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INDEPENDENT REMEDIAL ACTION REPORT

Federal Center South
4735 East Marginal Way South
Seattle, Washington

Prepared for

U.S. General Services Administration
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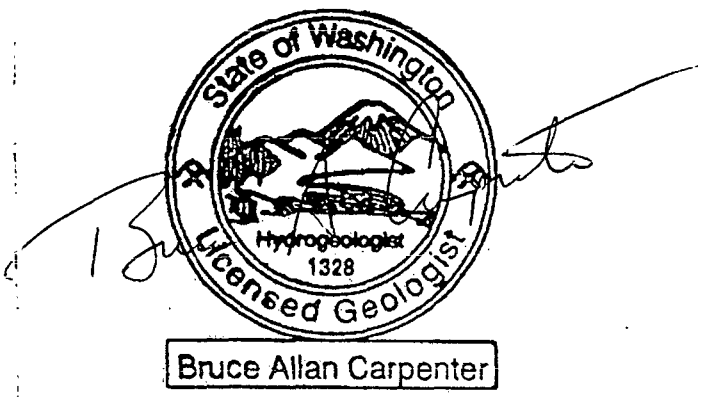
Work for this investigation was performed in accordance with generally accepted professional standards and practices for the type of work performed. While information regarding subsurface conditions, including soil and ground water quality, is believed to be generally representative of conditions at the site, conditions may change within short distances. Additional subsurface materials and contaminants may be present at locations not investigated during this study.



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Introduction

This independent remedial action report presents the results of ground water monitoring conducted on behalf of U.S. General Services Administration (GSA) at the former motor pool facility in Seattle, Washington. The facility is located at 4735 East Marginal Way South (Figure 1), along the eastern riverbank of the Duwamish Waterway within the industrial portion of South Seattle. The objective of the report is to demonstrate that the site has been cleaned for Model Toxics Control Act (MTCA) method A cleanup standards based on source removal and subsequent monitoring of ground water.

This report documents four quarters of ground water monitoring conducted as a follow-up to eight quarters of ground water monitoring following underground storage tank and contaminated soil removal at the Federal Center South facility in Seattle, Washington. Also presented herein are the results of four additional quarters of ground water monitoring at well FC9 and push-probe soil and ground water sampling adjacent to monitoring well FC-9 to identify a possible source of heavy-oil range petroleum hydrocarbons. A request for no further action based on ground water monitoring results is proposed.

The site is owned and managed by the GSA. The removed tanks included a 12,000-gallon gasoline tank used to provide fuel for motor pool vehicles and a 1,000-gallon waste oil tank used for storage of fluids resulting from motor pool vehicle maintenance. Limited exploration during the tank removal process indicated a gasoline release beneath a former fuel dispenser unit, extending approximately 30 feet to the south and west. Approximately 100 feet south of the gasoline tank, a waste oil tank also was found to have released diesel and heavy oil to soil immediately surrounding the tank. Initial contaminant characterization indicated that polychlorinated biphenyls (PCBs), halogeneted volatile organics, polycyclic aromatic hydrocarbons (PAHs), and metals were not of concern and have not been further analyzed (Herrera 1999, 2000, 2001b).

The site ranges 5 to 10 feet above mean sea level, consisting of a relatively level concrete/asphalt parking lot and several multi-story office and warehouse buildings. The former GSA motor pool (Building 12.03) is currently leased by the U.S. Federal Bureau of Investigation for servicing vehicles. No soil is exposed to the surface at any place onsite, with the exception of a small area at the northwest corner of the property.

Site Background

The following site characterization and cleanup activities have been conducted at the Federal Center South site west of Building 12.03 since underground storage tanks were removed in May 1998:

Date	Activities Performed Onsite
5/98	Underground storage tank decommissioning and closure activities, including excavation and removal of one 12,000-gallon gasoline tank, one 1,000-gallon waste-oil tank, and approximately 170 cubic yards contaminated soil.
8/98	Site investigation, including soil and ground water sampling from 15 push probe locations
4/99	Additional soil excavation (approximately 350 yards) from the gasoline dispenser area and from around the waste oil tank.
6/99-7/99	Installation of seven monitoring wells FC1 through FC7 and first quarterly ground water monitoring/sampling event.
10/99	Second quarter ground water monitoring/sampling event.
1/00	Third quarter ground water monitoring/sampling event.
4/00	Fourth quarter ground water monitoring/sampling event.
7/00	Fifth quarter ground water monitoring/sampling event.
10/00	Installation of two additional monitoring wells FC8 and FC9 and sixth quarter ground water monitoring/sampling event.
1/01	Seventh quarter ground water monitoring/sampling event.
4/01	Eighth quarter ground water monitoring/sampling event.
7/01	Ninth quarter ground water monitoring/sampling event.
10/01	Tenth quarter ground water monitoring/sampling event.
1/02	Eleventh quarter ground water monitoring/sampling event.
4/02	Twelfth quarter ground water monitoring/sampling event.
7/02	Ground water sample collection, well FC9.
9/02	Push-probe sampling (soil and ground water) in vicinity of well FC9.
10/02	Ground water sample collection, well FC9.
1/03	Ground water sample collection, well FC9.
4/03	Ground water sample collection, well FC9.

The locations of historic underground storage tanks are provided in Figure 2; locations of monitoring wells are provided in Figure 3.

Herrera has provided results to Ecology from the first four activities listed above in two deliverables entitled *Underground Storage Tank Site Assessment* (dated May 3, 1999) and *Environmental Site Assessment and Ground Water Monitoring—Federal Center South, 4735 East Marginal Way, Seattle, Washington* (dated January 7, 2000). The results of the first eight

rounds of ground water monitoring and sampling were presented to Ecology in *Baseline Ground Water Monitoring—Federal Center South* (dated December 11, 2001). The first five sampling rounds were conducted at wells FC1 through FC7 from July 1999 to July 2000. Monitoring wells FC8 and FC9, installed in October 2000 to further characterize the extent of ground water contamination between the source area and downgradient property boundary, were sampled with wells FC1 through FC7 in October 2000 and January and April 2001.

This report presents the results of the third year of quarterly ground water monitoring, plus additional sampling in an identified area of concern near FC9. When concentrations of heavy oil-range petroleum hydrocarbons exceeding Model Toxics Control Act (MTCA) method A cleanup criterion were detected at well FC9 in October 2000, it was sampled for four additional quarters, and additional push-probe soil and ground water sampling was conducted in the surrounding area.

Field Investigation

Ground water monitoring and push-probe sampling field procedures are presented in Appendix A.

Ground Water Monitoring Summary

Ground Water Conditions

Ground water surface levels were measured and recorded during four sampling events conducted on July 26 and October 26, 2001, and January 24 and April 18, 2002 (Table 1). Quarterly ground water surface levels measured prior to July 26, 2001, recorded during eight sampling events conducted on July 6 and October 13, 1999; January 12, April 12, July 20-26, October 26, 2000; and January 24 and April 26, 2001 also are presented in Table 1. Figures B-1 through B-4 in Appendix B illustrate the ground water surface contours compiled and interpreted from a set of ground water elevation data obtained during each sampling event. The water level contour pattern, as interpreted from the data collected, generally indicates ground water flow to the west, with a flat gradient.

Tidal fluctuations appear to affect ground water flow and water quality in the vicinity of well FC1. A tidal assessment conducted by Herrera was presented in an earlier report and demonstrated limited tidal influence across the area of interest (Herrera 2001b). Monitoring wells FC1 and FC4, located about 24 feet and 20 feet, respectively, from the Duwamish River, were most affected by tidal fluctuations, with net changes of 2.48 feet and 0.21 feet, respectively, over a 12-hour period. Tidal charts from each of the four days of sample collection are presented in Appendix C (Nautical Software 1995).

Ground Water Analytical Results

Ground water sampling was conducted on July 25 and October 25, 2001, and January 24 and April 18, 2002. All samples collected from each sampling event were submitted under chain-of-custody protocol to Onsite Environmental, Inc. for analysis of benzene, toluene, ethylbenzene, total xylenes (BTEX), and gasoline-range petroleum hydrocarbons using the Washington State Department of Ecology (Ecology) NWTPH- G/BTEX method. Samples from wells FC3, FC4, FC5, and FC9 also were analyzed for diesel- and heavy oil-range hydrocarbon constituents using the Ecology NWTPH-Dx (extended) method. Analytical results of each sampling event, including eight earlier sampling events, are presented in Table 2. A data quality assurance review for each sampling event is presented in Appendix D and laboratory analytical data including chain-of-custody forms are presented in Appendix E.

Evidence of tidal influence appears to affect water quality, particularly in well FC1. This is based on fluctuating specific conductivity levels observed over the last 3 years in FC1 compared to the consistently lower and more stable levels observed in the remaining eight wells. A

summary of field parameters measured during each of the sampling events is presented in Table 3.

Water quality has continued to improve since the tanks and approximately 170 yards of contaminated soil were removed in May 1998, followed by additional excavation and removal of 350 yards of contaminated soil in April 1999. Based on 12 quarters of ground water monitoring, the following evaluations are provided for each well:

FC1—This well is located downgradient from the former gasoline tank and fuel dispenser at the property boundary and has been sampled during periods of both high and low tides. It consistently has shown no impact from the gasoline release, with the exception of very low concentrations of toluene or total xylenes detected on July 20, 2001, January 24, 2002, and April 18, 2002, all below Ecology MTCA method A cleanup criteria.

FC2—This well is located downgradient from the former gasoline tank and fuel dispenser. During the first four sampling periods elevated concentrations (maximum concentrations listed in parentheses) of gasoline range-hydrocarbons (2,700 μg/L), benzene (33 μg/L), ethylbenzene (360 μg/L), and xylenes (633 μg/L) have been detected. Concentrations have decreased steadily and during the last four monitoring periods, from July 26, 2001 through April 18, 2002, benzene concentrations ranged from 1.8 to 4.3 μg/L, below the MTCA method A cleanup criterion of 5 μg/L (Figure 4).

FC3—This well is located downgradient of the former gasoline fuel dispenser. Benzene concentrations have been detected during all 12 sampling events, with concentrations ranging from 1.3 to 7.7 μg/L (Figure 4). Benzene concentrations have demonstrated a downward trend during the past four monitoring periods and have been below MTCA method A cleanup criteria of 5 μg/L during the past three sampling efforts. Diesel range- (390 μg/L) and heavy oil range- (630 μg/L) hydrocarbons were the only other parameters detected during one (January 2000) of 12 sampling events. The MTCA method A cleanup criterion is 500 μg/L for diesel and heavy oil-range petroleum hydrocarbons.

FC4—This well is located at the property boundary, downgradient of the former gasoline fuel dispenser. During the April 2000 sampling event it was sampled at high and low tidal cycles, with results below practical quantitation limits. No gasoline-, diesel-, or heavy oil-range hydrocarbons or BTEX constituents were detected during 10 of 13 sampling events. Heavy oil- (520 μg/L) and diesel range-hydrocarbons (890 μg/L) were detected once in January 1999 and January 2000, respectively, both above the MTCA method A cleanup level of 500 mg/L.

FC5—This well is located downgradient of the former diesel fuel tank. A low concentration of diesel-range hydrocarbons (250 μg/L) was detected once on October 26, 2000; benzene was detected at the practical quantitation limit one

time (October 13, 1999). Heavy oil-range hydrocarbons (560 µg/L) were detected once (October 26, 2001), slightly above the MTCA criteria of 500 µg/L.

FC6—This well is located cross-gradient of the gasoline fuel dispenser. Concentrations of gasoline range-hydrocarbons, ethylbenzene, and toluene have steadily declined since the first sampling event. None of these concentrations have ever exceeded MTCA method A cleanup criteria.

FC7—This well is located downgradient of the former gasoline tank. No gasoline-range hydrocarbons or BTEX constituents were detected above the practical quantitation limits during nine quarterly sampling events.

FC8—This well is located downgradient of the former gasoline tank and fuel dispenser. Benzene (8.5 µg/L) exceeded the MTCA method A cleanup criterion (5 µg/L) when initially sampled in November 2000; concentrations decreased below the cleanup criterion for the last six sampling events (Figure 4). Xylenes and gasoline range-hydrocarbons were the only other parameters detected, but at concentrations below MTCA cleanup criteria.

FC9—This well is located downgradient of the former gasoline fuel dispenser. Diesel- (700 µg/L) and heavy oil- range hydrocarbons (3,300 µg/L) were detected above the MTCA method A cleanup criterion (500 µg/L) during initial sampling in November 2000. Ground water sampling in this well was continued for four quarters (July 2002 to April 2003) beyond the quarterly sampling conducted for wells FC1 through FC8. Diesel-range hydrocarbons were not detected above the practical quantitation limit (500 µg/L during the next 10 sampling events, but heavy oil-range concentrations have ranged from below the practical quantitation limit (400 µg/L) to a maximum of 3,300 µg/L in January 16, 2003, with no apparent trend. Based on ground water flow direction and upgradient sampling results, the source of heavy oil does not appear to be from the former USTs at Building 12.03. Push-probe sampling was conducted in the vicinity of well FC9 in September 2002 to identify a possible source of the heavy oil-range hydrocarbons. Results of probe findings are discussed later in this report. Xylenes at concentrations less than the MTCA cleanup criterion were the only other constituents detected (April and July 2001).

Push-probe Sampling Summary

Based on the ground water flow direction and location of monitoring well FC9 relative to the former Building 12.03 waste oil tank, it is unlikely that heavy oil-range hydrocarbons detected in the well were released from the tank. A phase I completed for Federal Center South was reviewed to identify other possible sources of contamination (Herrera 2001a). Aerial photographs indicated that Building 12.03 was constructed between 1946 and 1956 and that the

area west of the building was paved in the late 1950s. A history of building usage was not available, but GSA has used it as a motor pool building for fleet maintenance during the 1960s and 1970s. An historic topographic map from 1909 indicated that the project area was not developed and was part of the Duwamish River floodplain. A 1936 aerial photograph indicated no development for the project area west of Building 12.01. Aerial photographs prior to 1936 were not available for review.

Six push-probe borings were completed upgradient of monitoring well FC9 to search for a possible source of heavy oil-range hydrocarbons detected in ground water periodically during 11 sampling events. The six borings were completed to depths of 9-feet below ground surface (bgs), with temporary well screens set from 5 to 9 feet bgs. Boring locations are shown in Figure 5 and boring logs are presented in Appendix F.

The area around well FC9 was underlain by 4 to 5 feet of fill material consisting of medium sand. The fill material was underlain by dark brown to black silty sand, extending to the bottom of each boring at 9 feet. Ground water was encountered at about 6 feet bgs. In boring FC9-S2, the former ground surface was encountered at 4.5 feet bgs when organic material, black stained soil, and wood fragments were present. Fragments of red brick were encountered in boring FC9-S4 at 5 feet bgs; there was no evidence of stained soil or possible contamination sources in any of the other borings. There was no void while drilling through the brick material at FC9-54; the nearest catch basin was 70 feet to the northeast.

Soil samples collected at 5-feet bgs in each of the six borings were submitted for analysis of diesel- and heavy oil-range hydrocarbons. No diesel-range hydrocarbons were detected above practical quantitation limits in any of the six borings (Table 4). Heavy oil-range hydrocarbons were detected in borings FC9-S2, FC9-S4, and FC9-S6 at respective concentrations of 2,600 mg/kg, 100 mg/kg, and 230 mg/kg. The MTCA method A cleanup criterion for heavy oil-range hydrocarbons is 2,000 mg/kg.

Ground water samples were collected from the push-probes at FC9-S1, FC9-S2, FC9-S4, FC9-S5, and FC9-S6. No petroleum hydrocarbons were detected above practical quantitation limits based on diesel- and heavy oil-range hydrocarbon analyses (Table 5). A fuel-like odor was present at each boring when water was encountered during drilling.

It is likely that limited, spotty petroleum residues may be found in soil at the site. Residues may result from historic filling or site operations. Push-probe drilling did not indicate a substantial source of heavy oil-range hydrocarbon contamination. The stained soil identified at boring location FC9-S2 was only a few inches thick and was not present at the other five borings. Diesel- and heavy oil-range petroleum hydrocarbons were not detected in ground water from six probe samples collected upgradient of well FC9. In addition to the heavy oil concentrations periodically detected in ground water at well FC9 during seven of 11 quarterly sampling events, ground water sampling at the other eight locations with well spacings ranging from 50 to 150 feet across the approximate 1-acre site only indicated heavy oil detections above the practical quantitation limit in three wells. The detections in each of the three wells occurred once during 12 monitoring periods. Petroleum residues were not observed during installation of the nine

monitoring wells or in 14 of 15 push-probes completed during the initial site assessment in August 1998.

Statistical Analysis of Ground Water Analytical Results

During three years of ground water monitoring from July 1999 to April 2002, benzene was not detected above the practical quantitation limit in wells FC1, FC4, FC5, FC6, and FC7. Benzene also was not detected in well FC9 during seven quarters of ground water monitoring and was not detected in well FC8 during three of the past four quarterly monitoring periods. Based on these monitoring results, a statistical analysis was conducted on FC2 and FC3 analytical data generated since July 1999 to determine whether the site complies with the MTCA method A ground water cleanup standard for benzene. MTCA STAT 3.0 was used to perform the statistical analysis. Pursuant to this standard, the site is considered clean if it meets the following conditions, in accordance with MTCA cleanup regulations (WAC 173-340-720[9][e]):

- The upper confidence limit (UCL) on the mean is less than the method A ground water cleanup standard
- No single value is greater than two times the ground water cleanup standard
- Less than 10 percent of the sample concentrations shall exceed the ground water cleanup standard during a representative sampling period.

The UCL for 12 sampling events at well FC2 is 13.3 μg/L, decreasing to 5.08 μg/L over the last eight sampling events. Concentrations for the January and April 2000 sampling events were 33 μg/L and 19 μg/L, more than twice the ground water cleanup standard. However, the highest benzene concentration for the last eight sampling events was 6.3 μg/L, less than twice the MTCA method A cleanup criterion of 5 μg/L. Benzene concentrations exceeded the method A cleanup criterion in only one of the last eight sampling events; the last four events have been below 5 μg/L.

The UCL for 12 sampling events at well FC3 is 5.64 μg/L, increasing to 8.31 μg/L over the last eight sampling events. Benzene concentrations were less than the method A cleanup criterion in nine of the 12 sampling events; the highest concentration detected being 7.7 μg/L, less than twice the MTCA method A cleanup criterion of 5 μg/L. Benzene concentrations have been below the method A cleanup criterion (5 μg/L) for the last three quarterly events.

Data from wells FC2 and FC3 did not meet all three MTCA*STAT* cleanup criteria bulleted above, despite the fact that benzene concentrations in well FC2 demonstrated a downward trend and concentrations in well FC3 were stable with the highest benzene concentration at 7.7 μg/L over 12 quarterly monitoring events. Ecology was contacted to discuss alternative methods of statistical analysis focusing on developing guidance for a statistical procedure applicable to

monitored natural attenuation. Ecology's draft monitored natural attenuation spreadsheet uses the non-parametric Mann-Kendall test to determine if concentrations are increasing, decreasing, or stable (San Juan 2003). According to the Mann-Kendall test results, benzene concentrations are decreasing in well FC2 and stable in well FC3. Benzene concentrations are now at levels below the established cleanup standard and based on analysis of three years of quarterly monitoring data, it was concluded that compliance with MTCA requirements could be demonstrated.

Conclusions/Recommendations

Approximately 170 cubic yards of gasoline-, diesel-, and heavy oil-range petroleum hydrocarbon contaminated soil was removed from Federal Center South in May 1998. Additional soil excavation of gasoline-contaminated soil (350 cubic yards) was removed from around the former gasoline dispenser in April 1999. Following soil removal, seven ground water monitoring wells were installed in June 1999 and two in October 2000. Quarterly monitoring has been conducted at the site from July 1999 to April 2002.

The cleanup action taken at the site and results of ground water monitoring during 12 sampling events indicate that a standard point of compliance has been achieved for this site as defined by the MTCA ground water cleanup regulation (WAC 173-340-720[8]), based on the following site conditions:

- Two underground storage tanks and petroleum hydrocarbon contaminated soil were removed from the site, eliminating potential ongoing sources of hydrocarbon releases
- Ground water monitoring results demonstrate that no benzene contamination has been detected in samples collected from downgradient wells FC1, FC4, and FC9, indicating that contaminants have not migrated offsite
- Ground water monitoring results demonstrate that no benzene contamination has been detected above the practical quantitation limit (1 μg/L) in crossgradient wells FC5 and FC7, indicating that the plume is not expanding laterally
- Soil removal and natural attenuation have resulted in improved ground water quality downgradient of the former gasoline and diesel fuel underground storage tanks
- Benzene concentrations have been below MTCA method A cleanup criteria (5 μg/L) for the past four quarters in monitoring well FC2 and three quarters in FC3, immediately downgradient of the original source area
- Statistical analysis (Mann-Kendall) indicates a decreasing trend in benzene concentrations in well FC-2 and a stable trend in well FC-3
- The site is located within a commercial and industrial area; there are no future plans for this area to be developed into residential use; ground water in the area is not currently being used as drinking water.

- Push-probe sampling results upgradient of boring FC9 indicate that the presence of heavy oil-range hydrocarbons detected in the ground water is not the result of the two former underground storage tanks associated with Building 12.03. Two likely sources of sporadic heavy oil contamination are from imported fill and/or historic site operations.

For reasons stated above, the petroleum hydrocarbon release at Building 12.03 of the Federal Center South meets the ground water standard point of compliance requirement as defined in the MTCA cleanup regulations. Three years of ground water monitoring has demonstrated minimal to no long-term effect on ground water across the site.

Based on these results, the Federal Center South Building 12.03 site qualifies for closure according to the MTCA method A cleanup criteria. No further work is proposed at this site, and no further action is warranted. Based on WAC 173-340-720, U.S. GSA requests that no further action be required for this site.

