BP Service Station
320 3rd Avenue NE, Suite 200
Issaquah, WA 98027
(aka Pacific Express)
T: 425 . 427.0061
F: 425 . 427.0067

Seattle LUST # 447945

FARALLON CONSULTING
Quality Service for Environmental Solutions

June 20, 2001

Mr. Gil Reavis
c/o Marten & Brown
1191 Second Avenue, Suite 2200
Seattle, WA 98101

RE: QUARTERLY STATUS REPORT
SOUTHCENTER OIL/PACIFIC PRIDE
3215 4TH AVE. SOUTH, SEATTLE, WASHINGTON
FARALLON PN: 698-001

ENTERED 8-15 2001

Dear Mr. Reavis

Farallon Consulting, L.L.C. (Farallon) has prepared this Quarterly Status Report to summarize the results of quarterly groundwater monitoring, air sparge well installation, and air sparge pilot testing conducted at the Pacific Pride retail fuel station located at 3215 4th Avenue South in Seattle, Washington (referred to as the site, Figure 1). The scope of work summarized in this report was conducted from March through May 2001 in accordance with the *Proposal for Air Sparge Pilot Test and Remediation System Operation and Maintenance* prepared by Farallon, dated March 13, 2001, and approved by Mr. Thorp on April 11, 2001. The work included: operation and maintenance of the existing remediation system; a quarterly groundwater monitoring event; installation of an air sparge well; conducting an air sparge pilot test, and evaluation of the pilot test data for applicability of this technology for cleanup of groundwater at the site.

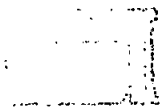
SITE DESCRIPTION AND BACKGROUND

The site is currently used as a gas station for private and commercial vehicles and contains both gasoline and diesel refueling stations. Site features include a convenience store, fuel dispenser islands, maintenance sheds, a truck scale, and a fenced enclosure with aboveground components of the soil vapor extraction (SVE) system (Figure 2).

Soil underlying the site consists of fill comprised of sand and silty sand overlying native silts and clayey-silts of the pre-development tidal flats. According to information on soil boring logs and well logs from prior exploration of the subsurface conditions at the site, the fill varies between 15 and 20 feet thick. The shallow groundwater is approximately 8 to 10 feet below ground surface (bgs) with seasonal fluctuations of approximately 2 feet.

Prior investigations conducted at the site by others have confirmed the release of total petroleum hydrocarbons in the gasoline range (TPH–G) and benzene, toluene, ethylbenzene, and xylenes (BTEX) to soil and groundwater. Quarterly groundwater samples have been collected from

RECEIVED JUN 28 2001 DEPT OF ECOLOGY



monitoring wells MW-1 through MW-5 since May 1998, from monitoring wells MW-6 through MW-12 since July 1998, and from monitoring wells MW-13 and MW-14 since October 1999. The last groundwater-sampling event was conducted at the site on October 27, 2000 as documented in the *Results of 3rd Quarter 2000 Groundwater Monitoring* report prepared by WGR Southwest, Inc., dated November 17, 2000.

A SVE system was installed in the northern portion of the site in 1999 to remediate concentrations of TPH-G and BTEX in soil above the groundwater table and free product (gasoline) floating on groundwater (referred to as light non-aqueous phase liquid or LNAPL). From October 1999 to November, 2000, the SVE system has removed an estimated 8,000 pounds of TPH. A catalytic oxidation unit is used to treat the extracted soil vapor prior to discharge to the atmosphere.

The effectiveness of the SVE system for remediation of the free product and dissolved phase TPH-G and BTEX in groundwater is limited. The use of *in-situ* air sparge technology, in combination with the SVE system, has the potential to significantly accelerate remediation of TPH dissolved in groundwater (dissolved phase TPH), and the free product (LNAPL) floating on the groundwater surface. An air sparge pilot test was performed on May 8, 2001 by Farallon to evaluate the appropriateness of the air sparge technology for site-specific conditions and to develop an understanding of the groundwater/soil/contaminant response to air sparging. This information has been used to determine if air sparging may enhance cleanup of soil and groundwater at the site.

QUARTERLY GROUNDWATER MONITORING

The scope of work for the quarterly groundwater monitoring program included:

- Measuring groundwater levels and product layer thickness, if present, from the top of casing (TOC) on each well head and the total well depth;
- Employing low flow purging techniques at each well to obtain samples representative of groundwater conditions;
- Collection of groundwater samples for laboratory analysis; and,
- Analysis of the groundwater samples by an analytical laboratory for TPH-G and BTEX.

Farallon measured groundwater levels and collected groundwater samples from monitoring wells MW-1 through MW-12 on April 18, 2001, and from monitoring wells MW-13 and MW-14 on May 8, 2001.

The groundwater monitoring wells were purged and sampled using a peristaltic pump and low flow sampling techniques. Monitoring wells MW-4 and MW-6 contained product and therefore were not sampled. During purging, the water from each well was monitored for the following field parameters: pH, dissolved oxygen, oxidation-reduction potential, and specific conductance.

Water purged from the monitoring wells prior to sampling is stored in 55-gallon drums at the site pending disposal. Groundwater samples from each monitoring well were submitted to Onsite Environmental Services in Redmond, Washington for analysis of TPH-G and BTEX using Washington State Department of Ecology (Ecology) Method NWTPH-Gx/BTEX.

The field parameters were recorded on field log forms and are summarized in Table 1. The dissolved oxygen, measured in the field, indicates that aerobic conditions are present in the shallow water-bearing zone as the dissolved oxygen levels are greater than 2 milligrams per liter (mg/l). Aerobic conditions in groundwater are more amenable to in situ biodegradation of dissolved-phase TPH than anaerobic conditions, where groundwater is depleted in oxygen with dissolved oxygen levels less than 2 mg/l.

The depth to groundwater ranged from 8.25 feet at monitoring well MW-2 to 10.51 feet at monitoring well MW-14 below the TOC (Table 2). The groundwater gradient beneath the site was elevated to the northeast on April 18, 2001 which is consistent with previous monitoring events.

LNAPL was measured in monitoring wells MW-4 and MW-6 at thicknesses of 0.35 feet and 0.02 feet, respectively. No measurable LNAPL was present in any of the other on-site monitoring wells. LNAPL was reportedly not present at monitoring wells MW-4 during the two prior groundwater monitoring events or at monitoring well MW-6 during the prior groundwater monitoring event. The SVE system was not operating for over three weeks prior to the April 2001 groundwater monitoring event, which may have allowed the accumulation of LNAPL in these wells. The SVE system was typically turned off only three days prior to collecting samples during prior monitoring events.

Analytical results for groundwater samples are summarized in Table 3 and the laboratory analytical reports are presented in Attachment A. Concentrations of TPH-G and/or one or more of the BTEX constituents exceeded their respective Ecology Model Toxics Control Act (MTCA) Chapter 173-340 WAC Method A cleanup levels for groundwater in samples from all of the on-site monitoring wells except monitoring well MW-2.

Concentrations of TPH-G and/or BTEX in groundwater samples, collected in April 2000, were similar to the concentrations of TPH-G and BTEX detected during prior sampling events in five monitoring wells (MW-1, MW-3, MW-5, MW-8, and MW-12). The concentrations of TPH-G and BTEX declined in six monitoring wells (MW-7, MW-9, MW-10, MW-11, MW-13, and MW-14) that are located on the periphery of the contaminated area. The decline suggests that the potential for contaminant migration off site is also decreasing. Substantial increases in concentrations of TPH-G and BTEX were not recorded in groundwater samples collected from any of the monitoring wells during this sampling event; however, as discussed above, LNAPL was present in two monitoring wells (MW-4 and MW-6) during this sampling event that was not present during the last sampling event in October 2000.

AIR SPARGE WELL INSTALLATION

An air sparge pilot test well (AS-1) was installed approximately 15 feet northwest of monitoring well MW-4 (Figure 2). The well was installed on April 19, 2001 by Cascade Drilling, Inc. of Woodinville, Washington under the supervision of a Farallon geologist.

Well AS-1 was advanced to 20 feet bgs. A composite soil sample was collected from the surface to 5 feet bgs. Soil samples were collected continuously from 5 feet to 20 feet bgs for screening using a photoionization detector (PID) and for lithologic description. Soil samples collected for potential laboratory analysis were transferred directly from the split-spoon sampling device into a laboratory prepared sample jar, labeled and placed in a cooler with ice. Soil encountered in boring AS-1 consisted of sand and silty sand from immediately below the asphalt paving to a depth of 18 feet bgs. Underlying the silty sand, at a depth of 19 to 20 feet bgs, was a clayey silt. A copy of the boring log for AS-1 is presented in Attachment B.

Well AS-1 was constructed of 2-inch diameter PVC and was set at a depth of 18 feet bgs. The well screen consisted of a one-foot section of 0.010 slot PVC that was placed from 17 to 18 feet bgs. A clean sand filter pack was placed from the bottom of the borehole to approximately one-foot above the well screen. The remainder of the borehole was filled with hydrated bentonite chips to a depth of 3 feet bgs. Concrete was placed from 3 feet to 2 feet bgs. The well was completed with a flush mount 18-inch steel monument.

Two soil samples (AS-1-6-7.5 and AS-1-7.5-9) were submitted for analysis for TPH-G and BTEX. Analytical results indicate that TPH-G and BTEX were detected in soil samples AS-1-6-7.5 and AS-1-7.5-9 at concentrations above the MTCA Method A cleanup level for each constituent. Analytical results for soil samples AS-1-6-7.5 and AS-1-7.5-9 are summarized in Table 4 and copies of the laboratory analytical reports are provided in Appendix A. Observations during drilling (strong petroleum-like odors) and elevated PID readings suggest that soil contamination extends well below the groundwater table (Attachment B).

AIR SPARGE PILOT TEST

Farallon performed an air sparge pilot test on May 8, 2001 to evaluate the applicability of air sparge for cleanup of TPH-G and BTEX in groundwater for the site-specific conditions and to develop an understanding of the groundwater/soil/contaminant response to air sparging. The response in groundwater to a constant pressurized air supply was measured at specific wells to assess the effectiveness of air sparging. The wells were monitored for presence, visual evidence of bubbles, mounding, and increased concentrations of TPH-G and/or benzene in the vapors. The measured response in the wells surrounding the air injection point provides an indication of the overall effect of air sparging.

