HALLS LAKE PHASE II
SITE INVESTIGATION
AND REMEDIATION

October 1994

BURLINGTON
ENVIRONMENTAL

HALLS LAKE PHASE II
SITE INVESTIGATION
AND REMEDIATION

October 1994

Prepared for:

Snohomish County P.U.D. #1
Everett, Washington

Project No. 10779

Prepared by:

BURLINGTON
ENVIRONMENTAL

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1 EXECUTIVE SUMMARY

Burlington Environmental Inc. (Burlington) was contracted by the Snohomish County Public Utility District (PUD) #1 to assist in a Phase II site investigation and remediation for the Halls Lake substation. Previous investigations by Hart Crowser (1993) of the PUD - Halls Lake substation and right-of way (ROW) property indicated elevated concentrations of lead and petroleum hydrocarbons in an upper drainage ditch running northeast to southwest on the PUD substation property, in a lower drainage ditch located on the PUD ROW, and in a sump connecting these two ditches. The suspected source was an adjacent radiator shop, Ken's Radiator, that had been operating for approximately 25 years, and was destroyed by fire in 1992. During Phase I in 1992, Hart Crowser performed a site remediation project to remove the impacted soil in the upper drainage ditch, the sump area, a portion of the lower drainage ditch, and the radiator shop area. The Phase II site investigation and remediation was to complete the clean up of the lower ditch area and to determine if other areas on the site required additional remediation. Groundwater monitoring/investigation was not included in the Phase II Scope of Work as defined in the PUD contract documents. All sampling and excavation activities were performed as determined by and under the direction of the PUD's project leader.

Burlington's scope of investigation included shallow hand-auger sampling in the upper ROW area and lower drainage ditch areas, and the collection of deep soil boring samples in the area between the upper and lower drainage ditch areas.

Shallow hand-auger sampling of the lower drainage ditch by Burlington occurred on October 25, 1993. All samples collected showed concentrations of lead and/or petroleum hydrocarbons exceeding the cleanup standards of 250 mg/kg total lead and 200 mg/kg total petroleum hydrocarbons (TPH). Excavation of this area began on November 4, 1993. Two excavations were needed before the verification samples, collected from the excavated areas attained the cleanup standards. The PUD then filled the area with clean fill. Approximately 77 cubic yards of excavated soil was stockpiled, profiled as hazardous waste (D007, characteristic lead), and transported off site to the Burlington Kent Facility on November 11, 1993 for proper disposal.

Eight 10-foot-deep soil borings were drilled and logged on November 1 and 2, 1993, in the area between the upper and lower drainage ditches. Split-spoon samples were collected and analyzed for total lead and TCLP lead at Burlington's Corporate Laboratory.

To confirm that the previous remediation of the upper ROW area had been complete, 10 hand auggered soil samples were collected. Five of the 10 samples in the upper ROW area showed total lead concentration exceeding cleanup standards. Additional excavation and verification sampling in this area was therefore required. Excavation of the upper ROW area was

conducted on December 6, 1993. Approximately 25 cubic yards of excavated soil was stockpiled, profiled, then transported off site to the Burlington Kent Facility for treatment and disposal on December 12, 1993. Analytical data collected during the Phase II investigation are presented in Appendix A.

2 PROJECT BACKGROUND / SITE DESCRIPTION

2.1 Location

The Snohomish County PUD Halls Lake substation is located at 6120 212th Street S.W. in Mountlake Terrace, Washington (Figure 1), and the PUD right-of-way (ROW) is located adjacent to the substation. The telephone number is 1-800-562-9142.

2.2 Topography and Geology

The Snohomish County PUD Halls Lake substation is located northeast of Halls Creek at an elevation of approximately 320 feet above the National Geodedic Vertical Datum (NGVD). The site is non-vegetated and slopes gently to the southwest towards Halls Creek.

Soils encountered at the site generally consist of sands and silts with a minor amount of fine to coarse gravel. Groundwater was generally encountered from four to eight feet below ground surface (bgs).

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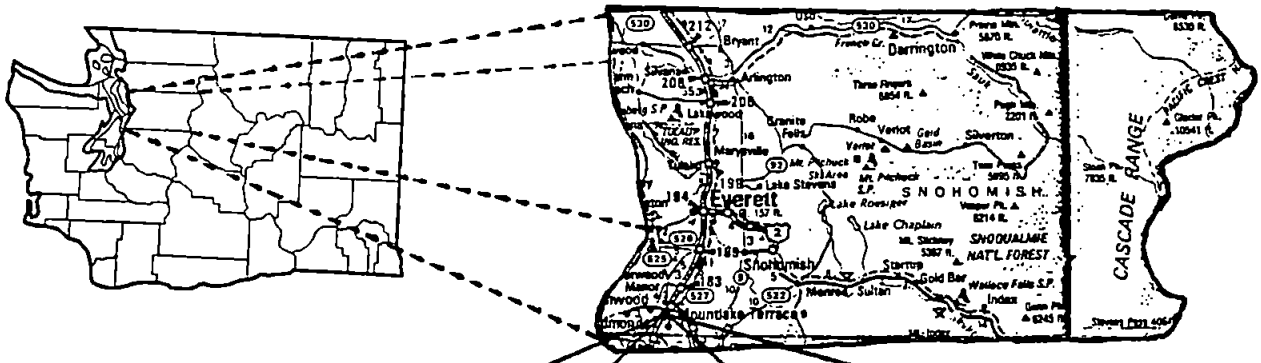

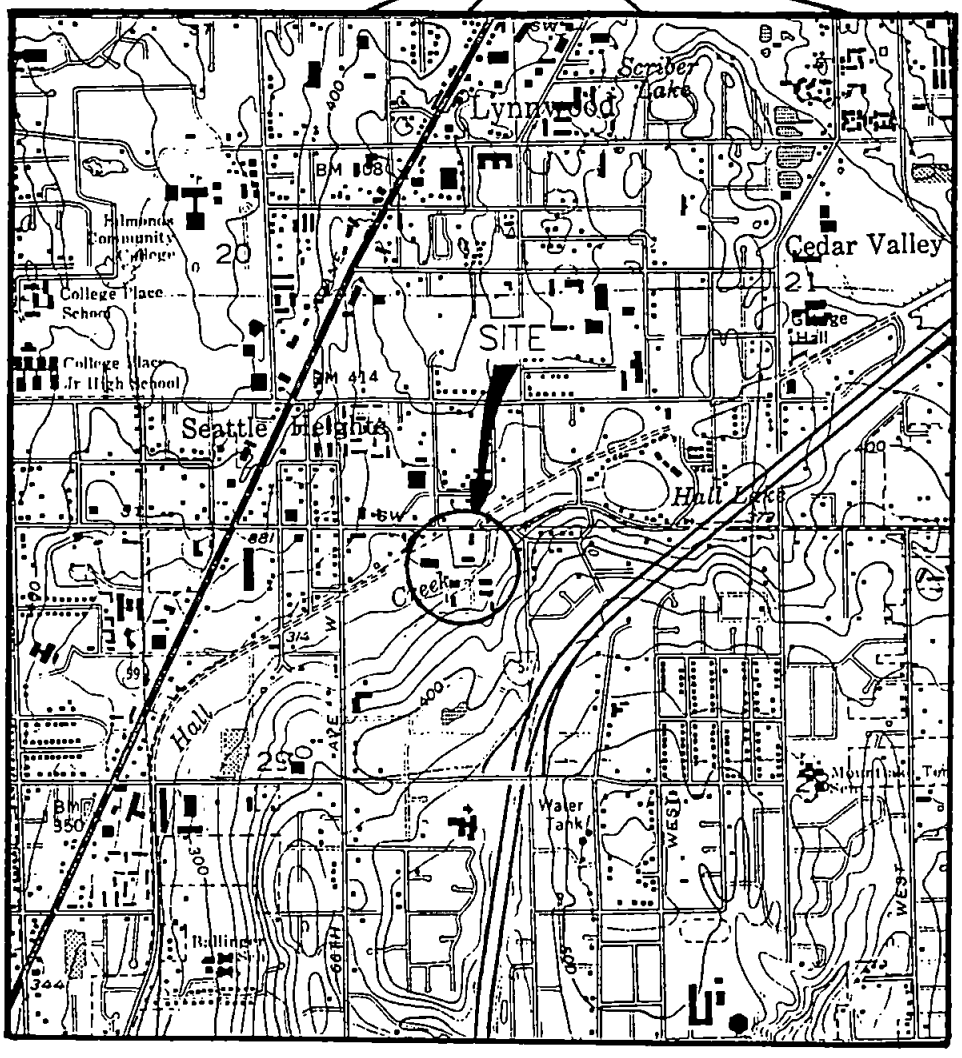

Burlington Environmental Inc.

SITE MAP

SNOHOMISH COUNTY PUD #1
MOUNTLAKE TERRACE, WASHINGTON
10779

FIGURE 1

3 RELEASE INFORMATION / SITE CHARACTERIZATION

3.1 Site Description

The upper portion of the site is adjacent to the former location of Ken's Radiator Shop (Figure 2). According to PUD records, the original house occupied by Ken's Radiator was built in 1954. The Slattum family bought the house in 1955 and opened a beauty shop in 1957. The house extended onto the Pacific Northwest Traction (PNT) ROW which was in existence before the house was built. The PUD purchased the PNT ROW in 1963 and in 1964 gave the Slattum's an easement for the house. In 1965 the house was sold to Ken Ravenstein. The first business license for Ken's Radiator was filed this same year.

Visual and sampling evidence shows that the area was impacted by contaminants generated at the radiator shop. Activities at the shop included automobile engine and radiator repair service and battery repair and disposal. A culvert leading from a storm drain at the northeast corner of the shop property to the northeast end of the upper ROW area was the conduit for the transport of contaminants to the upper drainage ditch and subsequently the lower drainage ditch. The City of Lynnwood has no record of installing this culvert, but believes it was built in the early 1960's. The 12-inch culvert appears in 1963 drawings of the switching station which was built on PNT property adjacent to the Slattum's property. A plastic drain pipe was installed between the upper and lower ditches, beginning at the sump, in the early 1980's when the right-of-way area adjoining the switching station was regraded and raised several feet. The lower drainage ditch extends to the southwest. It is located partially on PUD property, with the remainder of the lower drainage ditch on Sellen Construction property.

3.2 Boring Logs

Boring logs for all borings conducted during this investigation are included in Appendix B.

4 PREVIOUS INVESTIGATIONS

Previous investigations conducted by Hart Crowser indicated that soil and groundwater were impacted by lead and petroleum hydrocarbons (TPH). Contaminant concentrations of soil samples collected during the initial Hart Crowser site assessment, conducted in July 1992, showed contaminant concentrations as high as 110,000 milligrams per kilogram (mg/kg) lead and 55,000 mg/kg TPH in the upper drainage ditch area and 7,000 mg/kg lead and 940 mg/kg TPH in the lower ditch area. Two groundwater monitoring wells, one each in the upper and lower drainage ditch areas, were completed as part of the site assessment. Both dissolved lead and TPH were detected in the upper drainage ditch groundwater well at concentrations which exceed MTCA Method A groundwater cleanup standards. Groundwater samples from the lower drainage ditch groundwater well were invalidated due to high pH and conductivity measurements as a result of unset grout.

Phase I remediation of Halls Lake Substation was completed in December 1992, by Foss Environmental with oversight provided by Hart Crowser and representatives of the PUD. Soils contaminated with high concentrations of lead and petroleum hydrocarbons were excavated from the upper drainage ditch, lower drainage ditch, sump and radiator shop area. The two groundwater monitoring wells installed during the site assessment work were abandoned during the Phase I remediation project. Prior to well abandonment, a final round of monitoring was conducted in the upper drainage ditch well and water levels were taken in both wells. Analytical results for the upper well showed TPH concentration less than 1.0 milligrams per liter (mg/L) and dissolved lead concentration of 0.45 mg/L. The dissolved lead concentration exceeded the 0.005 mg/L MTCA Method A cleanup level, while the TPH concentration was below cleanup levels.

5 SELECTION OF CLEANUP STANDARDS

Cleanup standards have been negotiated between the Washington State Department of Ecology and the PUD. Inside the PUD substation boundaries, the cleanup standard is the lower of either 1,000 mg/kg total lead or 5.0 milligrams per liter (mg/L) toxicity characteristic leaching procedure (TCLP) lead. Within the remaining ROW areas outside the substation, a cleanup level of 250 mg/kg total lead has been set. At the direction of the PUD, soils from both the PUD substation area and ROW were excavated to meet the Model Toxics Control Act (MTCA) Method A soil cleanup level for an industrial area of 200 parts per million (ppm) TPH.