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Figures and Tables

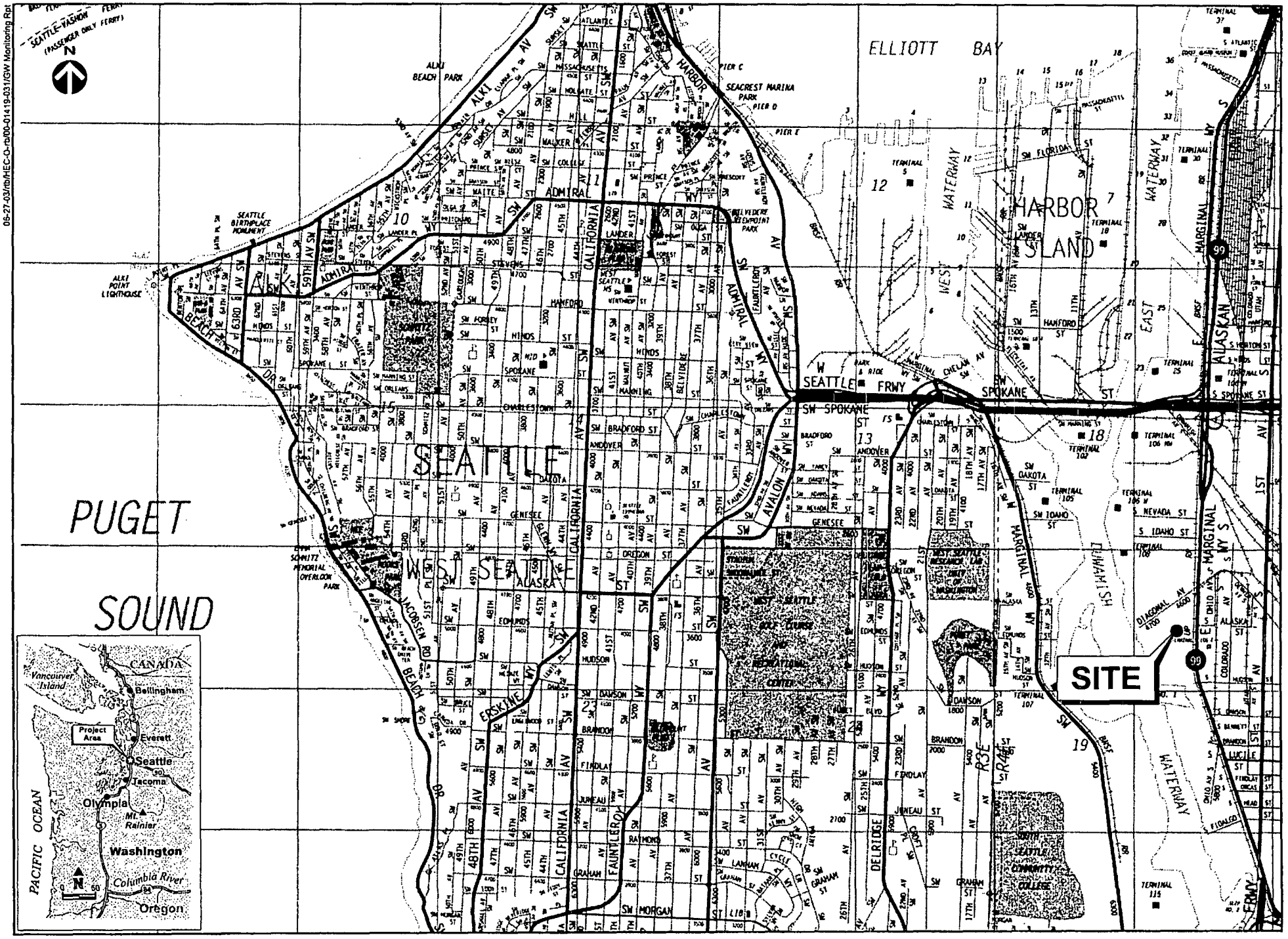

Figure 1. **Vicinity map, Federal Center South, Seattle, Washington.**

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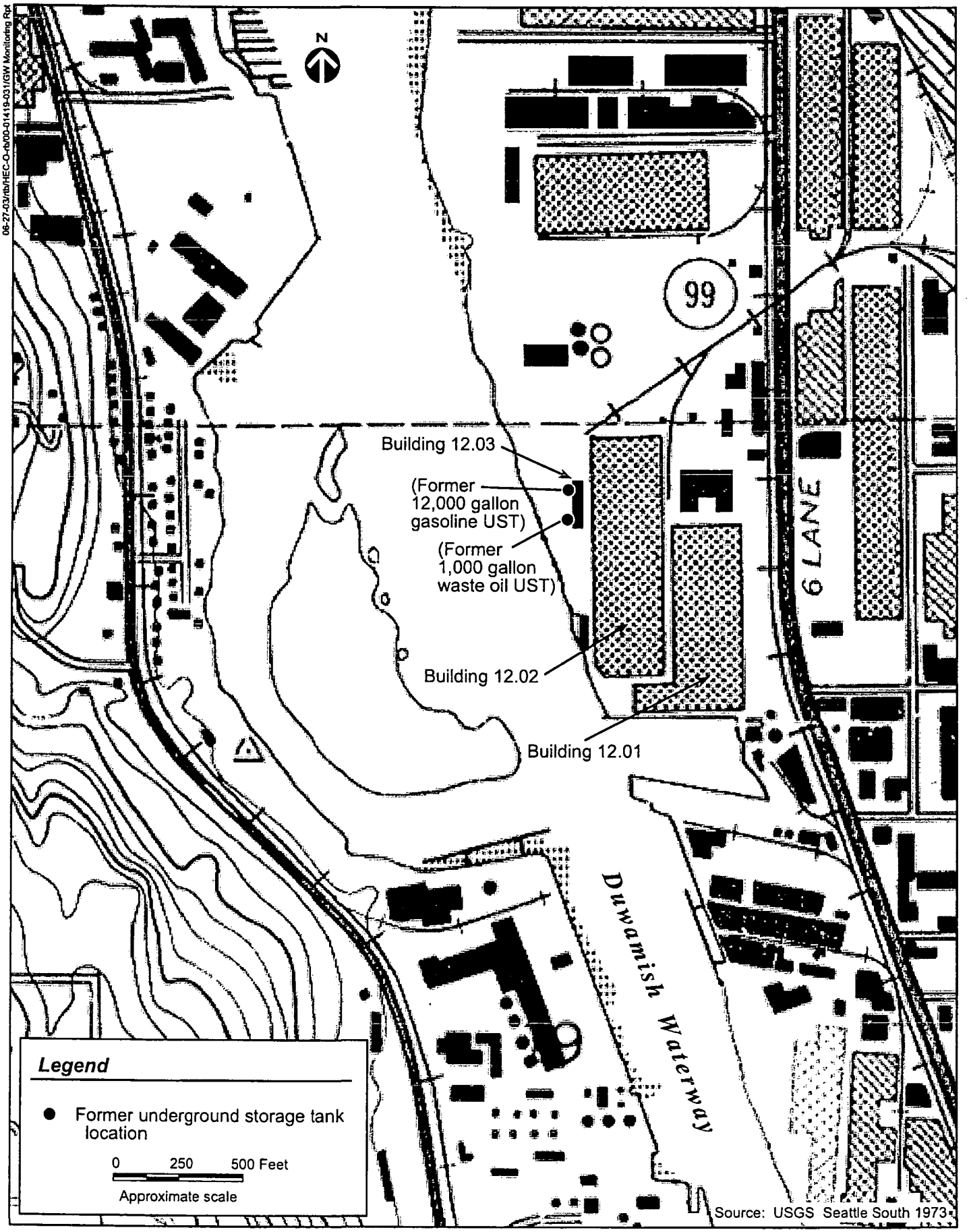

Figure 2. Site layout map, Federal Center South, Seattle, Washington.

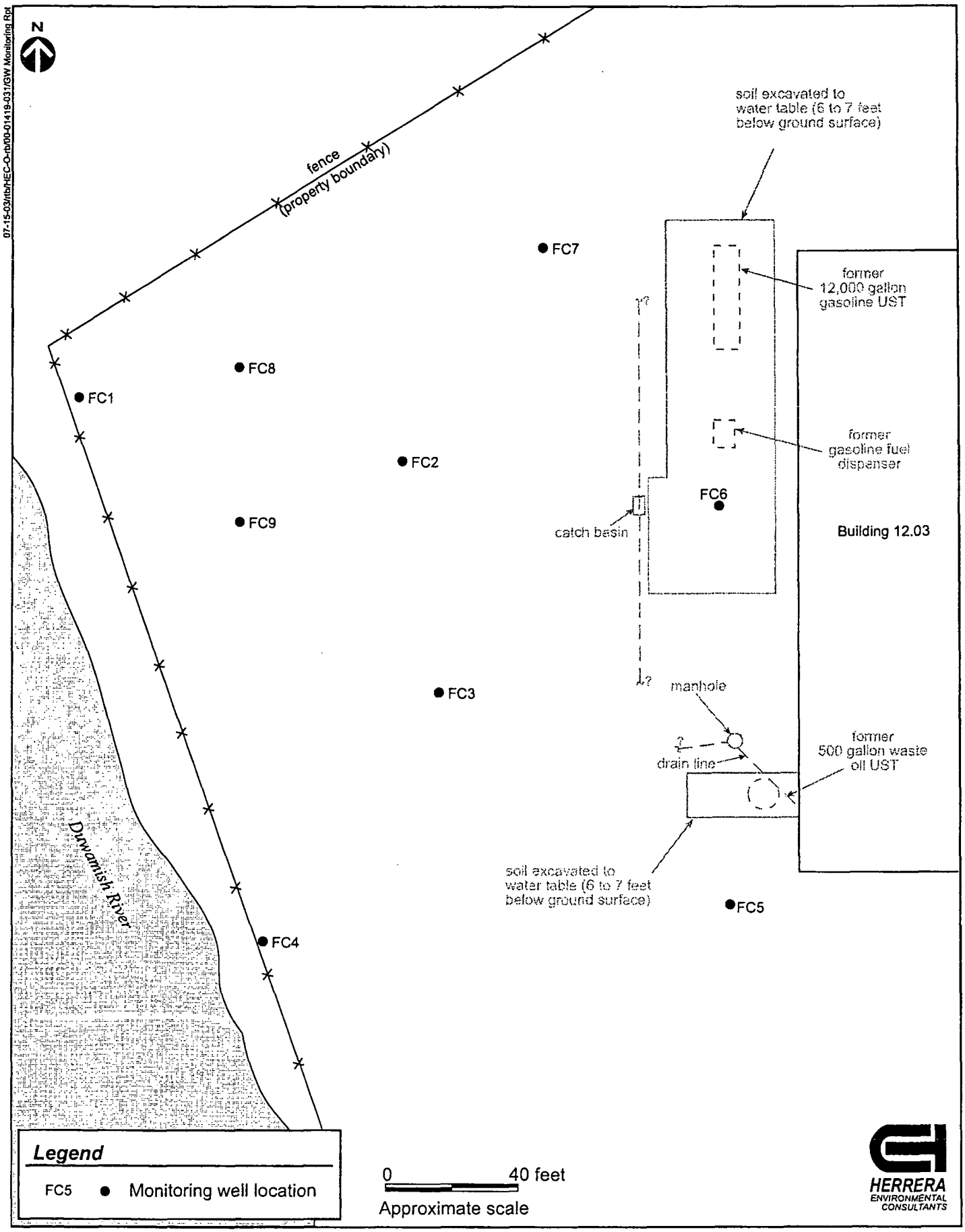

Figure 3. Monitoring well locations adjacent to building 12.03 at Federal Center South, Seattle, Washington.

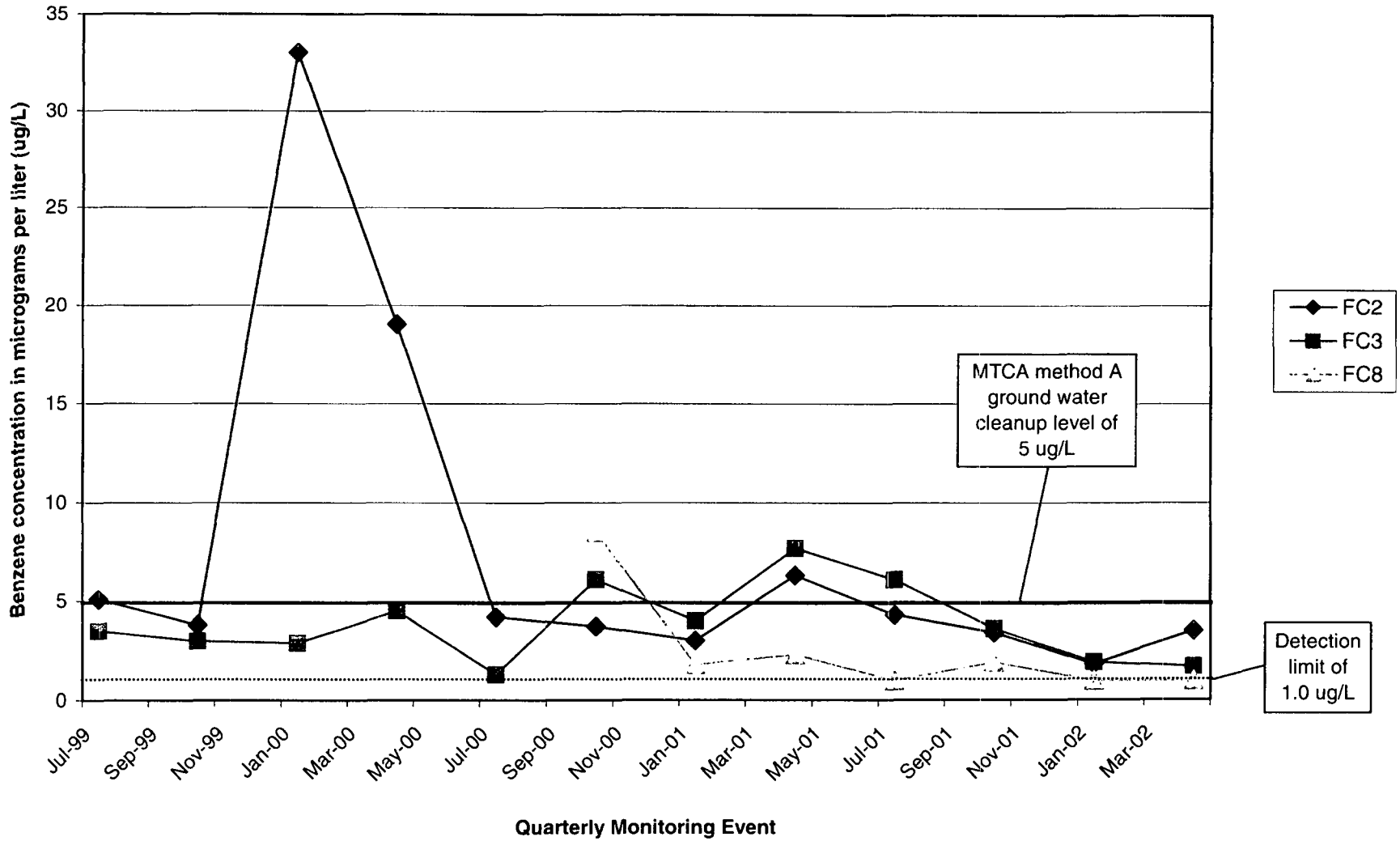

Figure 4. Trend analysis of benzene concentrations in ground water at Federal Center South, Seattle, Washington.

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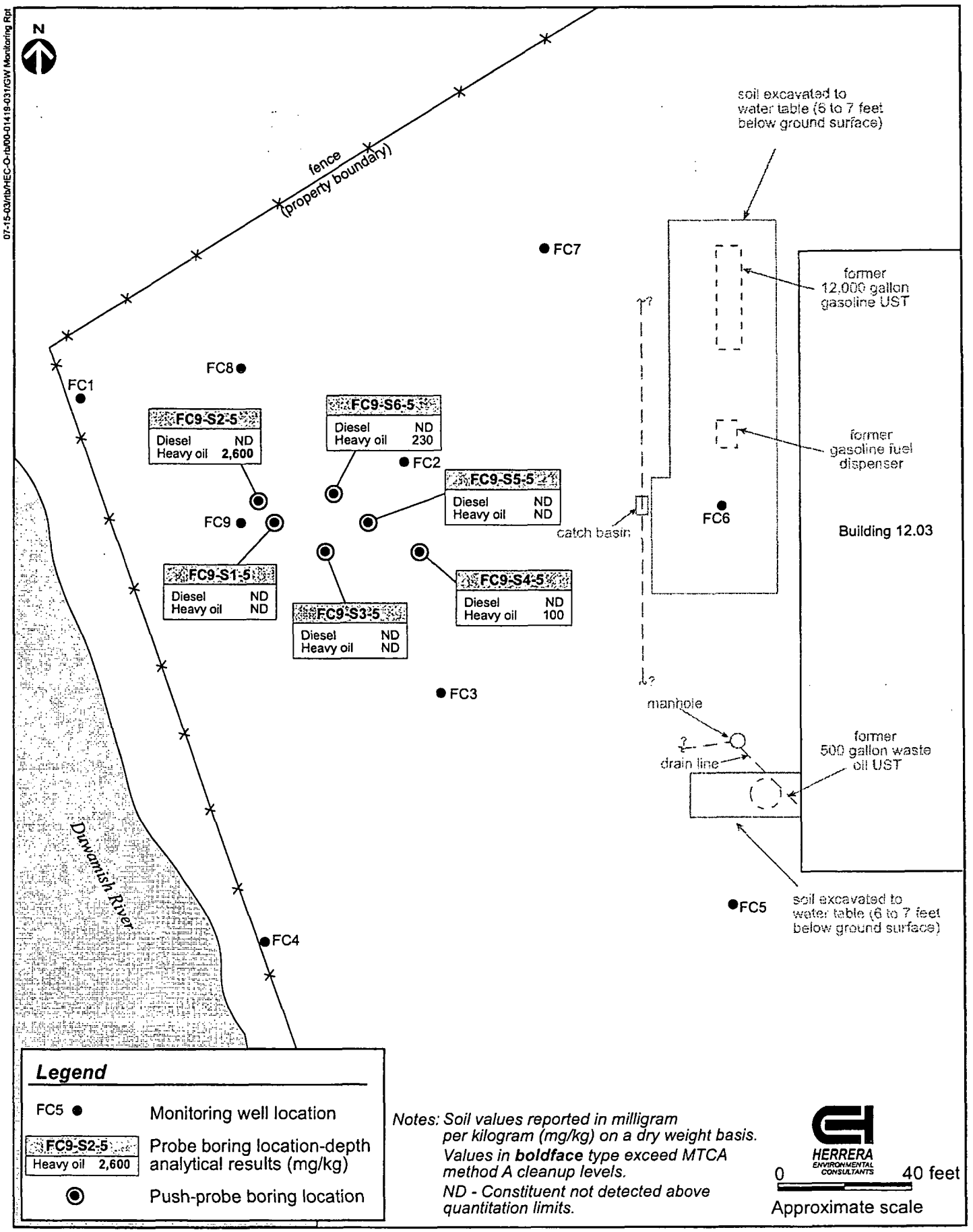


Figure 5. Push-probe boring location map and soil sampling analytical results (mg/kg), September 29, 2002, Federal Center South, Seattle, Washington.

Table 1. Summary of water level elevation data from monitoring wells at Federal Center South, Seattle, Washington.

Monitoring Well Identification	Measurement Date	Reference Point Elevation [a] (feet)	Depth to Water [b] (feet)	Water Level Elevation [c] (feet)
FC1	7/6/99	99.23	5.11	94.12
	10/13/99	99.23	4.20	95.03
	1/12/00	99.23	2.55	96.68
	4/19/00	99.23	5.62	93.61
	7/20/00	99.23	5.30	93.93
	10/26/00	99.23	5.40	93.83
	1/24/01	99.23	5.32	93.91
	4/26/01	99.23	5.44	93.79
	7/26/01	99.23	5.42	93.81
	10/25/01	99.23	5.80	93.43
	1/24/02	99.23	5.14	94.09
	4/18/02	99.23	5.67	93.56
FC2	7/6/99	100.59	5.90	94.69
	10/13/99	100.59	6.36	94.23
	1/12/00	100.59	5.45	95.14
	4/19/00	100.59	5.77	94.82
	7/20/00	100.59	6.03	94.56
	10/26/00	100.59	6.25	94.34
	1/24/01	100.59	5.84	94.75
	4/26/01	100.59	6.00	94.59
	7/26/01	100.59	6.06	94.53
	10/25/01	100.59	6.38	94.21
	1/24/02	100.59	5.27	95.32
	4/18/02	100.59	5.47	95.12
FC3	7/6/99	100.73	6.09	94.64
	10/13/99	100.73	6.56	94.17
	1/12/00	100.73	5.63	95.10
	4/19/00	100.73	5.95	94.78
	7/20/00	100.73	6.26	94.47
	10/26/00	100.73	6.43	94.30
	1/24/01	100.73	5.97	94.76
	4/26/01	100.73	6.20	94.53
	7/26/01	100.73	6.26	94.47
	10/25/01	100.73	6.55	94.18
	1/24/02	100.73	5.41	95.32
	4/18/02	100.73	5.62	95.11

Table 1. Summary of water level elevation data from monitoring wells at Federal Center South, Seattle, Washington (continued).

Monitoring Well Identification	Measurement Date	Reference Point Elevation [a] (feet)	Depth to Water [b] (feet)	Water Level Elevation [c] (feet)
FC4	7/6/99	98.65	6.05	92.60
	10/13/99	98.65	6.25	92.40
	1/12/00	98.65	4.76	93.89
	4/19/00	98.65	5.84	92.81
	7/20/00	98.65	5.87	92.78
	10/26/00	98.65	5.84	92.81
	1/24/01	98.65	5.14	93.51
	4/26/01	98.65	5.92	92.73
	7/26/01	98.65	6.08	92.57
	10/25/01	98.65	6.23	92.42
	1/24/02	98.65	5.47	93.18
	4/18/02	98.65	5.72	92.93
FC5	7/6/99	100.29	5.48	94.81
	10/13/99	100.29	6.03	94.26
	1/12/00	100.29	4.98	95.31
	4/19/00	100.29	5.34	94.95
	7/20/00	100.29	5.66	94.63
	10/26/00	100.29	5.94	94.35
	1/24/00	100.29	5.43	94.86
	4/26/01	100.29	5.50	94.79
	7/26/01	100.29	5.69	94.60
	10/25/01	100.29	5.99	94.30
	1/24/02	100.29	4.81	95.48
	4/18/02	100.29	5.03	95.26
FC6	7/6/99	99.76	4.96	94.80
	10/13/99	99.76	5.48	94.28
	1/12/00	99.76	4.49	95.27
	4/19/00	99.76	4.80	94.96
	7/20/00	99.76	5.06	94.70
	10/26/00	99.76	5.36	94.40
	1/24/01	99.76	4.93	94.83
	4/26/01	99.76	5.07	94.69
	7/26/01	99.76	5.18	94.58
	10/25/01	99.76	5.45	94.31
	1/24/02	99.76	4.18	95.58
	4/18/02	99.76	4.43	95.33

Table 1. Summary of water level elevation data from monitoring wells at Federal Center South, Seattle, Washington (continued).

Monitoring Well Identification	Measurement Date	Reference Point Elevation [a] (feet)	Depth to Water [b] (feet)	Water Level Elevation [c] (feet)
FC7	7/6/99	100.00	5.18	94.82
	10/13/99	100.00	5.75	94.25
	1/12/00	100.00	4.75	95.25
	4/19/00	100.00	5.07	94.93
	7/20/00	100.00	5.41	94.59
	10/26/00	100.00	5.59	94.41
	1/24/01	100.00	5.18	94.82
	4/26/01	100.00	5.34	94.66
	7/26/01	100.00	5.40	94.60
	10/25/01	100.00	-	-
	1/24/02	100.00	4.52	95.48
	4/18/02	100.00	4.69	95.31
FC8	10/26/00	100.80	5.82	94.98
	1/24/01	100.80	6.13	93.87
	4/26/01	100.80	6.31	94.49
	7/26/01	100.80	6.33	94.47
	10/25/01	100.80	6.62	94.18
	1/24/02	100.80	5.68	95.12
	4/18/02	100.80	5.84	94.96
FC9	10/26/00	100.10	6.49	93.61
	1/24/01	100.10	5.37	94.73
	4/26/01	100.10	5.57	94.53
	7/26/01	100.10	5.65	94.45
	10/25/01	100.10	5.88	94.22
	1/24/02	100.10	4.85	95.25
	4/18/02	100.10	5.03	95.07
	7/18/02	100.10	5.51	94.59
	10/17/02	100.10	6.05	94.05
	1/16/03	100.10	4.84	95.26
	4/17/03	100.10	4.89	95.21

[a] Elevations of reference points (top of well casing) were surveyed relative to a temporary datum with assigned value of 100.00 feet.
[b] Depth to water measurements were taken from reference point marks on top of PVC well casing.
[c] Relative to top of casing reference points.

Table 2. Summary of petroleum hydrocarbons and BTEX results of ground water samples collected quarterly on July 6, 1999 through April 17, 2003 from monitoring wells at Federal Center South (µg/L).