The pilot test was conducted in two stages; the first stage consisted of delivering a constant air flow rate of 2.5 standard cubic feet per minute (scfm) to well AS-1 for a period of approximately 4 hours. A 2-horsepower Gast rotary vane compressor was used to deliver air to well AS-1. A Dwyer rotometer was attached to well AS-1 and was used to control the amount of air delivered

to well AS-1 throughout the test. Monitoring ports were assembled on monitoring wells MW-4, MW-5, MW-7 and MW-8 and these wells were used as observation wells during the pilot test. Monitoring wells MW-4, MW-5, MW-7 and MW-8 were monitored every 15 minutes for changes in air pressure in the well. Pressure readings were collected at each well head using a gauge with readings of 0 to 3, or 0 to 150 inches of water (IOW). Once the pressure within all four monitoring wells had stabilized, vapor concentrations and water levels were measured in each of the four monitoring wells. Farallon used a Gastec colorimetric tube pump and Gastec colorimetric tubes, specific for gasoline range TPH and benzene, to measure the vapor concentrations within each well. Following the measurement of vapor concentrations, Farallon measured the depth to groundwater in each well to assess for groundwater mounding and visually inspected the water surface within each monitoring well for evidence of air bubbles.

The second stage of the pilot test consisted of increasing the air flow rate to 5 scfm. After the pressure in the well had stabilized, vapor concentrations for gasoline-range TPH and benzene were measured and groundwater levels were collected, and the water in the monitoring wells was visually inspected for effects of air sparging. The SVE system was then activated and the vapor concentrations for gasoline-range TPH and benzene in air extracted from monitoring wells MW-4, MW-7, and MW-8 were measured. An attempt was made to measure the vapor concentrations in air extracted from MW-5, but the conveyance pipe from monitoring well MW-5 to the aboveground SVE system components was filling with water so monitoring well MW-5 was closed off to the system.

The measurable effects of air injection (sparging) typically include a rise in pressure, a rise in groundwater levels, and an increase in vapor concentrations which vary inversely with distance at a site with uniform soil types. However, well logs from the monitoring wells and the air sparge well at this site show considerable variability of the soil types within the fill material. The variability in soils result in non-uniform permeabilities, which were responsible for the variable response over distance observed at the monitoring wells during the air sparge pilot test.

An example of the variability in the measured responses is illustrated by the pressure results from monitoring wells MW-4 , MW-7, and MW-5 (Table 5, Figure 3). During the first phase of the air sparge test, the sparge air injected in well AS-1 produced lower pressure in two relatively close monitoring wells (MW-4 and MW-7) than was observed in monitoring well MW-5 which is located at a greater distance (Figure 2). In-well pressure readings in monitoring wells MW-4 and MW-7 varied from 0.05 to 0.45 IOW and 0.01 to 0.23 IOW, respectively. The in-well pressure readings for monitoring well MW-5 varied from 0.18 to 9.0 IOW. The variability in pressure over distance is likely due to preferential migration of sparge air from well AS-1 to the west toward well MW-5.

A rise in the groundwater surface within the monitoring wells is also an indicator of the radius of influence of air sparging. A water surface rise was measured in all four monitoring wells (MW-4, MW-5, MW-7, and MW-8) in response to the air sparge test (Table 4, Figure 5). Monitoring well MW-4, the well located closest to well AS-1, had a total groundwater level rise of 3.32 feet. The groundwater in monitoring wells MW-5 and MW-7 rose 1.83 feet and 1.34 feet, respectively. The groundwater in monitoring well MW-8, located 48 feet from well

AS-1, had the smallest rise at 0.54 feet. The relative rise in groundwater levels with distance from well AS-1 also indicates that there is some preferential migration of sparge air due to variation in the permeability of soil in the water-bearing zone. Visual inspection of groundwater showed bubbling in monitoring wells MW-4 and MW-5 and slight surface movement in monitoring well MW-7 and MW-8.

The concentrations of TPH-G measured in the vapor in monitoring wells MW-4, MW-5, MW-7, and MW-8 were directly influenced by the variability of rate of air injection at well AS-1 (Table 4, Figure 4). The concentrations of TPH-G in the monitoring wells, in response to an increased rate of air injection above 2.5 scfm in well AS-1, was inconsistent. TPH-G concentrations in monitoring wells MW-4, MW-7 and MW-8 increased as the rate of air injection at well AS-1 was increased from 2.5 scfm to 5 scfm; however, TPH-G concentrations in the vapor at monitoring well MW-5 decreased as the air sparge pressure in well AS-1 was increased from 2.5 scfm to 5 scfm. The decrease in TPH-G concentrations observed in monitoring well MW-5 may have been caused by horizontal channeling within the subsurface soils as a result of sparge air. The horizontal channeling on preferential pathways may be diverting excess sparge air away or through the capture zone at monitoring well MW-5 as the pressure increases.

Benzene concentrations were not measured during the first phase of the air sparge test. Benzene concentrations ranged from a low of 4 parts per million volume (ppmv) in vapor at monitoring well MW-5 to a high of 90 ppmv in vapor at monitoring well MW-4 during the second stage of the air sparge test.

During the combined operation of the air sparge pilot test and the SVE system, concentrations of TPH-G and benzene were measured using a Gastec colorimetric tube pump and Gastec colorimetric tubes in vapor samples collected from vapor conveyance piping from monitoring wells MW-4, MW-7, and MW-8 and from the vapor extraction manifold. Vapor extraction readings were not collected from MW-5 due to the presence of water in the conveyance piping.

With the exception of monitoring well MW-8, concentrations of TPH-G and benzene from the individual extraction pipes were lower than when measured directly from the individual wells. TPH-G and benzene concentrations in the samples collected at the vapor extraction manifold were also lower than during the air sparge-only portion of the pilot test. A decrease in TPH-G and benzene concentrations is expected due to the dilution caused by the extraction of vadose zone air from cleaner soil from around the perimeter of the site.

The results of the air sparge test indicate that air sparge technology, when combined with SVE at the site, has the potential to accelerate the remediation of TPH from below the groundwater surface and the removal of LNAPL on the groundwater surface. The air sparge pilot test results indicate that the effective radius of influence is up to 38 feet at the site. However, due to the variability in site soil, Farallon suggests that actual spacing of air sparge wells be less than 38 feet. The spacing of air sparge wells will be determined based on several other factors in addition to the radius of influence, such as the location of existing vapor extraction wells, subsurface piping runs, and additional site features.

CLOSING

Farallon understands that results of the air sparge pilot test and potential enhancements to the existing remediation approach will be discussed during the meeting scheduled for June 12, 2001 with you, Mr. Bell, and Mr. Reaves of Marten and Brown. Farallon appreciates the opportunity to provide you with environmental consulting services. Please contact the undersigned at (425) 427-0061 if you have any questions regarding this report.

Sincerely,

Farallon Consulting, L.L.C.

Mark Chandler
Associate

Cliff Schmitt
Principal

Attachments Figure 1—Site Vicinity Map
Figure 2—Site Plan
Figure 3—Air Sparge Pilot Test Results – Pressure
Figure 4—Air Sparge Pilot Test Results – Vapor Concentrations
Figure 5—Air Sparge Pilot Test Results – Groundwater Levels

Table 1—Groundwater Elevation Measurements
Table 2—Summary Of Analytical Results - Groundwater
Table 3—Summary Of Analytical Results – Soil
Table 4—Air Sparge Pilot Test Data
Table 5—Water Quality Summary