6 EXPLANATION OF REMEDIAL ACTIONS

6.1 Investigation and Remediation of the Lower Ditch Area

On October 25, 1993, under the direction of the PUD Project Leader, Burlington personnel collected four hand-auger soil samples from the lower ditch on PUD ROW, along the property line of Sellen Construction (Figure 3) . These samples were collected at intervals from zero to one foot (0-1) deep and one to two feet (1-2) deep at each sample location, placed in stainless-steel bowls, and homogenized. The thin, greasy, gray/black-colored layer of soil encountered in previous investigations was present in three of the four sample locations. These samples were collected and analyzed separately as the "x" sample layer. The samples were sent to the Burlington Corporate Laboratory and analyzed for total lead and TPH. The analytical results indicate that all the sample locations exceeded the ROW cleanup standards for total lead (250 ppm) and two exceeded the cleanup standards for TPH (200 ppm). Total lead concentrations in soil from the gray layer ranged from 19,000 mg/kg to 44,000 mg/kg. Analytical data from samples taken from the lower ditch area are presented in Table 1.

Excavation of the lower ditch began November 4 and was completed November 8, 1993. The lower ditch was excavated in two separate sections (Figure 4). A small portion of the eastern half was separated by an area previously excavated and replaced with clean fill during Phase I. A small track-hoe was used to excavate the eastern half of the lower ditch. Excavated soils were placed on triple-layered plastic and covered with a single sheet of plastic at the end of the day, and sampled for waste profiling prior to disposal. Soils were excavated until the thin greasy gray/black layer of soil was no longer found along the eastern and northern walls of the excavation pit. The excavation along the south wall stopped at the property boundary line. Excavation in this section continued southwestward until clean fill dirt from Phase I was reached. The final excavated area in this section of the lower ditch was approximately 15 feet long, 10 feet wide and 4.5 feet deep.

The second area excavated in the lower ditch was immediately to the southwest of the area previously excavated and backfilled during Phase I. Because of the steep embankment, a larger track-hoe was used. As before, the soil removed was placed on triple layers of plastic and covered with a single sheet of plastic at the end of the day, and sampled for waste profiling prior to disposal. The final excavated area was measured at 100 feet long, 5 feet wide, and 2.3 feet deep.

As specified in the scope of work and at the direction of the District's Project Leader, eight deep soil borings were drilled and logged in the PNT ROW between the upper and lower ditch on November 1 and 2, 1993 (see Figure 5). Split-spoon samples were collected at 2, 4, 6,

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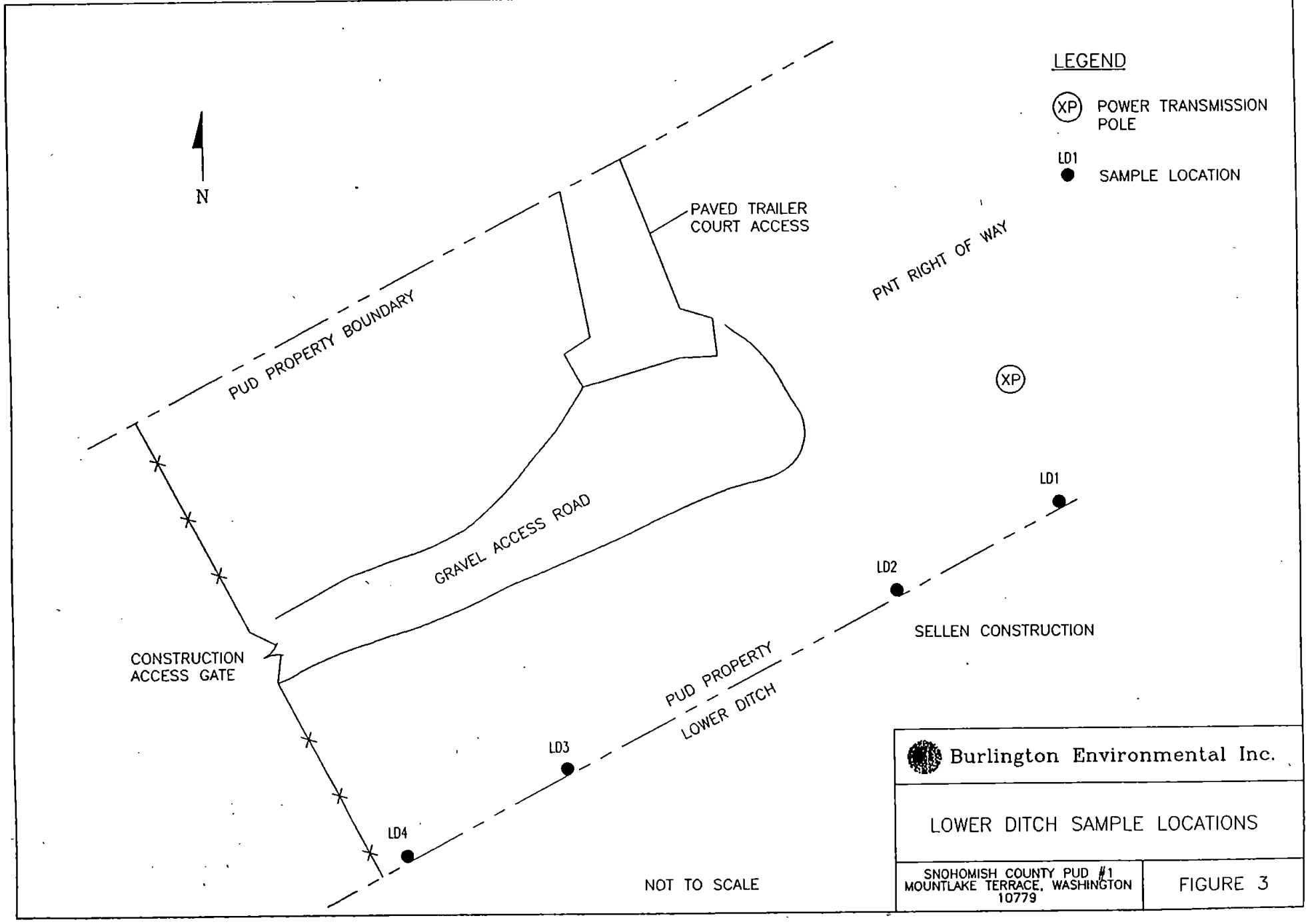

Burlington Environmental Inc.

LOWER DITCH SAMPLE LOCATIONS

SNOHOMISH COUNTY PUD #1
MOUNTLAKE TERRACE, WASHINGTON
10779

FIGURE 3

Table 1

LOWER DITCH SHALLOW BORINGS
SNOHOMISH COUNTY PUD NO. 1 - HALLS LAKE PHASE II

Sample I.D. Numbers	TPH (mg/kg)	Lead - Total (mg/kg)	Lead - TCLP (mg/L)
Lower Ditch Shallow Borings			
PUDIILD-1-0-1	44	660	NA
PUDIILD-1-1-2	<16	1,100	NA
PUDIILD-1-X	1,300	44,000	NA
PUDIILD-2-0-1	200	5,000	NA
PUDIILD-2-1-2	23	420	NA
PUDIILD-2-X	280	19,000	NA
PUDIILD-3-0-1	770	8,400	NA
PUDIILD-3-1-2	44	2,300	NA
PUDIILD-3-X	870	39,000	NA
PUDIILD-4-0-1	43	1,400	NA
PUDIILD-4-1-2	<16	140	NA

NA: Not analyzed

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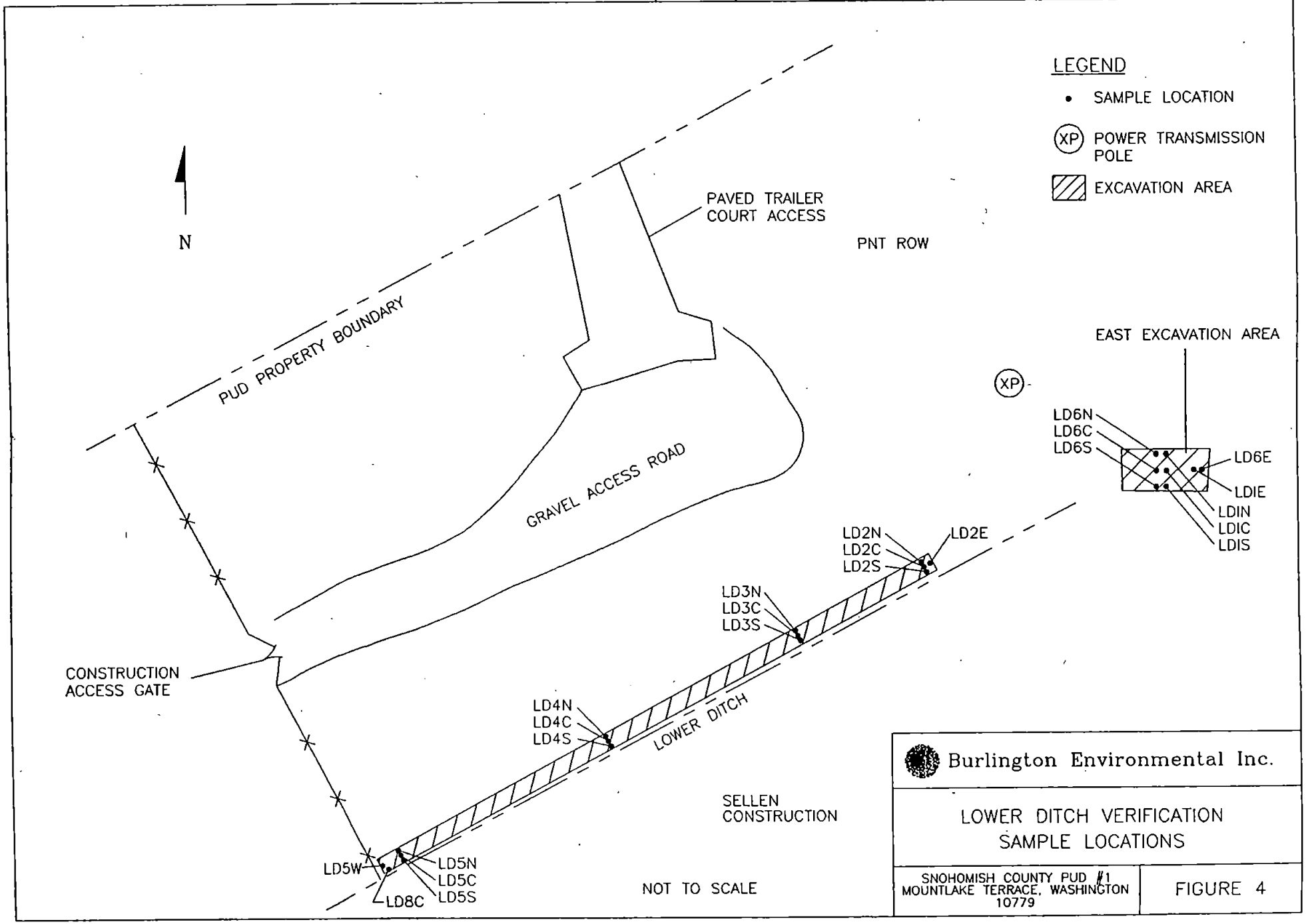

