

RELINQUISHED BY (Signature) Raymond Small DATE/TIME 1/14/2011 12:04 RECEIVED BY (Signature) Jeffrey DATE/TIME 1/14/2011 12:00

RELINQUISHED BY (Signature) _____ DATE/TIME _____ RECEIVED BY (Signature) _____ DATE/TIME _____

SAMPLE DISPOSAL INSTRUCTIONS

☐ ESN DISPOSAL @ \$2.00 each ☐ Return ☐ Pickup

LABORATORY NOTES:

TOTAL NUMBER OF CONTAINERS _____

CHAIN OF CUSTODY SEALS Y/N/A _____

SEALS INTACT? Y/N/A _____

RECEIVED GOOD COND./COLD _____

NOTES: _____

Turn Around Time: 24 HR 48 HR 5 DAY

APPENDIX C

DOMESTIC WATER SUPPLY WELL LOG

STATE OF WASHINGTON
DEPARTMENT OF CONSERVATION
AND DEVELOPMENT

WELL LOG

No. A. 6165

Date 3-5 1962

Record by.

Source driller's record

Location: State of WASHINGTON

County Thurston

Area

Map.

S $\frac{1}{2}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 4 T15 N., R. 3 $\frac{W}{W}$

Diagram of Section

Drilling Co. deceased

Address.

Method of Drilling

Date 7-20 1045

Owner Ben & Hazel Bier

Address Rt. 1, Box 53, Rochester, Wash.

Land surface, datum _____ ft. above
below

CORRELATION	MATERIAL	THICKNESS (feet)	DEPTH (feet)
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(Transcribe driller's terminology literally but paraphrase as necessary, in parentheses. If material water-bearing, so state and record static level if reported. Give depths in feet below land-surface datum unless otherwise indicated. Correlate with stratigraphic column, if feasible. Following log of materials, list all casings, perforations, screens, etc.)

[illegible]

Tied up

Sheet 2 of 2 sheets