Sample Identification (Sample Date)		Gasoline Range Hydrocarbons	Diesel Range Hydrocarbons	Heavy Oil Range Hydrocarbons	Benzene	Toluene	Ethylbenzene	Xylenes
MTCA method A cleanup level [a]		*1,000/800* [b]	*500*	*500*	*5*	*1,000*	*700*	*1,000*
FC1-1	(7/6/99)	ND (100)	NA	NA	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC1-2	(10/13/99)	ND (100)	NA	NA	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC1-3	(1/12/00)	ND (100)	NA	NA	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC1-4	(4/19/00)	ND (100)	NA	NA	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC1-5	(7/20/00)	ND (100)	NA	NA	ND (1.0)	12	ND (1.0)	1.0
FC1-6	(10/26/00)	ND (100)	NA	NA	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC1-7	(1/24/01)	ND (100)	ND (250)	ND (500)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC1-8	(4/26/01)	ND (100)	NA	NA	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC1-9	(7/26/01)	ND (100)	NA	NA	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC1-10	(10/25/01)	ND (100)	NA	NA	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC1-11	(1/24/02)	ND (100)	NA	NA	ND (1.0)	ND (1.0)	ND (1.0)	1.0
FC1-12	(4/18/02)	ND (100)	NA	NA	ND (1.0)	ND (1.0)	ND (1.0)	2.4
FC2-1	(7/6/99)	**820**	NA	NA	**5.1**	12	91	175
FC2-2	(10/13/99)	**2,700**	NA	NA	3.8	4.4	360	633
FC2-3	(1/12/00)	**1,300**	NA	NA	**33**	1.2	6.5	101
FC2-4	(4/19/00)	**1,200**	NA	NA	**19**	ND (1.0)	ND (1.0)	43
FC2-5	(7/20/00)	470	NA	NA	4.2	ND (1.0)	ND (1.0)	13
FC2-6	(10/26/00)	200	NA	NA	3.7	ND (1.0)	ND (1.0)	4.3
FC2-7	(1/24/01)	ND (100)	ND (250)	ND (500)	3.0	ND (1.0)	ND (1.0)	ND (1.0)
FC2-8	(4/26/01)	130	NA	NA	**6.3**	ND (1.0)	ND (1.0)	2.1
FC2-9	(7/26/01)	ND (100)	NA	NA	4.3	ND (1.0)	ND (1.0)	1.7
FC2-10	(10/25/01)	110	NA	NA	3.4	ND (1.0)	ND (1.0)	1.3
FC2-11	(1/24/02)	ND (100)	NA	NA	1.8	ND (1.0)	ND (1.0)	1.3
FC2-12	(4/18/02)	140	NA	NA	3.5	1.4	ND (1.0)	2.1
FC3-1	(7/6/99)	ND (100)	ND (250)	ND (500)	3.5	ND (1.0)	ND (1.0)	ND (1.0)
FC3-2	(10/13/99)	ND (100)	ND (250)	ND (500)	3.0	ND (1.0)	ND (1.0)	ND (1.0)
FC3-3	(1/12/00)	ND (100)	390	**630**	2.9	ND (1.0)	ND (1.0)	ND (1.0)
FC3-4	(4/19/00)	ND (100)	ND (250)	ND (500)	4.5	ND (1.0)	ND (1.0)	ND (1.0)
FC3-5	(7/20/00)	ND (100)	ND (250)	ND (500)	1.3	ND (1.0)	ND (1.0)	ND (1.0)
FC3-6	(10/26/00)	ND (100)	ND (250)	ND (500)	**6.1**	ND (1.0)	ND (1.0)	ND (1.0)
FC3-7	(1/24/01)	ND (100)	ND (250)	ND (500)	4.0	ND (1.0)	ND (1.0)	ND (1.0)
FC3-8	(4/26/01)	ND (100)	ND (250)	ND (500)	**7.7**	ND (1.0)	ND (1.0)	ND (1.0)
FC3-9	(7/26/01)	ND (100)	ND (250)	ND (500)	**6.1**	ND (1.0)	ND (1.0)	ND (1.0)
FC3-10	(10/25/01)	ND (100)	ND (250)	ND (500)	3.6	ND (1.0)	ND (1.0)	ND (1.0)
FC3-11	(1/24/02)	ND (100)	ND (250)	ND (500)	1.9	ND (1.0)	ND (1.0)	ND (1.0)
FC3-12	(4/18/02)	ND (100)	ND (250)	ND (400)	1.7	ND (1.0)	ND (1.0)	ND (1.0)

Table 2. Summary of petroleum hydrocarbons and BTEX results of ground water samples collected quarterly on July 6, 1999 through April 17, 2003 from monitoring wells at Federal Center South (µg/L) (continued).

Sample Identification (Sample Date)		Gasoline Range Hydrocarbons	Diesel Range Hydrocarbons	Heavy Oil Range Hydrocarbons	Benzene	Toluene	Ethylbenzene	Xylenes
FC4-1	(7/6/99)	ND (100)	ND (250)	**520**	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC4-2	(10/13/99)	ND (100)	ND (250)	ND (500)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC4-3	(1/12/00)	ND (100)	**890**	ND (500)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC4-4a	(4/19/00)	ND (100)	ND (250)	ND (500)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC4-4b	(4/19/00)	ND (100)	ND (250)	ND (500)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC4-5	(7/26/00)	ND (100)	ND (250)	ND (500)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC4-6	(10/26/00)	ND (100)	ND (250)	ND (500)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC4-7	(1/24/01)	ND (100)	ND (250)	ND (500)	ND (1.0)	1.7	ND (1.0)	1.4
FC4-8	(4/26/01)	ND (100)	ND (250)	ND (500)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC4-9	(7/26/01)	ND (100)	ND (250)	ND (500)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC4-10	(10/25/01)	ND (100)	ND (250)	ND (500)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC4-11	(1/24/02)	ND (100)	ND (250)	ND (500)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC4-12	(4/18/02)	ND (100)	ND (250)	ND (400)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC5-1	(7/6/99)	ND (100)	ND (250)	ND (500)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC5-2	(10/13/99)	ND (100)	ND (250)	ND (500)	1.0	ND (1.0)	ND (1.0)	ND (1.0)
FC5-3	(1/12/00)	ND (100)	ND (250)	ND (500)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC5-4	(4/19/00)	ND (100)	ND (250)	ND (500)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC5-5	(7/20/00)	ND (100)	ND (250)	ND (500)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC5-6	(10/26/00)	ND (100)	250	**560**	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC5-7	(1/24/01)	ND (100)	ND (250)	ND (500)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC5-8	(4/26/01)	ND (100)	ND (250)	ND (500)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC5-9	(7/26/01)	ND (100)	ND (250)	ND (500)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC5-10	(10/25/01)	ND (100)	ND (250)	ND (500)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC5-11	(1/24/02)	ND (100)	ND (250)	ND (500)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC5-12	(4/18/02)	ND (100)	ND (250)	ND (400)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC6-1	(7/6/99)	500	NA	NA	ND (1.0)	ND (1.0)	19	9.4
FC6-2	(10/13/99)	ND (100)	NA	NA	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC6-3	(1/12/00)	230	NA	NA	ND (1.0)	ND (1.0)	3.4	ND (1.0)
FC6-4	(4/19/00)	240	NA	NA	ND (1.0)	ND (1.0)	2.4	ND (1.0)
FC6-5	(7/20/00)	160	NA	NA	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC6-6	(10/26/00)	140	NA	NA	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC6-7	(1/24/01)	ND (100)	ND (250)	ND (500)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC6-8	(4/26/01)	110	NA	NA	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC6-9	(7/26/01)	ND (100)	NA	NA	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC6-10	(10/25/01)	ND (100)	NA	NA	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC6-11	(1/24/02)	ND (100)	NA	NA	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC6-12	(4/18/02)	ND (100)	NA	NA	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)

Table 2. Summary of petroleum hydrocarbons and BTEX results of ground water samples collected quarterly on July 6, 1999 through April 17, 2003 from monitoring wells at Federal Center South (µg/L) (continued).

Sample Identification (Sample Date)		Gasoline Range Hydrocarbons	Diesel Range Hydrocarbons	Heavy Oil Range Hydrocarbons	Benzene	Toluene	Ethylbenzene	Xylenes
FC7-1	(7/6/99)	ND (100)	NA	NA	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC7-2	(10/13/99)	ND (100)	NA	NA	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC7-3	(1/12/00)	ND (100)	NA	NA	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC7-4	(4/19/00)	ND (100)	NA	NA	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC7-5	(7/20/00)	ND (100)	NA	NA	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC7-6	(10/26/00)	ND (100)	NA	NA	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC7-7	(1/24/01)	ND (100)	ND (250)	ND (500)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC7-8	(4/26/01)	ND (100)	NA	NA	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC7-12	(4/18/02)	ND (100)	NA	NA	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC8-6	(10/26/00)	140	NA	NA	**8.5**	(1.0)	(1.0)	5.2
FC8-7	(1/24/01)	ND (100)	ND (250)	ND (500)	1.8	(1.0)	(1.0)	3.9
FC8-8	(4/26/01)	ND (100)	NA	NA	2.3	(1.0)	(1.0)	3.1
FC8-9	(7/26/01)	ND (100)	NA	NA	ND (1.0)	ND (1.0)	ND (1.0)	3.3
FC8-10	(10/25/01)	ND (100)	NA	NA	1.9	ND (1.0)	ND (1.0)	1.7
FC8-11	(1/24/02)	ND (100)	NA	NA	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC8-12	(4/18/02)	ND (100)	NA	NA	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC9-6	(10/26/00)	ND (100)	**700**	**3,300**	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC9-7	(1/24/01)	ND (100)	ND (250)	**700**	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC9-8	(4/26/01)	ND (100)	ND (250)	ND (500)	ND (1.0)	ND (1.0)	ND (1.0)	1.3
FC9-9	(7/26/01)	ND (100)	ND (250)	**1,200**	ND (1.0)	ND (1.0)	ND (1.0)	1.4
FC9-10	(10/25/01)	ND (100)	ND (250)	**1,100**	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC9-11	(1/24/02)	ND (100)	ND (250)	**1,900**	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC9-12	(4/18/02)	ND (100)	ND (250)	ND (400)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
FC9-13	(7/18/02)	NA	ND (250)	460	NA	NA	NA	NA
FC9-14	(10/17/02)	NA	ND (250)	ND (400)	NA	NA	NA	NA
FC9-15	(1/16/03)	NA	ND (250)	**3,300**	NA	NA	NA	NA
FC9-16	(4/17/03)	NA	ND (250)	ND (400)	NA	NA	NA	NA

[a] MTCA—Model Toxics Control Act cleanup regulation (Ecology 2001).
[b] Higher concentration 1,000 µg/L applies if no benzene is present in ground water.
Quarterly monitoring continued only at well FC9 from July 18, 2002 through April 17, 2003.
Concentrations exceeding MTCA method A cleanup levels are shown in **boldface** type.
(1.0) Indicates constituent not found above the enclosed practical quantitation limit.
NA Not analyzed.

Table 3. Summary of field parameters measured during quarterly ground water sampling from July 6, 1999 through April 17, 2003, Federal Center South, Seattle, Washington.

Sample Identification	Date Collected	pH	Specific Conductance (µmhos/cm)	Temperature °C
FC1-1	7/6/99	6.40	7,350	18.1
FC1-2	10/13/99	7.44	1,675	13.9
FC1-3	1/12/00	6.72	7,630	5.6
FC1-4	4/19/00	6.34	1,858	13.1
FC1-5	7/20/00	6.49	5,710	18.0
FC1-6	10/26/00	6.33	8,620	13.7
FC1-7	1/24/01	6.36	6,570	10.8
FC1-8	4/26/01	6.22	2,460	12.8
FC1-9	7/26/01	6.13	4,601	18.2
FC1-10	10/25/01	6.29	3,620	15.1
FC1-11	1/24/02	5.97	1,620	11.4
FC1-12	4/18/02	-	-	-
FC2-1	7/6/99	6.41	1,703	18.5
FC2-2	10/13/99	6.30	2,210	18.4
FC2-3	1/12/00	6.06	947	11.8
FC2-4	4/19/00	6.53	815	13.2
FC2-5	7/20/00	6.67	831	18.7
FC2-6	10/26/00	6.55	1,001	17.0
FC2-7	1/24/01	6.64	796	12.1
FC2-8	4/26/01	6.37	866	13.6
FC2-9	7/26/01	6.42	899	18.9
FC2-10	10/25/01	6.32	868	18.4
FC2-11	1/24/02	6.05	548	12.1
FC2-12	4/18/02	6.27	610	12.7
FC3-1	7/6/99	6.85	3,460	17.8
FC3-2	10/13/99	6.97	2,410	17.2
FC3-3	1/12/00	6.53	1,867	12.3
FC3-4	4/19/00	6.78	1,764	13.1
FC3-5	7/20/00	6.84	1,211	17.2
FC3-6	10/26/00	6.82	1,838	17.4
FC3-7	1/24/01	6.91	1,536	12.8
FC3-8	4/26/01	6.38	1,208	13.6
FC3-9	7/26/01	6.58	1,795	17.9
FC3-10	10/25/01	6.62	1,537	16.7
FC3-11	1/24/02	6.25	1,015	11.7
FC3-12	4/18/02	6.63	1,065	12.6

Table 3. Summary of field parameters measured during quarterly ground water sampling from July 6, 1999 through April 17, 2003, Federal Center South, Seattle, Washington (continued).

Sample Identification	Date Collected	pH	Specific Conductance (μmhos/cm)	Temperature °C
FC4-1	7/6/99	6.84	1,550	16.9
FC4-2	10/13/99	6.70	1,513	16.8
FC4-3	1/12/00	6.29	415	9.4
FC4-4	4/19/00	6.97	1,038	11.5
FC4-5	7/20/00	6.58	1,211	15.3
FC4-6	10/26/00	6.64	996	16.5
FC4-7	1/24/01	6.81	1,411	9.9
FC4-8	4/26/01	6.36	1,061	13.3
FC4-9	7/26/01	6.50	775	17.0
FC4-10	10/25/01	6.24	1,015	15.7
FC4-11	1/24/02	6.27	684	11.7
FC4-12	4/18/02	6.55	512	12.5
FC5-1	7/6/99	6.45	1,179	18.8
FC5-2	10/13/99	6.47	813	19.7
FC5-3	1/12/00	6.06	715	12.3
FC5-4	4/19/00	6.42	662	12.5
FC5-5	7/20/00	6.47	811	19.0
FC5-6	10/26/00	6.47	742	18.0
FC5-7	1/24/01	6.41	708	12.6
FC5-8	4/26/01	6.16	786	13.5
FC5-9	7/26/01	6.36	768	18.6
FC5-10	10/25/01	6.14	753	19.4
FC5-11	1/24/02	6.14	972	12.4
FC5-12	4/18/02	6.19	860	12.5
FC6-1	7/6/99	6.41	2,380	20.1
FC6-2	10/13/99	6.62	1,452	19.6
FC6-3	1/12/00	6.16	847	11.9
FC6-4	4/19/00	6.64	1,146	14.1
FC6-5	7/20/00	6.30	656	22.0
FC6-6	10/26/00	6.56	926	17.8
FC6-7	1/24/01	6.63	1,620	12.9
FC6-8	4/26/01	6.29	1,245	14.7
FC6-9	7/26/01	6.55	811	20.9
FC6-10	10/25/01	6.37	789	18.9
FC6-11	1/24/02	6.32	987	12.7
FC6-12	4/18/02	6.00	3,580	114.4

Table 3. Summary of field parameters measured during quarterly ground water sampling from July 6, 1999 through April 17, 2003, Federal Center South, Seattle, Washington (continued).

Sample Identification	Date Collected	pH	Specific Conductance (µmhos/cm)	Temperature °C
FC7-1	7/6/99	6.32	839	18.5
FC7-2	10/13/99	6.33	680	18.8
FC7-3	1/12/00	6.06	422	11.7
FC7-4	4/19/00	6.12	587	13.6
FC7-5	7/20/00	6.27	610	19.5
FC7-6	10/26/00	6.28	522	18.2
FC7-7	1/24/01	6.24	587	13.1
FC7-8	4/26/01	6.01	510	14.2
FC7-12	4/18/02	6.08	523	13.5
FC8-6	10/26/00	6.36	1,025	17.1
FC8-7	1/24/01	6.46	905	13.2
FC8-8	4/26/01	6.30	709	13.9
FC8-9	7/26/01	6.32	645	19.7
FC8-10	10/25/01	6.08	747	19.1
FC8-11	1/24/02	6.03	626	12.6
FC8-12	4/18/02	6.29	487	12.8
FC9-6	10/26/00	6.44	2,010	17.4
FC9-7	1/24/01	6.61	1,186	12.8
FC9-8	4/26/01	6.20	1,184	14.1
FC9-9	7/26/01	6.46	1,263	19.6
FC9-10	10/25/01	6.26	1,065	18.7
FC9-11	1/24/02	6.07	807	12.5
FC9-12	4/18/02	6.16	961	13.2
FC9-13	7/18/02	7.00	1,290	18.8
FC9-14	10/17/02	6.49	1,183	19.3
FC9-15	1/16/03	6.34	547	13.6
FC9-16	4/17/03	6.67	673	14.0

Quarterly monitoring continued only at well FC9 from July 18, 2002 through April 17, 2003.

Table 4. Summary of push-probe soil sampling (mg/kg), in vicinity of monitoring well FC9, September 29, 2002, Federal Center South, Seattle, Washington.

Sample Identification	Diesel Range Hydrocarbons	Heavy Oil Range Hydrocarbons
MTCA method A cleanup level [a]	*2,000*	*2,000*
FC9-S1-5	ND (31)	ND (62)
FC9-S2-5	ND (32)	**2,600**
FC9-S3-5	ND (27)	ND (53)
FC9-S4-5	ND (27)	100
FC9-S5-5	ND (27)	ND (53)
FC9-S6-5	ND (26)	230

Values reported in mg/kg dry weight basis
ND – Constituent not detected (detection limit).
[a] MTCA – Model Toxics Control Act cleanup regulation (Ecology 2001)
Concentrations exceeding MTCA method A cleanup levels are shown in **boldface** type.
Analytical method: NWTPH-Dx for diesel and heavy oil range hydrocarbons.

Table 5. Summary of push-probe ground water sampling (mg/L), in vicinity of monitoring well FC9, September 29, 2002, Federal Center South, Seattle, Washington.

Sample Identification	Diesel Range Hydrocarbons	Heavy Oil Range Hydrocarbons
MTCA method A cleanup level [a]	*500*	*500*
FC9-S1W	ND (0.25)	ND (0.40)
FC9-S2W	ND (0.25)	ND (0.40)
FC9-S3W	NA	NA
FC9-S4W	ND (0.25)	ND (0.40)
FC9-S5W	ND (0.26)	ND (0.41)
FC9-S6W	ND (0.26)	ND (0.41)

ND – Constituent not detected (detection limit).
NA – Not analyzed.
[a] MTCA – Model Toxics Control Act cleanup regulation (Ecology 2001)
Analytical method: NWTPH-Dx for diesel and heavy oil range hydrocarbons

APPENDIX A

Field Procedures

Field Procedures

This appendix documents the procedures used to perform the field investigations described in this report. The discussion includes information on the following subjects:

- Soil and water sample collection
- Drilling and soil sampling via push-probe drilling method
- Ground water sampling procedures
- Sample jars, sample handling, and chain-of-custody procedures
- Field equipment decontamination procedures
- Investigation-derived waste disposal.

These procedures are presented in the following sections.

Sample Designation

Ground water monitoring samples were designated by a four-digit alphanumeric system referencing the general site location and a number denoting the sampling event from which the samples were collected. For example:

- FC4-1 denotes the ground water sample collected at Federal Center South monitoring well location 4, collected during sampling event 1 on July 6, 1999.

Push-probe boring samples were collected to identify a potential source of contamination adjacent to well FC9. Soil and ground water samples were designated by a six-digit alphanumeric system referencing well FC9 and the boring number and sample collection depth. For example:

- FC9-S1-5 denotes the soil sample collected from probe boring S1 located near well FC9 at a depth of 5 feet.

- FC9-S6W denotes a ground water sample collected from probe boring S6 located near well FC9.

Sampling Procedures

Ground Water Sampling from Monitoring Wells

General procedures for collecting ground water samples from wells were as follows:

1. The well monument cover was removed and the condition of the well and surrounding area was observed. Observations were noted in the field notebook and well sampling log. The well casing plug was unlocked and removed.

2. Using an electronic water level meter, the depth to ground water was measured to the nearest 0.01 feet. Measurements were recorded relative to the surveyed reference mark at the top of the PVC well casing. Date, time, and measurements were recorded in the field notebook and well sampling log.

3. The well was purged of standing water using a dedicated disposable high-density polyethylene bailer attached to clean nylon twine that was lowered into the well to the screened interval. During purging, pH, water temperature, and specific conductivity were measured. The amount of water purged, field measurements, and time of collection were recorded in the field notebook and well sampling log. The well was purged until field readings had stabilized, with a minimum of three casing volumes of standing water removed prior to sampling. Purged water removed during development was contained in 55-gallon drums temporarily stored onsite along the fence near well FC-1.

4. Following purging, samples were collected using the same dedicated disposable bailer used to purge the well. Samples were collected by gently lowering the bailer into the well, retrieving the bailer to the surface, and pouring the contents of the bailer directly into sample containers provided by the analytical laboratory. Care was taken to ensure that no bubbles or headspace were present. Containers were securely capped, labeled, and placed into a chilled cooler for storage prior to delivery to the laboratory. The date and time of each sample collected was recorded in the field notebook, well sampling log, and on the chain-of-custody form.

5. The well casing plug was replaced and locked, and the well monument cover was secured.

Soil-Sampling from Push-Probe Borings

Six borings were drilled using the push-drive probe equipment for soil sampling purposes (FC9-S1 through FC9-S6; Figure 5). Probe borings were advanced using a probe-drive sampler attached to driven probe rods. All six borings were drilled to nine feet bgs. During drilling, discrete soil samples for soil classification, field screening, and chemical analysis were collected continuously at 2-foot intervals using a probe-drive sampler 2 feet long by 2 inches outside diameter. The sampler was sealed with a piston stop pin while being pushed or driven to the desired sampling depth. The piston stop pin was retracted into the sampler while the sampler

was pushed or driven to obtain a soil sample. Following retrieval, the split-spoon sampler was opened and the lexan liner was cut to expose the soil core. Each soil core sample was logged by a geologist for soil lithologies and field-screened for indications of contamination. Soil encountered during drilling was visually classified in accordance with the Unified Soil Classification System (USCS; American Society for Testing and Materials [ASTM] D2488-90). Pertinent geologic and hydrogeologic subsurface conditions were recorded on soil probe boring logs (Appendix F).

Soil samples selected for chemical analysis were prepared by removing the soil from the sampler, with placement into jars provided by the analytical laboratory. Each sample was uniquely labeled denoting the sample identification number and sample depth interval, date and time sampled, and job number. Soil samples were then placed in a chilled cooler for storage prior to delivery to the analytical laboratory. Soil samples collected at the 5- to 6-foot depth interval from all six probe borings (FC9-S1 through FC9-S6) were submitted to the laboratory for chemical analysis.

After drilling and sampling of soil and/or ground water from each probe boring location, boreholes were backfilled from the bottom to the ground surface with bentonite chips.

Ground Water Sampling from Push Probes

In-situ ground water samples were collected from six probe-drilled boring locations. The method for sampling ground water from probe-drilled borings consisted of driving a sealed stainless steel screened well point to the desired depth, opening the screen, and obtaining a water sample via dedicated tubing and peristaltic pump at the surface. Ideally the 4-foot long screen was placed to straddle the water table. Depth to water was determined by the field geologist based on observation of the moisture content in soil samples collected at each probe boring location. General procedures for collecting ground water samples from probe-drilled borings were as follows:

1. The screened well point sampler assembly was attached to the probe rods by the driller. The screened well point sampler was then driven down below the water table using the same probe hole used to collect soil samples.

2. The screened well point sampler was then pushed out from its enclosed sheath into the formation at the desired depth.

3. Flexible polyethylene tubing was threaded through the probe rods down to the screened well point sampler. Water from the screened interval was pumped up to the surface using a peristaltic pump. The screened interval was developed by purging approximately one gallon of water.

4. Samples were collected after development was completed. Samples were collected directly from the tubing into sample containers provided by the analytical laboratory. Immediately upon filling, each container was securely capped, labeled, and placed into a chilled cooler for storage prior to delivery to the analytical laboratory. The date and time of each sample collected was recorded in the field notebook and on the chain-of-custody form.

The tubing used for purging and sampling ground water from the screened well point sampler was pulled out and disposed of with other incidental waste (e.g. used nitrile gloves, paper towels). The screened well point sampler components were decontaminated between each probe boring following the procedures described below.

Survey Locations and Elevations

A scaled site map was drawn, including locations of all wells, probe-borings, and other site features, based on a site map provided by GSA. Well locations and other site features were located by measuring distances from reference points using a measuring tape. Distance measurements for the well locations and site features were plotted on the base site map.

Survey elevations of the reference mark on top of each well casing were collected following well installation using an auto leveler, tripod, and a level rod with graduations in feet and decimals. Wellhead elevations were measured and calculated to the nearest 0.01 foot and recorded in the field notebook. The wellhead reference mark at well location FC-7 was used as a temporary benchmark with assigned elevation of 100.00 feet.

Decontamination Procedures

Decontamination was performed on all sampling equipment potentially exposed to contaminated soil and ground water at the completion of each probe boring. In addition, chemical-resistant gloves worn by sample handlers were changed between sampling locations.

Decontamination of Soil and Water Sampling Equipment

The following decontamination procedure was used for soil and water sampling equipment, including push-drive probe rods, push-probe drive sampler, and screened well point samplers:

- Rinse with tap water
- Scrub with water and Alconox detergent
- Rinse with tap water
- Rinse with de-ionized water
- Air dry.

Sample Handling

All samples collected during this investigation were handled according to the procedures described in this section.