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LOWER DITCH VERIFICATION
SAMPLE LOCATIONS

SNOHOMISH COUNTY PUD #1
MOUNTLAKE TERRACE, WASHINGTON
10779

FIGURE 4

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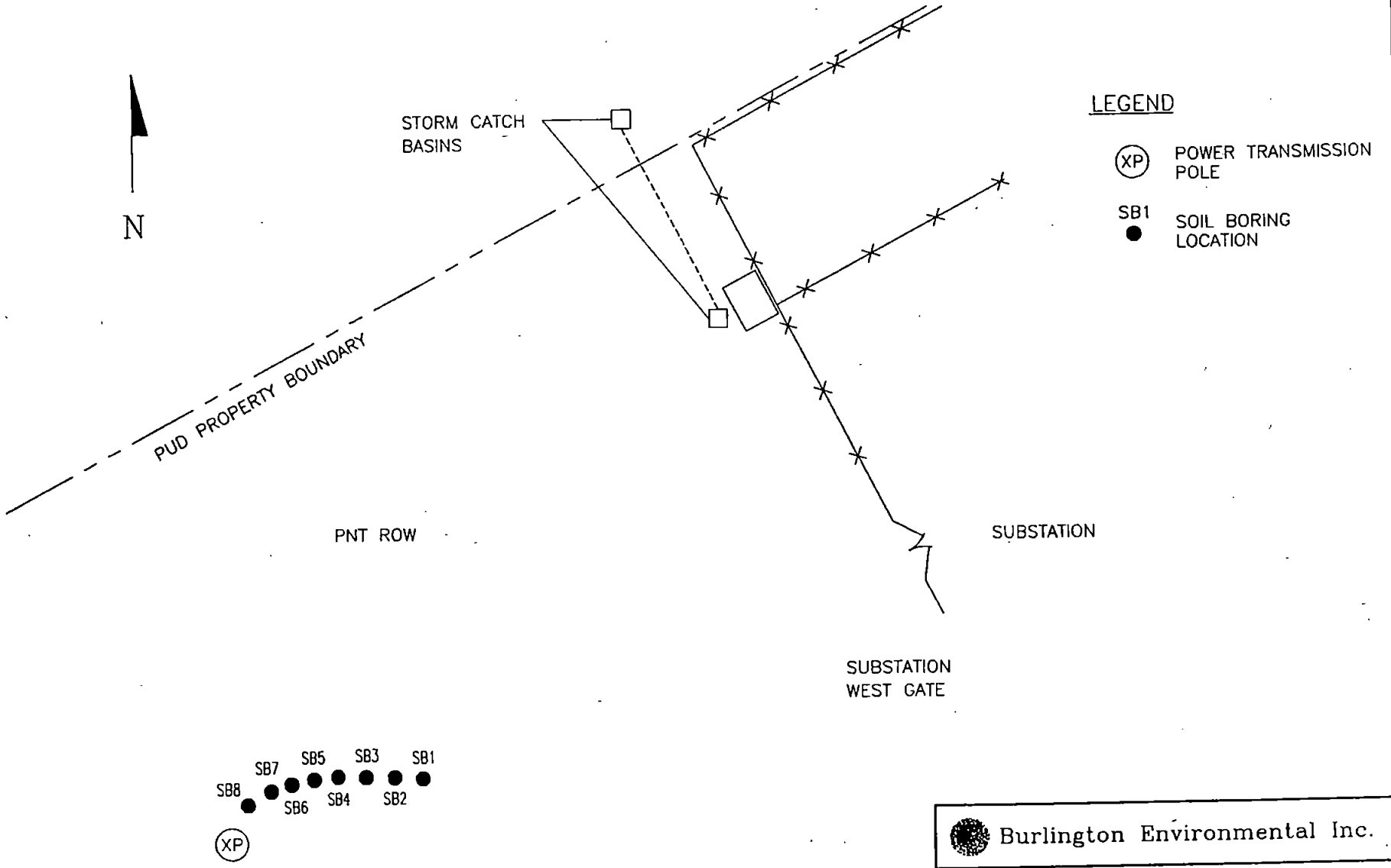

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DEEP SOIL BORING LOCATIONS

SNOHOMISH COUNTY PUD #1
MOUNTLAKE TERRACE, WASHINGTON
10779

FIGURE 5

8, and 10 feet from each boring. Samples collected at 2, 4 and 6 feet were submitted to the Burlington Corporate Laboratory to be analyzed for total lead. After the samples were collected, the borings were filled with bentonite chips and hydrated. Samples from two of the eight deep soil borings (HLSB 1-5-7, and HLSB 2-3-5), had total lead concentrations exceeding the cleanup standards of 250 mg/kg (Table 2). At the request of the PUD Project Leader, these two samples were then analyzed for TCLP lead. Based on the TCLP results (<0.10 mg/L and 0.12 mg/L), the PUD Project Leader did not request that any additional sampling be completed. Analytical data from samples collected in these deep borings is presented in Table 2. Records of subsurface exploration for these deep borings are presented in Appendix B.

6.2 Investigation and Remediation of the Upper ROW Area

To confirm that the previous remediation of the portion of the radiator shop on the District's property had been completed, Burlington personnel collected 10 hand-augered soil samples designated SS-7 through SS-16 at depths from 1 to 3 feet, in the upper ROW area (Figure 6). Five of the 10 soil samples collected had concentrations of lead exceeding the cleanup standards. Three of these five samples also exceeded cleanup standards for TPH. An additional sample of gray material placed near the fence post was taken by the District's Project Leader prior to excavation (MCC-1, 16,000 ppm of total lead). Analytical data from samples collected in the upper ROW area are shown in Table 3.

Based on the exceedances of the cleanup standards, PUD determined it was necessary to perform additional remediation in this area. On December 6, 1993 a backhoe excavated in the area where sample locations had elevated contaminant concentrations. Approximately 25 cubic yards of excavated soils were stockpiled in two piles on triple layered plastic. Both stockpiles were covered with a single sheet of plastic at the end of the day. The excavation was irregularly shaped, approximately 20 feet wide by 25 feet long and 3.5 feet deep.

Table 2

DEEP SOIL BORING ANALYTICAL RESULTS
SNOHOMISH COUNTY PUD NO. 1 - HALLS LAKE PHASE II

Sample I.D. Numbers	TPH (mg/kg)	Lead - Total (mg/kg)	Lead - TCLP (mg/L)
Deep Soil Borings			
HLSB-1-1-3	NA	97	NA
HLSB-1-3-5	NA	210	NA
HLSB-1-5-7	NA	350	<0.10
HLSB-2-1-3	NA	190	NA
HLSB-2-3-5	NA	580	0.12
HLSB-2-5-7	NA	17	NA
HLSB-3-1-3	NA	78	NA
HLSB-3-3-5	NA	99	NA
HLSB-3-5-7	NA	140	NA
HLSB-4-1-3	NA	61	NA
HLSB-4-3-5	NA	210	NA
HLSB-4-5-7	NA	43	NA
HLSB-5-1-3	NA	14	NA
HLSB-5-3-5	NA	18	NA
HLSB-5-7-9	NA	<7.5	NA
HLSB-6-1-3	NA	20	NA
HLSB-6-3-5	NA	6.7	NA
HLSB-6-5-7	NA	16	NA
HLSB-7-1-3	NA	24	NA
HLSB-7-3-5	NA	14	NA
HLSB-7-5-7	NA	16	NA
HLSB-8-1-3	NA	26	NA
HLSB-8-3-5	NA	18	NA
HLSB-8-5-7	NA	9.7	NA

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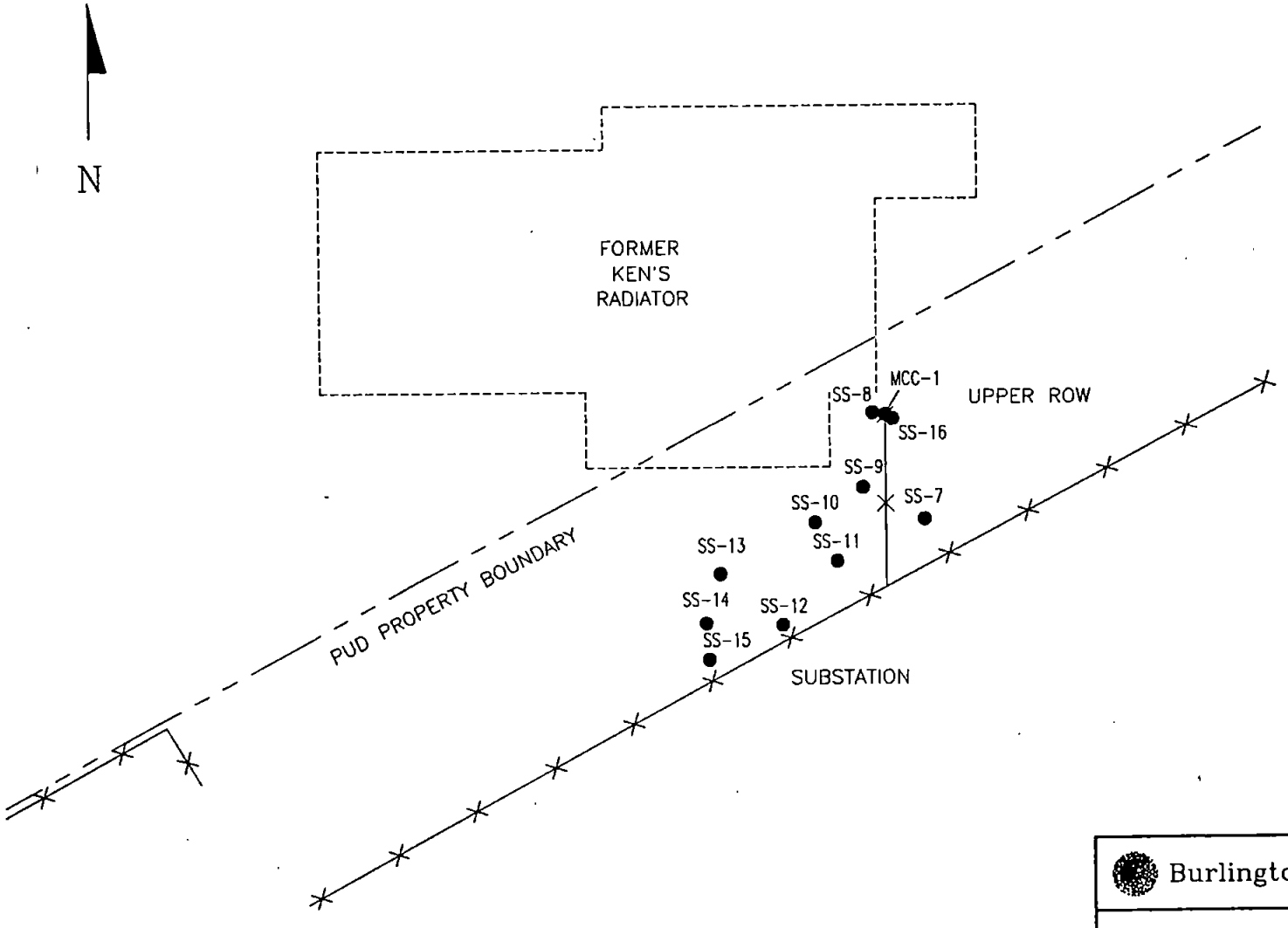

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UPPER ROW AREA
SAMPLE LOCATIONS

SNOHOMISH COUNTY PUD #1
MOUNTLAKE TERRACE, WASHINGTON
10779

FIGURE 6

Table 3

UPPER ROW SURFACE SAMPLES
SNOHOMISH COUNTY PUD NO. 1 - HALLS LAKE PHASE II

Sample I.D. Numbers	TPH (mg/kg)	Lead - Total (mg/kg)	Lead - TCLP (mg/L)
Surface Samples - Upper ROW			
PUDIISS-7 (10-29-93)	26	355	NA
PUDIISS-8 (10-29-93)	5,120	57,000	NA
PUDIISS-9	590	250	NA
PUDIISS-10	<16	390	NA
PUDIISS-11	<16	69	NA
PUDIISS-12	<16	61	NA
PUDIISS-13	<16	150	NA
PUDIISS-14	<16	110	NA
PUDIISS-15	<16	150	NA
PUDIISS-16	6,900	23,000	NA
MCC-1	NA	16,000	NA

7 INSTITUTIONAL CONTROLS

When Burlington arrived on site, institutional controls installed by the PUD were already in place.

8 SAMPLING AND ANALYSIS

8.1 Verification Sampling of the Lower Ditch Area

Four verification samples were collected from the north, east and south side walls (designated N, E and S) and from the bottom (designated C) of the east excavation area of the lower ditch excavation (Figure 4). The fill dirt from Phase I on the west side wall was not sampled. The verification samples were sent to the Burlington Corporate Laboratory for analysis. All of these samples exceeded cleanup standards, and as a result, it was necessary to continue excavating. A foot of soil was removed from the east side wall, north side wall and bottom of the excavation pit. A second set of verification samples was collected and analyzed (Figure 4). All of these samples were below the cleanup standards. Analytical data are presented in Table 4.

Fifteen verification samples were collected from the second lower ditch area (southwest of the east evacuation area of the lower ditch). These fifteen samples were collected from four locations along the trench from the bottom (designated C) and walls (designated N and S) of the trench (Figure 4). All verification samples met the cleanup standards with the exception of one sample (LD4S), along Sellen's property line. No further excavation was done because this sample location was on the property line where further digging would intrude onto Sellen Construction property. In addition, the gray layer was sampled along the southern PUD property line at both the east excavation area and the lower ditch (designated XX). The analytical data is presented in Table 4.