Attachment A—Laboratory Analytical Report
Attachment B—Boring Log for AS-1

cc: Mr. Jim Thop
Mr. Jeff Bell

MC/CS:dmr

FIGURES

FARALLON CONSULTING
320 3rd Avenue NE, Suite 200
Issaquah, WA 98027

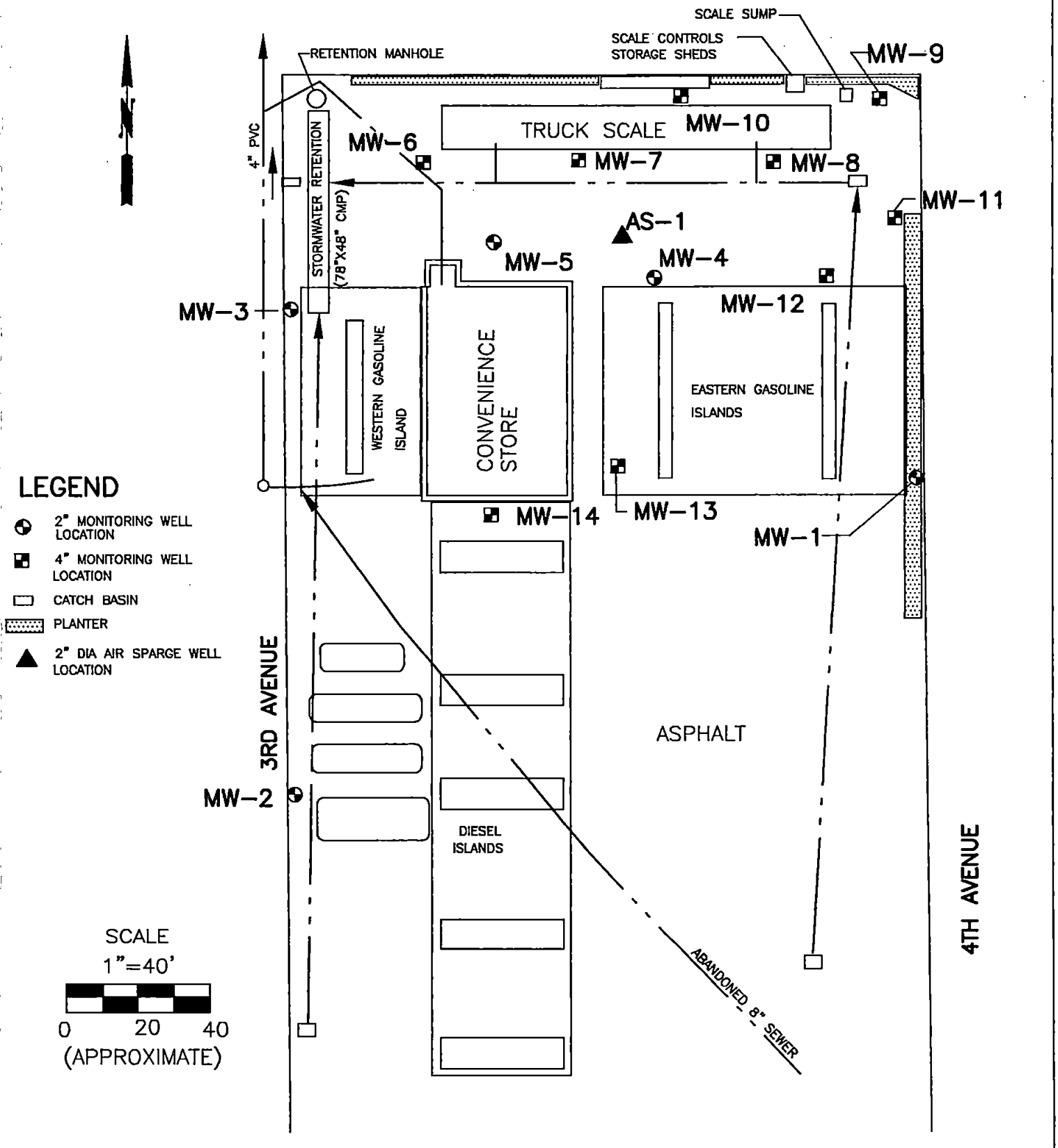
FIGURE 1

VICINITY MAP

SOUTHCENTER OIL
3215 4TH AVENUE SOUTH
SEATTLE, WASHINGTON

FARALLON PN:688-001

Drawn By:CTS	Checked By:PJ	Date:06/08/01	Disk Reference:SITE



320 3rd Avenue NE, Suite 200
Issaquah, WA 98027

FIGURE 2

SITE MAP

SOUTHCENTER OIL
3215 4TH AVENUE SOUTH
SEATTLE, WASHINGTON

FARALLON PN: 688-001

Drawn By:CTS	Checked By:PJ	Date:06-18-0	Disk Reference:HORTON

FIGURE 3
AIR SPARGE PILOT TEST
PRESSURE RESULTS
PACIFIC PRIDE/SOUTHCENTER OIL SITE
3215 4TH AVENUE SOUTH, SEATTLE, WA

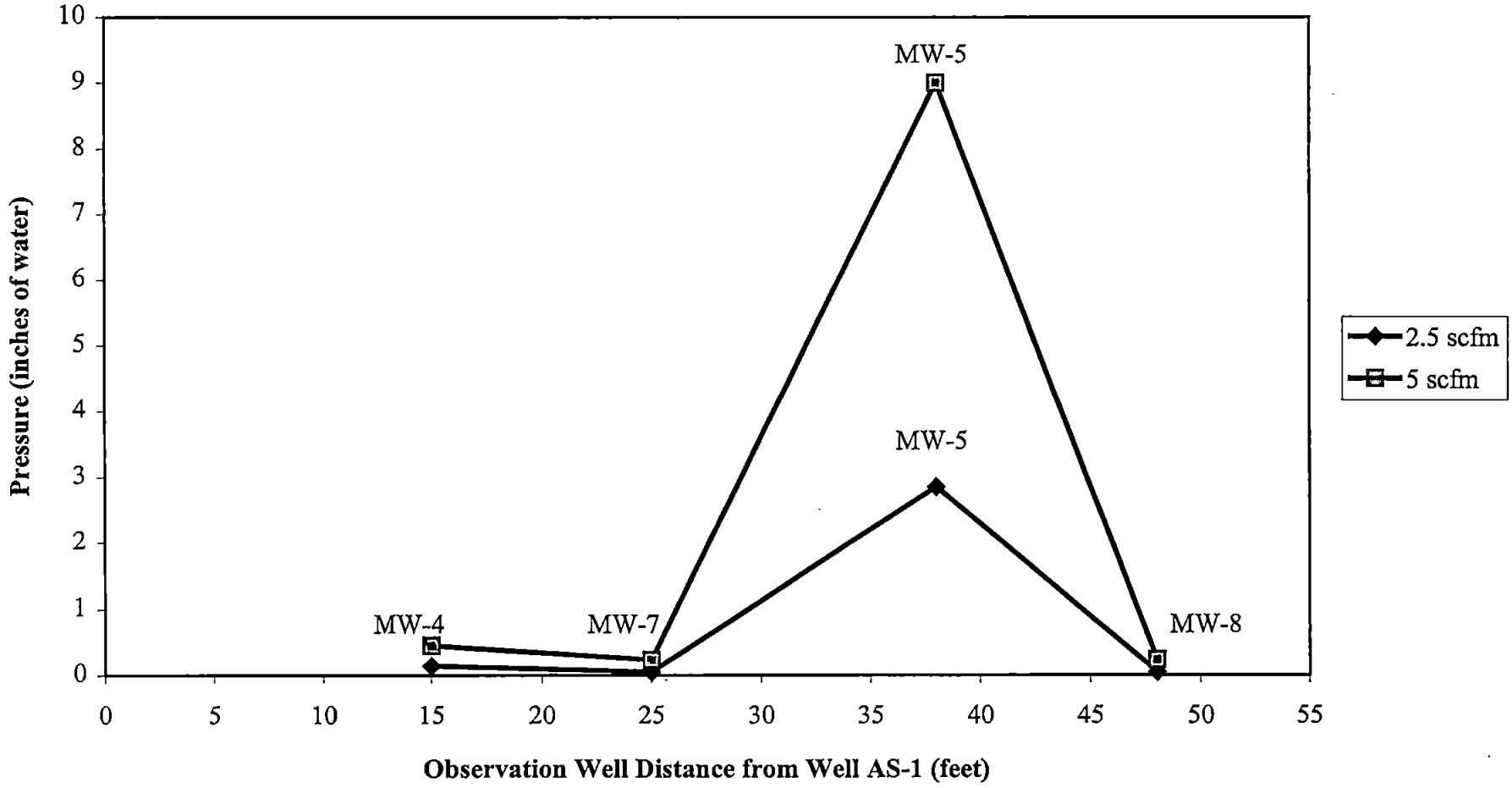


FIGURE 4
AIR SPARGE PILOT TEST
VAPOR CONCENTRATIONS
PACIFIC PRIDE/SOUTHCENTER OIL SITE
3215 4TH AVENUE SOUTH, SEATTLE, WA

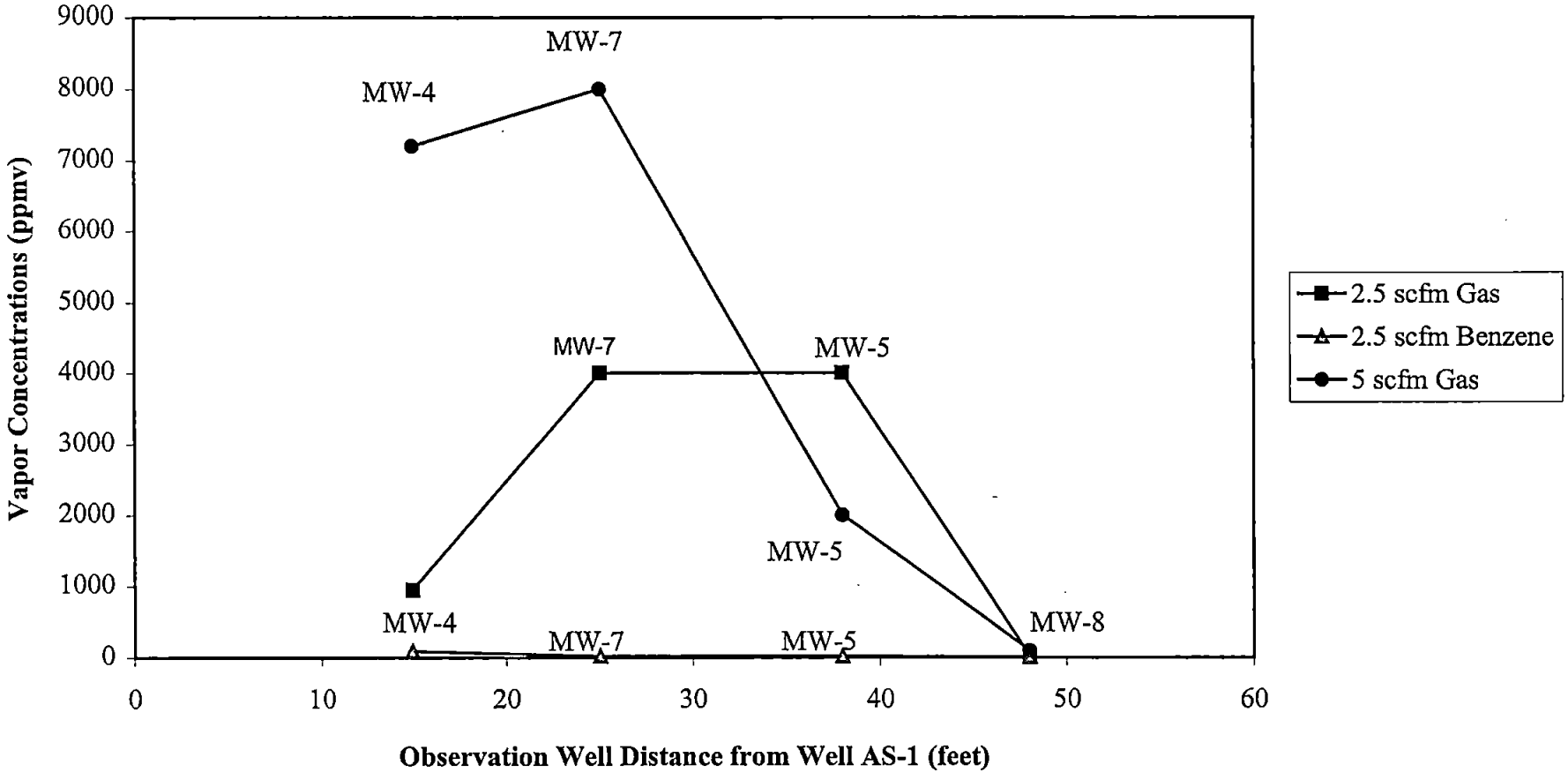
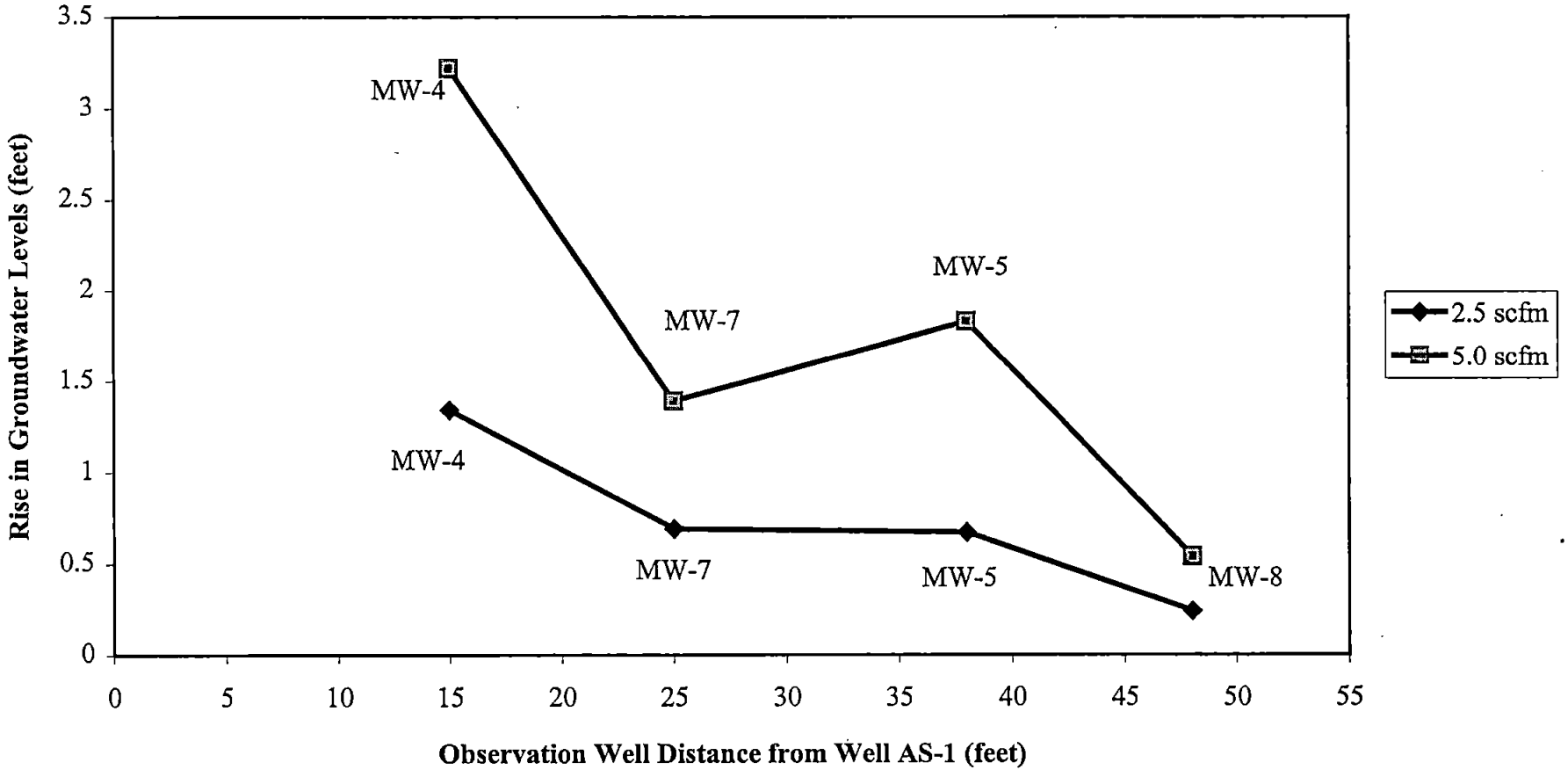