Sample Containers and Labeling

Samples were placed in containers supplied by the analytical laboratory appropriate for the analyses to be performed. Sample container labels were completed at the time of collection using a permanent waterproof pen or marker. Sample labels included the following information:

- Project name
- Sample identification (including site designation, sample number, and depth interval collected)
- Date and time of collection
- Initials of sampling personnel
- General analysis to be performed.

Sample Storage

Immediately following sample collection, sample containers were placed into a chilled cooler for storage prior to delivery to the analytical laboratory. Care was taken to ensure that sample holding times were not exceeded during periods of storage.

Chain of Custody

Following collection, sample information was recorded on a chain-of-custody form. The purpose of this record is to account for the possession (or custody) of each sample from the time it is collected until laboratory testing and reporting is complete. The signature of each person in possession of the samples must be recorded on the chain-of-custody form. Information recorded on the chain-of-custody record included the following:

- Project name and location
- Project number
- Names of project manager and sampling personnel
- Sample identification
- Sample matrix
- Date and time of collection (for each sample)
- Analysis requested (for each sample)

- Number of sample containers (for each sample)
- Signature, date, and time (for each person releasing or accepting sample custody).

Sample Shipment and Delivery

Samples collected during this investigation were sent by courier to the analytical laboratory.

Sample Documentation

All sampling activities during this investigation were documented in a dedicated field notebook. The notebook was labeled with the project name, project identification number, dates of field activities, and name of the field coordinator. All relevant activities were recorded in the field notebook during the period of the field investigation. Entries into the field notebook were made in permanent ink. Corrections were made by placing a single line through the original entry accompanied by the initials of the person entering the correction. At a minimum, information in the field notebook included:

- Date and atmospheric conditions
- Major activities to be performed
- Names of sampling personnel present (including subcontractors)
- Time of arrival at site, set-up, sample collection, and completion at each sample station
- General condition of sampling area
- Any unusual events or occurrences.

Disposal of Investigation-Derived Waste

All wastes generated during this investigation were disposed of according to regulatory requirements.

Disposal of Incidental Trash

Incidental trash generated during this investigation (including discarded gloves, paper towels, disposable bailers, and food packaging) was placed in plastic trash bags and disposed of as solid waste into a dumpster adjacent to Building 12.03 at Federal Center South in Seattle, Washington.

Decontamination Fluids and Purge Water Disposal

Decontamination fluids and purge water generated during sampling activities were secured in 55-gallon drums and stored adjacent to the fence along the western property boundary near monitoring well FC-1. Based on approval from King County Industrial Waste division, the water was discharged into a sink located inside Building 12.01.

APPENDIX B

Water Level Contour Maps

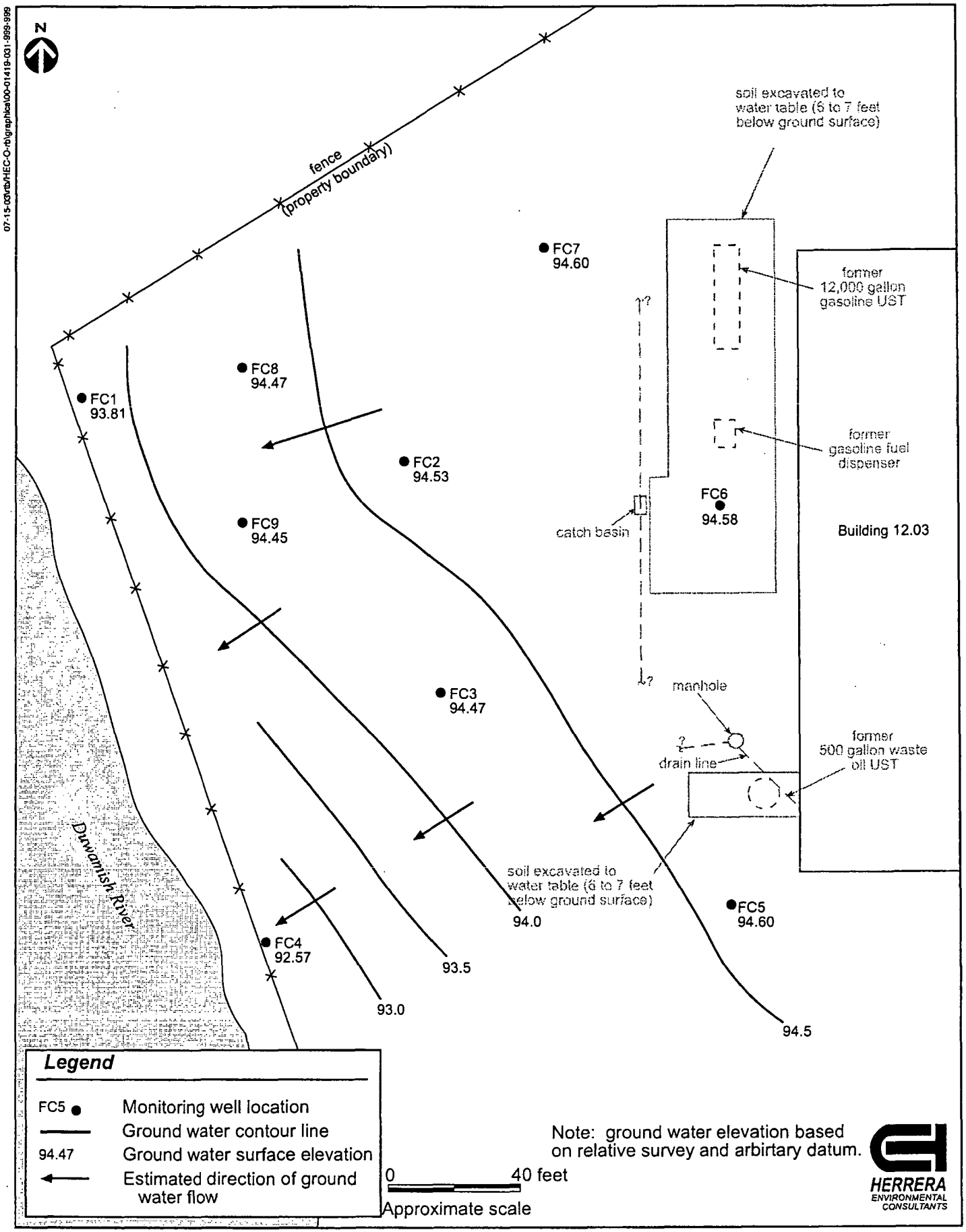


Figure B-1. Water level contour map, July 26, 2001, Federal Center South, Seattle, Washington.

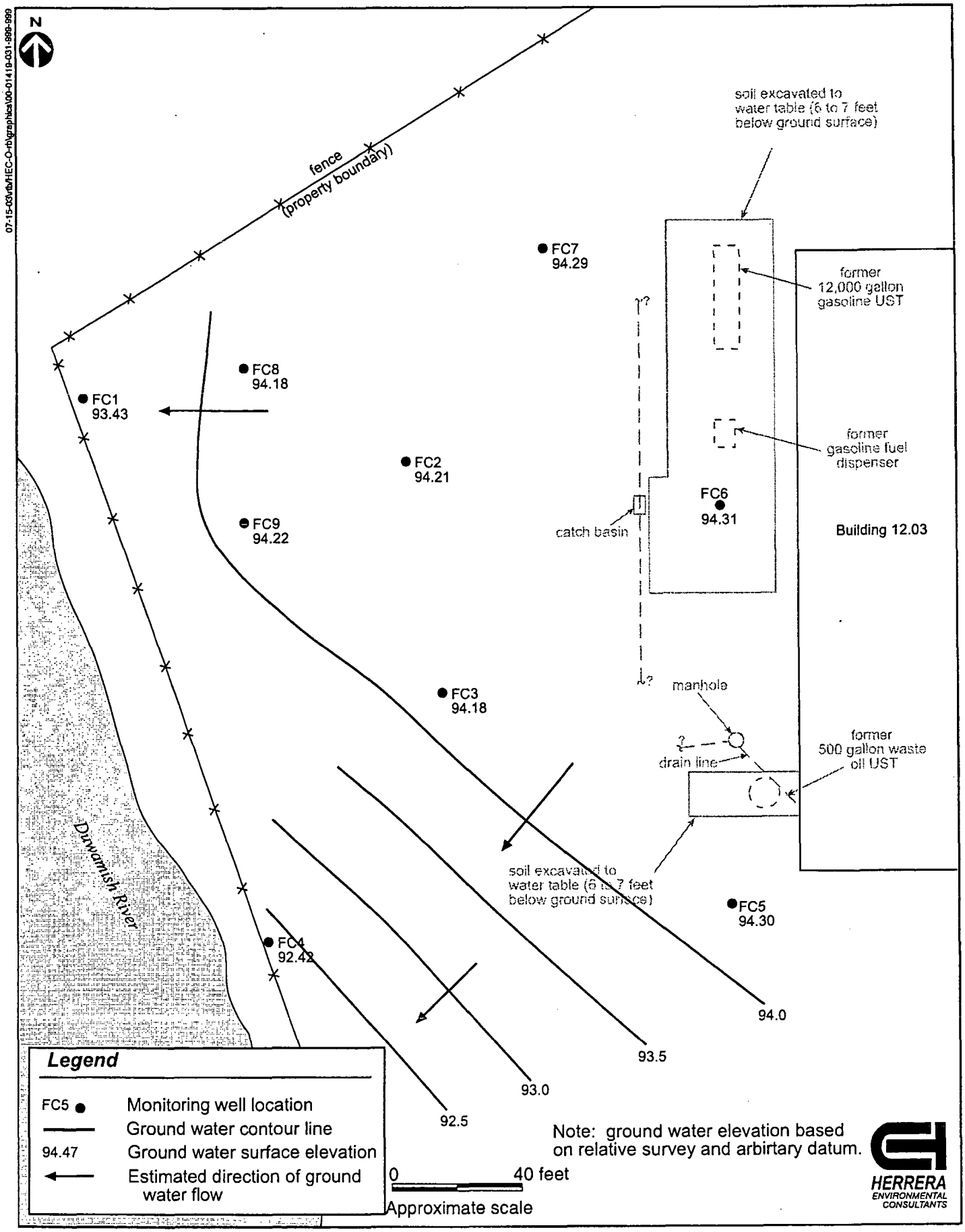


Figure B-2. Water level contour map, October 25, 2001, Federal Center South, Seattle, Washington.

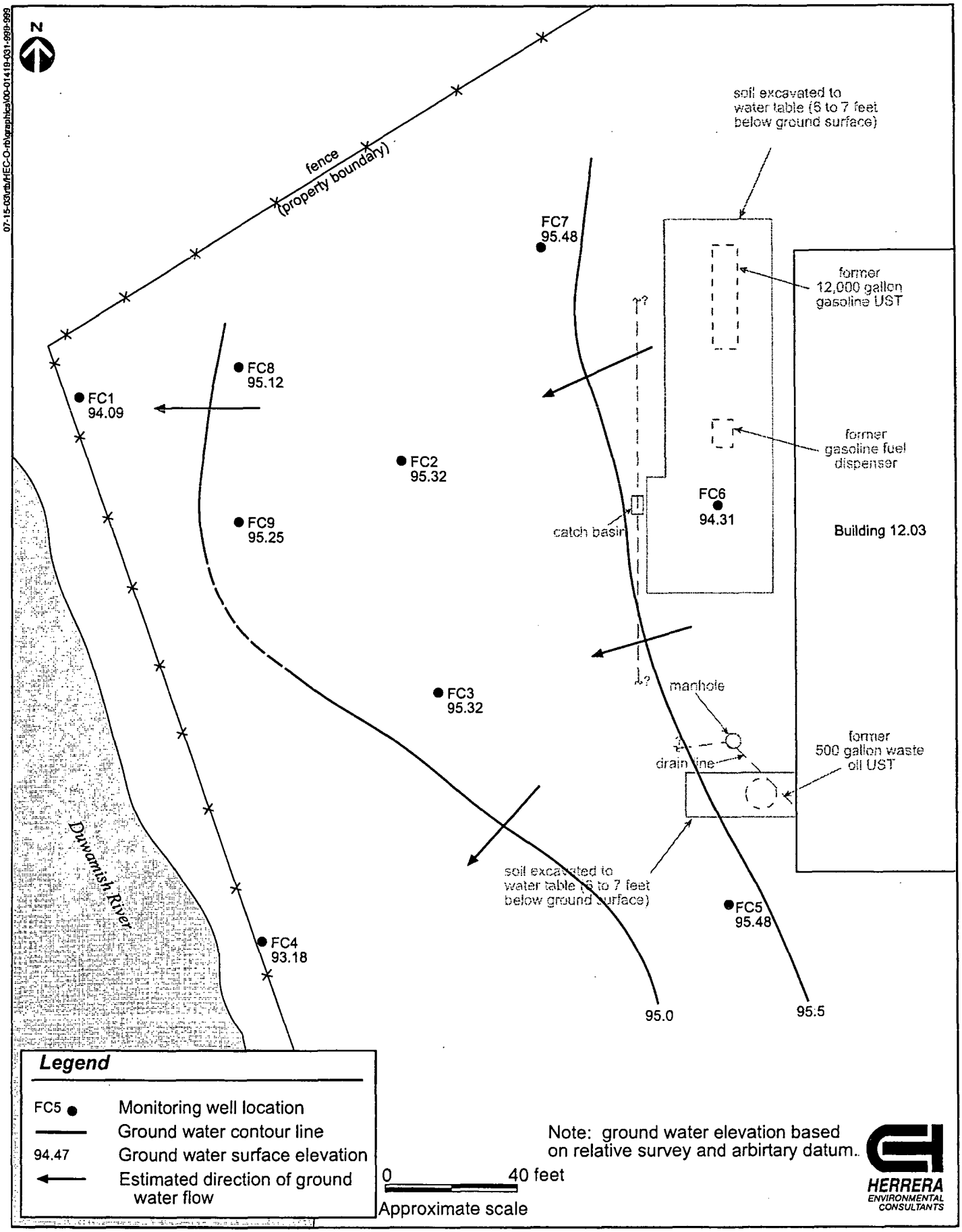


Figure B-3. Water level contour map, January 24, 2002, Federal Center South, Seattle, Washington.

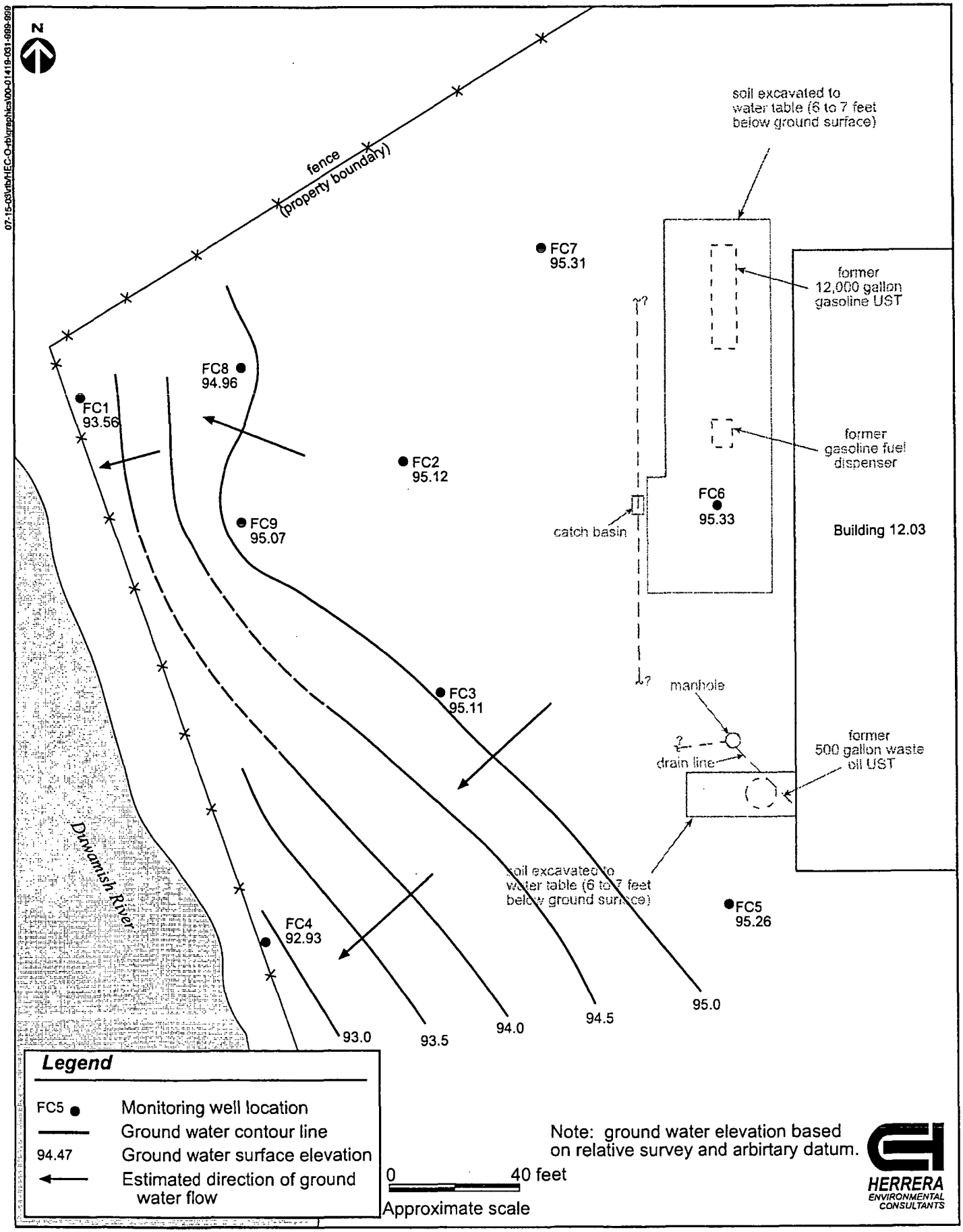


Figure B-4. Water level contour map, April 18, 2002, Federal Center South, Seattle, Washington.

APPENDIX C

Tidal Fluctuation Data

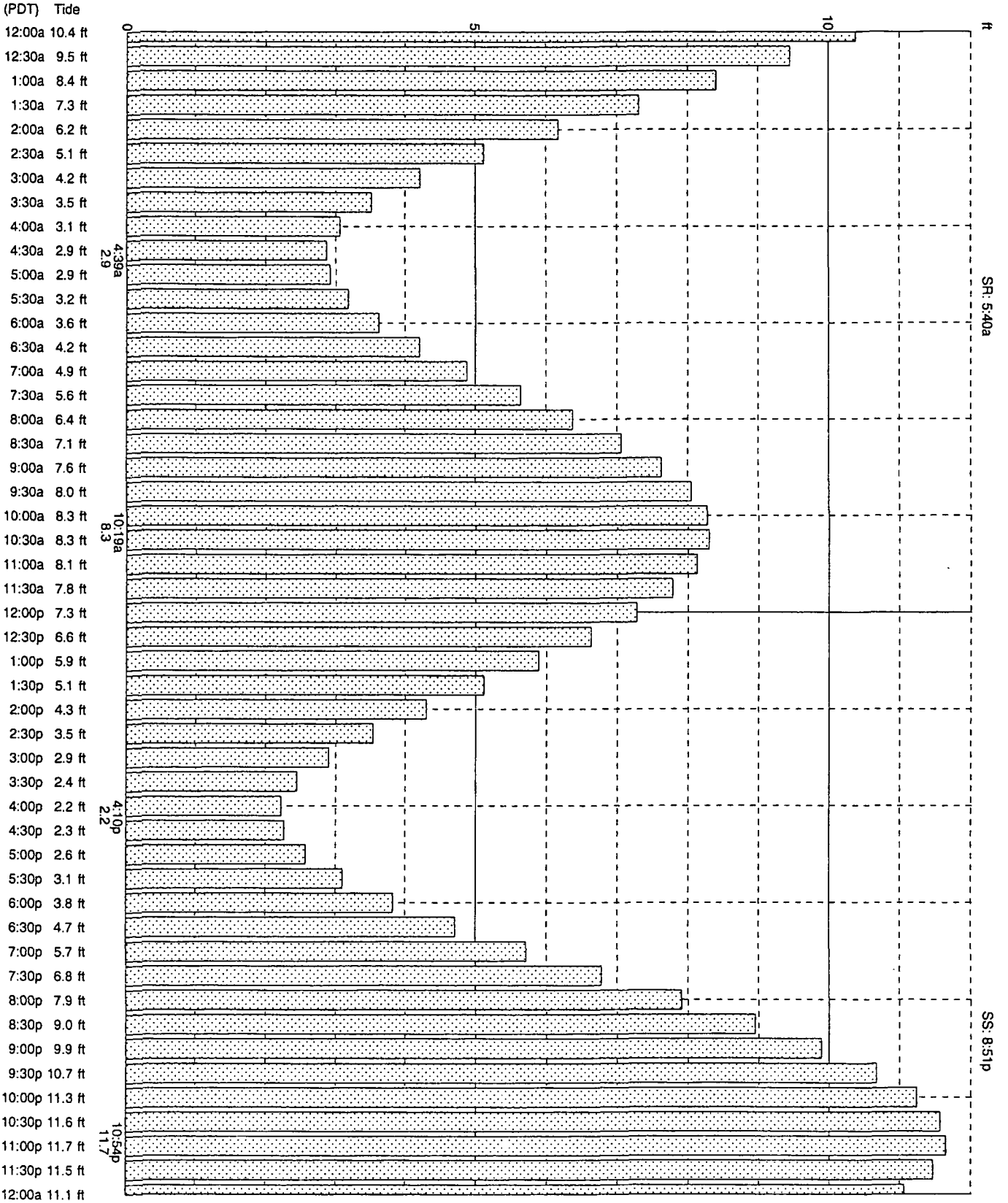
Tides-Duwamish Waterway, Eighth Ave. South

based on Seattle, Washington (NOAA)
47° 32.10 N 122° 19.30 W

Thursday, July 26, 2001

Average Tides	
Mean Range:	7.5 ft
MHHW:	11.1 ft
Mean Tide:	6.4 ft

Daily Highs & Lows		
4:39a	2.9 ft	Low
10:19a	8.3 ft	High
4:10p	2.2 ft	Low
10:54p	11.7 ft	High



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Tides-Duwamish Waterway, Eighth Ave. South

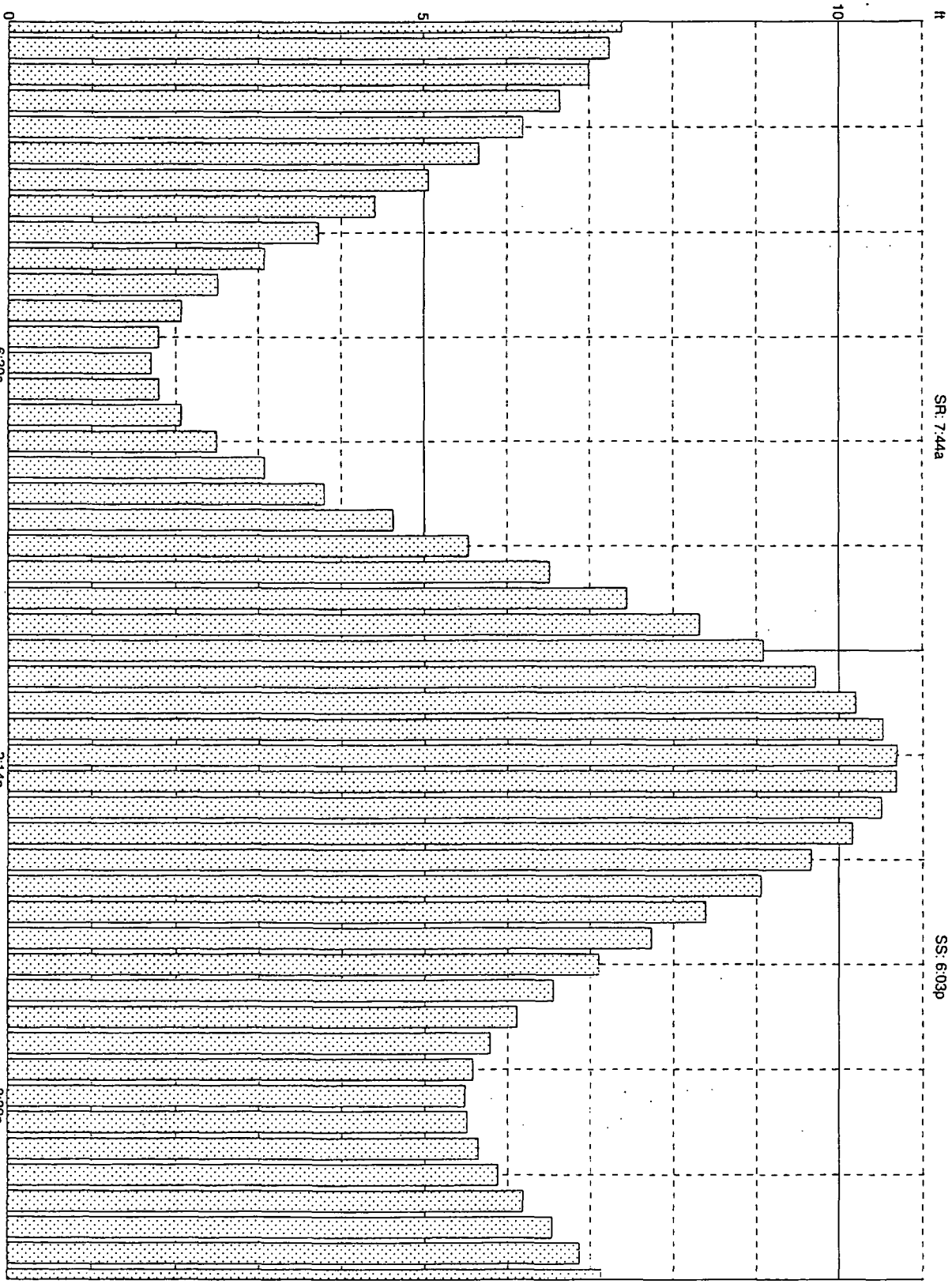
based on Seattle, Washington (NOAA)
47° 32.10 N 122° 19.30 W