The stockpiles from these excavations were sampled and analyzed for Toxicity Characteristic Leaching Procedures (TCLP) lead to determine regulatory status for disposal. Approximately 62 cubic yards were classified as hazardous waste (TCLP lead greater than 5.0 mg/L) and 15 cubic yards were classified as non-hazardous, contaminated waste. The stockpiles were removed from the site on November 10 and 11, 1993. The haul trucks were lined with plastic and the soil loaded with a backhoe. After the stockpiles were removed, PUD personnel installed a new culvert and filled in the lower ditch with clean fill. Prior to replacing soil in the lower ditch, a plastic liner was installed to delineate clean areas of the lower ditch from areas on Sellen's property which were not yet remediated. Burlington has been informed by the PUD's project leader that remediation activities have taken place on Sellen property after Phase II was completed.

Table 4

LOWER DITCH VERIFICATION SAMPLES
SNOHOMISH COUNTY PUD NO.1 - HALLS LAKE PHASE II

Sample I.D. Numbers	TPH (mg/kg)	Lead - Total (mg/kg)	Lead - TCLP (mg/kg)
Excavation Verification Samples - Lower Ditch			
PUDIILD-1-E	<16	1,100	NA
PUDIILD-1-N	42	700	NA
PUDIILD-1-C	17	470	NA
PUDIILD-1-S	<16	410	NA
PUDIILD-1-XX	170	5,200	NA
PUDIILD-2-E	<16	51	NA
PUDIILD-2-N	<16	<4.2	NA
PUDIILD-2-S	<16	120	NA
PUDIILD-2-C	<16	120	NA
PUDIILD-3-N	<16	<7.6	NA
PUDIILD-3-C	<16	<8.8	NA
PUDIILD-3-S	<16	120	NA
PUDIILD-4-N	<16	7.6	NA
PUDIILD-4-C	<16	74	NA
PUDIILD-4-S	<16	300	NA
PUDIILD-5-N	62	30	NA
PUDIILD-5-S	<16	18	NA
PUDIILD-5-C	<16	14	NA
PUDIILD-5-W	<16	11	NA
PUDIILD-2-XX	NA	8,700	NA
PUDIILD-3-XX	NA	16,000	NA
PUDIILD-4-XX	NA	4,600	NA
PUDIILD-5-XX	NA	11,000	NA
PUDIILD-6-C	<16	<4.5	NA
PUDIILD-6-N	<16	17	NA
PUDIILD-6-E	<16	38	NA
PUDIILD-6-S	NA	18	NA
PUDIILD-6-2XX	WTPH-HCID	340	0.11
PUDIILD-6-XX	WTPH-HCID	4,100	4.70
PUDIILD-8-C	NA	<4.0	NA

NA: Not analyzed

8.2 Verification Sampling of the Upper ROW Area

Once excavation of the upper ROW area was completed, eight verification samples were collected, (Figure 7). The verification samples were analyzed for total lead and are presented in Table 5. All but one verification sample (PUDIISS-3, 1,800 mg/kg lead, approximately two to three feet deep) met the cleanup standards. It was determined that no further excavation was required because this sample was located slightly north of the PUD property line (Figure 7). On December 8, 1993 two additional verification samples were collected by the PUD Project Leader on either side of PUDIISS-3 (designated S1 and N1), on the PUD property line, and submitted to the Burlington Corporate Laboratory for analysis. Results showed these samples met cleanup standards. Three stockpile samples were collected and analyzed for TCLP lead to determine regulatory status for disposal. Based on TCLP analysis, both stockpiles were classified as hazardous waste and were removed for disposal on December 10, 1993. Once the stockpiles were removed, PUD personnel filled in the excavated area with clean fill.

8.3 Halls Creek Area Sampling

On November 8, 1993, as directed by the PUD Project Leader, Burlington personnel collected two soil samples at location LD7, at depths of one and two feet, from the Halls Creek lower wetland area (Figure 8). These samples were analyzed for TPH and total lead. On November 11, 1993, Burlington personnel collected another two soil samples at location LD9 for total lead analysis at depths of one and two feet using a shovel and stainless-steel spoons (Figure 8). On November 22, 1993 the PUD Project Leader collected three surface soil samples (HC1, HC2, and HC3) at the stakes marking the PUD property line. Since total lead at location HCSS-1 (HC1) was 3,200 ppm and TCLP was 5.2 ppm for lead, an additional six soil samples were collected to delineate this area of contamination at one foot and three feet radii from this point on December 2 and 22, 1993 respectively. The samples were analyzed for total lead and TCLP lead. The analytical results of all samples collected in the Halls Creek lower wetland area are presented in Table 6.

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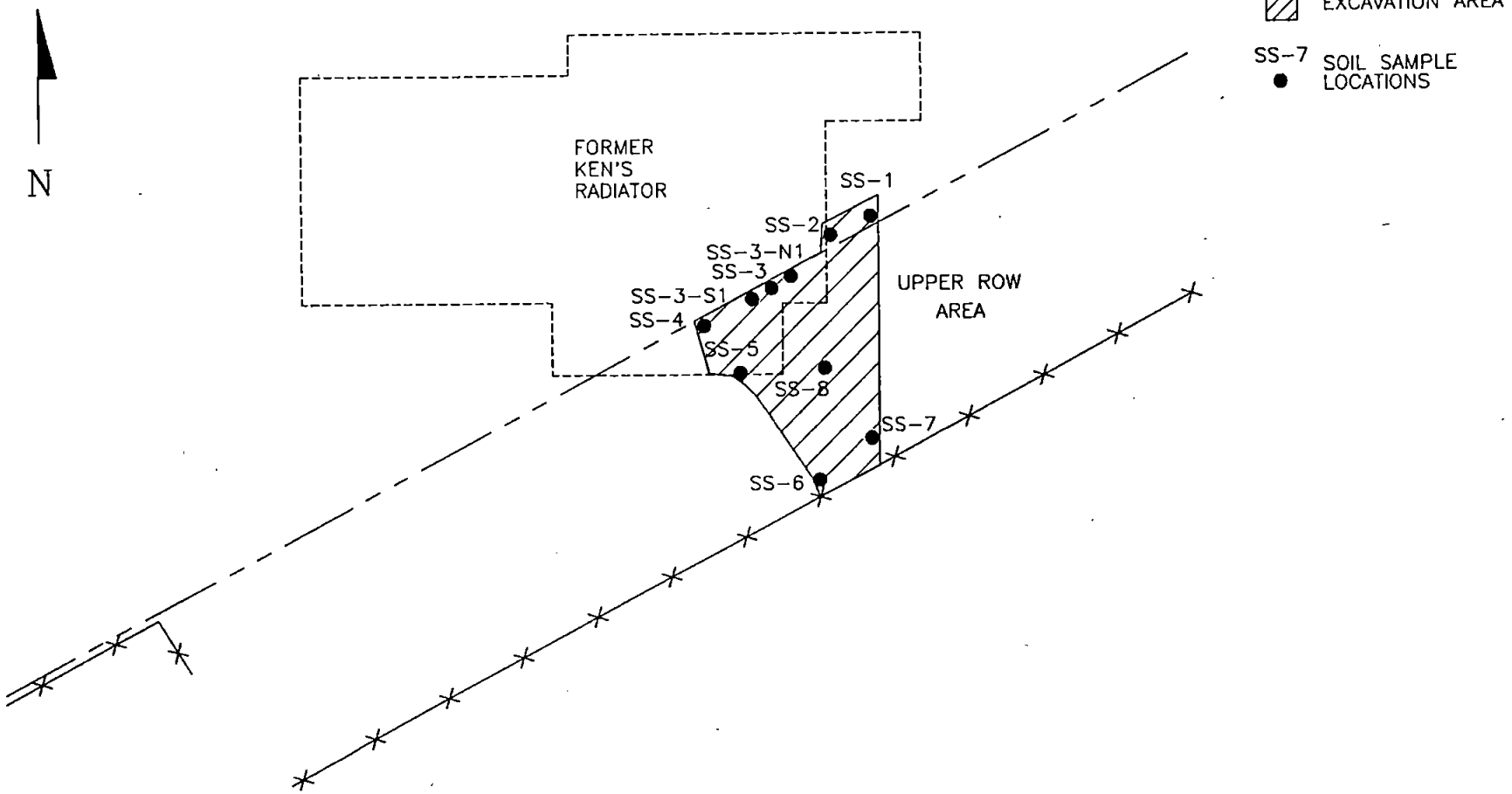

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UPPER ROW VERIFICATION SAMPLE LOCATIONS

SNOHOMISH COUNTY PUD #1
MOUNTLAKE TERRACE, WASHINGTON
10779

FIGURE 7

Table 5

UPPER ROW VERIFICATION SAMPLES
SNOHOMISH COUNTY PUD NO. 1 - HALLS LAKE PHASE II

Sample I.D. Numbers	TPH (mg/kg)	Lead - Total (mg/kg)	Lead - TCLP (mg/L)
Excavation Verification Samples - Upper ROW			
PUDIISS-1	NA	14	NA
PUDIISS-2	NA	18	NA
PUDIISS-3	NA	1,800	NA
PUDIISS-4	NA	7.7	NA
PUDIISS-5	NA	<4.3	NA
PUDIISS-6	NA	26	NA
PUDIISS-7 (12-6-93)	NA	6.5	NA
PUDIISS-8 (12-6-93)	NA	<4.7	NA
PUD2SS-3-S1	NA	82	NA
PUD2SS-3-N1	NA	28	NA

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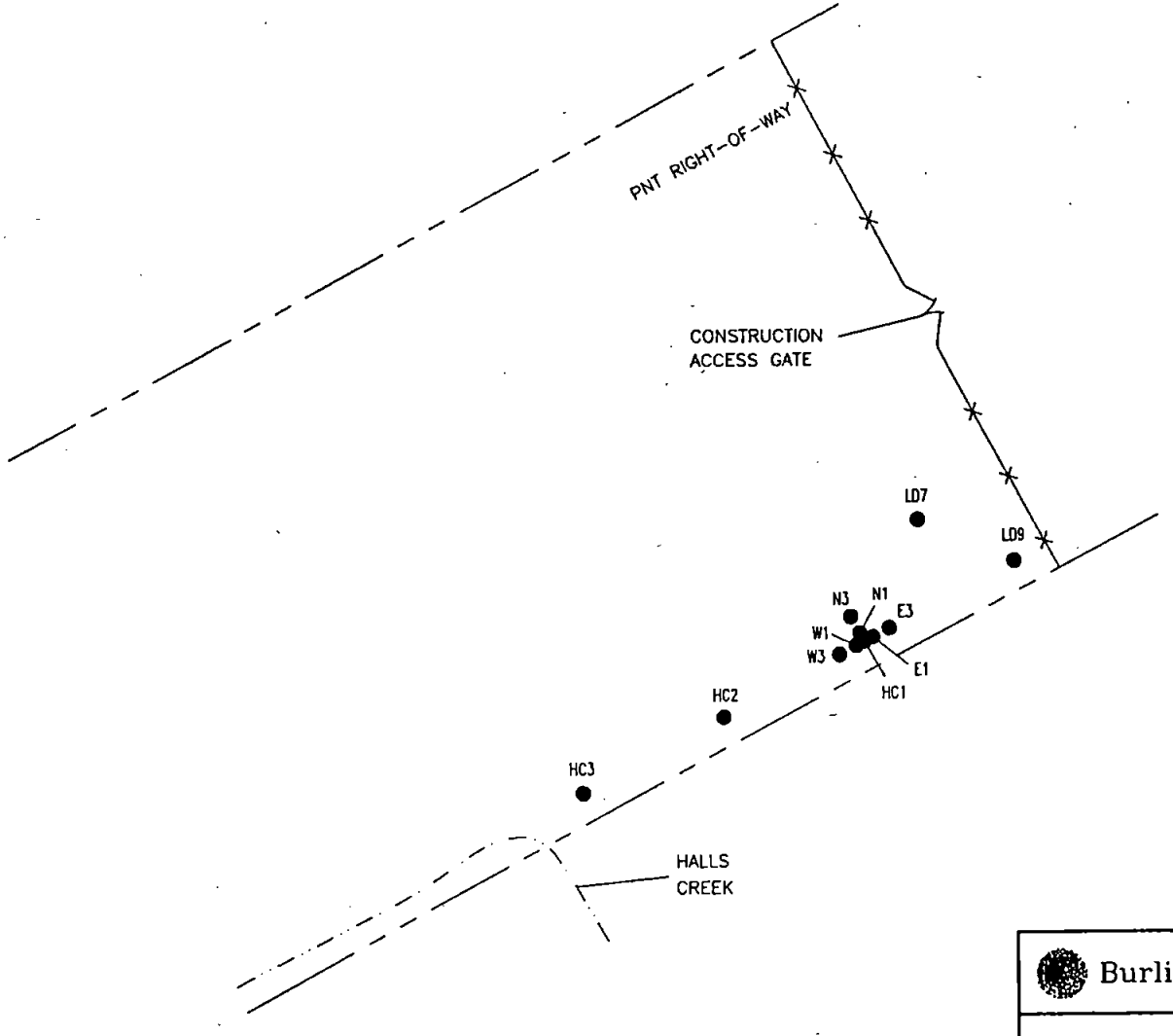


LEGEND

E1
● SAMPLE LOCATION

GRAPHIC SCALE

10 0 10 20

IN FEET

Burlington Environmental Inc.