FIGURE 5
AIR SPARGE PILOT TEST
RISE IN GROUNDWATER LEVELS
PACIFIC PRIDE/SOUTHCENTER OIL SITE
3215 4TH AVENUE SOUTH, SEATTLE, WA



TABLES

TABLE 1
SUMMARY OF WATER QUALITY MEASUREMENTS
PACIFIC PRIDE/SOUTHCENTER OIL SITE
3215 4TH AVENUE SOUTH, SEATTLE, WA
FARALLON PN: 698-001

Well Number	Date Sampled[1]	Temperature (Celsius)	Specific Conductance (S/cm)	pH	Dissolved Oxygen (mg/L)	Oxydation Reduction Potential (mV)
MW-1	4/18/01	15.3	0.7	6.85	4.74	-65
MW-2	4/18/01	14.3	0.618	6.44	7.91	-77
MW-3	4/18/01	16.3	2.59	7.23	10.88	-122
MW-4	4/18/01	P	P	P	P	P
MW-5	4/18/01	15	2.71	6.93	11.58	-73
MW-6	4/18/01	P	P	P	P	P
MW-7	4/18/01	15.2	1.72	6.96	9.84	-50
MW-8	4/18/01	18.3	1.79	6.9	11.84	-78
MW-9	4/18/01	16.7	1.64	7.25	13.1	-81
MW-10	4/18/01	14.8	0.47	7.18	12.11	-2
MW-11	4/18/01	16.2	0.831	7.02	11.75	-55
MW-12	4/18/01	15.4	3.96	5.71	10.57	13
MW-13	5/8/01	—	—	—	—	—
MW-14	5/8/01	—	—	—	—	—

Note:
P = Water quality measurements not taken because of presence of product in well
— = Water quality measurements not taken
S/cm = microohms per centimeter
mg/L = milligrams per liter
mV = millivolts
[1]Water quality measurements taken using Horiba meter model U-22

TABLE 2
SUMMARY OF GROUNDWATER ELEVATION MEASUREMENTS
PACIFIC PRIDE/SOUTHCENTER OIL SITE
3215 4TH AVENUE SOUTH, SEATTLE, WA
FARALLON PN: 698-001

Well Number	Water Level Measurement Date	Well Head Elevation (feet)[1]	Depth to Water (feet)[2]	Depth to Product (feet)[2]	Product Thickness (feet)	Elevation of Groundwater (feet)
MW-1	4/18/01	99.17	9.05	—	—	90.12
MW-2	4/18/01	98.46	8.25	—	—	90.21
MW-3	4/18/01	99.40	9.1	—	—	90.30
MW-4	4/18/01	99.97	10.25	9.90	0.35	*[3]
MW-5	4/18/01	100.23	9.85	—	—	90.38
MW-6	4/18/01	99.52	8.87	8.85	0.02	*[3]
MW-7	4/18/01	99.90	9.16	—	—	90.74
MW-8	4/18/01	99.45	9.28	—	—	90.17
MW-9	4/18/01	99.55	9.56	—	—	89.99
MW-10	4/18/01	99.47	9.81	—	—	89.66
MW-11	4/18/01	99.12	9.01	—	—	90.11
MW-12	4/18/01	99.55	9.38	—	—	90.17
MW-13	5/8/01	100.10	10.14	—	—	89.96
MW-14	5/8/01	100.49	10.51	—	—	89.98

Note:
— = No product present

[1]Wellhead elevation relative to an arbitrary datum of 100 feet.

[2]Depth to water or product in feet below the top of the well casing.

[3]Groundwater elevation not estimated due to the presence of product layer.

TABLE 3
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
PACIFIC PRIDE/SOUTHCENTER OIL SITE
3215 4TH AVENUE SOUTH
SEATTLE, WASHINGTON
FARALLON PN: 698-001

Well Number	Sampled by	Date Sampled	TPH-G	Analytical Results (micrograms per liter)			
				Benzene	Toluene	Ethyl-benzene	Total Xylenes
MW-1	WGR	05/08/98	170	**120**	ND	10	1.5
	WGR	07/28/98	130	**51**	14	1.6	10
	WGR	12/15/98	ND	**207**	ND	ND	ND
	WGR	03/29/99	ND	**290**	ND	ND	ND
	WGR	06/30/99	83.5	**329**	1.34	2.65	7.75
	WGR	10/14/99	ND	**170**	ND	ND	ND
	WGR	01/07/00	ND	**250**	ND	ND	ND
	WGR	04/18/00	780	**130**	ND	3.3	8.6
	WGR	07/11/00	ND	**280**	**52**	14	**110**
	WGR	10/27/00	ND	**180**	ND	ND	ND
	Farallon	04/18/01	<100	**180**	<1.0	<1.0	<1.1
MW-2	WGR	05/08/98	190	**380**	2	ND	1.8
	WGR	07/28/98	200	**150**	ND	ND	ND
	WGR	12/15/98	242	**7.08**	ND	ND	ND
	WGR	03/29/99	ND	**339**	ND	ND	ND
	WGR	06/30/99	312	**296**	4.24	ND	8.97
	WGR	10/14/99	ND	**34**	ND	ND	ND
	WGR	01/07/00	260	**140**	1.3	ND	3.8
	WGR	04/18/00	340	ND	ND	ND	ND
	WGR	07/11/00	1,100	**67**	**69**	16	**120**
	WGR	10/27/00	ND	2	ND	ND	ND
	Farallon	04/18/01	220	2.2	<1.0	<1.0	<1.0
MW-3	WGR	05/08/98	**9,800**	**8,100**	**230**	**1,200**	**2,200**
	WGR	07/28/98	**45,000**	**12,000**	**640**	**1,300**	**3,400**
	WGR	12/15/98	ND	**655**	ND	**130**	ND
	WGR	03/29/99	**6,470**	**5,260**	ND	**992**	**630**
	WGR	06/30/99	**8,080**	**5,536**	ND	**1,160**	**574**
	WGR	10/14/99	**5,300**	**6,600**	29	**1,200**	**350**
	WGR	01/07/00	**1,400**	**3,000**	8.2	**1,100**	**39**
	WGR	04/18/00	**4,100**	**2,800**	14	**890**	**74**
	WGR	07/11/00	**33,000**	**7,500**	**340**	**2,100**	**880**
	WGR	10/27/00	**3,400**	**1,900**	5	**420**	**96**
	Farallon	04/18/01	**5,200**	**2,400**	<10	**360**	18

TABLE 3
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
PACIFIC PRIDE/SOUTHCENTER OIL SITE
3215 4TH AVENUE SOUTH
SEATTLE, WASHINGTON
FARALLON PN: 698-001