Thursday, October 25, 2001

Average Tides
Mean Range: 7.5 ft
MHHW: 11.1 ft
Mean Tide: 6.4 ft

Daily Highs & Lows
6:30a 1.7 ft Low
2:14p 10.7 ft High
8:39p 5.5 ft Low

(PDT)	Tide
12:00a	7.4 ft
12:30a	7.2 ft
1:00a	7.0 ft
1:30a	6.6 ft
2:00a	6.2 ft
2:30a	5.7 ft
3:00a	5.1 ft
3:30a	4.4 ft
4:00a	3.7 ft
4:30a	3.1 ft
5:00a	2.5 ft
5:30a	2.1 ft
6:00a	1.8 ft
6:30a	1.7 ft
7:00a	1.8 ft
7:30a	2.1 ft
8:00a	2.5 ft
8:30a	3.1 ft
9:00a	3.8 ft
9:30a	4.6 ft
10:00a	5.5 ft
10:30a	6.5 ft
11:00a	7.5 ft
11:30a	8.3 ft
12:00p	9.1 ft
12:30p	9.7 ft
1:00p	10.2 ft
1:30p	10.5 ft
2:00p	10.7 ft
2:30p	10.7 ft
3:00p	10.5 ft
3:30p	10.2 ft
4:00p	9.7 ft
4:30p	9.1 ft
5:00p	8.4 ft
5:30p	7.7 ft
6:00p	7.1 ft
6:30p	6.6 ft
7:00p	6.1 ft
7:30p	5.8 ft
8:00p	5.6 ft
8:30p	5.5 ft
9:00p	5.5 ft
9:30p	5.6 ft
10:00p	5.9 ft
10:30p	6.2 ft
11:00p	6.5 ft
11:30p	6.9 ft
12:00a	7.1 ft



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Tides-Duwamish Waterway, Eighth Ave. South

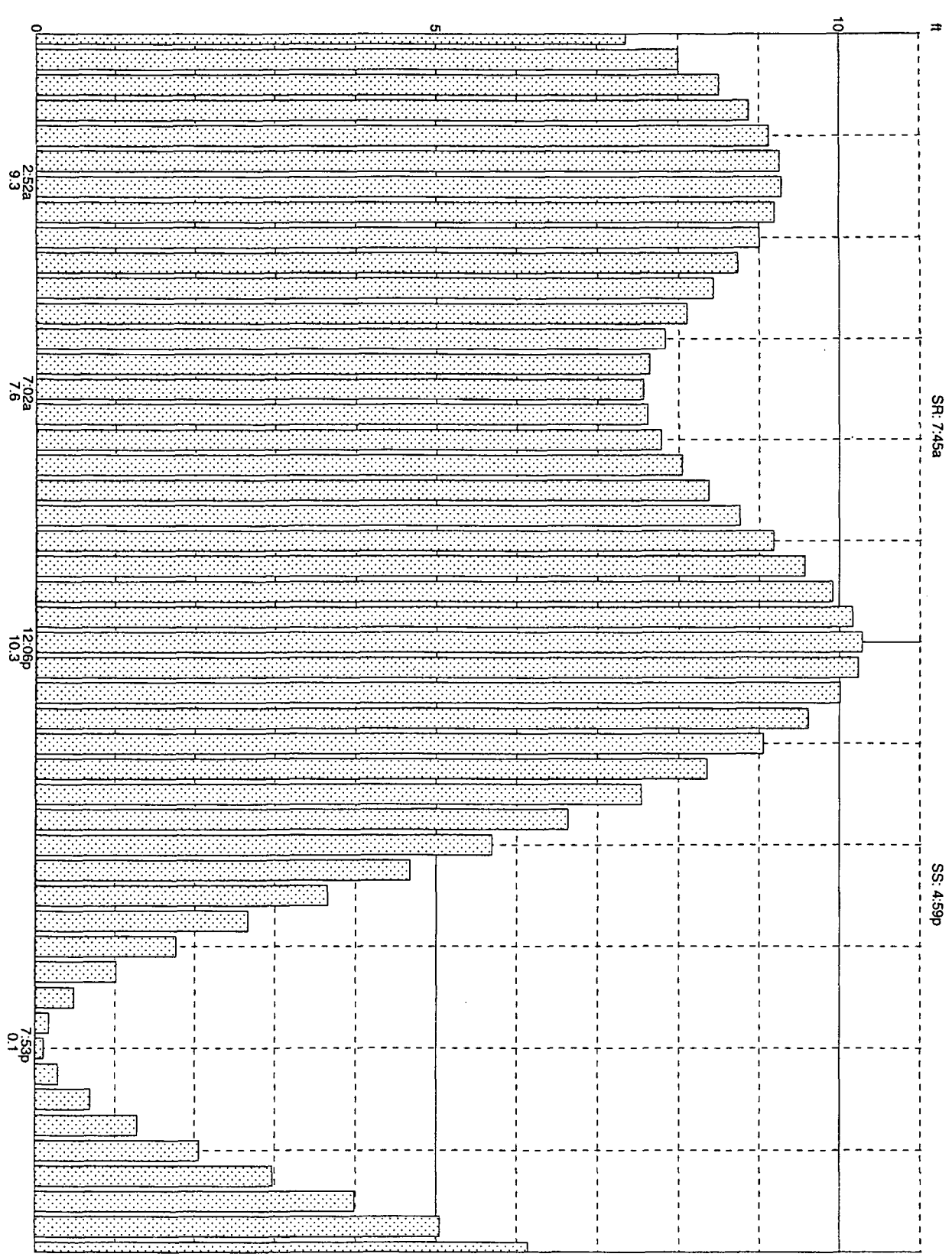
based on Seattle, Washington (NOAA)
47° 32.10 N 122° 19.30 W

Thursday, January 24, 2002

Average Tides
Mean Range: 7.5 ft
MHHW: 11.1 ft
Mean Tide: 6.4 ft

Daily Highs & Lows
2:52a 9.3 ft High
7:02a 7.6 ft Low
12:06p 10.3 ft High
7:53p 0.1 ft Low

(PST)	Tide
12:00a	7.4 ft
12:30a	8.0 ft
1:00a	8.5 ft
1:30a	8.9 ft
2:00a	9.1 ft
2:30a	9.3 ft
3:00a	9.3 ft
3:30a	9.2 ft
4:00a	9.0 ft
4:30a	8.7 ft
5:00a	8.4 ft
5:30a	8.1 ft
6:00a	7.8 ft
6:30a	7.6 ft
7:00a	7.6 ft
7:30a	7.6 ft
8:00a	7.8 ft
8:30a	8.0 ft
9:00a	8.4 ft
9:30a	8.8 ft
10:00a	9.2 ft
10:30a	9.6 ft
11:00a	9.9 ft
11:30a	10.2 ft
12:00p	10.3 ft
12:30p	10.2 ft
1:00p	10.0 ft
1:30p	9.6 ft
2:00p	9.0 ft
2:30p	8.4 ft
3:00p	7.5 ft
3:30p	6.6 ft
4:00p	5.7 ft
4:30p	4.7 ft
5:00p	3.7 ft
5:30p	2.7 ft
6:00p	1.8 ft
6:30p	1.0 ft
7:00p	0.5 ft
7:30p	0.2 ft
8:00p	0.1 ft
8:30p	0.3 ft
9:00p	0.7 ft
9:30p	1.3 ft
10:00p	2.1 ft
10:30p	3.0 ft
11:00p	4.0 ft
11:30p	5.0 ft
12:00a	6.1 ft



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Tides-Duwamish Waterway, Eighth Ave. South

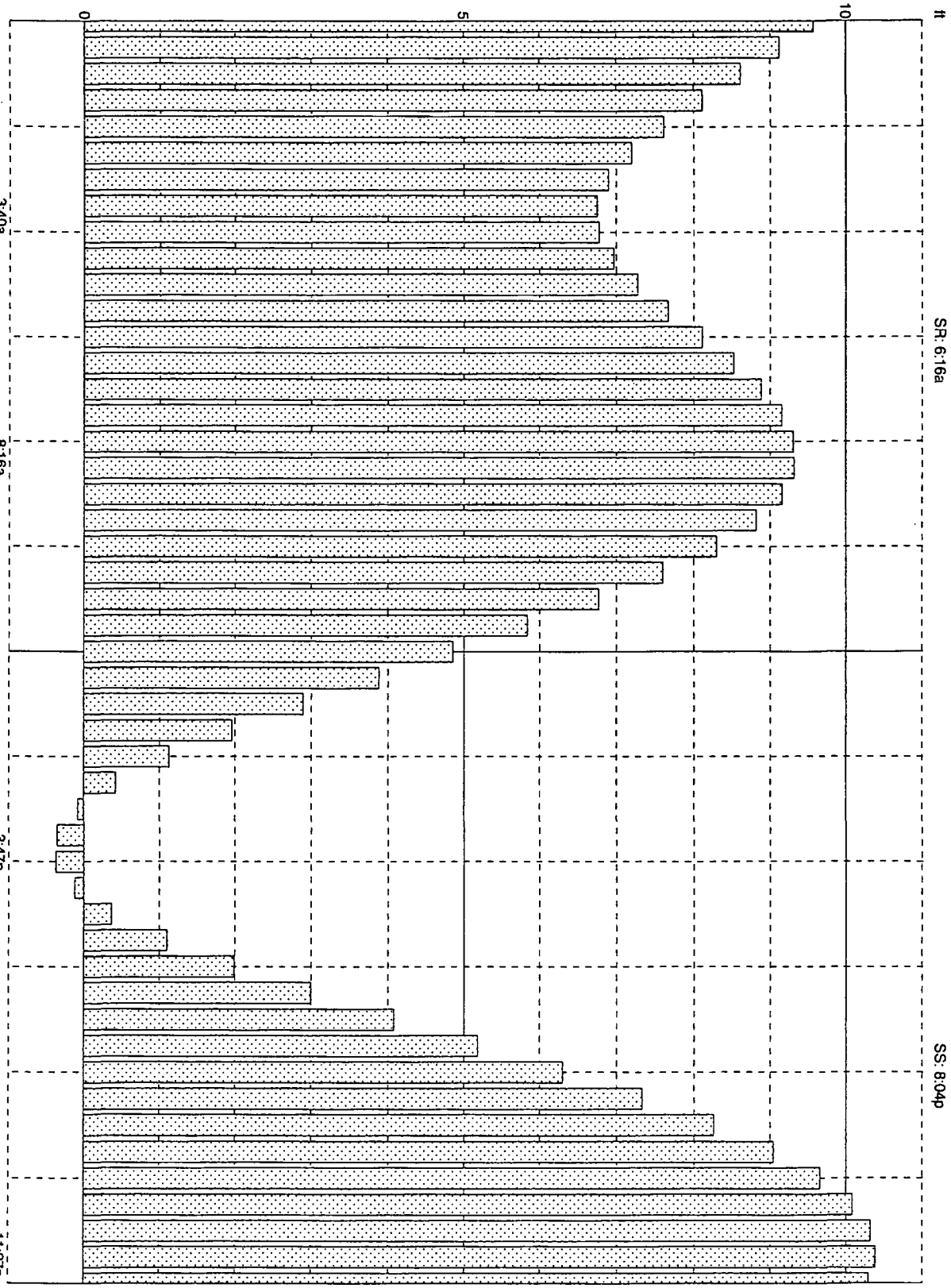
based on Seattle, Washington (NOAA)
47° 32.10 N 122° 19.30 W

Thursday, April 18, 2002

Average Tides
Mean Range: 7.5 ft
MHHW: 11.1 ft
Mean Tide: 6.4 ft

Daily Highs & Lows
3:40a 6.7 ft Low
8:16a 9.3 ft High
3:47p -0.4 ft Low
11:27p 10.4 ft High

(PDT)	Tide
12:00a	9.6 ft
12:30a	9.1 ft
1:00a	8.6 ft
1:30a	8.1 ft
2:00a	7.6 ft
2:30a	7.2 ft
3:00a	6.9 ft
3:30a	6.8 ft
4:00a	6.8 ft
4:30a	7.0 ft
5:00a	7.3 ft
5:30a	7.7 ft
6:00a	8.1 ft
6:30a	8.5 ft
7:00a	8.9 ft
7:30a	9.2 ft
8:00a	9.3 ft
8:30a	9.3 ft
9:00a	9.2 ft
9:30a	8.8 ft
10:00a	8.3 ft
10:30a	7.6 ft
11:00a	6.8 ft
11:30a	5.8 ft
12:00p	4.9 ft
12:30p	3.9 ft
1:00p	2.9 ft
1:30p	2.0 ft
2:00p	1.1 ft
2:30p	0.4 ft
3:00p	-0.1 ft
3:30p	-0.4 ft
4:00p	-0.4 ft
4:30p	-0.1 ft
5:00p	0.4 ft
5:30p	1.1 ft
6:00p	2.0 ft
6:30p	3.0 ft
7:00p	4.1 ft
7:30p	5.2 ft
8:00p	6.3 ft
8:30p	7.3 ft
9:00p	8.3 ft
9:30p	9.0 ft
10:00p	9.7 ft
10:30p	10.1 ft
11:00p	10.3 ft
11:30p	10.4 ft
12:00a	10.3 ft



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APPENDIX D

Data Quality Assurance Review

Data Quality Assurance Review

QA Review for July 26, 2001 Sampling Event

The NWTPH-G/BTEX and NWTPH-Dx analyses of eight ground water samples collected from wells FC-1 through FC-6, FC-8, and FC-9 determined to be acceptable for use based on the following criteria:

Holding Times—All sample analyses were performed within the maximum holding times specified by the method.

Method Blanks—There were no contaminants detected in the method blanks above the instrument detection limit.

Surrogate Compounds—All surrogate compound recoveries (ranging from 103 to 134 percent for NWTPH-G/BTEX, and from 71 to 127 percent for NWTPH-Dx) were within laboratory control limits.

Matrix Spikes—The matrix spike recoveries (ranging from 86 to 103 percent) and the relative percent difference (RPD) between the matrix spike duplicates (12 percent) for NWTPH-G/BTEX analyses were within the laboratory control limits. Matrix spikes were not analyzed for the NWTPH-Dx analyses in accordance with the method.

Laboratory Duplicates—RPD values were not calculated for the duplicate NWTPH-G/BTEX and NWTPH-Dx analyses because none of the analytes were detected above practical quantitation limits.

Laboratory Flags—The laboratory flagged (qualified) the NWTPH-Dx results to note that the sample extract was treated with an acid cleanup procedure.

QA Review for October 25, 2001 Sampling Event

The NWTPH-G/BTEX and NWTPH-Dx analyses of eight ground water samples collected from wells FC-1 through FC-6, FC-8, and FC-9 were determined to be acceptable for use based on the following criteria:

Holding Times—All sample analyses were performed within the maximum holding times specified by the method.

Method Blanks—There were no contaminants detected in the method blanks above the instrument detection limit.

Surrogate Compounds—All surrogate compound recoveries (ranging from 96 to 101 percent for NWTPH-G/BTEX, and from 78 to 136 percent for NWTPH-Dx) were within laboratory control limits.

Matrix Spikes—Matrix spike recoveries (ranging from 86 to 102 percent) and the relative percent difference (RPD) between the matrix spike duplicates (ranging from 0.46 to 3.1 percent) for the NWTPH-G/BTEX analyses were within the laboratory control limits. Matrix spikes were not analyzed for the NWTPH-Dx analyses in accordance with the method.

Laboratory Duplicates—RPD values were not calculated for the duplicate NWTPH-G/BTEX and NWTPH-Dx analyses because none of the analytes were detected above practical quantitation limits.

Laboratory Flags—The laboratory flagged (qualified) the NWTPH-Dx results to note that the sample extract was treated with an acid cleanup procedure.

QA Review for January 24, 2002 Sampling Event

The NWTPH-G/BTEX and NWTPH-Dx analyses of eight ground water samples collected from wells FC-1 through FC-6, FC-8, and FC-9 were determined to be acceptable for use based on the following criteria:

Holding Times—All sample analyses were performed within the maximum holding times specified by the method.

Method Blanks—There were no contaminants detected in the method blanks above the instrument detection limit.

Surrogate Compounds—All surrogate compound recoveries (ranging from 93 to 102 percent for NWTPH-G/BTEX, and from 86 to 116 percent for NWTPH-Dx) were within laboratory control limits.

Matrix Spikes—Matrix spike recoveries (ranging from 92 to 98 percent) and the relative percent difference (RPD) between the matrix spike duplicates (ranging from 0.53 to 2.7 percent) for the NWTPH-G/BTEX analyses were within the laboratory control limits. Matrix spikes were not analyzed for the NWTPH-Dx analyses in accordance with the method.

Laboratory Duplicates—RPD values were not calculated for the duplicate NWTPH-G/BTEX and NWTPH-Dx analyses because none of the analytes were detected above practical quantitation limits.

Laboratory Flags—The laboratory flagged (qualified) the NWTPH-Dx results to note that the sample extract was treated with an acid cleanup procedure.

QA Review for April 18, 2002 Sampling Event

The NWTPH-G/BTEX and NWTPH-Dx analyses of nine ground water samples collected from wells FC-1 through FC-9 were determined to be acceptable for use based on the following criteria:

Holding Times—All sample analyses were performed within the maximum holding times specified by the method.

Method Blanks—There were no contaminants detected in the method blanks above the instrument detection limit.

Surrogate Compounds—All surrogate compound recoveries (ranging from 92 to 96 percent for NWTPH-G/BTEX, and from 82 to 105 percent for NWTPH-Dx) were within laboratory control limits.

Matrix Spikes—Matrix spike recoveries (ranging from 98 to 102 percent) and the relative percent difference (RPD) between the matrix spike duplicates (ranging from 1.1 to 1.8 percent) for the NWTPH-G/BTEX analyses were within the laboratory control limits. Matrix spikes were not analyzed for the NWTPH-Dx analyses in accordance with the method.

Laboratory Duplicates—RPD values were not calculated for the duplicate NWTPH-G/BTEX and NWTPH-Dx analyses because none of the analytes were detected above practical quantitation limits.

Laboratory Flags—The laboratory flagged (qualified) the NWTPH-Dx results to note that the sample extract was treated with an acid cleanup procedure.

QA Review for July 18, 2002 Sampling Event

The NWTPH-Dx analysis of one ground water sample collected from well FC-9 was determined to be acceptable for use based on the following criteria:

Holding Times—All sample analysis was performed within the maximum holding time specified by the method.

Method Blanks—There were no contaminants detected in the method blanks above the practical quantitation limit.

Surrogate Compounds—The surrogate compound recoveries (104 percent for the sample and 64 percent for the method blank) were within laboratory control limits.

Laboratory Duplicates—Laboratory duplicate analysis was performed on a batch sample, but RPD values were not calculated because none of the analytes were detected above practical quantitation limits.

Laboratory Flags—The laboratory flagged (qualified) the NWTPH-Dx results to note that the sample extract was treated with an acid cleanup procedure.

QA Review for August 29, 2002 Sampling Event

The NWTPH-Dx analysis of six soil samples and five ground water samples collected from push-probe borings completed in the vicinity of well FC-9 was determined to be acceptable for use based on the following criteria:

Holding Times—All sample analyses were performed within the maximum holding times specified by the method.

Method Blanks—There were no contaminants detected in the method blanks above the practical quantitation limit.

Surrogate Compounds—All surrogate compound recoveries (ranging from 74 to 93 percent for soil, and from 57 to 105 percent for water) were within laboratory control limits.

Laboratory Duplicates—RPD values were not calculated for the duplicate soil and water sample analyses because none of the analytes were detected above practical quantitation limits.

Laboratory Flags—The laboratory flagged (qualified) the water sample results to note that the sample extracts were treated with an acid cleanup procedure. In addition, water samples FC9-S5W and FC9-S6W were flagged because hydrocarbons in the gasoline range were identified by the laboratory in these two samples.

QA Review for October 17, 2002 Sampling Event

The NWTPH-Dx analysis of one ground water sample collected from well FC-9 was determined to be acceptable for use based on the following criteria:

Holding Times—The sample analysis was performed within the maximum holding time specified by the method.

Method Blanks—There were no contaminants detected in the method blanks above the practical quantitation limit.

Surrogate Compounds—The surrogate compound recoveries (79 percent for sample FC9-14 and 81 percent for the method blank) were within laboratory control limits.

Laboratory Duplicates—A RPD value was not calculated for the laboratory duplicate analysis because none of the analytes were detected above practical quantitation limits.

Laboratory Flags—The laboratory flagged (qualified) the NWTPH-Dx results to note that the sample extract was treated with an acid cleanup procedure.

QA Review for January 16, 2002 Sampling Event

The NWTPH-Dx analysis of one ground water sample collected from well FC-9 was determined to be acceptable for use based on the following criteria:

Holding Times—All sample analyses were performed within the maximum holding times specified by the method.

Method Blanks—There were no contaminants detected in the method blank above the practical quantitation limit.

Surrogate Compounds—The surrogate compound recoveries (92 percent for sample FC9-15 and 87 percent for the method blank) were within laboratory control limits.

Laboratory Duplicates—Laboratory duplicate analysis was performed on a batch sample, but the RPD value was not calculated because none of the analytes were detected above practical quantitation limits.

Laboratory Flags—The laboratory flagged (qualified) the NWTPH-Dx results to note that the sample extract was treated with an acid cleanup procedure.

QA Review for April 17, 2002 Sampling Event

The NWTPH-Dx analysis of one ground water sample collected from well FC-9 was determined to be acceptable for use based on the following criteria:

Holding Times—The sample analysis was performed within the maximum holding time specified by the method.

Method Blanks—There were no contaminants detected in the method blank above the practical quantitation limit.

Surrogate Compounds—The surrogate compound recoveries (90 percent for sample FC9-16 and 102 percent for the method blank) were within laboratory control limits.

Laboratory Duplicates—Laboratory duplicate analysis was performed on a batch sample, but the RPD value was not calculated because none of the analytes were detected above practical quantitation.

Laboratory Flags—The laboratory flagged (qualified) the NWTPH-Dx results to note that the sample extract was treated with an acid cleanup procedure.