HALLS CREEK
SAMPLE LOCATIONS

SNOHOMISH COUNTY PUD #1
MOUNTLAKE TERRACE, WASHINGTON
10779

FIGURE 8

Table 6

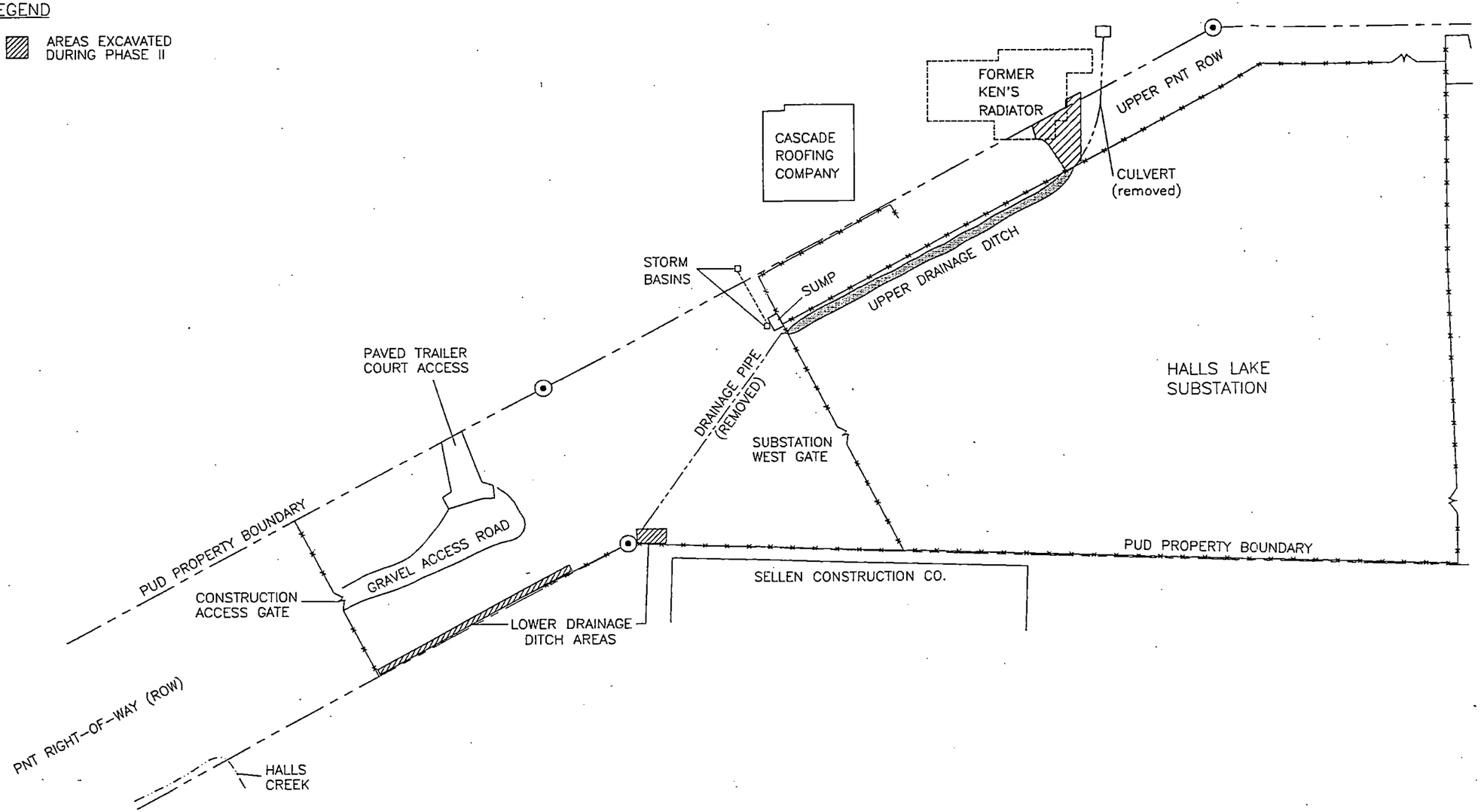
HALLS CREEK ANALYTICAL RESULTS
SNOHOMISH COUNTY PUD NO. 1 - HALLS LAKE PHASE II

Sample I.D. Numbers	TPH (mg/kg)	Lead - Total (mg/kg)	Lead - TCLP (mg/L)
Halls Creek Lower Wetland Area			
PUDIILD-7-1	<16	66	NA
PUDIILD-7-2	<16	15	NA
PUDIILD-9-1	NA	680	4.50
PUDIILD-9-2	NA	150	NA
HCSS-1	NA	3,200	5.20
HCSS-1-E3	NA	10,000	14.00
HCSS-1-W3	NA	1,900	2.20
HCSS-1-N3	NA	1,200	3.90
HCSS-2	NA	72	<0.10
HCSS-3	NA	28	<0.10
HCSS1W1	NA	4,100	4.80
HCSS1E1	NA	3,600	6.00
HCSS1N1	NA	3,200	5.00

PT/DP 10779A 10/03/94	DRAWN BY		CHECKED BY		DOCUMENT MANAGER		PROJECT MANAGER	

LEGEND

AREAS EXCAVATED DURING PHASE II



NOT TO SCALE

Burlington Environmental Inc.

SITE MAP

SNOHOMISH COUNTY PUD #1
MOUNTLAKE TERRACE, WASHINGTON
10779

FIGURE 2

APPENDIX A

Phase II Investigation Analytical Data

CHEMPRO

CHEMICAL PROCESSORS
CORPORATE LABORATORY
REQUEST FOR ANALYSIS/CHAIN OF CUSTODY

DATE 2-11-94
DEPARTMENT
CLIENT SNOHOMISH PUD #1
SALESPERSON
LAB No. 51416 CP/PROJECT No. 10779

SEND REPORT TO: Mo Azose / Lou LaRosa
SEND INVOICE TO:
ADDRESS:
ATTENTION:

NORMAL (3 - 8 days) X (Initial screen)
RUSH (1 - 3 days)
AUTHORIZATION NECESSARY FOR ALL RUSHES!

SAMPLE INFORMATION: TYPE OF COMPANY Snohomish Co. PUD #1
No. OF SAMPLES 3
SAMPLE DESCRIPTION/PROCESS/DRUM MARKINGS/OTHER

Soil Samples Nos HCSS N3 - 51416-3
HCSS E3 - 51416-1
HCSS W3 - 51416-2

UNKNOWNS
Sample No.'s
C/C
Sample No.'s

METALS (you must specify which individual metals you want run)
Sample No.'s HCSSW3, HCSSN3, HCSSE3
Total TCLP X EPTOX

PIER 91 ACCEPTANCE
SAMPLE No.'s
FLASH POINT EMULSION TEST
pH DOHRMANN
CHLOR-D-TECT
(>1000 ppm - Dohrmann?)
(If Dohrmann fails, test by GC/MS?)

As (Arsenic)		Pb (Lead)	X	CALIFORNIA LIST METALS	(As, Cd, Pb, Hg, Se, Cr6, Ni, Tl)
Be (Beryllium)		Hg (Mercury)		DISCHARGE METALS	(Cd, Cr, Cu, Pb, Ni, Zn)
Cd (Cadmium)		Ni (Nickel)		EP TOX METALS	(As, Ba, Cd, Cr, Pb, Hg, Se, Ag)
Cr (Chromium)		Ag (Silver)		F006 TCLP METALS	(Cd, Cr, Pb, Ni, Ag)
Cr^{6+}		Zn (Zinc)		PROFILE METALS	(As, Ba, Cd, Cr, Hg, Pb, Se, Ag, Cu, Ni, Zn, Tl)
Cu (Copper)		OTHER			

MISCELLANEOUS TESTING
PCB'S TCT TPH BETX A-FUEL
DETECTION LIMIT/METHOD

GC/MS TESTING ANALYSES
F-LISTED SOLVENTS
CHLORINATED SOLVENTS
CCWE TABLE F-LISTED SOLVENTS
BY TCLP & ZHE
EPA METHOD 624 (volatiles)
EPA METHOD 625 (semi-volatiles)

SPECIAL TESTS:

DATE: 2-11-94
RELINQUISHED BY Lou LaRosa

DATE: 2/11/94
RECEIVED BY Heidi Young

DATE:
RELINQUISHED BY

DATE:
RECEIVED BY

Metals Laboratory Report

Lab Number : 51416

Plant/Generator Name : TECH. SERVICES / SNOHOMISH CO. PUD
Sample Type : SOIL - PROJECT #10779
Date of Receipt : 01/12/94 Analyst: BLW/~~EL~~
Date of Report : 01/14/94 QC Checked: 1/14/94
Parameters for Analysis: TOTAL LEAD
Outside Lab : NONE Outside Lab Report No:

TOTAL LEAD BY SW-846 3050, 6010.

Metals:	PREP BLANK MG/L	% LCS RECOVERY	51416-1 HCSS1E3	51416-1 DUP HCSS1E3 DUP
Lead	<0.10	86.9	10000	11000

Comments and Conclusions:

RESULTS REPORTED AS MG/KG DRY WEIGHT.

Metals Laboratory Report

Lab Number : 51416

Plant/Generator Name : TECH. SERVICES / SNOHOMISH CO. PUD
Sample Type : SOIL - PROJECT #10779
Date of Receipt : 01/12/94 Analyst: BLW/EL
Date of Report : 01/14/94 QC Checked: 1/14/94
Parameters for Analysis: TOTAL LEAD
Outside Lab : NONE Outside Lab Report No:

TOTAL LEAD BY SW-846 3050, 6010.

Metals:	51416-2 HCSS1W3	51416-3 HCSS1N3	% MATRIX SPIKE RECOVERY
Lead	1900	1200	*

Comments and Conclusions:

RESULTS REPORTED AS MG/KG DRY WEIGHT.
LEVEL OF ANALYTE IN THE SAMPLE WAS GREATER THAN
TIMES THE LEVEL OF SPIKE ADDED.

Metals Laboratory Report

Lab Number : 51416

Plant/Generator Name : TECH. SERVICES / SNOHOMISH CO. PUD
Sample Type : SOIL - PROJECT #10779
Date of Receipt : 01/12/94 Analyst: BLW/EL
Date of Report : 02/16/94 QC Checked: BWB 2/16/94
Parameters for Analysis: TOTAL / TCLP LEAD
Outside Lab : NONE Outside Lab Report No:

TCLP LEAD BY SW-846 1311, 6010.

Metals:	PREP BLANK MG/L - TCLP	% LCS RECOVERY	51416-1 TCLP HCSSE3-TCLP	51416-2 TCLP HCSSW3-TCLP
Lead	<0.10	105.6	14	2.2

Comments and Conclusions:

RESULTS REPORTED AS MG/L IN TCLP EXTRACT.

Metals Laboratory Report

Lab Number : 51416

Plant/Generator Name : TECH. SERVICES / SNOHOMISH CO. PUD
Sample Type : SOIL - PROJECT #10779
Date of Receipt : 01/12/94 Analyst: BLW/EL
Date of Report : 02/16/94 QC Checked: _____
Parameters for Analysis: TOTAL / TCLP LEAD
Outside Lab : NONE Outside Lab Report No:

TCLP LEAD BY SW-846 1311, 6010.

Metals:	51416-3 HCSSN3 - TCLP	% MATRIX SPIKE RECOVERY
Lead	3.9	114.8

Comments and Conclusions:

RESULTS REPORTED AS MG/L IN TCLP EXTRACT.
51416-1 94 GRAMS OF SAMPLE EXTRACTED.
51416-2 73 GRAMS OF SAMPLE EXTRACTED.
51416-3 100 GRAMS OF SAMPLE EXTRACTED.