Well Number	Sampled by	Date Sampled	TPH-G	Analytical Results (micrograms per liter)			
				Benzene	Toluene	Ethyl-benzene	Total Xylenes
MW-4	WGR	05/08/98	**26,000**	**16,000**	**5,600**	**950**	**3,200**
	WGR	07/28/98	**79,000**	**44,000**	**21,000**	**2,000**	**5,800**
	WGR	12/15/98	**25,900**	**22,400**	**5,960**	**1,320**	**2,910**
	WGR	03/29/99	P [3]	P	P	P	P
	WGR	06/30/99	P	P	P	P	P
	WGR	10/14/99	P	P	P	P	P
	WGR	01/07/00	P	P	P	P	P
	WGR	04/18/00	P	P	P	P	P
	WGR	07/11/00	**250,000**	**40,000**	**16,000**	**2,300**	**17,000**
	WGR	10/27/00	**280,000**	**18,000**	**11,000**	**1,700**	**13,000**
	Farallon	04/18/01	P	P	P	P	P
MW-5	WGR	05/08/98	**27,000**	**3,700**	**2,600**	**850**	**4,400**
	WGR	07/28/98	**83,000**	**20,000**	**1,800**	**1,600**	**9,100**
	WGR	12/15/98	**7,320**	**3,640**	**1,220**	**250**	**1,140**
	WGR	03/29/99	P	P	P	P	P
	WGR	10/14/99	P	P	P	P	P
	WGR	01/07/00	**1,100,000**	**8,800**	**23,000**	**8,500**	**110,000**
	WGR	04/18/00	P	P	P	P	P
	WGR	07/11/00	P	P	P	P	P
	WGR	10/27/200	**120,000**	**14,000**	**12,000**	**2,600**	**17,000**
	Farallon	04/18/01	**140,000**	**7,200**	**18,000**	**2,000**	**11,300**
MW-6	WGR	07/28/98	360	**2,700**	7.6	2	**24**
	WGR	12/15/98	ND	**2,860**	37.4	ND	**62**
	WGR	03/29/99	ND	**824**	16.4	11.4	**54.1**
	WGR	06/30/99	ND	**1,520**	ND	14	**32**
	WGR	10/14/99	310	**990**	**19**	3.7	18
	WGR	01/07/00	**1,300**	**1,900**	**50**	12	**140**
	WGR	04/18/00	550	ND	1	2.3	2.3
	WGR	07/11/00	P	P	P	P	P
	WGR	10/27/00	ND	**250**	2.4	4.3	**25**
	Farallon	04/18/01	P	P	P	P	P

TABLE 3
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
PACIFIC PRIDE/SOUTHCENTER OIL SITE
3215 4TH AVENUE SOUTH
SEATTLE, WASHINGTON
FARALLON PN: 698-001

Well Number	Sampled by	Date Sampled	TPH-G	Analytical Results (micrograms per liter)			
				Benzene	Toluene	Ethyl-benzene	Total Xylenes
MW-7	WGR	07/28/98	P	P	P	P	P
	WGR	12/15/98	P	P	P	P	P
	WGR	03/29/99	P	P	P	P	P
	WGR	06/30/99	P	P	P	P	P
	WGR	10/14/99	P	P	P	P	P
	WGR	01/07/00	P	P	P	P	P
	WGR	04/18/00	P	P	P	P	P
	WGR	07/11/00	240,000	4,000	1,700	320	11,000
	WGR	10/27/00	70,000	5,600	2,700	770	10,000
	Farallon	04/18/01	21,000	280	190	190	1,730
MW-8	WGR	07/28/98	130,000	39,000	33,000	4,100	19,000
	WGR	12/15/98	27,000	10,600	1,300	1,310	4,940
	WGR	03/29/99	126,000	22,300	17,600	4,140	17,900
	WGR	06/30/99	96,900	25,900	10,500	3,950	16,000
	WGR	10/14/99	60,000	26,000	1,600	3,400	13,000
	WGR	01/07/00	63,000	24,000	10,000	3,400	14,000
	WGR	04/18/00	270,000	13,000	3,100	2,700	10,200
	WGR	07/11/00	150,000	23,000	6,700	2,800	12,000
	WGR	10/27/00	35,000	3,900	1,600	590	6,200
	Farallon	04/18/01	140,000	20,000	21,000	2,700	11,900
MW-9	WGR	07/28/98	35,000	2,600	2,700	1,500	6,500
	WGR	12/15/98	7,770	2,460	201	372	1,550
	WGR	03/29/99	90,300	1,420	1,120	3,780	149,000
	WGR	06/30/99	47,600	1,570	557	2,660	8,320
	WGR	10/14/99	7,500	1,600	21	390	1,100
	WGR	01/07/00	230	440	5	2	10
	WGR	04/18/00	16,000	2,000	100	550	1,900
	WGR	07/11/00	8,000	750	14	350	480
	WGR	10/27/00	140	420	1.5	2.3	5.7
	Farallon	04/18/01	630	200	<1.0	20	3.5

TABLE 3
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
PACIFIC PRIDE/SOUTHCENTER OIL SITE
3215 4TH AVENUE SOUTH
SEATTLE, WASHINGTON
FARALLON PN: 698-001

Well Number	Sampled by	Date Sampled	TPH-G	Analytical Results (micrograms per liter)			
				Benzene	Toluene	Ethyl-benzene	Total Xylenes
MW-10	WGR	07/28/98	13,000	170	6.8	ND	ND
	WGR	12/15/98	ND	1,970	ND	ND	64.2
	WGR	03/29/99	525	549	ND	18.5	41.3
	WGR	06/30/99	3,560	1,070	71.4	172	712
	WGR	10/14/99	3,100	1,300	8.3	360	440
	WGR	01/07/00	8,000	450	45	410	900
	WGR	04/18/00	500	230	17	8	32
	WGR	07/11/00	1,200	600	57	55	93
	WGR	10/27/00	ND	370	ND	14	ND
	Farallon	04/18/01	140	53	<1.0	<1.0	<1.0
MW-11	WGR	07/28/98	1,600	5,900	5.2	ND	9.2
	WGR	12/15/98	2,680	1,340	143	121	622
	WGR	03/29/99	103,000	16,600	17,700	2,830	13,500
	WGR	10/14/99	4,900	4,100	430	340	1,600
	WGR	01/07/00	90,000	13,000	12,000	810	16,000
	WGR	04/18/00	140,000	49	3,000	1,500	8,400
	WGR	07/11/00	23,000	2,600	850	320	3,000
	WGR	10/27/00	550,000	3,600	65	ND	1,200
	Farallon	04/18/01	5,600	3,500	<10	330	166
MW-12	WGR	07/28/98	190,000	46,000	35,000	2,600	100
	WGR	12/15/98	156,000	21,400	35,400	3,730	19,800
	WGR	03/29/99	P	P	P	P	P
	WGR	06/30/99	P	P	P	P	P
	WGR	10/14/99	150,000	27,000	33,000	1,800	12,000
	WGR	01/07/00	P	P	P	P	P
	WGR	04/18/00	P	P	P	P	P
	WGR	07/11/00	170,000	24,000	26,000	1,900	15,00
	WGR	10/27/00	120,000	11,000	20,000	1,500	14,00
	Farallon	04/18/01	160,000	9,700	17,000	1,400	14,800

TABLE 3
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
PACIFIC PRIDE/SOUTHCENTER OIL SITE
3215 4TH AVENUE SOUTH
SEATTLE, WASHINGTON
FARALLON PN: 698-001

Well Number	Sampled by	Date Sampled	TPH-G	Analytical Results (micrograms per liter)			
				Benzene	Toluene	Ethyl-benzene	Total Xylenes
MW-13	WGR	10/14/99	**2,200**	**750**	**210**	**110**	**500**
	WGR	01/07/00	**1,900**	**550**	24	**48**	**160**
	WGR	04/18/00	200	**1,100**	ND	**54**	6.8
	WGR	07/11/00	**1,600**	**950**	**80**	**55**	**210**
	WGR	10/27/00	ND	**52**	7.3	4.3	11
	Farallon	05/08/01	<100	**27**	1.2	3.3	<1.0
MW-14	WGR	10/14/99	480	**510**	20	8.6	**32**
	WGR	01/07/00	100	**440**	3.6	2	4
	WGR	04/18/00	ND	**170**	ND	ND	ND
	WGR	07/11/00	560	**330**	39	7.4	**55**
	WGR	10/27/00	ND	**200**	7.2	1.7	14
	Farallon	05/08/01	<100	**12**	1.9	<1.0	1.2
MTCA Method A Cleanup Levels for Groundwater [1]			1,000	5	40	30	20

Note:
ND = not detected above the laboratory analytical method reporting limit (<X = reporting limit).
TPH-G = total petroleum hydrocarbons as gasoline.
P = product present in well, groundwater not sampled.
Bold = concentrations exceed Model Toxics Control Act (MTCA) Chapter 173-340 WAC Method A cleanup levels.
[1]MTCA Chapter 173-340 WAC Method A cleanup levels.

TABLE 4
SUMMARY OF SOIL ANALYTICAL RESULTS
PACIFIC PRIDE/SOUTHCENTER OIL SITE
3215 4TH AVENUE SOUTH, SEATTLE, WA
FARALLON PN: 698-001

Boring Sample Location	Sample Number	Sample Depth[1]	Date Sampled	Analytical Results (milligrams per kilogram)				
				NWTPH-G[2]	Benzene[2]	Toluene[2]	Ethyl Benzene[2]	Total Xylenes[2]
AS-1	AS1-6-7.5	6.0 to 7.5	4/19/01	**21,000**	**90**	**1,100**	**400**	**1,520**
AS-1	AS1-7.5-9	7.5 to 9.0	4/19/01	**22,000**	**370**	**1,100**	**430**	**1,690**
MTCA Cleanup Levels for Soil[3]				**100**	**0.5**	**40**	**20**	**20**

NOTE: NWTPH-G = Northwest total petroleum hydrocarbons for gasoline
Bold indicates concentrations above Model Toxics Control Act (MTCA) Chapter 173-340 WAC Method A cleanup levels.
[1]In feet below grade.
[2]Analyzed using Ecology Method NWTPH-GX\BTEX
[3]MTCA Chapter 173-340 WAC Method A cleanup levels

TABLE 5
SUMMARY OF AIR SPARGE PILOT TEST DATA
PACIFIC PRIDE/SOUTHCENTER OIL SITE
3215 4TH AVENUE SOUTH, SEATTLE, WA
FARALLON PN: 698-001