APPENDIX E

Laboratory Analytical Reports and Chain of Custody Record

OnSite Environmental Inc.
Analytical Testing and Mobile Laboratory Services

August 1, 2001

RECEIVED
AUG - 2 2001

Bruce Carpenter
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 601
Seattle, WA 98121

Re: Analytical Data for Project 00-01419-010
Laboratory Reference No. 0107-182

Dear Bruce:

Enclosed are the analytical results and associated quality control data for samples submitted on July 27, 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

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

Date of Report: August 1, 2001
Samples Submitted: July 27, 2001
Lab Traveler: 07-182
Project: 00-01419-010

NWTPH-Gx/BTEX

Date Extracted: 7-31-01
Date Analyzed: 7-31-01

Matrix: Water
Units: ug/L (ppb)

Client ID:	**FC5-9**			**FC6-9**		
Lab ID:	07-182-01			07-182-02		
	Result	Flags	PQL	**Result**	Flags	PQL
Benzene	**ND**		1.0	**ND**		1.0
Toluene	**ND**		1.0	**ND**		1.0
Ethyl Benzene	**ND**		1.0	**ND**		1.0
m,p-Xylene	**ND**		1.0	**ND**		1.0
o-Xylene	**ND**		1.0	**ND**		1.0
TPH-Gas	**ND**		100	**ND**		100
Surrogate Recovery:						
Fluorobenzene	103%			106%		

Date of Report: August 1, 2001
Samples Submitted: July 27, 2001
Lab Traveler: 07-182
Project: 00-01419-010

NWTPH-Gx/BTEX

Date Extracted: 7-31-01
Date Analyzed: 7-31-01

Matrix: Water
Units: ug/L (ppb)

Client ID:	**FC2-9**			**FC9-9**		
Lab ID:	07-182-03			07-182-04		
	Result	Flags	PQL	**Result**	Flags	PQL
Benzene	**4.3**		1.0	**ND**		1.0
Toluene	**ND**		1.0	**ND**		1.0
Ethyl Benzene	**ND**		1.0	**ND**		1.0
m,p-Xylene	**1.7**		1.0	**1.4**		1.0
o-Xylene	**ND**		1.0	**ND**		1.0
TPH-Gas	**ND**		100	**ND**		100
Surrogate Recovery:						
Fluorobenzene	120%			119%		

Date of Report: August 1, 2001
Samples Submitted: July 27, 2001
Lab Traveler: 07-182
Project: 00-01419-010

NWTPH-Gx/BTEX

Date Extracted: 7-31-01
Date Analyzed: 7-31-01

Matrix: Water
Units: ug/L (ppb)

Client ID:	**FC3-9**			**FC8-9**		
Lab ID:	07-182-05			07-182-06		
	Result	Flags	PQL	**Result**	Flags	PQL
Benzene	**6.1**		1.0	**ND**		1.0
Toluene	**ND**		1.0	**ND**		1.0
Ethyl Benzene	**ND**		1.0	**ND**		1.0
m,p-Xylene	**ND**		1.0	**3.3**		1.0
o-Xylene	**ND**		1.0	**ND**		1.0
TPH-Gas	**ND**		100	**ND**		100
Surrogate Recovery:						
Fluorobenzene	108%			134%		

Date of Report: August 1, 2001
Samples Submitted: July 27, 2001
Lab Traveler: 07-182
Project: 00-01419-010

NWTPH-Gx/BTEX

Date Extracted: 7-31-01
Date Analyzed: 7-31-01

Matrix: Water
Units: ug/L (ppb)

Client ID:	**FC4-9**			**FC1-9**		
Lab ID:	07-182-07			07-182-08		
	Result	Flags	PQL	**Result**	Flags	PQL
Benzene	**ND**		1.0	**ND**		1.0
Toluene	**ND**		1.0	**ND**		1.0
Ethyl Benzene	**ND**		1.0	**ND**		1.0
m,p-Xylene	**ND**		1.0	**ND**		1.0
o-Xylene	**ND**		1.0	**ND**		1.0
TPH-Gas	**ND**		100	**ND**		100
Surrogate Recovery:						
Fluorobenzene	107%			114%		

Date of Report: August 1, 2001
Samples Submitted: July 27, 2001
Lab Traveler: 07-182
Project: 00-01419-010

NWTPH-Gx/BTEX
METHOD BLANK QUALITY CONTROL

Date Extracted: 7-31-01
Date Analyzed: 7-31-01

Matrix: Water
Units: ug/L (ppb)

Lab ID: MB0731W1

	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 101%

Date of Report: August 1, 2001
Samples Submitted: July 27, 2001
Lab Traveler: 07-182
Project: 00-01419-010

NWTPH-Gx/BTEX
DUPLICATE QUALITY CONTROL

Date Extracted: 7-31-01
Date Analyzed: 7-31-01

Matrix: Water
Units: ug/L (ppb)

Lab ID:	07-216-02 **Original**	07-216-02 **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	108%	106%		

Date of Report: August 1, 2001
Samples Submitted: July 27, 2001
Lab Traveler: 07-182
Project: 00-01419-010

NWTPH-Gx/BTEX
MS/MSD QUALITY CONTROL

Date Extracted: 7-31-01
Date Analyzed: 7-31-01

Matrix: Water
Units: ug/L (ppb)

Spike Level: 50.0 ppb

Lab ID:	07-216-02 **MS**	Percent Recovery	07-216-02 **MSD**	Percent Recovery	**RPD**	**Flags**
Benzene	**43.1**	**86**	**48.8**	**98**	12	
Toluene	**44.5**	**89**	**50.2**	**100**	12	
Ethyl Benzene	**45.7**	**92**	**51.7**	**103**	12	
m,p-Xylene	**44.8**	**90**	**50.6**	**101**	12	
o-Xylene	**44.5**	**89**	**50.0**	**100**	12	

Surrogate Recovery:

Fluorobenzene	57%	77%

Date of Report: August 1, 2001
Samples Submitted: July 27, 2001
Lab Traveler: 07-182
Project: 00-01419-010

NWTPH-Dx

Date Extracted: 7-27-01
Date Analyzed: 7-30-01

Matrix: Water
Units: mg/L (ppm)

Client ID:	FC5-9	FC9-9	FC3-9
Lab ID:	07-182-01	07-182-04	07-182-05
Diesel Fuel:	ND	ND	ND
PQL:	0.25	0.25	0.25
Heavy Oil:	ND	1.2	ND
PQL:	0.50	0.50	0.50
Surrogate Recovery:			
o-Terphenyl	126%	127%	127%
Flags:	Y	Y	Y

Date of Report: August 1, 2001
Samples Submitted: July 27, 2001
Lab Traveler: 07-182
Project: 00-01419-010

NWTPH-Dx

Date Extracted:	7-27-01
Date Analyzed:	7-27-01
Matrix:	Water
Units:	mg/L (ppm)

Client ID:	FC4-9
Lab ID:	07-182-07
Diesel Fuel:	ND
PQL:	0.25
Heavy Oil:	ND
PQL:	0.50
Surrogate Recovery:	
o-Terphenyl	71%

Flags:

Date of Report: August 1, 2001
Samples Submitted: July 27, 2001
Lab Traveler: 07-182
Project: 00-01419-010

NWTPH-Dx
METHOD BLANK QUALITY CONTROL

Date Extracted:	7-27-01
Date Analyzed:	7-30-01
Matrix:	Water
Units:	mg/L (ppm)
Lab ID:	MB0727W1
Diesel Fuel:	ND
PQL:	0.25
Heavy Oil:	ND
PQL:	0.50
Surrogate Recovery:	
o-Terphenyl	128%
Flags:	Y

Date of Report: August 1, 2001
Samples Submitted: July 27, 2001
Lab Traveler: 07-182
Project: 00-01419-010

NWTPH-Dx
DUPLICATE QUALITY CONTROL

Date Extracted:	7-27-01
Date Analyzed:	7-30-01
Matrix:	Water
Units:	mg/L (ppm)

Lab ID:	07-182-05	07-182-05 DUP
Diesel Fuel:	ND	ND
PQL:	0.25	0.25
RPD:	N/A	
Surrogate Recovery:		
o-Terphenyl	127%	117%
Flags:	Y	Y

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

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

Company: Herrera Environmental
Project No.: 00-01419-010
Project Name: FedMon 3
Project Manager: Bruce Carpenter

Turnaround Request (in working days)
(Check One)
☐ Same Day ☐ 1 Day
☐ 2 Day ☐ 3 Day
☒ Standard 8/3
(Hydrocarbon analyses: 5 days, All other analyses: 7 days)
☐ _____ (other)

Project Manager: DB
Laboratory No.

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	Herbicides by 8151A	Total RCRA Metals (8)	Priority Pollutant Metals (13)	TCLP Metals	VPH	EPH					% Moisture
1	FC5-9	7/26/01	1025	W	4		X	X																	
2	FC6-9		1130		2		X																		
3	FC2-9		1245		2		X																		
4	FC9-9		1355		4		X	X																	
5	FC3-9		1420		4		X	X																	
6	FC8-9		1505		2 ~~4~~ Bk		X																		
7	FC4-9		1610		4		X	X																	
8	FC1-9		1710		2		X																		

RELINQUISHED BY	DATE	RECEIVED BY	DATE
Bruce A. Carpenter	7/27/01	[illegible]	7/27/01
FIRM: Herrera Environmental	TIME: 7:30	FIRM: OnSite Inc	TIME: 7:30
RELINQUISHED BY	DATE	RECEIVED BY	DATE
FIRM	TIME	FIRM	TIME
REVIEWED BY		DATE REVIEWED	

COMMENTS:

Chromatographs with final report ☐

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

OnSite Environmental Inc.
Analytical Testing and Mobile Laboratory Services

RECEIVED
NOV - 6 2001

November 2, 2001

Bruce Carpenter
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 601
Seattle, WA 98121

Re: Analytical Data for Project 00-01419-010
Laboratory Reference No. 0110-223

Dear Bruce:

Enclosed are the analytical results and associated quality control data for samples submitted on October 26, 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

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

Date of Report: November 2, 2001
Samples Submitted: October 26, 2001
Lab Traveler: 10-223
Project: 00-01419-010

NWTPH-Gx/BTEX

Date Extracted: 10-26-01
Date Analyzed: 10-26-01

Matrix: Water
Units: ug/L (ppb)

Client ID:	**FC1-10**			**FC2-10**		
Lab ID:	10-223-01			10-223-02		
	Result	Flags	PQL	**Result**	Flags	PQL
Benzene	**ND**		1.0	**3.4**		1.0
Toluene	**ND**		1.0	**ND**		1.0
Ethyl Benzene	**ND**		1.0	**ND**		1.0
m,p-Xylene	**ND**		1.0	**1.3**		1.0
o-Xylene	**ND**		1.0	**ND**		1.0
TPH-Gas	**ND**		100	**110**		100
Surrogate Recovery:						
Fluorobenzene	100%			101%		

Date of Report: November 2, 2001
Samples Submitted: October 26, 2001
Lab Traveler: 10-223
Project: 00-01419-010

NWTPH-Gx/BTEX

Date Extracted: 10-26-01
Date Analyzed: 10-26-01

Matrix: Water
Units: ug/L (ppb)

Client ID:	**FC4-10**			**FC9-10**		
Lab ID:	10-223-03			10-223-04		
	Result	Flags	PQL	**Result**	Flags	PQL
Benzene	**ND**		1.0	**ND**		1.0
Toluene	**ND**		1.0	**ND**		1.0
Ethyl Benzene	**ND**		1.0	**ND**		1.0
m,p-Xylene	**ND**		1.0	**ND**		1.0
o-Xylene	**ND**		1.0	**ND**		1.0
TPH-Gas	**ND**		100	**ND**		100
Surrogate Recovery:						
Fluorobenzene	97%			99%		

Date of Report: November 2, 2001
Samples Submitted: October 26, 2001
Lab Traveler: 10-223
Project: 00-01419-010

NWTPH-Gx/BTEX

Date Extracted: 10-26-01
Date Analyzed: 10-26-01

Matrix: Water
Units: ug/L (ppb)

Client ID:	**FC3-10**			**FC8-10**		
Lab ID:	10-223-05			10-223-06		
	Result	Flags	PQL	**Result**	Flags	PQL
Benzene	**3.6**		1.0	**1.9**		1.0
Toluene	**ND**		1.0	**ND**		1.0
Ethyl Benzene	**ND**		1.0	**ND**		1.0
m,p-Xylene	**ND**		1.0	**1.7**		1.0
o-Xylene	**ND**		1.0	**ND**		1.0
TPH-Gas	**ND**		100	**ND**		100
Surrogate Recovery:						
Fluorobenzene	97%			99%		

Date of Report: November 2, 2001
Samples Submitted: October 26, 2001
Lab Traveler: 10-223
Project: 00-01419-010

NWTPH-Gx/BTEX

Date Extracted: 10-26-01
Date Analyzed: 10-26-01

Matrix: Water
Units: ug/L (ppb)

Client ID:	**FC5-10**			**FC6-10**		
Lab ID:	10-223-07			10-223-08		
	Result	Flags	PQL	**Result**	Flags	PQL
Benzene	**ND**		1.0	**ND**		1.0
Toluene	**ND**		1.0	**ND**		1.0
Ethyl Benzene	**ND**		1.0	**ND**		1.0
m,p-Xylene	**ND**		1.0	**ND**		1.0
o-Xylene	**ND**		1.0	**ND**		1.0
TPH-Gas	**ND**		100	**ND**		100
Surrogate Recovery:						
Fluorobenzene	96%			97%		

Date of Report: November 2, 2001
Samples Submitted: October 26, 2001
Lab Traveler: 10-223
Project: 00-01419-010

NWTPH-Gx/BTEX
METHOD BLANK QUALITY CONTROL

Date Extracted: 10-26-01
Date Analyzed: 10-26-01

Matrix: Water
Units: ug/L (ppb)

Lab ID: MB1026W1

	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 98%

Date of Report: November 2, 2001
Samples Submitted: October 26, 2001
Lab Traveler: 10-223
Project: 00-01419-010

NWTPH-Gx/BTEX
DUPLICATE QUALITY CONTROL

Date Extracted: 10-26-01
Date Analyzed: 10-26-01

Matrix: Water
Units: ug/L (ppb)

Lab ID:	10-223-01 **Original**	10-223-01 **Duplicate**	**RPD**	**Flags**
Benzene	**ND**	**ND**	NA	
Toluene	**ND**	**ND**	NA	
Ethyl Benzene	**ND**	**ND**	NA	
m,p-Xylene	**ND**	**ND**	NA	
o-Xylene	**ND**	**ND**	NA	
TPH-Gas	**ND**	**ND**	NA	
Surrogate Recovery:				
Fluorobenzene	100%	99%		

Date of Report: November 2, 2001
Samples Submitted: October 26, 2001
Lab Traveler: 10-223
Project: 00-01419-010

NWTPH-Gx/BTEX
MS/MSD QUALITY CONTROL

Date Extracted: 10-26-01
Date Analyzed: 10-26-01

Matrix: Water
Units: ug/L (ppb)

Spike Level: 50.0 ppb

Lab ID:	10-223-01 **MS**	Percent Recovery	10-223-01 **MSD**	Percent Recovery	**RPD**	**Flags**
Benzene	**42.9**	**86**	**43.4**	**87**	1.2	
Toluene	**47.4**	**95**	**48.0**	**96**	1.1	
Ethyl Benzene	**49.0**	**98**	**50.3**	**101**	2.8	
m,p-Xylene	**49.4**	**99**	**50.9**	**102**	3.1	
o-Xylene	**49.4**	**99**	**49.6**	**99**	0.46	

Surrogate Recovery:

Fluorobenzene	101%	101%

Date of Report: November 2, 2001
Samples Submitted: October 26, 2001
Lab Traveler: 10-223
Project: 00-01419-010

NWTPH-Dx

Date Extracted: 10-29-01
Date Analyzed: 10-29&11-01-01

Matrix: Water
Units: mg/L (ppm)

Client ID:	FC4-10	FC9-10	FC3-10
Lab ID:	10-223-03	10-223-04	10-223-05
Diesel Fuel:	ND	ND	ND
PQL:	0.25	0.25	0.25
Heavy Oil:	ND	1.1	ND
PQL:	0.50	0.50	0.50
Surrogate Recovery:			
o-Terphenyl	106%	114%	78%

Flags:

Date of Report: November 2, 2001
Samples Submitted: October 26, 2001
Lab Traveler: 10-223
Project: 00-01419-010

NWTPH-Dx

Date Extracted:	10-29-01
Date Analyzed:	10-30-01

Matrix:	Water
Units:	mg/L (ppm)

Client ID:	FC5-10
Lab ID:	10-223-07

Diesel Fuel:	ND
PQL:	0.25

Heavy Oil:	ND
PQL:	0.50

Surrogate Recovery:

o-Terphenyl	136%

Flags:

Date of Report: November 2, 2001
Samples Submitted: October 26, 2001
Lab Traveler: 10-223
Project: 00-01419-010

NWTPH-Dx
METHOD BLANK QUALITY CONTROL

Date Extracted:	10-29-01
Date Analyzed:	10-29-01

Matrix:	Water
Units:	mg/L (ppm)

Lab ID:	MB1029W1

Diesel Fuel:	ND
PQL:	0.25

Heavy Oil:	ND
PQL:	0.50

Surrogate Recovery:	
o-Terphenyl	88%

Flags:

Date of Report: November 2, 2001
Samples Submitted: October 26, 2001
Lab Traveler: 10-223
Project: 00-01419-010

NWTPH-Dx
DUPLICATE QUALITY CONTROL

Date Extracted:	10-29-01
Date Analyzed:	10-30&31-01
Matrix:	Water
Units:	mg/L (ppm)

Lab ID:	10-195-03	10-195-03 DUP
Diesel Fuel:	ND	ND
PQL:	0.25	0.25
RPD:	N/A	
Surrogate Recovery:		
o-Terphenyl	114%	124%
Flags:	Y	Y

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

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

Company: Herrera Environmental
Project No.: 00-01419-010
Project Name: Fed Mon 3
Project Manager: Bruce Carpenter

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)
☐ _____ (other)

Project Manager: DB

Laboratory No. 10-223

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	Herbicides by 8151A	Total RCRA Metals (8)	Priority Pollutant Metals (13)	TCLP Metals	VPH	EPH					% Moisture
1	FC 1-10	10/25/01	849	W	2		X																		
2	FC 2-10	↓	1100	↓	2		X																		
3	FC 4-10	↓	1130	↓	4		X	X																	
4	FC 9-10	↓	1244	↓	4		X	X																	
5	FC 3-10	↓	1325	↓	4		X	X																	
6	FC 8-10	↓	1425	↓	2		X																		
7	FC 5-10	↓	1535	↓	4		X	X																	
8	FC 6-10	↓	1620	↓	2		X																		

RELINQUISHED BY	DATE	RECEIVED BY	DATE
Bruce A. Carpenter	10/26/01	[illegible]	10-26-01
FIRM: Herrera Environmental	TIME: 9:00	FIRM: OSE	TIME: 11:20
RELINQUISHED BY	DATE	RECEIVED BY	DATE
FIRM	TIME	FIRM	TIME

REVIEWED BY
DATE REVIEWED

COMMENTS: Sent via Courier

Chromatographs with final report ☐

DIST[illegible]ION L[illegible]: WI[illegible] nSite [illegible] Yellow [illegible]rt Co[illegible] [illegible]k - Cl[illegible]py

OnSite Environmental Inc.
Analytical Testing and Mobile Laboratory Services

January 30, 2002

Bruce Carpenter
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 601
Seattle, WA 98121

Re: Analytical Data for Project 00-01419-010
Laboratory Reference No. 0201-143

Dear Bruce:

Enclosed are the analytical results and associated quality control data for samples submitted on January 25, 2002.

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

RECEIVED
FEB - 1 2002

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

Date of Report: January 30, 2002
Samples Submitted: January 25, 2002
Lab Traveler: 01-143
Project: 00-01419-010

NWTPH-Gx/BTEX

Date Extracted: 1-28-02
Date Analyzed: 1-28-02

Matrix: Water
Units: ug/L (ppb)

Client ID:	**FC5-11**			**FC6-11**		
Lab ID:	01-143-01			01-143-02		
	Result	Flags	PQL	**Result**	Flags	PQL
Benzene	**ND**		1.0	**ND**		1.0
Toluene	**ND**		1.0	**ND**		1.0
Ethyl Benzene	**ND**		1.0	**ND**		1.0
m,p-Xylene	**ND**		1.0	**ND**		1.0
o-Xylene	**ND**		1.0	**ND**		1.0
TPH-Gas	**ND**		100	**ND**		100
Surrogate Recovery:						
Fluorobenzene	99%			102%		

Date of Report: January 30, 2002
Samples Submitted: January 25, 2002
Lab Traveler: 01-143
Project: 00-01419-010

NWTPH-Gx/BTEX

Date Extracted: 1-28-02
Date Analyzed: 1-28-02

Matrix: Water
Units: ug/L (ppb)

Client ID:	**FC3-11**			**FC2-11**		
Lab ID:	01-143-03			01-143-04		
	Result	Flags	PQL	**Result**	Flags	PQL
Benzene	**1.9**		1.0	**1.8**		1.0
Toluene	**ND**		1.0	**ND**		1.0
Ethyl Benzene	**ND**		1.0	**ND**		1.0
m,p-Xylene	**ND**		1.0	**ND**		1.0
o-Xylene	**ND**		1.0	**ND**		1.0
TPH-Gas	**ND**		100	**ND**		100
Surrogate Recovery:						
Fluorobenzene	95%			95%		

Date of Report: January 30, 2002
Samples Submitted: January 25, 2002
Lab Traveler: 01-143
Project: 00-01419-010

NWTPH-Gx/BTEX

Date Extracted: 1-28-02
Date Analyzed: 1-28-02

Matrix: Water
Units: ug/L (ppb)

Client ID:	**FC8-11**			**FC9-11**		
Lab ID:	01-143-05			01-143-06		
	Result	Flags	PQL	**Result**	Flags	PQL
Benzene	**ND**		1.0	**ND**		1.0
Toluene	**ND**		1.0	**ND**		1.0
Ethyl Benzene	**ND**		1.0	**ND**		1.0
m,p-Xylene	**ND**		1.0	**ND**		1.0
o-Xylene	**ND**		1.0	**ND**		1.0
TPH-Gas	**ND**		100	**ND**		100
Surrogate Recovery:						
Fluorobenzene	100%			97%		

Date of Report: January 30, 2002
Samples Submitted: January 25, 2002
Lab Traveler: 01-143
Project: 00-01419-010

NWTPH-Gx/BTEX

Date Extracted: 1-28-02
Date Analyzed: 1-28-02

Matrix: Water
Units: ug/L (ppb)

Client ID:	**FC4-11**			**FC1-11**		
Lab ID:	01-143-07			01-143-08		
	Result	Flags	PQL	**Result**	Flags	PQL
Benzene	**ND**		1.0	**ND**		1.0
Toluene	**ND**		1.0	**ND**		1.0
Ethyl Benzene	**ND**		1.0	**ND**		1.0
m,p-Xylene	**ND**		1.0	**1.0**		1.0
o-Xylene	**ND**		1.0	**ND**		1.0
TPH-Gas	**ND**		100	**ND**		100
Surrogate Recovery:						
Fluorobenzene	94%			93%		

Date of Report: January 30, 2002
Samples Submitted: January 25, 2002
Lab Traveler: 01-143
Project: 00-01419-010

NWTPH-Gx/BTEX
METHOD BLANK QUALITY CONTROL

Date Extracted: 1-28-02
Date Analyzed: 1-28-02

Matrix: Water
Units: ug/L (ppb)

Lab ID: MB0128W1

	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 111%

Date of Report: January 30, 2002
Samples Submitted: January 25, 2002
Lab Traveler: 01-143
Project: 00-01419-010

NWTPH-Gx/BTEX
DUPLICATE QUALITY CONTROL

Date Extracted: 1-28-02
Date Analyzed: 1-28-02

Matrix: Water
Units: ug/L (ppb)

Lab ID:	01-143-01 **Original**	01-143-01 **Duplicate**	**RPD**	**Flags**
Benzene	**ND**	**ND**	NA	
Toluene	**ND**	**ND**	NA	
Ethyl Benzene	**ND**	**ND**	NA	
m,p-Xylene	**ND**	**ND**	NA	
o-Xylene	**ND**	**ND**	NA	
TPH-Gas	**ND**	**ND**	NA	
Surrogate Recovery:				
Fluorobenzene	99%	102%		

Date of Report: January 30, 2002
Samples Submitted: January 25, 2002
Lab Traveler: 01-143
Project: 00-01419-010

NWTPH-Gx/BTEX
MS/MSD QUALITY CONTROL

Date Extracted: 1-28-02
Date Analyzed: 1-28-02

Matrix: Water
Units: ug/L (ppb)

Spike Level: 50.0 ppb

Lab ID:	01-143-01 **MS**	Percent Recovery	01-143-01 **MSD**	Percent Recovery	**RPD**	**Flags**
Benzene	**46.2**	**92**	**46.9**	**94**	1.6	
Toluene	**48.2**	**97**	**48.5**	**97**	0.58	
Ethyl Benzene	**49.0**	**98**	**48.3**	**97**	1.6	
m,p-Xylene	**49.4**	**99**	**48.0**	**96**	2.7	
o-Xylene	**48.7**	**97**	**49.0**	**98**	0.53	