BURLINGTON
ENVIRONMENTAL

210 West Sand Bank Road
P.O. Box 330
Columbia, IL 62236-0330
618/281-7173
618/281-5120 FAX

CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 6300

PROJECT NAME Simo County PUD
PROJECT NUMBER 10779 MAJOR TASK
SAMPLERS Kamen Rose
LAB DESTINATION BEI LABS

SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE LOCATION	NO. OF CONTAINERS	TYPE OF ANALYSIS: TOTAL Pb						ICED	PRESERVATIVES: CHEMICALS ADDED	REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE)
51416-1	1/10	11:00 AM			HCSS1E3		✓								Regular time not Rush
51416-2	1	1			HCSS1W3		✓								4
51416-3	1	1			HCSS1N3		✓								

RELINQUISHED BY: SIGNATURE	DATE	TIME	RECEIVED BY: SIGNATURE	DATE	TIME
M Agor	1/5 pm	1/15	Heidi Young	1/12	3:15

SHIPPING NOTES Samples Relogd by Kamen Rose
Shipped on 1/11
Recd on 1/12

LAB NOTES

BE-34 (1/92)

Metals Laboratory Report

Lab Number : 51416

Plant/Generator Name : TECH. SERVICES / SNOHOMISH CO. PUD
Sample Type : SOIL - PROJECT #10779
Date of Receipt : 01/12/94 Analyst: BLW/~~EL~~
Date of Report : 01/14/94 QC Checked: 1/14/94
Parameters for Analysis: TOTAL LEAD
Outside Lab : NONE Outside Lab Report No:

TOTAL LEAD BY SW-846 3050, 6010.

Metals:	PREP BLANK MG/L	% LCS RECOVERY	51416-1 HCSS1E3	51416-1 DUP HCSS1E3 DUP
Lead	<0.10	86.9	10000	11000

Comments and Conclusions:

RESULTS REPORTED AS MG/KG DRY WEIGHT.

Metals Laboratory Report

Lab Number : 51416

Plant/Generator Name : TECH. SERVICES / SNOHOMISH CO. PUD
Sample Type : SOIL - PROJECT #10779
Date of Receipt : 01/12/94 Analyst: BLW/EL
Date of Report : 01/14/94 QC Checked: 1/14/94
Parameters for Analysis: TOTAL LEAD
Outside Lab : NONE Outside Lab Report No:

TOTAL LEAD BY SW-846 3050, 6010.

Metals:	51416-2 HCSS1W3	51416-3 HCSS1N3	% MATRIX SPIKE RECOVERY
Lead	1900	1200	*

Comments and Conclusions:

RESULTS REPORTED AS MG/KG DRY WEIGHT.
* LEVEL OF ANALYTE IN THE SAMPLE WAS GREATER THAN
4 TIMES THE LEVEL OF SPIKE ADDED.

BURLINGTON
ENVIRONMENTAL

210 West Sand Bank Road
P.O. Box 330
Columbia, IL 62236-0330
618/281-7173
618/281-5120 FAX

CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 5696

PROJECT NAME Snohomish Co. PUD Hall's Lake
PROJECT NUMBER 10779 MAJOR TASK 0017
SAMPLERS Brotherton
LAB DESTINATION BET

SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE LOCATION	NO. OF CONTAINERS	TYPE OF ANALYSIS: TCLP							ICED	PRESERVATIVES: CHEMICALS ADDED	REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE)
51183-1	12-10-93	1145			PUDIT-SPB-E	1	X									
-2		1146			PUDIT-SPB-W	1	X									
		1147			PUDIT-DW-1	1		X								
		1148			PUDIT-DW-2	1		X								

RELINQUISHED BY

SIGNATURE	DATE	TIME
David Brotherton	12-10-93	1327

RECEIVED BY

SIGNATURE	DATE	TIME
Mark Lindsey	12.10	1330

SHIPPING NOTES

LAB NOTES

BE-34 (1/92)

Metals Laboratory Report

Lab Number : 51183

Plant/Generator Name : TECH. SERVICES - SNOHOMISH CO. PUD-PROJECT #10779
Sample Type : SOIL - MAJOR TASK #0077
Date of Receipt : 12/10/93 Analyst: BLW/EL
Date of Report : 12/11/93 QC Checked: BLW 12.11.93
Parameters for Analysis: TCLP LEAD
Outside Lab : NONE Outside Lab Report No:

TCLP LEAD BY SW-846 1311, 7420.

Metals:	PREP BLANK	% LCS RECOVERY	51183-1 PUDII-SPB-E	51183-1 DUP PUDII-SPB-E DUP
Lead	<0.20	90.3	<0.20	<0.20

Comments and Conclusions:

RESULTS REPORTED AS MG/L IN TCLP EXTRACT.

Metals Laboratory Report

Lab Number : 51183

Plant/Generator Name : TECH. SERVICES - SNOHOMISH CO. PUD-PROJECT #10779
Sample Type : SOIL - MAJOR TASK #0077
Date of Receipt : 12/10/93 Analyst: BLW/EL
Date of Report : 12/11/93 QC Checked: BLW 12.11.93
Parameters for Analysis: TCLP LEAD
Outside Lab : NONE Outside Lab Report No:

TCLP LEAD BY SW-846 1311, 7420.

Metals:	51183-2 PUDII-SPB-W	% MATRIX SPIKE RECOVERY
Lead	<0.20	94.5

Comments and Conclusions:

RESULTS REPORTED AS MG/L IN TCLP EXTRACT.

BURLINGTON
ENVIRONMENTAL

General Laboratory Report

Lab Number : 51183

Plant/Generator Name : Tech. Services - Snohomish Co. PUD-Project #10779
Sample Type : Soil - Major Task #0077
Date of Receipt : 12/10/93 Analyst: BLW/EL
Date of Report : 12/11/93 QC Checked: Kathy Opps
Parameters for Analysis: TCLP Lead and Total Lead
Outside Lab : Sound Outside Lab Report No: 36762

Data:

These two soil samples from Snohomish County PUD, Project 10779, Major Task 0077, labeled PUDII-SPB-E and PUDII-SPB-W, were analyzed for TCLP Lead by the Burlington Environmental Corporate Laboratory and for Total Lead by Sound Analytical Services. Copies of the Total Lead results are attached.

Comments and Conclusions:

BURLINGTON ENVIRONMENTAL
2203 Airport Way South, Suite 400
Seattle, WA 98134
206-223-0500 • FAX: 223-7791

Chain of Custody/ Laboratory Analysis Request

DATE _____ PAGE _____ OF _____

PROJECT Snd Co PUD. # 10779
CLIENT INFO. CONTACT
CHEMPRO DIVISION/GENERATOR NAME Sch. Tech Svcs.
TELEPHONE # Mo Azose 223-7593
SAMPLERS NAME _____ PHONE # _____
SAMPLERS SIGNATURE _____

SAMPLE I.D.	DATE	TIME	LAB I.D.	TYPE
1. PUDII - SPB - E	12/10	1145	S11831	
2. PUDII - SPB - W	12/10	1145	-2	
3.				
4.				
5.				
6.				
7.				
8.				

ANALYSIS REQUESTED

BASE/NEU/ACID ORGAN. GC/MS/625/8270	VOLATILE ORGANICS GC/MS/624/8240	PCB's 608/8080	TPH (circle method) 418.1 or 8015	BETX (circle method) 8240 or 8020	F-LISTED SOLVENTS 8240	TCLP F-LISTED SOLVENTS 1311/8240	TCLP METALS D004-11	METALS (TOTAL) As, Ba, Cd, Cr, Cu, Pb, Ni, Hg, Ag, Se, Tl, Sb, Zn	TCLP ORGANICS (specify methods) • VOA's 8240 • BNA's 8270 • Pesticides 8080 • Herbicides 8150	DISCHARGE TESTING	OTHER (Specify)						NUMBER OF CONTAINERS	RECEIVED IN GOOD CONDITION?
								✓										
								✓										

Relinquished By	Relinquished By	Relinquished By
Signature Mo Azose	Signature	Signature
Printed Name BEI	Printed Name	Printed Name
Firm 12/13/93 925 AM	Firm	Firm
Date/Time	Date/Time	Date/Time
Received By	Received By	Received By
Signature J. PALMQUIST	Signature	Signature
Printed Name SPB	Printed Name	Printed Name
Firm 12-13-93	Firm	Firm
Date/Time 10:00 AM	Date/Time	Date/Time

SPECIAL INSTRUCTIONS/COMMENTS:
ANALYZE FOR TOTAL LEAD.
RESULTS BY WED. 200 PM
12/15/93

DISTRIBUTION: WHITE ... YELLOW ... lab: ... retained ... original ... Rev

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

TRANSMITTAL MEMORANDUM

DATE: December 14, 1993

TO: Mo Azose
Burlington Environmental, Seattle Facility

PROJECT NAME: Snohomish County PUD

PROJET NUMBER: 10779

LABORATORY NUMBER: 36762

Enclosed are one original and one copy of the Tier I data deliverables package for Laboratory Work Order Number 36762. Two samples were received for analysis at Sound Analytical Services, Inc., on December 13, 1993.

If there are any questions regarding this data package, please do not hesitate to call me at (206) 922-2310.

Sincerely,

Lila A Transue

Lila A. Transue
Project Manager

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

Report To: Burlington Environmental
Seattle Facility

Date: December 14, 1993

Report On: Analysis of Soil

Lab No.: 36762

IDENTIFICATION:
Samples received on 12-13-93
Project: Snohomish County PUD
PO # 44391

ANALYSIS:

Lead Per EPA Method 6010
Date Analyzed: 12-13-93

Lab Sample No.	Client ID	Lead, mg/kg	PQL
36762-1	PUDII-SPB-E 51183-1	20	2.4
36762-2	PUDII-SPB-W 51183-2	65	2.0

PQL - Practical Quantitation Limit

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

QUALITY CONTROL REPORT

Total Lead

Client: Burlington Environmental, Seattle Facility
Lab No: 36762qc
Units: mg/kg

METHOD BLANK

Date Analyzed: 12-13-93

Parameter	Result	PQL
Lead	ND	2.5

PQL - Practical Quantitation Limit
ND - Not Detected

BURLINGTON ENVIRONMENTAL
2203 Airport Way South, Suite 400
Seattle, WA 98134
206-223-0500 • FAX: 223-7791

Chain of Custody/ Laboratory Analysis Request

DATE _____ PAGE _____ OF _____

PROJECT Snvd Cty PUD. # 10779
CLIENT INFO. CONTACT _____
CHEMPRO DIVISION/GENERATOR NAME Sed. Test Svcs.
TELEPHONE # Mo Arose 223-7593
SAMPLERS NAME _____ PHONE # _____
SAMPLERS SIGNATURE _____

SAMPLE I.D.	DATE	TIME	LAB I.D.	TYPE	BASE/NEU/ACID ORGAN. GC/MS/625/8270	VOLATILE ORGANICS GC/MS/624/8240	PCB's 608/8080	TPH (circle method) 418.1 or 8015	BETX (circle method) 8240 or 8020	F-LISTED SOLVENTS 8240	TCLP F-LISTED SOLVENTS 1311/8240	TCLP METALS D004-11	METALS (TOTAL) As. Ba. Cd. Cr. Cu. Ni. Hg. Ag. Se. Tl. Sb. Zn	TCLP ORGANICS (specify methods) • VOA's 8240 • BNA's 8270 • Pesticides 8080 • Herbicides 8150	DISCHARGE TESTING	OTHER (Specify)						NUMBER OF CONTAINERS	RECEIVED IN GOOD CONDITION?
1. PUD II-SPB-E	12/10	1145	S11833-1										✓										
2. PUD II-SPB-W	12/10	1145	-2										✓										
3.																							
4.																							
5.																							
6.																							
7.																							
8.																							

Relinquished By: M Arose	Relinquished By: J Palmquist	Relinquished By
Signature: Mo Arose	Signature: J PALMQUIST	Signature
Printed Name: BEI	Printed Name: SAS	Printed Name
Firm: 12/13/93 9:25 AM	Firm: 12-13-93	Firm
Date/Time	Date/Time: 12:30 P.M.	Date/Time
Received By: J Palmquist	Received By: Mary Curtiss	Received By
Signature: J. PALMQUIST	Signature: Mary Curtiss	Signature
Printed Name: SAS	Printed Name: SAS	Printed Name
Firm: 12-13-93	Firm: 12/13/93 12:30	Firm
Date/Time: 10:00 AM	Date/Time	Date/Time

SPECIAL INSTRUCTIONS/COMMENTS:
ANALYZE FOR TOTAL LEAD.
RESULTS BY WED. 200 PM
12/15/93

DISTRIBUTION: WHITE - return to originator; YELLOW - lab; PINK - retained by originator.