Well Number[1]	Time	Sparge Well Air Flow (scfm)	Pressure (inches of water)	Depth to Product (feet)[2]	Depth to Water (feet)[2]	TPH-G (ppmv)	Benzene (ppmv)
AS-1	1210	2.5	140	—	—	—	—
	1246	2.5	118	—	—	—	—
	1311	2.5	113	—	—	—	—
	1327	2.5	111.6	—	—	—	—
	1344	2.5	109	—	—	—	—
	1522	5	167	—	—	—	—
	1533	5	168.5	—	—	—	—
	1548	5	162.4	—	—	—	—
	1603	5	156.5	—	—	—	—
	1643	5	141.4	—	—	—	—
	1700	5	137	—	—	—	—
	1706	5	135.5	—	—	—	—
	1728	5	131.2	—	—	—	—
	1846	5	117.4	—	—	—	—
MW-4	1145	2.5	—	10.04	10.34	—	—
	1200	2.5	0	—	—	—	—
	1237	2.5	0.05	—	—	—	—
	1307	2.5	0.12	—	—	—	—
	1323	2.5	0.14	—	—	—	—
	1345	2.5	0.14	—	—	—	—
	1355	2.5	—	—	—	950	—
	1400	2.5	—	—	—	>1,000	—
	1426	2.5	—	8.86	9.00	—	—
	1534	5	0.65	—	—	—	—
	1549	5	0.94	—	—	—	—
	1603	5	0.64	—	—	—	—
	1629	5	0.44	—	—	—	—
	1643	5	0.45	—	—	—	—
	1646	5	—	—	—	7,200	—
	1700	5	—	—	—	—	90
	1703	5	—	—	7.12	—	—
MW-5	1140	2.5	—	No product	10.08	—	—
	1155	2.5	0	in well	—	—	—
	1238	2.5	0.18	—	—	—	—
	1308	2.5	1.38	—	—	—	—
	1323	2.5	1.63	—	—	—	—
	1346	2.5	1.85	—	—	—	—
	1420	2.5	2.33	—	—	—	—
	1439	2.5	2.6	—	—	—	—
	1450	2.5	2.7	—	—	—	—
	1516	2.5	2.85	—	9.41	4,000	—
	1536	5	8.00	—	—	—	—
	1550	5	8.00	—	—	—	—
	1605	5	8.00	—	—	—	—
	1642	5	8.50	—	—	—	—
	1704	5	9.00	—	—	—	—
	1706	5	—	—	—	2,000	>20
	1712	5	—	—	8.25	—	—

TABLE 5
SUMMARY OF AIR SPARGE PILOT TEST DATA
PACIFIC PRIDE/SOUTHCENTER OIL SITE
3215 4TH AVENUE SOUTH, SEATTLE, WA
FARALLON PN: 698-001

Well Number[1]	Time	Sparge Well Air Flow (scfm)	Pressure (inches of water)	Depth to Product (feet)[2]	Depth to Water (feet)[2]	TPH-G (ppmv)	Benzene (ppmv)
MW-7	1141	2.5	0.01	No product	9.4	—	—
	1239	2.5	0.02	in well	—	—	—
	1309	2.5	0.05	—	—	—	—
	1324	2.5	0.045	—	—	—	—
	1346	2.5	0.05	—	—	—	—
	1406	2.5	—	—	—	>2,000	—
	1410	2.5	—	—	—	4,000	—
	1432	2.5	—	—	8.71	—	—
	1535	5	0.16	—	—	—	—
	1550	5	0.23	—	—	—	—
	1604	5	0.23	—	—	—	—
	1610	5	—	—	—	>4,000	—
	1612	5	—	—	—	>8,000	—
	1625	5	—	—	8.06	—	>20
MW-8	1143	2.5	—	No product	9.45	—	—
	1200	2.5	0	in well	—	—	—
	1243	2.5	0.03	—	—	—	—
	1310	2.5	0.04	—	—	—	—
	1324	2.5	0.05	—	—	—	—
	1347	2.5	0.05	—	—	—	—
	1417	2.5	—	—	—	20	—
	1444	2.5	—	—	9.21	—	—
	1535	5	0.19	—	—	—	—
	1549	5	0.23	—	—	—	—
	1604	5	0.23	—	—	—	—
	1626	5	—	—	—	100	4
	1638	5	—	—	8.91	—	—
VAPOR EXTRACTION SYSTEM							
MW-4	—	—	—	—	—	1,600	>25
MW-5	—	—	—	—	—	NS[2]	NS
MW-7	—	—	—	—	—	1,000	10
MW-8	—	—	—	—	—	>4,000	5
Manifold	—	—	—	—	—	450	5

NOTE:
— = no reading taken
NS = not sampled because of water in the vapor extraction pipes
scfm = standard cubic feet per minute
ppmv = parts per million volume
[1]Well AS-1 was the air injection (sparge) well and wells MW-4, MW-5, MW-7, and MW-8 were the observation wells.
[2]In feet below top of well casing.

ATTACHMENT A
LABORATORY ANALYTICAL REPORT

QUARTERLY STATUS REPORT
Southcenter Oil/Pacific Pride
3215 4th Ave. South, Seattle, Washington
Farallon PN: 698-001

JUNE 13, 2001

OnSite
Environmental Inc.
Analytical Testing and Mobile Laboratory Services

April 24, 2001

Mark Chandler
Farallon Consulting, LLC
320 3rd Avenue NE, Suite 200
Issaquah, WA 98027

Re: Analytical Data for Project 698-001
Laboratory Reference No. 0104-136

Dear Mark:

Enclosed are the analytical results and associated quality control data for samples submitted on April 18, 2001.

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

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

Sincerely,

David Baumeister
Project Manager

Enclosures

Date of Report: April 24, 2001
Samples Submitted: April 18, 2001
Lab Traveler: 04-136
Project: 698-001

NWTPH-Gx/BTEX

Date Extracted: 4-19&20-01
Date Analyzed: 4-19&20-01

Matrix: Water
Units: ug/L (ppb)

Client ID:	**MW2**			**MW1**		
Lab ID:	04-136-01			04-136-02		
	Result	Flags	PQL	**Result**	Flags	PQL
Benzene	**2.2**		1.0	**180**		10
Toluene	**ND**		1.0	**ND**		1.0
Ethyl Benzene	**ND**		1.0	**ND**		1.0
m,p-Xylene	**ND**		1.0	**1.1**		1.0
o-Xylene	**ND**		1.0	**ND**		1.0
TPH-Gas	**220**		100	**ND**		100
Surrogate Recovery:						
Fluorobenzene	94%			103%		

Date of Report: April 24, 2001
Samples Submitted: April 18, 2001
Lab Traveler: 04-136
Project: 698-001

NWTPH-Gx/BTEX

Date Extracted: 4-19&20-01
Date Analyzed: 4-19&20-01

Matrix: Water
Units: ug/L (ppb)

Client ID:	**MW11**			**MW10**		
Lab ID:	04-136-03			04-136-04		
	Result	Flags	PQL	**Result**	Flags	PQL
Benzene	**3500**		100	**53**		1.0
Toluene	**ND**		10	**ND**		1.0
Ethyl Benzene	**330**		10	**ND**		1.0
m,p-Xylene	**140**		10	**ND**		1.0
o-Xylene	**26**		10	**ND**		1.0
TPH-Gas	**5600**		1000	**140**		100
Surrogate Recovery:						
Fluorobenzene	101%			97%		

Date of Report: April 24, 2001
Samples Submitted: April 18, 2001
Lab Traveler: 04-136
Project: 698-001

NWTPH-Gx/BTEX

Date Extracted: 4-19&20-01
Date Analyzed: 4-19&20-01

Matrix: Water
Units: ug/L (ppb)

Client ID:	**MW9**			**MW7**		
Lab ID:	04-136-05			04-136-06		
	Result	Flags	PQL	**Result**	Flags	PQL
Benzene	**200**		10	**280**		100
Toluene	**ND**		1.0	**190**		100
Ethyl Benzene	**20**		1.0	**190**		100
m,p-Xylene	**3.5**		1.0	**1400**		100
o-Xylene	**ND**		1.0	**330**		100
TPH-Gas	**630**		100	**21000**		10000
Surrogate Recovery:						
Fluorobenzene	101%			93%		

Date of Report: April 24, 2001
Samples Submitted: April 18, 2001
Lab Traveler: 04-136
Project: 698-001

NWTPH-Gx/BTEX

Date Extracted: 4-19&20-01
Date Analyzed: 4-19&20-01

Matrix: Water
Units: ug/L (ppb)

Client ID:	**MW3**			**MW5**		
Lab ID:	04-136-07			04-136-08		
	Result	Flags	PQL	**Result**	Flags	PQL
Benzene	**2400**		100	**7200**		100
Toluene	**ND**		10	**18000**		250
Ethyl Benzene	**360**		10	**2000**		100
m,p-Xylene	**18**		10	**8100**		100
o-Xylene	**ND**		10	**3200**		100
TPH-Gas	**5200**		1000	**140000**		10000
Surrogate Recovery:						
Fluorobenzene	105%			96%		

Date of Report: April 24, 2001
Samples Submitted: April 18, 2001
Lab Traveler: 04-136
Project: 698-001

NWTPH-Gx/BTEX

Date Extracted: 4-19&20-01
Date Analyzed: 4-19&20-01

Matrix: Water
Units: ug/L (ppb)

Client ID:	**MW8**			**MW12**		
Lab ID:	04-136-09			04-136-10		
	Result	Flags	PQL	**Result**	Flags	PQL
Benzene	**20000**		250	**9700**		100
Toluene	**21000**		250	**17000**		250
Ethyl Benzene	**2700**		100	**1400**		100
m,p-Xylene	**8200**		100	**9900**		100
o-Xylene	**3700**		100	**4900**		100
TPH-Gas	**140000**		10000	**160000**		10000
Surrogate Recovery:						
Fluorobenzene	98%			97%		

Date of Report: April 24, 2001
Samples Submitted: April 18, 2001
Lab Traveler: 04-136
Project: 698-001

NWTPH-Gx/BTEX

Date Extracted: 4-19-01
Date Analyzed: 4-19-01

Matrix: Water
Units: ug/L (ppb)

Client ID: **trip blanks**
Lab ID: 04-136-11

	Result	Flags	PQL
Benzene	**ND**		1.0
Toluene	**ND**		1.0
Ethyl Benzene	**ND**		1.0
m,p-Xylene	**ND**		1.0
o-Xylene	**ND**		1.0
TPH-Gas	**ND**		100
Surrogate Recovery:			
Fluorobenzene	94%		