Surrogate Recovery:

Fluorobenzene	103%	102%

Date of Report: January 30, 2002
Samples Submitted: January 25, 2002
Lab Traveler: 01-143
Project: 00-01419-010

NWTPH-Dx

Date Extracted: 1-25-02
Date Analyzed: 1-25&28-02

Matrix: Water
Units: mg/L (ppm)

Client ID:	FC5-11	FC3-11	FC9-11
Lab ID:	01-143-01	01-143-03	01-143-06
Diesel Fuel:	ND	ND	ND
PQL:	0.25	0.25	0.25
Heavy Oil:	ND	ND	1.9
PQL:	0.50	0.50	0.50
Surrogate Recovery:			
o-Terphenyl	86%	90%	116%
Flags:			Y

Date of Report: January 30, 2002
Samples Submitted: January 25, 2002
Lab Traveler: 01-143
Project: 00-01419-010

NWTPH-Dx

Date Extracted:	1-25-02
Date Analyzed:	1-25-02

Matrix:	Water
Units:	mg/L (ppm)

Client ID:	FC4-11
Lab ID:	01-143-07

Diesel Fuel:	ND
PQL:	0.25
Heavy Oil:	ND
PQL:	0.50

Surrogate Recovery:	
o-Terphenyl	89%

Flags:

Date of Report: January 30, 2002
Samples Submitted: January 25, 2002
Lab Traveler: 01-143
Project: 00-01419-010

NWTPH-Dx
METHOD BLANK QUALITY CONTROL

Date Extracted:	1-25-02
Date Analyzed:	1-28-02
Matrix:	Water
Units:	mg/L (ppm)
Lab ID:	MB0125W1
Diesel Fuel:	ND
PQL:	0.25
Heavy Oil:	ND
PQL:	0.50
Surrogate Recovery:	
o-Terphenyl	107%
Flags:	Y

Date of Report: January 30, 2002
Samples Submitted: January 25, 2002
Lab Traveler: 01-143
Project: 00-01419-010

NWTPH-Dx
DUPLICATE QUALITY CONTROL

Date Extracted: 1-25-02
Date Analyzed: 1-25-02

Matrix: Water
Units: mg/L (ppm)

Lab ID:	01-143-01	01-143-01 DUP
Diesel Fuel:	ND	ND
PQL:	0.25	0.25
RPD:	N/A	
Surrogate Recovery:		
o-Terphenyl	86%	92%

Flags:

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

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

Company: Herrera Environmental
Project No.: 00-01419-010
Project Name: Fed Mon 3
Project Manager: Bruce Carpenter

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)
☐ _____ (other)

Project Manager: DB

Laboratory No. 01-143

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	Herbicides by 8151A	Total RCRA Metals (8)	Priority Pollutant Metals (13)	TCLP Metals	VPH	EPH					% Moisture
1	FC5-11	1/24/02	945	W	4		X	X																	
2	FC6-11	↓	1120	↓	2		X																		
3	FC3-11		1235		4		X	X																	
4	FC7-11		1340		2		X																		
5	FC8-11		1450		2		X																		
6	FC9-11		1540		4		X	X																	
7	FC4-11		1630		4		X	X																	
8	FC1-11	↓	1720	↓	2		X																		

RELINQUISHED BY	DATE	RECEIVED BY	DATE
Bruce A. Carpenter	1/25/01	Laura Kent	1-25-02
FIRM: Herrera Environmental	TIME: 930	FIRM: OSE	TIME: 11:55
RELINQUISHED BY	DATE	RECEIVED BY	DATE
FIRM	TIME	FIRM	TIME

REVIEWED BY
DATE REVIEWED

COMMENTS: Sent via Courier

Chromatographs with final report ☐

DIST[illegible]ION L[illegible]: Wh[illegible] nSite [illegible] Yellow [illegible]rt Co[illegible]k - Cl[illegible]py

OnSite Environmental Inc.
Analytical Testing and Mobile Laboratory Services

APR 29 2002

April 26, 2002

Bruce Carpenter
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 601
Seattle, WA 98121

Re: Analytical Data for Project 00-01419-010
Laboratory Reference No. 0204-136

Dear Bruce:

Enclosed are the analytical results and associated quality control data for samples submitted on April 19, 2002.

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,

for David Baumeister
Project Manager

Enclosures

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

Date of Report: April 26, 2002
Samples Submitted: April 19, 2002
Lab Traveler: 04-136
Project: 00-01419-010

Case Narrative

Samples were collected on April 18, 2002. Samples were maintained at the laboratory at 4°C and followed SW846 analysis and extraction methods.

NWTPH Gx/BTEX Analysis

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

NWTPH Dx Analysis

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

Date of Report: April 26, 2002
Samples Submitted: April 19, 2002
Lab Traveler: 04-136
Project: 00-01419-010

NWTPH-Gx/BTEX

Date Extracted: 4-22-02
Date Analyzed: 4-22-02

Matrix: Water
Units: ug/L (ppb)

Client ID:	**FC5-12**			**FC6-12**		
Lab ID:	04-136-01			04-136-02		
	Result	Flags	PQL	**Result**	Flags	PQL
Benzene	**ND**		1.0	**ND**		1.0
Toluene	**ND**		1.0	**ND**		1.0
Ethyl Benzene	**ND**		1.0	**ND**		1.0
m,p-Xylene	**ND**		1.0	**ND**		1.0
o-Xylene	**ND**		1.0	**ND**		1.0
TPH-Gas	**ND**		100	**ND**		100
Surrogate Recovery:						
Fluorobenzene	95%			95%		

Date of Report: April 26, 2002
Samples Submitted: April 19, 2002
Lab Traveler: 04-136
Project: 00-01419-010

NWTPH-Gx/BTEX

Date Extracted: 4-22-02
Date Analyzed: 4-22-02

Matrix: Water
Units: ug/L (ppb)

Client ID:	**FC7-12**			**FC2-12**		
Lab ID:	04-136-03			04-136-04		
	Result	Flags	PQL	**Result**	Flags	PQL
Benzene	**ND**		1.0	**3.5**		1.0
Toluene	**ND**		1.0	**1.4**		1.0
Ethyl Benzene	**ND**		1.0	**ND**		1.0
m,p-Xylene	**ND**		1.0	**2.1**		1.0
o-Xylene	**ND**		1.0	**ND**		1.0
TPH-Gas	**ND**		100	**140**		100
Surrogate Recovery:						
Fluorobenzene	95%			93%		

Date of Report: April 26, 2002
Samples Submitted: April 19, 2002
Lab Traveler: 04-136
Project: 00-01419-010

NWTPH-Gx/BTEX

Date Extracted: 4-22-02
Date Analyzed: 4-22-02

Matrix: Water
Units: ug/L (ppb)

Client ID:	**FC9-12**			**FC3-12**		
Lab ID:	04-136-05			04-136-06		
	Result	Flags	PQL	**Result**	Flags	PQL
Benzene	**ND**		1.0	**1.7**		1.0
Toluene	**ND**		1.0	**ND**		1.0
Ethyl Benzene	**ND**		1.0	**ND**		1.0
m,p-Xylene	**ND**		1.0	**ND**		1.0
o-Xylene	**ND**		1.0	**ND**		1.0
TPH-Gas	**ND**		100	**ND**		100
Surrogate Recovery:						
Fluorobenzene	92%			96%		

Date of Report: April 26, 2002
Samples Submitted: April 19, 2002
Lab Traveler: 04-136
Project: 00-01419-010

NWTPH-Gx/BTEX

Date Extracted: 4-22-02
Date Analyzed: 4-22-02

Matrix: Water
Units: ug/L (ppb)

Client ID:	**FC1-12**			**FC4-12**		
Lab ID:	04-136-07			04-136-08		
	Result	Flags	PQL	**Result**	Flags	PQL
Benzene	**ND**		1.0	**ND**		1.0
Toluene	**ND**		1.0	**ND**		1.0
Ethyl Benzene	**ND**		1.0	**ND**		1.0
m,p-Xylene	**2.4**		1.0	**ND**		1.0
o-Xylene	**ND**		1.0	**ND**		1.0
TPH-Gas	**ND**		100	**ND**		100
Surrogate Recovery:						
Fluorobenzene	96%			94%		

Date of Report: April 26, 2002
Samples Submitted: April 19, 2002
Lab Traveler: 04-136
Project: 00-01419-010

NWTPH-Gx/BTEX

Date Extracted: 4-22-02
Date Analyzed: 4-22-02

Matrix: Water
Units: ug/L (ppb)

Client ID: **FC8-12**
Lab ID: 04-136-09

	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 92%

Date of Report: April 26, 2002
Samples Submitted: April 19, 2002
Lab Traveler: 04-136
Project: 00-01419-010

NWTPH-Gx/BTEX
METHOD BLANK QUALITY CONTROL

Date Extracted: 4-22-02
Date Analyzed: 4-22-02

Matrix: Water
Units: ug/L (ppb)

Lab ID: MB0422W1

	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 26, 2002
Samples Submitted: April 19, 2002
Lab Traveler: 04-136
Project: 00-01419-010

NWTPH-Gx/BTEX
DUPLICATE QUALITY CONTROL

Date Extracted: 4-22-02
Date Analyzed: 4-22-02

Matrix: Water
Units: ug/L (ppb)

Lab ID:	04-136-03 **Original**	04-136-03 **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%	91%		

Date of Report: April 26, 2002
Samples Submitted: April 19, 2002
Lab Traveler: 04-136
Project: 00-01419-010

NWTPH-Gx/BTEX
MS/MSD QUALITY CONTROL

Date Extracted: 4-22-02
Date Analyzed: 4-22-02

Matrix: Water
Units: ug/L (ppb)

Spike Level: 50.0 ppb

Lab ID:	04-136-03 **MS**	Percent Recovery	04-136-03 **MSD**	Percent Recovery	**RPD**	**Flags**
Benzene	**48.8**	**98**	**49.7**	**100**	1.8	
Toluene	**50.2**	**100**	**50.8**	**102**	1.3	
Ethyl Benzene	**50.6**	**101**	**51.2**	**102**	1.2	
m,p-Xylene	**49.1**	**98**	**49.7**	**99**	1.2	
o-Xylene	**50.2**	**100**	**50.8**	**102**	1.1	

Surrogate Recovery:

Fluorobenzene	95%	93%

Date of Report: April 26, 2002
Samples Submitted: April 19, 2002
Lab Traveler: 04-136
Project: 00-01419-010

NWTPH-Dx

Date Extracted:	4-24-02
Date Analyzed:	4-24&25-02
Matrix:	Water
Units:	mg/L (ppm)

Client ID:	FC5-12	FC9-12	FC3-12
Lab ID:	04-136-01	04-136-05	04-136-06
Diesel Range:	ND	ND	ND
PQL:	0.25	0.25	0.25
Identification:	---	---	---
Lube Oil Range:	ND	ND	ND
PQL:	0.40	0.40	0.40
Identification:	---	---	---
Surrogate Recovery			
o-Terphenyl:	82%	103%	102%
Flags:		Y	Y

Date of Report: April 26, 2002
Samples Submitted: April 19, 2002
Lab Traveler: 04-136
Project: 00-01419-010

NWTPH-Dx

Date Extracted:	4-24-02
Date Analyzed:	4-25-02
Matrix:	Water
Units:	mg/L (ppm)
Client ID:	FC4-12
Lab ID:	04-136-08
Diesel Range:	ND
PQL:	0.25
Identification:	---
Lube Oil Range:	ND
PQL:	0.40
Identification:	---
Surrogate Recovery	
o-Terphenyl:	105%
Flags:	Y

Date of Report: April 26, 2002
Samples Submitted: April 19, 2002
Lab Traveler: 04-136
Project: 00-01419-010

NWTPH-Dx
METHOD BLANK QUALITY CONTROL

Date Extracted:	4-24-02
Date Analyzed:	4-24-02
Matrix:	Water
Units:	mg/L (ppm)
Lab ID:	MB0424W1
Diesel Range:	ND
PQL:	0.25
Identification:	---
Lube Oil Range:	ND
PQL:	0.40
Identification:	---
Surrogate Recovery	
o-Terphenyl:	99%
Flags:	Y

Date of Report: April 26, 2002
Samples Submitted: April 19, 2002
Lab Traveler: 04-136
Project: 00-01419-010

NWTPH-Dx
DUPLICATE QUALITY CONTROL

Date Extracted: 4-24-02
Date Analyzed: 4-25-02

Matrix: Water
Units: mg/L (ppm)

Lab ID:	04-136-05	04-136-05 DUP
Diesel Range:	ND	ND
PQL:	0.25	0.25
RPD:	N/A	
Surrogate Recovery		
o-Terphenyl:	103%	107%
Flags:	Y	Y

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.

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

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

Chain of Custody

Laboratory Number: 04-136

Company: Herrera Environmental
Project Number: 00-01419-010
Project Name: Federal Center South
Project Manager: Bruce Carpenter
Sampled by: Bruce Carpenter

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

Requested Analysis

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Dx	Volatiles by 8260B	Halogenated Volatiles by 8260B	Semivolatiles by 8270C	PAHs by 8270C	PCB's by 8082	Pesticides by 8081	Herbicides by 8151A	Total RCRA Metals (8)	TCLP Metals	HEM by 1664	VPH	EPH					% Moisture
1	FC5-12	4/18/02	915	W	4		X	X																	
2	FC6-12		1025		2		X																		
3	FC7-12		1115		2		X																		
4	FC2-12		1220		2		X																		
5	FC9-12		1415		4		X	X																	
6	FC3-12		1430		4		X	X																	
7	FC1-12		1530		2		X																		
8	FC4-12		1615		4		X	X																	
9*	FC8-12		1715		2		X																		

	Signature	Company	Date	Time
Relinquished by	Bruce A. Carpenter	Herrera Environmental	4/19/02	8:00
Received by	Laura Kent	OSE	4/19/02	10:05
Relinquished by				
Received by				
Relinquished by				
Received by				
Reviewed by/Date		Reviewed by/Date		

Comments/Special Instructions:
Sent by Courier
per Bruce Carpenter
4/22

Chromatograms with final report ☐

DIST ON L): WI nSite Yellow ort Co. k - Cl py

OnSite Environmental Inc.
Analytical Testing and Mobile Laboratory Services

JUL 2 6 2002

July 24, 2002

Bruce Carpenter
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 601
Seattle, WA 98121

Re: Analytical Data for Project 00-01419-010
Laboratory Reference No. 0207-139

Dear Bruce:

Enclosed are the analytical results and associated quality control data for samples submitted on July 19, 2002.

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,

for David Baumeister
Project Manager

Enclosures

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

Date of Report: July 24, 2002
Samples Submitted: July 19, 2002
Lab Traveler: 07-139
Project: 00-01419-010

Case Narrative

Samples were collected on July 18, 2002. Samples were maintained at the laboratory at 4°C and followed SW846 analysis and extraction methods.

NWTPH Dx Analysis

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

Date of Report: July 24, 2002
Samples Submitted: July 19, 2002
Lab Traveler: 07-139
Project: 00-01419-010

NWTPH-Dx

Date Extracted:	7-22-02
Date Analyzed:	7-22-02

Matrix:	Water
Units:	mg/L (ppm)

Client ID:	FC9-13
Lab ID:	07-139-01

Diesel Range:	ND
PQL:	0.25
Identification:	---

Lube Oil Range:	0.46
PQL:	0.40
Identification:	Lube Oil

Surrogate Recovery	
o-Terphenyl:	104%

Flags:	Y

gde 5/29/03

Date of Report: July 24, 2002
Samples Submitted: July 19, 2002
Lab Traveler: 07-139
Project: 00-01419-010

NWTPH-Dx
METHOD BLANK QUALITY CONTROL

Date Extracted:	7-22-02
Date Analyzed:	7-22-02
Matrix:	Water
Units:	mg/L (ppm)
Lab ID:	MB0722W1
Diesel Range:	ND
PQL:	0.25
Identification:	---
Lube Oil Range:	ND
PQL:	0.40
Identification:	---
Surrogate Recovery	
o-Terphenyl:	64%
Flags:	Y

gde 5/29/03

Date of Report: July 24, 2002
Samples Submitted: July 19, 2002
Lab Traveler: 07-139
Project: 00-01419-010

NWTPH-Dx
DUPLICATE QUALITY CONTROL

Date Extracted:	7-22-02
Date Analyzed:	7-22-02
Matrix:	Water
Units:	mg/L (ppm)

Lab ID:	07-143-14	07-143-14 DUP
Diesel Range:	ND	ND
PQL:	0.25	0.25
RPD:	N/A	
Surrogate Recovery		
o-Terphenyl:	90%	94%
Flags:	Y	Y

gpc 5/29/03

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.

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

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

Chain of Custody

Company: Herrera Environmental
Project Number: 00-01419-010
Project Name: Fed Cons.
Project Manager: Bruce Carpenter
Sampled by: Bruce Carpenter

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

Laboratory Number: 07-139

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	Herbicides by 8151A	Total RCRA Metals (8)	TCLP Metals	HEM by 1664	VPH	EPH					% Moisture
1	FC 9-13	7/18/02	1625	W	2			X																	

	Signature	Company	Date	Time
Relinquished by	Bruce A. Carpenter	Herrera Environmental	7/19/02	8:00
Received by	Jamie Kent	OSE	7-19-02	9:25
Relinquished by				
Received by				
Relinquished by				
Received by				
Reviewed by/Date		Reviewed by/Date		

Comments/Special Instructions: Sent via courier

Chromatograms with final report ☐

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

OnSite Environmental Inc.
Analytical Testing and Mobile Laboratory Services

RECEIVED
SEP - 9 2002

September 6, 2002

Bruce Carpenter
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 601
Seattle, WA 98121

Re: Analytical Data for Project 00-01419-010
Laboratory Reference No. 0208-219

Dear Bruce:

Enclosed are the analytical results and associated quality control data for samples submitted on August 29, 2002.

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

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

Sincerely,

David Baumeister
Project Manager

Enclosures

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

Date of Report: September 6, 2002
Samples Submitted: August 29, 2002
Lab Traveler: 08-219
Project: 00-01419-010

Case Narrative

Samples were collected on August 29, 2002. Samples were maintained at the laboratory at 4°C and followed SW846 analysis and extraction methods.

NWTPH Dx Analysis

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

Date of Report: September 6, 2002
Samples Submitted: August 29, 2002
Lab Traveler: 08-219
Project: 00-01419-010

NWTPH-Dx

Date Extracted:	8-30-02
Date Analyzed:	8-30-02
Matrix:	Soil
Units:	mg/Kg (ppm)

Client ID:	FC9-S1-5	FC9-S2-5	FC9-S3-5
Lab ID:	08-219-01	08-219-03	08-219-05
Diesel Range:	ND	ND	ND
PQL:	31	32	27
Identification:	---	---	---
Lube Oil Range:	ND	2600	ND
PQL:	62	64	53
Identification:	---	Lube Oil	---
Surrogate Recovery			
o-Terphenyl:	79%	91%	85%

Flags:

gpc 5/29/03

Date of Report: September 6, 2002
Samples Submitted: August 29, 2002
Lab Traveler: 08-219
Project: 00-01419-010

NWTPH-Dx

Date Extracted:	8-30-02
Date Analyzed:	8-30-02
Matrix:	Soil
Units:	mg/Kg (ppm)

Client ID:	FC9-S4-5	FC9-S5-5	FC9-S6-5
Lab ID:	08-219-07	08-219-09	08-219-11
Diesel Range:	ND	ND	ND
PQL:	27	27	26
Identification:	---	---	---
Lube Oil Range:	100	ND	230
PQL:	54	53	52
Identification:	Lube Oil	---	Lube Oil
Surrogate Recovery			
o-Terphenyl:	74%	81%	93%

Flags:

gpc 5/29/03

Date of Report: September 6, 2002
Samples Submitted: August 29, 2002
Lab Traveler: 08-219
Project: 00-01419-010

NWTPH-Dx
METHOD BLANK QUALITY CONTROL

Date Extracted:	8-30-02
Date Analyzed:	8-30-02

Matrix:	Soil
Units:	mg/Kg (ppm)

Lab ID:	MB0830S1

Diesel Range:	ND
PQL:	25
Identification:	---

Lube Oil Range:	ND
PQL:	50
Identification:	---

Surrogate Recovery

o-Terphenyl:	79%

Flags:

OJC 5/29/03

Date of Report: September 6, 2002
Samples Submitted: August 29, 2002
Lab Traveler: 08-219
Project: 00-01419-010

NWTPH-Dx
DUPLICATE QUALITY CONTROL

Date Extracted:	8-30-02
Date Analyzed:	8-30-02
Matrix:	Soil
Units:	mg/Kg (ppm)

Lab ID:	08-219-01	08-219-01 DUP
Diesel Range:	ND	ND
PQL:	25	25
RPD:	N/A	
Surrogate Recovery		
o-Terphenyl:	79%	86%
Flags:		

gpc 5/29/03

Date of Report: September 6, 2002
Samples Submitted: August 29, 2002
Lab Traveler: 08-219
Project: 00-01419-010

NWTPH-Dx

Date Extracted: 8-30-02
Date Analyzed: 9-3-02

Matrix: Water
Units: mg/L (ppm)

Client ID:	FC9-S1W	FC9-S4W	FC9-S5W
Lab ID:	08-219-02	08-219-08	08-219-10
Diesel Range:	ND	ND	ND
PQL:	0.25	0.25	0.26
Identification:	---	---	---
Lube Oil Range:	ND	ND	ND
PQL:	0.40	0.40	0.41
Identification:	---	---	---
Surrogate Recovery			
o-Terphenyl:	63%	75%	59%
Flags:	Y	Y	Y,M

gjc 5/29/03

Date of Report: September 6, 2002
Samples Submitted: August 29, 2002
Lab Traveler: 08-219
Project: 00-01419-010

NWTPH-Dx

Date Extracted:	9-3-02
Date Analyzed:	9-3-02

Matrix:	Water
Units:	mg/L (ppm)

Client ID:	FC9-S6W
Lab ID:	08-219-12

Diesel Range:	ND
PQL:	0.26
Identification:	---

Lube Oil Range:	ND
PQL:	0.41
Identification:	---

Surrogate Recovery	
o-Terphenyl:	68%

Flags:	Y,M

gpc 5/29/03

Date of Report: September 6, 2002
Samples Submitted: August 29, 2002
Lab Traveler: 08-219
Project: 00-01419-010

NWTPH-Dx
METHOD BLANK QUALITY CONTROL

Date Extracted:	8-30-02
Date Analyzed:	9-3-02

Matrix:	Water
Units:	mg/L (ppm)

Lab ID:	MB0830W1

Diesel Range:	ND
PQL:	0.25
Identification:	---

Lube Oil Range:	ND
PQL:	0.40
Identification:	---

Surrogate Recovery	
o-Terphenyl:	64%

Flags:	Y

gsc 5/29/03

Date of Report: September 6, 2002
Samples Submitted: August 29, 2002
Lab Traveler: 08-219
Project: 00-01419-010

NWTPH-Dx
DUPLICATE QUALITY CONTROL

Date Extracted:	8-30-02
Date Analyzed:	9-3-02
Matrix:	Water
Units:	mg/L (ppm)

Lab ID:	08-219-02	08-219-02 DUP
Diesel Range:	ND	ND
PQL:	0.25	0.25
RPD:	N/A	
Surrogate Recovery		
o-Terphenyl:	63%	57%
Flags:	Y	Y

gbc 5/29/03

Date of Report: September 6, 2002
Samples Submitted: August 29, 2002
Lab Traveler: 08-219
Project: 00-01419-010

% MOISTURE

Date Analyzed: 8-30-02

Client ID	Lab ID	% Moisture
FC9-S1-5	08-219-01	19
FC9-S2-5	08-219-03	22
FC9-S3-5	08-219-05	6.0
FC9-S4-5	08-219-07	7.0
FC9-S5-5	08-219-09	6.0
FC9-S6-5	08-219-11	4.0

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.

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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.