(LAB-200 Rev. 10/90)

BURLINGTON ENVIRONMENTAL
2203 Airport Way South, Suite 400
Seattle, WA 98134
206-223-0500 • FAX: 223-7791

Chain of Custody/ Laboratory Analysis Request

DATE _____ PAGE _____ OF _____

PROJECT 10779 # _____
CLIENT INFO. CONTACT Snohomish County PUD
CHEMPRO DIVISION/GENERATOR NAME Terri Sues.
TELEPHONE # _____
SAMPLERS NAME ABBOTT PHONE # _____
SAMPLERS SIGNATURE _____

SAMPLE I.D.	DATE	TIME	LAB I.D.	TYPE
1. PUD2SS3-S1	12/9	1200	S1169-1	
2. PUD2SS3-N1	12/9	1200	-2	
3.				
4.				
5.				
6.				
7.				
8.				

ANALYSIS REQUESTED

BASE/NEU/ACID ORGAN. GC/MS/625/8270	VOLATILE ORGANICS GC/MS/624/8240	PCB's 608/8080	TPH (circle method) 418.1 or 8015	BETX (circle method) 8240 or 8020	F-LISTED SOLVENTS 8240	TCLP F-LISTED SOLVENTS 1311/8240	TCLP METALS D004-11	METALS (TOTAL) As, Ba, Cd, Cr, Cu, Pb, Ni, Hg, Ag, Se, Tl, Sb, Zn	TCLP ORGANICS (specify methods) • VOA's 8240 • BNA's 8270 • Pesticides 8080 • Herbicides 8150	DISCHARGE TESTING	OTHER (Specify)						NUMBER OF CONTAINERS	RECEIVED IN GOOD CONDITION?
								✓										
								✓										

Relinquished By	Relinquished By	Relinquished By
Signature Mona D'Atz	Signature	Signature
Printed Name Mo Acosta	Printed Name	Printed Name
Firm BEI	Firm	Firm
Date/Time 12/9 1200	Date/Time	Date/Time
Received By	**Received By**	**Received By**
Signature A D Bell	Signature	Signature
Printed Name B D BELL	Printed Name	Printed Name
Firm BEI	Firm	Firm
Date/Time 12/9 1215	Date/Time	Date/Time

SPECIAL INSTRUCTIONS/COMMENTS:

DISTRIBUTION: WHITE - return to originator; YELLOW - lab; PINK - retained by originator (LAB-200 Rev. 10/90)

Metals Laboratory Report

Lab Number : 51169

Plant/Generator Name : TECH. SERVICES / SNOHOMISH CO. PUD
Sample Type : SOIL - PROJECT #10779
Date of Receipt : 12/09/93 Analyst: BB/EL
Date of Report : 12/10/93 QC Checked: BB 12/10/93
Parameters for Analysis: TOTAL LEAD
Outside Lab : NONE Outside Lab Report No:

TOTAL LEAD BY SW-846 3050, 6010.

Metals:	PREP BLANK MG/L	% LCS RECOVERY	51169-1 PUD2SS3-S1	51169-2 PUD2SS3-N1
Lead	<0.10	79.5	82	28

Comments and Conclusions:

RESULTS REPORTED AS MG/KG DRY WEIGHT.

Metals Laboratory Report

Lab Number : 51169

Plant/Generator Name : TECH. SERVICES / SNOHOMISH CO. PUD
Sample Type : SOIL - PROJECT #10779
Date of Receipt : 12/09/93 Analyst: BB/EL
Date of Report : 12/10/93 QC Checked: 12/10/93
Parameters for Analysis: TOTAL LEAD
Outside Lab : NONE Outside Lab Report No:

Metals:	% MATRIX SPIKE RECOVERY
Lead	92.4

Comments and Conclusions:

BURLINGTON
ENVIRONMENTAL

210 West Sand Bank Road
P.O. Box 330
Columbia, IL 62236-0330
618/281-7173
618/281-5120 FAX

CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 5693

PROJECT NAME Snohomish Co PUD Halls Lake
PROJECT NUMBER 10779 MAJOR TASK 0077
SAMPLERS Brooks
LAB DESTINATION BEL

SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE LOCATION	NO. OF CONTAINERS	TYPE OF ANALYSIS: TPH	TCLP Total Lead						ICED	PRESERVATIVES: CHEMICALS ADDED	REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE)
5085-1	12-6-93	1400			PUDIESS-NSP E	1	1									
-2		1401			PUDIESS-SSP MW	1	1									
-3		1402			PUDIISS-SSP E	1	1									
-4		1441			PUDIESS-1	1		1								24 hour
-5		1442			-2	1		1								TURN AROUND
-6		1443			-3	1		1								
-7		1444			-4	1		1								
-8		1445			-5	1		1								
-9		1446			-6	1		1								
-10		1447			-7	1		1								
-11		1448			-8	1		1								

RELINQUISHED BY SIGNATURE	DATE	TIME	RECEIVED BY SIGNATURE	DATE	TIME
James M. Lamon	12-6-93	3:53	Eric Langan	12-6-93	3:55

SHIPPING NOTES

LAB NOTES

BE-34 (1/92)

Metals Laboratory Report

Lab Number : 51085

Plant/Generator Name : TECH. SERVICES / SNOHOMISH CO. PUD-PROJECT #10779
Sample Type : SOIL - MAJOR TASK 0077
Date of Receipt : 12/06/93 Analyst: BLW/EL
Date of Report : 12/08/93 QC Checked: 12/8/93
Parameters for Analysis: TOTAL / TCLP LEAD
Outside Lab : NONE Outside Lab Report No:

TCLP LEAD BY SW-846 1311, 6010.

Metals:	PREP BLANK TCLP	51085-1 TCLP PUDIISS-NSPE	51085-2 TCLP PUDIISS-SSDW	51085-3 TCLP PUDIISS-SSPE
Lead	<0.10	1.8	7.4	31

Comments and Conclusions:

RESULTS REPORTED AS MG/L IN TCLP EXTRACT.

Metals Laboratory Report

Lab Number : 51085

Plant/Generator Name : TECH. SERVICES / SNOHOMISH CO. PUD-PROJECT #10779
Sample Type : SOIL - MAJOR TASK 0077
Date of Receipt : 12/06/93 Analyst: BLW/EL
Date of Report : 12/08/93 QC Checked: 12/8/93
Parameters for Analysis: TOTAL / TCLP LEAD
Outside Lab : NONE Outside Lab Report No:

TOTAL LEAD BY SW-846 3050, 6010.

Metals:	PREP BLANK MG/L TOTAL	%LCS RECOVERY TOTAL	51085-4 TOTAL PUDIISS-1	51085-4 DUP PUDIISS-1 DUP
Lead	<0.10	86.9	14	13

Comments and Conclusions:

RESULTS REPORTED AS MG/KG DRY WEIGHT.

Metals Laboratory Report

Lab Number : 51085

Plant/Generator Name : TECH. SERVICES / SNOHOMISH CO. PUD-PROJECT #10779
Sample Type : SOIL - MAJOR TASK 0077
Date of Receipt : 12/06/93 Analyst: BLW/EL
Date of Report : 12/08/93 QC Checked: 12/8/93
Parameters for Analysis: TOTAL / TCLP LEAD
Outside Lab : NONE Outside Lab Report No:

TOTAL LEAD BY SW-846 3050, 6010.

Metals:	51085-5 PUDIISS-2	51085-6 PUDIISS-3	51085-7 PUDIISS-4	51085-8 PUDIISS-5
Lead	18	1800	7.7	<4.3

Comments and Conclusions:

RESULTS REPORTED AS MG/KG DRY WEIGHT.

Metals Laboratory Report

Lab Number : 51085

Plant/Generator Name : TECH. SERVICES / SNOHOMISH CO. PUD-PROJECT #10779
Sample Type : SOIL - MAJOR TASK 0077
Date of Receipt : 12/06/93 Analyst: BLW/EL
Date of Report : 12/08/93 QC Checked: 12/8/93
Parameters for Analysis: TOTAL / TCLP LEAD
Outside Lab : NONE Outside Lab Report No:

TOTAL LEAD BY SW-846 3050, 6010.

Metals:	51085-9 TOTAL PUDIISS-6	51085-10 TOTAL PUDIISS-7	51085-11 TOTAL PUDIISS-8	% MATRIX SPIKE RECOVERY-TOTAL
Lead	26	6.5	<4.7	86.8

Comments and Conclusions:

RESULTS REPORTED AS MG/KG DRY WEIGHT.

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CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 6470

PROJECT NAME SNOHOMISH PUD #1
PROJECT NUMBER 10779 MAJOR TASK 0077
SAMPLERS KAREN ROSE ALBERT
LAB DESTINATION BEI

SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE LOCATION #	NO. OF CONTAINERS	TYPE OF ANALYSIS: Total Pb	TCLP Pb						PRESERVATIVES: ICED	PRESERVATIVES: CHEMICALS ADDED	REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE)
51073-1	12/2/93	09:00		✓	HLSS1W1	1	✓	✓								
-2	12/2/93	0900		✓	HLSS1E1	1	✓	✓								
-3	12/2/93	0900		✓	HLSS1N1	1	✓	✓								

RELINQUISHED BY SIGNATURE	DATE	TIME	RECEIVED BY SIGNATURE	DATE	TIME
[signature]	12/3/93	1630	[signature]	12/03/93	1630

SHIPPING NOTES

LAB NOTES

BE-34 (1/92)

Metals Laboratory Report

Lab Number : 51073

Plant/Generator Name : TECH. SERVICES- SNOHOMISH PUD #1 - PROJECT #10779
Sample Type : SOIL - MAJOR TASK 0077
Date of Receipt : 12/03/93 Analyst: BLW/EL
Date of Report : 12/07/93 QC Checked: 12/2/93
Parameters for Analysis: TOTAL / TCLP LEAD
Outside Lab : NONE Outside Lab Report No:

TOTAL LEAD BY SW-846 3050, 6010.

Metals:	PREP BLANK MG/L TOTAL	51073-1 TOTAL HLSS1W1 TOTAL	51073-2 TOTAL HLSS1E1 TOTAL	51073-3 TOTAL HLSS1N1 TOTAL
Lead	<0.10	4100	3600	3200

Comments and Conclusions:

RESULTS REPORTED AS MG/KG DRY WEIGHT.

Metals Laboratory Report

Lab Number : 51073

Plant/Generator Name : TECH. SERVICES- SNOHOMISH PUD #1 - PROJECT #10779
Sample Type : SOIL - MAJOR TASK 0077
Date of Receipt : 12/03/93 Analyst: BLW/EL
Date of Report : 12/07/93 QC Checked: 12/7/93
Parameters for Analysis: TOTAL / TCLP LEAD
Outside Lab : NONE Outside Lab Report No:

TCLP METALS BY SW-846 1311, 6010.

Metals:	PREP BLANK TCLP	51073-1 TCLP HLSS1W1 TCLP	51073-2 TCLP HLSS1E1 TCLP	51073-3 TCLP HLSS1N1 TCLP
Lead	<0.10	4.8	6.0	5.0

Comments and Conclusions:

RESULTS REPORTED AS MG/L IN TCLP EXTRACT.

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Seattle, WA 98134
206-223-0500 • FAX: 223-7791

Chain of Custody/ Laboratory Analysis Request

DATE 11/18 PAGE 1 OF 1

PROJECT Snoq. Cty RUD #1 # 10779
CLIENT INFO.
CONTACT
CHEMPRO DIVISION/GENERATOR NAME Tech Services
TELEPHONE # Mr. Azose
SAMPLERS NAME Karen Rose Albrecht PHONE #
SAMPLERS SIGNATURE

SAMPLE I.D.	DATE	TIME	LAB I.D.	TYPE
1. HCSS-1	11/17	10:00 AM	50845-1	SOIL
2. HCSS-2	"	9:30 AM	-2	"
3. HCSS-3	"	9:00 AM	-3	"
4.				
5.				
6.				
7.				
8.				