Date of Report: April 24, 2001
Samples Submitted: April 18, 2001
Lab Traveler: 04-136
Project: 698-001

NWTPH-Gx/BTEX
METHOD BLANK QUALITY CONTROL

Date Extracted: 4-19-01
Date Analyzed: 4-19-01

Matrix: Water
Units: ug/L (ppb)

Lab ID: MB0419W1

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

Surrogate Recovery:
Fluorobenzene 95%

Date of Report: April 24, 2001
Samples Submitted: April 18, 2001
Lab Traveler: 04-136
Project: 698-001

NWTPH-Gx/BTEX
METHOD BLANK QUALITY CONTROL

Date Extracted: 4-19-01
Date Analyzed: 4-19-01

Matrix: Water
Units: ug/L (ppb)

Lab ID: MB0419W2

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

Surrogate Recovery:
Fluorobenzene 94%

Date of Report: April 24, 2001
Samples Submitted: April 18, 2001
Lab Traveler: 04-136
Project: 698-001

NWTPH-Gx/BTEX
METHOD BLANK QUALITY CONTROL

Date Extracted: 4-20-01
Date Analyzed: 4-20-01

Matrix: Water
Units: ug/L (ppb)

Lab ID: MB0420W1

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

Surrogate Recovery:
Fluorobenzene 93%

Date of Report: April 24, 2001
Samples Submitted: April 18, 2001
Lab Traveler: 04-136
Project: 698-001

NWTPH-Gx/BTEX
DUPLICATE QUALITY CONTROL

Date Extracted: 4-19-01
Date Analyzed: 4-19-01

Matrix: Water
Units: ug/L (ppb)

Lab ID:	04-136-04 **Original**	04-136-04 **Duplicate**	**RPD**	**Flags**
Benzene	**53.4**	**51.8**	3.1	
Toluene	**ND**	**ND**	NA	
Ethyl Benzene	**ND**	**ND**	NA	
m,p-Xylene	**ND**	**ND**	NA	
o-Xylene	**ND**	**ND**	NA	
TPH-Gas	**141**	**ND**	NA	
Surrogate Recovery:				
Fluorobenzene	97%	97%		

Date of Report: April 24, 2001
Samples Submitted: April 18, 2001
Lab Traveler: 04-136
Project: 698-001

NWTPH-Gx/BTEX
DUPLICATE QUALITY CONTROL

Date Extracted: 4-20-01
Date Analyzed: 4-20-01

Matrix: Water
Units: ug/L (ppb)

Lab ID:	04-146-01 **Original**	04-146-01 **Duplicate**	**RPD**	**Flags**
Benzene	**148**	**137**	7.4	
Toluene	**24.8**	**23.1**	7.3	
Ethyl Benzene	**11.6**	**10.8**	7.3	
m,p-Xylene	**33.5**	**31.0**	7.8	
o-Xylene	**13.5**	**12.6**	6.7	
TPH-Gas	**640**	**605**	5.6	
Surrogate Recovery:				
Fluorobenzene	94%	94%		

Date of Report: April 24, 2001
Samples Submitted: April 18, 2001
Lab Traveler: 04-136
Project: 698-001

NWTPH-Gx/BTEX
MS/MSD QUALITY CONTROL

Date Extracted: 4-19-01
Date Analyzed: 4-19-01

Matrix: Water
Units: ug/L (ppb)

Spike Level: 50.0 ppb

Lab ID:	04-136-04 **MS**	Percent Recovery	04-136-04 **MSD**	Percent Recovery	**RPD**	**Flags**
Benzene	**98.5**	**90**	**85.4**	**64**	14	
Toluene	**48.5**	**97**	**47.4**	**95**	2.1	
Ethyl Benzene	**48.5**	**97**	**45.6**	**91**	6.1	
m,p-Xylene	**49.4**	**99**	**45.3**	**91**	8.6	
o-Xylene	**48.5**	**97**	**44.1**	**88**	9.5	

Surrogate Recovery:

Fluorobenzene	97%	97%	

OnSite Environmental Inc.

DATA QUALIFIERS AND ABBREVIATIONS

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

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

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

D - Data from 1:____ dilution.

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

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

G - Insufficient sample quantity for duplicate analysis.

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

I - Compound recovery is outside of the control limits.

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

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

L - The RPD is outside of the control limits.

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

O - Hydrocarbons outside the defined gasoline range are present in the sample; NWTPH-Dx recommended.

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

Q - Surrogate recovery is outside of the control limits.

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

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

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

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

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

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

Y - Sample extract treated with an acid cleanup procedure.

Z -

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

Chain of Custody

Page 1 of 1

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

Company: Farallon
Project No.: 698-001
Project Name: Trolpt Bell
Project Manager: Mark Chandler

Turnaround Request (in working days)

(Check One)

☐ Same Day ☐ 1 Day
☐ 2 Day ☐ 3 Day
☐ Standard (Hydrocarbon analyses: 5 days, All other analyses: 7 days)
☒ 10 days 5/2/01 (other)

Project Chemist: DB

Laboratory No. 04-136

Requested Analysis

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Dx	Volatiles by 8260B	Halogenated Volatiles by 8260B	Semivolatiles by 8270C	PAHs by 8270C	PCB's by 8082	Pesticides by 8081	Total RCRA Metals (8)	TCLP Metals	VPH	EPH	% Moisture
1	MW2	4/18/01	853	W	3		X												
2	MW1		929				X												
3	MW11		1005				X												
4	MW10		1045				X												
5	MW9		1115				X												
6	MW7		1200				X												
7	MW3		1242				X												
8	MW5		1317				X												
9	MW8		1353				X												
10	MW12	"	1420	"	"		X												
11	trip blanks	—	—	W	2		X												

RELINQUISHED BY	DATE	RECEIVED BY	DATE
Mark	4-18-01	Jodi Wyatt	4/18/01
FIRM Farallon	TIME 16:18	FIRM OSE	TIME 4:20 pm
RELINQUISHED BY	DATE	RECEIVED BY	DATE
FIRM	TIME	FIRM	TIME
REVIEWED BY		DATE REVIEWED	

COMMENTS:

Chromatographs with final report ☐

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

May 16, 2001

Mark Chandler
Farallon Consulting, LLC
320 3rd Avenue NE, Suite 200
Issaquah, WA 98027

Re: Analytical Data for Project 698-001-003
Laboratory Reference No. 0105-056

Dear Mark:

Enclosed are the analytical results and associated quality control data for samples submitted on May 9, 2001.

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

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

Sincerely,

David Baumeister
Project Manager

Enclosures

Date of Report: May 16, 2001
Samples Submitted: May 9, 2001
Lab Traveler: 05-056
Project: 698-001-003

NWTPH-Gx/BTEX

Date Extracted: 5-11-01
Date Analyzed: 5-11-01

Matrix: Water
Units: ug/L (ppb)

Client ID:	**MW13**			**MW14**		
Lab ID:	05-056-01			05-056-02		
	Result	Flags	PQL	**Result**	Flags	PQL
Benzene	**27**		1.0	**12**		1.0
Toluene	**1.2**		1.0	**1.9**		1.0
Ethyl Benzene	**3.3**		1.0	**ND**		1.0
m,p-Xylene	**ND**		1.0	**1.2**		1.0
o-Xylene	**ND**		1.0	**ND**		1.0
TPH-Gas	**ND**		100	**ND**		100
Surrogate Recovery:						
Fluorobenzene	101%			95%		

Date of Report: May 16, 2001
Samples Submitted: May 9, 2001
Lab Traveler: 05-056
Project: 698-001-003

NWTPH-Gx/BTEX
METHOD BLANK QUALITY CONTROL

Date Extracted: 5-11-01
Date Analyzed: 5-11-01

Matrix: Water
Units: ug/L (ppb)

Lab ID: MB0511W1

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

Surrogate Recovery:
Fluorobenzene 95%

Date of Report: May 16, 2001
Samples Submitted: May 9, 2001
Lab Traveler: 05-056
Project: 698-001-003

NWTPH-Gx/BTEX
DUPLICATE QUALITY CONTROL

Date Extracted: 5-11-01
Date Analyzed: 5-11-01

Matrix: Water
Units: ug/L (ppb)

Lab ID:	05-056-02 **Original**	05-056-02 **Duplicate**	**RPD**	**Flags**
Benzene	**11.5**	**11.6**	0.69	
Toluene	**1.89**	**ND**	NA	
Ethyl Benzene	**ND**	**ND**	NA	
m,p-Xylene	**1.16**	**ND**	NA	
o-Xylene	**ND**	**ND**	NA	
TPH-Gas	**ND**	**ND**	NA	
Surrogate Recovery:				
Fluorobenzene	95%	98%		

Date of Report: May 16, 2001
Samples Submitted: May 9, 2001
Lab Traveler: 05-056
Project: 698-001-003

NWTPH-Gx/BTEX
MS/MSD QUALITY CONTROL

Date Extracted: 5-11-01
Date Analyzed: 5-11-01

Matrix: Water
Units: ug/L (ppb)

Spike Level: 50.0 ppb

Lab ID:	05-056-02 **MS**	Percent Recovery	05-056-02 **MSD**	Percent Recovery	**RPD**	**Flags**
Benzene	**64.6**	**106**	**66.1**	**109**	2.3	
Toluene	**56.7**	**110**	**58.0**	**112**	2.2	
Ethyl Benzene	**56.6**	**113**	**58.7**	**117**	3.7	
m,p-Xylene	**56.3**	**110**	**58.9**	**115**	4.6	
o-Xylene	**56.6**	**113**	**58.8**	**118**	3.9	

Surrogate Recovery:

Fluorobenzene	99%		100%

OnSite Environmental Inc.

DATA QUALIFIERS AND ABBREVIATIONS

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

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

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

D - Data from 1:____ dilution.

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

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

G - Insufficient sample quantity for duplicate analysis.

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

I - Compound recovery is outside of the control limits.

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

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

L - The RPD is outside of the control limits.

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

O - Hydrocarbons outside the defined gasoline range are present in the sample; NWTPH-Dx recommended.

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

Q - Surrogate recovery is outside of the control limits.

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

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

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

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

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

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

Y - Sample extract treated with an acid cleanup procedure.