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

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

Chain Of Custody

Laboratory Number: 08-219

Company: Herrera Environmental
Project Number: 00-01419-010
Project Name: FEDMON3
Project Manager: Bruce Carpenter
Sampled by: Bruce Carpenter

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

Requested Analysis

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Dx	Volatiles by 8260B	Halogenated Volatiles by 8260B	Semivolatiles by 8270C	PAHs by 8270C	PCB's by 8082	Pesticides by 8081	Herbicides by 8151A	Total RCRA Metals (8)	TCLP Metals	HEM by 1664	VPH	EPH					% Moisture
1	FC9-S1-5	8/29/02	750	S	1			X																	X
2	FC9-S1W		815	W	2			X																	
3	FC9-S2-5		830	S	1			X																	X
4	FC9-S2W		855	W	2			X																	
5	FC9-S3-5		910	S	1			X																	X
6	FC9-S3W		930	W	2																				
7	FC9-S4-5		950	S	1			X																	X
8	FC9-S4W		1010	W	2			X																	
9	FC9-S5-5		1025	S	1			X																	X
10	FC9-S5W		1045	W	2			X																	

	Signature	Company	Date	Time
Relinquished by	Bruce A. Carpenter	Herrera Environmental	8/29/02	1340
Received by	Diana M. Phelan	HERRERA	8/29/02	13:40
Relinquished by	Diana M. Phelan	HERRERA	8/29/02	17:18
Received by	Kathleen M. Spear	OSE	8/29/02	17:18
Relinquished by				
Received by				
Reviewed by/Date		Reviewed by/Date		

Comments/Special Instructions: Archive water samples FC9-S2W and FC9-S3W

Chromatograms with final report ☐

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

Chain of Custody

Company: Herrera Environmental
Project Number: 00-01419-010
Project Name: FFD MonW3
Project Manager: Bruce Carpenter
Sampled by: Bruce Carpenter

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

Laboratory Number: 08-219

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	Herbicides by 8151A	Total RCRA Metals (8)	TCLP Metals	HEM by 1664	VPH	EPH					% Moisture
11	FC9-S6-5	8/29/02	1105	S	1			X																	X
12	FC9-S6W	8/29/02	1125	W	2			X																	

	Signature	Company	Date	Time
Relinquished by	[signature]	Herrera Environmental	8/29/02	13:40
Received by	Diana M. Phelan	HERRERA	8/29/02	13:40
Relinquished by	Diana M. Phelan	HERRERA	8/29/02	17:18
Received by	Kathleen M. Spear	OSE	8/29/02	17:18
Relinquished by				
Received by				
Reviewed by/Date		Reviewed by/Date		

Comments/Special Instructions:

Chromatograms with final report ☐

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OnSite Environmental Inc.
Analytical Testing and Mobile Laboratory Services

RECEIVED
SEP 17 2002

September 16, 2002

Bruce Carpenter
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 601
Seattle, WA 98121

Re: Analytical Data for Project 00-01419-010
Laboratory Reference No. 0208-219

Dear Bruce:

Enclosed are the analytical results and associated quality control data for samples submitted on August 29, 2002.

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

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

Sincerely,

David Baumeister
Project Manager

Enclosures

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

Date of Report: September 16, 2002
Samples Submitted: August 29, 2002
Lab Traveler: 08-219
Project: 00-01419-010

Case Narrative

Samples were collected on August 29, 2002. Samples were maintained at the laboratory at 4°C and followed SW846 analysis and extraction methods.

NWTPH Dx Analysis

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

Date of Report: September 16, 2002
Samples Submitted: August 29, 2002
Lab Traveler: 08-219
Project: 00-01419-010

NWTPH-Dx

Date Extracted:	9-10-02
Date Analyzed:	9-12-02

Matrix:	Water
Units:	mg/L (ppm)

Client ID:	FC9-S2W
Lab ID:	08-219-04

Diesel Range:	ND
PQL:	0.25
Identification:	---

Lube Oil Range:	ND
PQL:	0.40
Identification:	---

Surrogate Recovery	
o-Terphenyl:	89%

Flags:	Y

gpc 5/29/03

Date of Report: September 16, 2002
Samples Submitted: August 29, 2002
Lab Traveler: 08-219
Project: 00-01419-010

NWTPH-Dx
METHOD BLANK QUALITY CONTROL

Date Extracted:	9-10-02
Date Analyzed:	9-12-02
Matrix:	Water
Units:	mg/L (ppm)
Lab ID:	MB0910W1
Diesel Range:	ND
PQL:	0.25
Identification:	---
Lube Oil Range:	ND
PQL:	0.40
Identification:	---
Surrogate Recovery	
o-Terphenyl:	105%
Flags:	Y

gpc 5/29/03

Date of Report: September 16, 2002
Samples Submitted: August 29, 2002
Lab Traveler: 08-219
Project: 00-01419-010

NWTPH-Dx
DUPLICATE QUALITY CONTROL

Date Extracted:	9-10-02
Date Analyzed:	9-11-02

Matrix:	Water
Units:	mg/L (ppm)

Lab ID:	09-055-01	09-055-01DUP
Diesel Range:	ND	ND
PQL:	0.25	0.25
RPD:	N/A	
Surrogate Recovery		
o-Terphenyl:	83%	77%

Flags:

gdc 05/29/03

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.

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

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

Chain of Custody

Laboratory Number: 08-219

Company: Herrera Environmental
Project Number: 00-01419-010
Project Name: FEDMON3
Project Manager: Bruce Carpenter
Sampled by: Bruce Carpenter

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

Requested Analysis

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Dx	Volatiles by 8260B	Halogenated Volatiles by 8260B	Semivolatiles by 8270C	PAHs by 8270C	PCB's by 8082	Pesticides by 8081	Herbicides by 8151A	Total RCRA Metals (8)	TCLP Metals	HEM by 1664	VPH	EPH					% Moisture
1	FC9-S1-5	8/29/02	750	S	1			X																	X
2	FC9-S1W		815	W	2			X																	
3	FC9-S2-5		830	S	1			X																	X
4	FC9-S2W		855	W	2			⊗																	
5	FC9-S3-5		910	S	1			X																	X
6	FC9-S3W		930	W	2																				
7	FC9-S4-5		950	S	1			X																	X
8	FC9-S4W		1010	W	2			X																	
9	FC9-S5-5		1025	S	1			X																	X
10	FC9-S5W		1045	W	2			X																	

	Signature	Company	Date	Time
Relinquished by	[signature]	Herrera Environmental	8/29/02	13:40
Received by	Diana M. Phelan	HERRERA	8/29/02	13:40
Relinquished by	Diana M. Phelan	HERRERA	8/29/02	17:18
Received by	[signature]	OSE	8/29/02	17:18
Relinquished by				
Received by				
Reviewed by/Date		Reviewed by/Date		

Comments/Special Instructions:
Archive water samples FC9-S2W and FC9-S3W
⊗Added 9/10/02. DB STANDARD TAT.

Chromatograms with final report ☐

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

Chain of Custody

Company: Herrera Environmental
Project Number: 00-01419-010
Project Name: FED MonW3
Project Manager: Bruce Carpenter
Sampled by: Bruce Carpenter

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

Laboratory Number: 08-219

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	Herbicides by 8151A	Total RCRA Metals (8)	TCLP Metals	HEM by 1664	VPH	EPH					% Moisture
11	FC9-S6-5	8/29/02	1105	S	1			X																	X
12	FC9-S6W	8/29/02	1125	W	2			X																	

	Signature	Company	Date	Time
Relinquished by	[signature]	Herrera Environmental	8/29/02	13:40
Received by	Diana M. Phelan	HERRERA	8/29/02	13:40
Relinquished by	Diana M. Phelan	HERRERA	8/29/02	17:18
Received by	Kathleen M Spen	OSE	8/29/02	17:18
Relinquished by				
Received by				

Comments/Special Instructions:

Reviewed by/Date

Reviewed by/Date

Chromatograms with final report ☐

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OnSite Environmental Inc.
Analytical Testing and Mobile Laboratory Services

RECEIVED
OCT 28 2002

October 25, 2002

Bruce Carpenter
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 00-01419-010
Laboratory Reference No. 0210-122

Dear Bruce:

Enclosed are the analytical results and associated quality control data for samples submitted on October 17, 2002.

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,

for David Baumeister
Project Manager

Enclosures

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

Date of Report: October 25, 2002
Samples Submitted: October 17, 2002
Lab Traveler: 10-122
Project: 00-01419-010

Case Narrative

Samples were collected on October 17, 2002. Samples were maintained at the laboratory at 4°C and followed SW846 analysis and extraction methods.

NWTPH Dx Analysis

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

Date of Report: October 25, 2002
Samples Submitted: October 17, 2002
Lab Traveler: 10-122
Project: 00-01419-010

NWTPH-Dx

Date Extracted:	10-21-02
Date Analyzed:	10-22-02
Matrix:	Water
Units:	mg/L (ppm)
Client ID:	FC9-14
Lab ID:	10-122-01b
Diesel Range:	ND
PQL:	0.25
Identification:	---
Lube Oil Range:	ND
PQL:	0.40
Identification:	---
Surrogate Recovery	
o-Terphenyl:	79%
Flags:	Y

gpc 5/29/03

Date of Report: October 25, 2002
Samples Submitted: October 17, 2002
Lab Traveler: 10-122
Project: 00-01419-010

NWTPH-Dx
METHOD BLANK QUALITY CONTROL

Date Extracted:	10-21-02
Date Analyzed:	10-22-02

Matrix:	Water
Units:	mg/L (ppm)

Lab ID:	MB1021W1

Diesel Range:	ND
PQL:	0.25
Identification:	---

Lube Oil Range:	ND
PQL:	0.40
Identification:	---

Surrogate Recovery	
o-Terphenyl:	81%

Flags:	Y

QAC 5/29/03

Date of Report: October 25, 2002
Samples Submitted: October 17, 2002
Lab Traveler: 10-122
Project: 00-01419-010

NWTPH-Dx
DUPLICATE QUALITY CONTROL

Date Extracted:	10-21-02
Date Analyzed:	10-21-02
Matrix:	Water
Units:	mg/L (ppm)

Lab ID:	10-118-01b	10-118-01b DUP
Diesel Range:	ND	ND
PQL:	0.26	0.26
RPD:	N/A	
Surrogate Recovery		
o-Terphenyl:	73%	68%
Flags:		

gbc 5/29/03

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.

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

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

Chain Of Custody

Company: Herrera Environmental
Project Number: 00-01419-010
Project Name: FEDMON3
Project Manager: Bruce Carpenter
Sampled by: Bruce Carpenter

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

Laboratory Number: 10-122

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	Herbicides by 8151A	Total RCRA Metals (8)	TCLP Metals	HEM by 1664	VPH	EPH					% Moisture
1	FC9-14	10/17/02	900	W	2			X																	

	Signature	Company	Date	Time
Relinquished by	Bruce A. Carpenter	Herrera Environmental	10/17/02	10:30
Received by	Kelley Hill	ONSITE ENV.	10/17/02	13:30
Relinquished by				
Received by				
Relinquished by				
Received by				
Reviewed by/Date		Reviewed by/Date		

Comments/Special Instructions: Sent via Courier

Chromatograms with final report ☐

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OnSite Environmental Inc.
Analytical Testing and Mobile Laboratory Services

RECEIVED
JAN 29 2003

January 27, 2003

Bruce Carpenter
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 00-01419-031
Laboratory Reference No. 0301-080

Dear Bruce:

Enclosed are the analytical results and associated quality control data for samples submitted on January 17, 2003.

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

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

Sincerely,

David Baumeister
Project Manager

Enclosures

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

Date of Report: January 27, 2003
Samples Submitted: January 17, 2003
Lab Traveler: 01-080
Project: 00-01419-031

Case Narrative

Samples were collected on January 16, 2003. Samples were maintained at the laboratory at 4°C and followed SW846 analysis and extraction methods.

NWTPH Dx Analysis

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

Date of Report: January 27, 2003
Samples Submitted: January 17, 2003
Lab Traveler: 01-080
Project: 00-01419-031

NWTPH-Dx

Date Extracted:	1-17-03
Date Analyzed:	1-20-03
Matrix:	Water
Units:	mg/L (ppm)
Client ID:	FC9-15
Lab ID:	01-080-01
Diesel Range:	ND
PQL:	0.25
Identification:	---
Lube Oil Range:	3.3
PQL:	0.41
Identification:	Lube Oil
Surrogate Recovery	
o-Terphenyl:	92%
Flags:	Y

gpc 5/29/03

Date of Report: January 27, 2003
Samples Submitted: January 17, 2003
Lab Traveler: 01-080
Project: 00-01419-031

NWTPH-Dx
METHOD BLANK QUALITY CONTROL

Date Extracted:	1-17-03
Date Analyzed:	1-20-03
Matrix:	Water
Units:	mg/L (ppm)
Lab ID:	MB0117W1
Diesel Range:	ND
PQL:	0.25
Identification:	---
Lube Oil Range:	ND
PQL:	0.40
Identification:	---
Surrogate Recovery	
o-Terphenyl:	87%
Flags:	Y

gfc 5/29/03

Date of Report: January 27, 2003
Samples Submitted: January 17, 2003
Lab Traveler: 01-080
Project: 00-01419-031

NWTPH-Dx
DUPLICATE QUALITY CONTROL

Date Extracted:	1-17-03
Date Analyzed:	1-21-03
Matrix:	Water
Units:	mg/L (ppm)

Lab ID:	01-078-06	01-078-06 DUP
Diesel Range:	ND	ND
PQL:	0.25	0.25
RPD:	N/A	
Surrogate Recovery		
o-Terphenyl:	83%	92%
Flags:	Y	Y

gpc 5/29/03

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.

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

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

Chain of Custody

Laboratory Number: 01-080

Company: Herrera Environmental
Project Number: 00-0419-031
Project Name: Fed Mont
Project Manager: Bruce Carpenter
Sampled by: Bruce Carpenter

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

Requested Analysis

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Dx	Volatiles by 8260B	Halogenated Volatiles by 8260B	Semivolatiles by 8270C	PAHs by 8270C	PCB's by 8082	Pesticides by 8081	Herbicides by 8151A	Total RCRA Metals (8)	TCLP Metals	HEM by 1664	VPH	EPH					% Moisture
1	FC9-15	1/16/03	1545	W	2			X																	

	Signature	Company	Date	Time
Relinquished by	[signature]	Herrera Environmental	1/17/03	8:00
Received by	[signature]	OSE to Fa	1/17/03	11:00
Relinquished by				
Received by				
Relinquished by				
Received by				
Reviewed by/Date		Reviewed by/Date		

Comments/Special Instructions: Sent Via Courier

Chromatograms with final report ☐

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OnSite Environmental Inc.
Analytical Testing and Mobile Laboratory Services

MAY 2 2003

April 30, 2003

Bruce Carpenter
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 00-01419-031
Laboratory Reference No. 0304-115

Dear Bruce:

Enclosed are the analytical results and associated quality control data for samples submitted on April 18, 2003.

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

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

Sincerely,

David Baumeister
Project Manager

Enclosures

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

Date of Report: April 30, 2003
Samples Submitted: April 18, 2003
Lab Reference: 04-115
Project: 00-01419-031

Case Narrative

Samples were collected on April 17, 2003. Samples were maintained at the laboratory at 4°C and followed SW846 analysis and extraction methods.

NWTPH Dx Analysis

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

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: April 30, 2003
Samples Submitted: April 18, 2003
Lab Reference: 04-115
Project: 00-01419-031

NWTPH-Dx

Date Extracted:	4-21-03
Date Analyzed:	4-22-03

Matrix:	Water
Units:	mg/L (ppm)

Client ID:	FC9-16
Lab ID:	04-115-01

Diesel Range:	ND
PQL:	0.26
Identification:	---

Lube Oil Range:	ND
PQL:	0.41
Identification:	---

Surrogate Recovery	
o-Terphenyl:	90%

Flags:	Y

gfc 5/29/03

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: April 30, 2003
Samples Submitted: April 18, 2003
Lab Reference: 04-115
Project: 00-01419-031

NWTPH-Dx
METHOD BLANK QUALITY CONTROL

Date Extracted:	4-21-03
Date Analyzed:	4-21-03
Matrix:	Water
Units:	mg/L (ppm)
Lab ID:	MB0421W1
Diesel Range:	ND
PQL:	0.25
Identification:	---
Lube Oil Range:	ND
PQL:	0.40
Identification:	---
Surrogate Recovery	
o-Terphenyl:	102%
Flags:	Y

gbc 5/29/03

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: April 30, 2003
Samples Submitted: April 18, 2003
Lab Reference: 04-115
Project: 00-01419-031

NWTPH-Dx
DUPLICATE QUALITY CONTROL

Date Extracted:	4-21-03
Date Analyzed:	4-21-03
Matrix:	Water
Units:	mg/L (ppm)

Lab ID:	04-109-09	04-109-09 DUP
Diesel Range:	ND	ND
PQL:	0.26	0.26
RPD:	N/A	
Surrogate Recovery		
o-Terphenyl:	64%	69%
Flags:	Y	Y

gpc 5/29/03

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

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.

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 is outside control limits due to sample inhomogeniety.

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

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

Z -

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

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

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

Chain Of Custody

Laboratory Number: 04-115

Company: Herrera Environmental
Project Number: 00-01419-031
Project Name: Fed Gen. South
Project Manager: Bruce Carpenter
Sampled by: Bruce Carpenter

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

Requested Analysis

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Dx	Volatiles by 8260B	Halogenated Volatiles by 8260B	Semivolatiles by 8270C	PAHs by 8270C	PCB's by 8082	Pesticides by 8081	Herbicides by 8151A	Total RCRA Metals (8)	TCLP Metals	HEM by 1664	VPH	EPH					% Moisture
-01	FC9-16	4/17/03	1400	W	2			X																	

	Signature	Company	Date	Time
Relinquished by	[signature]	Herrera Environmental	4/18/03	8:00
Received by	[signature]	OnSite Env.	4/18/03	10:10A
Relinquished by				
Received by				
Relinquished by				
Received by				
Reviewed by/Date		Reviewed by/Date		

Comments/Special Instructions: Sent Via Courier

Chromatograms with final report ☐

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

APPENDIX F

Probe Boring Logs

HERRERA ENVIRONMENTAL CONSULTANTS

PROBE BORING LOG

Boring # FC9-S1
Total depth 9 feet
Sheet 1 of 1

Project name	FEDMON4	Drilling Contractor	Cascade Drilling	Drilling method	Push probe
Project number	1419.31	Start date	8-29-02	Sampling method	2-ft sampler with liner
Client	GSA	Compl. date	8-29-02	Air monitoring Inst	No
HEC rep.	Bruce Carpenter	Location	12 feet east of well FC9 and 43 feet southwest of well FC2		

Sample type, interval	% recovery	Depth (feet, BGS)	Soil group	Soil description
Drive Push Probe	65	1 2	SP	Asphalt Brown medium SAND, poorly graded, (fill), dry
Drive Push Probe	75	3 4		
Drive Push-Probe FC9-S1-5	80	5 6	SP	Dark Brown medium SAND, poorly graded, dry wet
		7 8 9		
				Temporary well screen set from 5 to 9 feet; backfilled probe boring with bentonite chip seal.

HERRERA ENVIRONMENTAL CONSULTANTS

PROBE BORING LOG

Boring # FC9-S2
Total depth 9 feet
Sheet 1 of 1

Project name	FEDMON4	Drilling Contractor	Cascade Drilling	Drilling method	Push probe
Project number	1419.31	Start date	8-29-02	Sampling method	2-ft sampler with liner
Client	GSA	Compl. date	8-29-02	Air monitoring Inst	No
HEC rep.	Bruce Carpenter	Location	10 feet northeast of well FC9 and 45 feet west-southwest of well FC2		

Sample type, interval	% recovery	Depth (feet, BGS)	Soil group	Soil description
Drive Push Probe	80	1 2	SP	Asphalt Brown medium SAND, poorly graded, (fill), dry
Drive Push Probe	85	3 4		
Drive Push-Probe FC9-S2-5	90	5 6	SM	Dark brown SAND, some organic material, black stained soil, wood fragments, (former ground surface), dry wet
Drive Push Probe	50	7 8	SP	Dark brown-black medium SAND, poorly graded, fuel like odor, wet
		9		Temporary well screen set from 5 to 9 feet; backfilled probe boring with bentonite chip seal.

HERRERA
ENVIRONMENTAL CONSULTANTS

PROBE BORING LOG

Boring # FC9-S3
Total depth 9 feet
Sheet 1 of 1

Project name	FEDMON4	Drilling Contractor	Cascade Drilling	Drilling method	Push probe
Project number	1419.31	Start date	8-29-02	Sampling method	2-ft sampler with liner
Client	GSA	Compl. date	8-29-02	Air monitoring Inst	No
HEC rep.	Bruce Carpenter	Location	32 feet east of well FC9 and 49 feet south-southwest of well FC2		

Sample type, interval	% recovery	Depth (feet, BGS)	Soil group	Soil description
Drive Push Probe	75	1 2	SP	Asphalt Brown medium SAND, poorly graded, (fill), dry
Drive Push Probe	75	3 4		Some silt
Drive Push-Probe FC9-S3-5	100	5 6	SP	Brown-black medium SAND, poorly graded, damp
Drive Push Probe	70	7 8		Wet, fuel-like odor
		9		
				Temporary well screen set from 5 to 9 feet; backfilled probe boring with bentonite chip seal.

HERRERA
ENVIRONMENTAL CONSULTANTS

PROBE BORING LOG

Boring # FC9-S4
Total depth 9 feet
Sheet 1 of 1

Project name	FEDMON4	Drilling Contractor	Cascade Drilling	Drilling method	Push probe
Project number	1419.31	Start date	8-29-02	Sampling method	2-ft sampler with liner
Client	GSA	Compl. date	8-29-02	Air monitoring Inst	No
HEC rep.	Bruce Carpenter	Location	27 feet north of well FC3 and 45 feet south-southeast of well FC2		

Sample type, interval	% recovery	Depth (feet, BGS)	Soil group	Soil description
Drive Push Probe	75	1 2	SP	Asphalt Brown medium SAND, poorly graded, (fill), dry
Drive Push Probe	85	3 4	SM	Dark brown-black silty SAND, with gravel, dry
Drive Push-Probe FC9-S4-5	100	5 6	SP	Brown-black silty SAND with 2-inch layer of red brick like material Dark brown-black medium SAND, poorly graded wet
Drive Push Probe	50	7 8		Fuel-like odor
		9		Temporary well screen set from 5 to 9 feet; backfilled probe boring with bentonite chip seal.

HERRERA
ENVIRONMENTAL CONSULTANTS

PROBE BORING LOG

Boring # FC9-S5
Total depth 9 feet
Sheet 1 of 1

Project name	FEDMON4	Drilling Contractor	Cascade Drilling	Drilling method	Push probe
Project number	1419.31	Start date	8-29-02	Sampling method	2-ft sampler with liner
Client	GSA	Compl. date	8-29-02	Air monitoring Inst	No
HEC rep.	Bruce Carpenter	Location	56 feet north of well FC3 and 15.5 feet south of well FC2		

Sample type, interval	% recovery	Depth (feet, BGS)	Soil group	Soil description
Drive Push Probe	75	1 2	SP	Asphalt Brown medium SAND, poorly graded, (fill), dry
Drive Push Probe	100	3 4	SM	Brown-black, silty SAND, with gravel, dry
Drive Push-Probe FC9-S5-5	100	5 6	SP	Dark brown-black medium SAND, poorly graded, damp
Drive Push Probe	75	7 8		Wet, fuel-like odor
		9		Temporary well screen set from 5 to 9 feet; backfilled probe boring with bentonite chip seal.

HERRERA
ENVIRONMENTAL CONSULTANTS

PROBE BORING LOG

Boring # FC9-S6
Total depth 9 feet
Sheet 1 of 1

Project name	FEDMON4	Drilling Contractor	Cascade Drilling	Drilling method	Push probe
Project number	1419.31	Start date	8-29-02	Sampling method	2-ft sampler with liner
Client	GSA	Compl. date	8-29-02	Air monitoring Inst	No
HEC rep.	Bruce Carpenter	Location	22.5 feet west-southwest of well FC2 and 47 feet southeast of well FC8		

Sample type, interval	% recovery	Depth (feet, BGS)	Soil group	Soil description
Drive Push Probe	80	1 2	SP	Asphalt Brown medium SAND, poorly graded, (fill), dry
Drive Push Probe	90	3 4	SM	Dark brown black silty SAND, with gravel, dry
Drive Push-Probe FC9-S6-5	100	5 6	SP	Brown sandy silt lens Dark brown black medium SAND, poorly graded Wet, fuel-like odor
Drive Push Probe	50	7 8		
		9		Temporary well screen set from 5 feet to 9 feet; backfilled probe boring with bentonite chip seal.