Z -

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

INVOICE #: 0105-056

Mark Chandler
Farallon Consulting, LLC
320 3rd Avenue NE, Suite 200
Issaquah, WA 98027

ATTENTION: ACCOUNTS PAYABLE
Terms: Net 30 days
Past Due Accounts: 1.5% interest per month

Date of Report: May 16, 2001
Samples Submitted: May 9, 2001
Project: 698-001-003

Quantity	Analysis	Unit Price	Amount
2	NWTPH-G/BTEX	90.00	$ 180.00
		Total Due	$180.00

PROJECT

OnSite Environmental Inc.
Analytical Testing and Mobile Laboratory Services

April 30, 2001

Mark Chandler
Farallon Consulting, LLC
320 3rd Avenue NE, Suite 200
Issaquah, WA 98027

Re: Analytical Data for Project 698-001-004
Laboratory Reference No. 0104-151

Dear Mark:

Enclosed are the analytical results and associated quality control data for samples submitted on April 19, 2001.

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

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

Sincerely,

David Baumeister
Project Manager

Enclosures

Date of Report: April 30, 2001
Samples Submitted: April 19, 2001
Lab Traveler: 04-151
Project: 698-001-004

NWTPH-Gx/BTEX

Date Extracted: 4-23-01
Date Analyzed: 4-23&24-01

Matrix: Soil
Units: mg/Kg (ppm)

Client ID:	**AS1-6-7.5**			**AS1-7.5-9**		
Lab ID:	04-151-01			04-151-02		
	Result	Flags	PQL	**Result**	Flags	PQL
Benzene	**90**		1.1	**370**	E	1.3
Toluene	**1100**	E	1.1	**1100**	E	1.3
Ethyl Benzene	**400**	E	1.1	**430**	E	1.3
m,p-Xylene	**980**	E	1.1	**1100**	E	1.3
o-Xylene	**540**	E	1.1	**590**	E	1.3
TPH-Gas	**21000**	E	110	**22000**	E	130
Surrogate Recovery:						
Fluorobenzene	116%			140%		

Date of Report: April 30, 2001
Samples Submitted: April 19, 2001
Lab Traveler: 04-151
Project: 698-001-004

NWTPH-Gx/BTEX
METHOD BLANK QUALITY CONTROL

Date Extracted: 4-23-01
Date Analyzed: 4-23-01

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: MB0423S1

	Result	Flags	PQL
Benzene	ND		0.050
Toluene	ND		0.050
Ethyl Benzene	ND		0.050
m,p-Xylene	ND		0.050
o-Xylene	ND		0.050
TPH-Gas	ND		5.0
Surrogate Recovery: Fluorobenzene	99%		

Date of Report: April 30, 2001
Samples Submitted: April 19, 2001
Lab Traveler: 04-151
Project: 698-001-004

NWTPH-Gx/BTEX
DUPLICATE QUALITY CONTROL

Date Extracted: 4-23-01
Date Analyzed: 4-24-01

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID:	04-164-02 **Original**	04-164-02 **Duplicate**	**RPD**	**Flags**
Benzene	**ND**	**ND**	NA	
Toluene	**ND**	**ND**	NA	
Ethyl Benzene	**ND**	**ND**	NA	
m,p-Xylene	**ND**	**ND**	NA	
o-Xylene	**ND**	**ND**	NA	
TPH-Gas	**ND**	**ND**	NA	
Surrogate Recovery:				
Fluorobenzene	95%	88%		

Date of Report: April 30, 2001
Samples Submitted: April 19, 2001
Lab Traveler: 04-151
Project: 698-001-004

NWTPH-Gx/BTEX
MS/MSD QUALITY CONTROL

Date Extracted: 4-23-01
Date Analyzed: 4-23-01

Matrix: Soil
Units: mg/Kg (ppm)

Spike Level: 1.00 ppm

Lab ID:	04-164-02 **MS**	Percent Recovery	04-164-02 **MSD**	Percent Recovery	**RPD**	**Flags**
Benzene	**0.880**	**88**	**0.894**	**89**	1.6	
Toluene	**0.920**	**92**	**0.938**	**94**	1.9	
Ethyl Benzene	**0.931**	**93**	**0.951**	**95**	2.1	
m,p-Xylene	**0.936**	**94**	**0.973**	**97**	3.9	
o-Xylene	**0.929**	**93**	**0.943**	**94**	1.5	
Surrogate Recovery:						
Fluorobenzene	89%		91%			

Date of Report: April 30, 2001
Samples Submitted: April 19, 2001
Lab Traveler: 04-151
Project: 698-001-004

% MOISTURE

Date Analyzed: 4-23-01

Client ID	Lab ID	% Moisture
AS1-6-7.5	04-151-01	11
AS1-7.5-9	04-151-02	21

OnSite Environmental Inc.

DATA QUALIFIERS AND ABBREVIATIONS

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

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

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

D - Data from 1:____ dilution.

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

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

G - Insufficient sample quantity for duplicate analysis.

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

I - Compound recovery is outside of the control limits.

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

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

L - The RPD is outside of the control limits.

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

O - Hydrocarbons outside the defined gasoline range are present in the sample; NWTPH-Dx recommended.

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

Q - Surrogate recovery is outside of the control limits.

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

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

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

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

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

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

Y - Sample extract treated with an acid cleanup procedure.

Z -

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

Chain of Custody

Page 1 of 1

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

Turnaround Request (in working days)

(Check One)

- ☐ Same Day
- ☐ 1 Day
- ☐ 2 Day
- ☐ 3 Day
- ☒ Standard (Hydrocarbon analyses: 5 days, All other analyses: 7 days)
- ☐ 4/26/01 (other)

Project Chemist: DB

Laboratory No. 04-151

Company: FARALLON

Project No.: 698-001-004

Project Name: Thorpe Bell / Pacific Pride

Project Manager: Maik Chandler

Requested Analysis

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Dx	Volatiles by 8260B	Halogenated Volatiles by 8260B	Semivolatiles by 8270C	PAHs by 8270C	PCB's by 8082	Pesticides by 8081	Total RCRA Metals (8)	TCLP Metals	VPH	EPH	HOLD	% Moisture
1	AS1-6-7.5	4/19/01	1025	S	1		X													X
2	AS1-7.5-9		1032				X													X
3	AS1-9-10.5		1037																X	
4	AS1-13.5-15		1049																X	
5	AS1-16.5-18	↓	1105	↓	↓														X	

RELINQUISHED BY	DATE	RECEIVED BY	DATE
Carla Brock	4/19/01	Jodi Wycoff	4/19/01
FIRM FARALLON	TIME 1450	FIRM OSE	TIME 2:50pm
RELINQUISHED BY	DATE	RECEIVED BY	DATE
FIRM	TIME	FIRM	TIME
REVIEWED BY		DATE REVIEWED	

COMMENTS:

Chromatographs with final report ☐

D ITIO ND: OnSi Yell port ink - opy

ATTACHMENT B
BORING LOG FOR AS-1

QUARTERLY STATUS REPORT
Southcenter Oil/Pacific Pride
3215 4th Ave. South, Seattle, Washington
Farallon PN: 698-001

JUNE 13, 2001

FARALLON CONSULTING
320 3rd Ave. NE, Suite 200
Issaquah, WA 98027

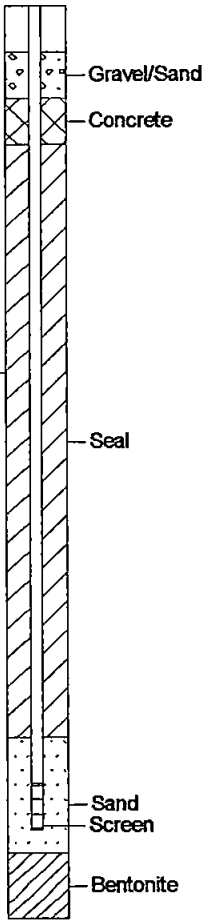
LOG OF WELL AS-1

PACIFIC PRIDE
Thorp & Bell
3215 4th Ave S
Seattle, WA
Farallon PN: 698-001 004

Date/Time Started : 4/19/01 1015
Date/Time Completed : 4/19/01 1300
Total Depth : 20 feet
Drilling Method : Hollow Stem Auger
Sampler Type : Split Spoon 3" OD
Depth to water ATD : 8'

Depth in Feet	Samples	% Recovery	Blow Counts 6/6/6	Sample ID	PID (ppm)	USCS	GRAPHIC	DESCRIPTION
0						AS		ASPHALT
						GP		Sandy GRAVEL, fine to coarse gravel, coarse sand, dark brown, dry, (moist at 1').
						SP		SAND, fine to medium grained, minor fine gravel, dark brown, moist.
5			13/16/17			SP		SAND, medium grained, minor fine gravel, dark brown, dense, moist, strong petroleum-like odor.
		60		AS1-6-7.5	>2000			
		80	3/4/4	AS1-7.5-9	1142	SP		SAND, medium to coarse grained, dark brown to black, loose, wet, strong petroleum-like odor, sheen.
10		80	2/1/1	AS1-9-10.5	749	SM		Silty SAND, fine to medium sand, dark gray, very loose, wet, strong petroleum-like odor, (trace organics).
								No Recovery.
		80	8/10/10		261	SM		Silty SAND, fine to coarse sand, dark gray, medium dense, wet, petroleum-like odor, visible sheen.
		80	7/9/12	AS1-13.5-15	454	SP		SAND, medium to coarse grained, minor silt, black (some red sand grains), medium dense, wet, petroluem-like odor.
15		90	8/11/16		334	SP		SAND, medium to coarse grained, trace organics, black with red grains, medium dense, wet, petroleum-like odor.
		60	4/4/4	AS1-16.5-18	431	SP		SAND, medium to coarse, trace organics, black with red grains, loose, wet, strong petroleum-like odor.
		90	2/3/4		635	ML		Clayey SILT, minor coarse SAND, dark gray, wet, medium stiff, strong petroleum-like odor.
20								
25								

Well: AS-1
Elev.:



Total depth @ 20 feet below ground surface.

Drilling Company: Cascade Drilling Co.
Drilling Crew: James, Andy, Jesse
Farallon Rep.: C. Brock/J. Cyr

LOG OF WELL AS-1

(Page 1 of 1)

D:\QUANTUM\FARALLON\698\AS1.BOR
08-01-2001