ANALYSIS REQUESTED

BASE/NEU/ACID ORGAN. GC/MS/625/8270	VOLATILE ORGANICS GC/MS/624/8240	PCB's 608/8080	TPH (circle method) 418.1 or 8015	BETX (circle method) 8240 or 8020	F-LISTED SOLVENTS 8240	TCLP F-LISTED SOLVENTS 1311/8240	TCLP METALS D004-11	METALS (TOTAL) As. Ba. Cd. Cr. Cu. (Pb.) Ni. Hg. Ag. Se. Tl. Sb. Zn	TCLP ORGANICS (specify methods) • VOA's 8240 • BNA's 8270 • Pesticides 8080 • Herbicides 8150	DISCHARGE TESTING	OTHER (Specify)						NUMBER OF CONTAINERS	RECEIVED IN GOOD CONDITION?
								TOTAL LEAD										
								/										
								/										

Relinquished By	Relinquished By	Relinquished By
Signature M Azose	Signature	Signature
Printed Name Morris Azose	Printed Name	Printed Name
Firm Burlington	Firm	Firm
Date/Time 11/18 1:05 pm	Date/Time	Date/Time
Received By Barbara Walker	**Received By**	**Received By**
Signature Barbara Walker	Signature	Signature
Printed Name BEI	Printed Name	Printed Name
Firm 11.18 93 1:10	Firm	Firm
Date/Time	Date/Time	Date/Time

SPECIAL INSTRUCTIONS/COMMENTS:
SAMPLES TAKEN BY KAREN ROSE ALBRECHT.

DISTRIBUTION: WHITE - return to originator; YELLOW - lab; PINK - retained by originator.

(LAB-200 Rev. 10/90)

Metals Laboratory Report

Lab Number : 50845

Plant/Generator Name : TECH. SERVICES - SNOHOMISH CO. PUD
Sample Type : SOIL - PROJECT #10779
Date of Receipt : 11/18/93 Analyst: BLW/EL
Date of Report : 11/19/93 QC Checked: 11/19/93
Parameters for Analysis: TOTAL LEAD
Outside Lab : NONE Outside Lab Report No:

TOTAL LEAD BY SW-846 3050, 6010.

Metals:	PREP BLANK MG/L	% LCS RECOVERY	50845-1 HCSS-1	50845-1 DUP HCSS-1 DUP
Lead	<0.10	80.9	3200	3000

Comments and Conclusions:

RESULTS REPORTED AS MG/KG DRY WEIGHT.

Metals Laboratory Report

Lab Number : 50845

Plant/Generator Name : TECH. SERVICES - SNOHOMISH CO. PUD
Sample Type : SOIL - PROJECT #10779
Date of Receipt : 11/18/93 Analyst: BLW/EL
Date of Report : 11/19/93 QC Checked: 11/19/93
Parameters for Analysis: TOTAL LEAD
Outside Lab : NONE Outside Lab Report No:

TOTAL LEAD BY SW-846 3050, 6010.

Metals:	50845-2 HCSS-2	50845-3 HCSS-3	% MATRIX SPIKE RECOVERY
Lead	72	28	87.1

Comments and Conclusions:

RESULTS REPORTED AS MG/KG DRY WEIGHT.

Metals Laboratory Report

Lab Number : 50845B

Plant/Generator Name : TECH. SERVICES - HALLS LAKE REMEDIATION
Sample Type : SOIL
Date of Receipt : 11/19/93 Analyst: BLW/EL
Date of Report : 11/23/93 QC Checked: 11/23/93
Parameters for Analysis: TCLP LEAD
Outside Lab : NONE Outside Lab Report No:

TCLP LEAD BY SW-846 1311, 6010.

Metals:	PREP BLANK	% LCS RECOVERY	50845-1 HCSS-1	50845-2 HCSS-2
Lead	<0.10	101.1	5.2	<0.10

Comments and Conclusions:

RESULTS REPORTED AS MG/L IN TCLP EXTRACT.
5 GRAMS OF SAMPLE #1 EXTRACTED.

Metals Laboratory Report

Lab Number : 50845B

Plant/Generator Name : TECH. SERVICES - HALLS LAKE REMEDIATION
Sample Type : SOIL
Date of Receipt : 11/19/93 Analyst: BLW/EL
Date of Report : 11/23/93 QC Checked: 11/23/93
Parameters for Analysis: TCLP LEAD
Outside Lab : NONE Outside Lab Report No:

TCLP LEAD BY SW-846 1311, 6010.

Metals:	50845-3 HCSS-3	% MATRIX SPIKE RECOVERY
Lead	<0.10	98.4

Comments and Conclusions:

RESULTS REPORTED AS MG/L IN TCLP EXTRACT.

Metals Laboratory Report

Lab Number : 50704B

Plant/Generator Name : TECH. SERVICES - HALLS LAKE REMEDIATION
Sample Type : SOIL
Date of Receipt : 11/19/93 Analyst: BLW/EL
Date of Report : 11/23/93 QC Checked: 11/23/93
Parameters for Analysis: TCLP LEAD
Outside Lab : NONE Outside Lab Report No:

TCLP LEAD BY SW-846 1311, 6010.

Metals:	PREP BLANK	% LCS RECOVERY	50704-2 PUDIILD-9-1	% MATRIX SPIKE RECOVERY
Lead	<0.10	101.1	4.5	98.4

Comments and Conclusions:

RESULTS REPORTED AS MG/L IN TCLP EXTRACT.

Metals Laboratory Report

Lab Number : 50498B

Plant/Generator Name : TECH. SERVICES - HALLS LAKE REMEDIATION
Sample Type : SOIL
Date of Receipt : 11/19/93 Analyst: BLW/EL
Date of Report : 11/23/93 QC Checked: 11/23/93
Parameters for Analysis: TCLP LEAD
Outside Lab : NONE Outside Lab Report No:

TCLP LEAD BY SW-846 1311, 6010.

Metals:	PREP BLANK	% LCS RECOVERY	50498-3 HLSB-1-5-7	50498-3 DUP HLSB-1-5-7-DUP
Lead	<0.10	101.1	<0.10	0.12

Comments and Conclusions:

RESULTS REPORTED AS MG/L IN TCLP EXTRACT.

Metals Laboratory Report

Lab Number : 50498B

Plant/Generator Name : TECH. SERVICES - HALLS LAKE REMEDIATION
Sample Type : SOIL
Date of Receipt : 11/19/93 Analyst: BLW/EL
Date of Report : 11/23/93 QC Checked: BLW 11/23/93
Parameters for Analysis: TCLP LEAD
Outside Lab : NONE Outside Lab Report No:

TCLP LEAD BY SW-846 1311, 6010.

Metals:	50498-5 HLSB-2-3-5	% MATRIX SPIKE RECOVERY
Lead	0.12	98.4

Comments and Conclusions:

RESULTS REPORTED AS MG/L IN TCLP EXTRACT.

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CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 5700

PROJECT NAME Snohomish Co. PUD Halls Lake
PROJECT NUMBER 10774 MAJOR TASK 0077
SAMPLERS Boden
LAB DESTINATION BEI

SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE LOCATION	NO. OF CONTAINERS	TYPE OF ANALYSIS: Total Lead							PRESERVATIVES: ICED	PRESERVATIVES: CHEMICALS ADDED	REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE)
50704-1	11-11-93	1200		✓	PUDII LD-8C	1	X									24 Hour Turn Around
-2	↓	1230	✓		PUDII LD-9-1	1	X									
-3	↓	1235	✓		PUDII LD-9-2	1	X									

RELINQUISHED BY

SIGNATURE	DATE	TIME
David Boden	11-11-93	1530

RECEIVED BY

SIGNATURE	DATE	TIME
Barbara L Walker	11/11-93	3:30

SHIPPING NOTES

LAB NOTES

BE-34 (1/92)

Metals Laboratory Report

Lab Number : 50704

Plant/Generator Name : TECH. SERVICES - HALLS LAKE REMEDIATION
Sample Type : SOIL - PROJECT #10779 MAJOR TASK 0077
Date of Receipt : 11/11/93 Analyst: BLW/EL
Date of Report : 11/12/93 QC Checked: 11/12/93
Parameters for Analysis: TOTAL LEAD
Outside Lab : NONE Outside Lab Report No:

TOTAL LEAD BY SW-846 3050, 6010.

Metals:	PREP BLANK MG/L	% LCS RECOVERY	50704-1 PUDIILD-8C	50704-1 DUP PUDIILD-8C DUP
Lead	<0.10	81.8	<4.0	<4.4

Comments and Conclusions:

RESULTS REPORTED AS MG/KG DRY WEIGHT.

Metals Laboratory Report

Lab Number : 50704

Plant/Generator Name : TECH. SERVICES - HALLS LAKE REMEDIATION
Sample Type : SOIL - PROJECT #10779 MAJOR TASK 0077
Date of Receipt : 11/11/93 Analyst: BLW/EL
Date of Report : 11/12/93 QC Checked: 11/12/93
Parameters for Analysis: TOTAL LEAD
Outside Lab : NONE Outside Lab Report No:

TOTAL LEAD BY SW-846 3050, 6010.

Metals:	50704-2 PUDIILD-9-1	50704-3 PUDIILD-9-2	% MATRIX SPIKE RECOVERY
Lead	680	150	124.7

Comments and Conclusions:

RESULTS REPORTED AS MG/KG DRY WEIGHT.

Metals Laboratory Report

Lab Number : 50704B

Plant/Generator Name : TECH. SERVICES - HALLS LAKE REMEDIATION
Sample Type : SOIL
Date of Receipt : 11/19/93 Analyst: BLW/EL
Date of Report : 11/23/93 QC Checked: 11/23/93
Parameters for Analysis: TCLP LEAD
Outside Lab : NONE Outside Lab Report No:

TCLP LEAD BY SW-846 1311, 6010.

Metals:	PREP BLANK	% LCS RECOVERY	50704-2 PUDIILD-9-1	% MATRIX SPIKE RECOVERY
Lead	<0.10	101.1	4.5	98.4

Comments and Conclusions:

RESULTS REPORTED AS MG/L IN TCLP EXTRACT.

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CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 6281

PROJECT NAME Snohomish Co. PUD Halls Lake
PROJECT NUMBER 10779 MAJOR TASK 0077
SAMPLERS Broten
LAB DESTINATION BEI

SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE LOCATION	NO. OF CONTAINERS	TYPE OF ANALYSIS: Total Lead							PRESERVATIVES: ICED	PRESERVATIVES: CHEMICALS ADDED	REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE)
SOC52-1	11-9-93	1500		/	PUDILD-GS	1	X							/		24 Hour Turnaround
-2	11-10-93	1115		/	MCC-1	1	X							/		

RELINQUISHED BY

SIGNATURE	DATE	TIME
David Broten	11-10-93	1220

RECEIVED BY

SIGNATURE	DATE	TIME
A M Lipinski	11/10/93	12:20 pm

SHIPPING NOTES

LAB NOTES

BE-34 (1/92)

Metals Laboratory Report

Lab Number : 50652

Plant/Generator Name : TECH. SERVICES - HALLS LAKE REMEDIATION
Sample Type : SOIL - PROJECT #10779 MAJOR TASK 0077
Date of Receipt : 11/10/93 Analyst: BLW/EL
Date of Report : 11/11/93 QC Checked: 11/11/93
Parameters for Analysis: TOTAL LEAD
Outside Lab : NONE Outside Lab Report No:

TOTAL LEAD BY SW-846 3050, 6010.

Metals:	PREP BLANK MG/L	% LCS RECOVERY	50652-1 PUDIILD-6S	50652-1 DUP PUDIILD-6S DUP
Lead	<0.10	88.3	18	18

Comments and Conclusions:

RESULTS REPORTED AS MG/KG DRY WEIGHT.

Metals Laboratory Report

Lab Number : 50652

Plant/Generator Name : TECH. SERVICES - HALLS LAKE REMEDIATION
Sample Type : SOIL - PROJECT #10779 MAJOR TASK 0077
Date of Receipt : 11/10/93 Analyst: BLW/EL
Date of Report : 11/11/93 QC Checked: 11/11/93
Parameters for Analysis: TOTAL LEAD
Outside Lab : NONE Outside Lab Report No:

TOTAL LEAD BY SW-846 3050, 6010.

Metals:	50652-2 MCC-1	% MATRIX SPIKE RECOVERY
Lead	16000	*

Comments and Conclusions:

RESULTS REPORTED AS MG/KG DRY WEIGHT.
* LEVEL OF ANALYTE IN THE SAMPLE WAS GREATER THAN 4 TIMES THE LEVEL OF SPIKE ADDED.

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CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 5699

PROJECT NAME Snohomish Co PUD Halls lake
PROJECT NUMBER 10979 MAJOR TASK 0077
SAMPLERS Brotn
LAB DESTINATION BEI

SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE LOCATION	NO. OF CONTAINERS	Total Lead	TPH	TCLP	WTPH-HCID			ICED	CHEMICALS ADDED	REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE)
50637-1	11-8-93	1235			PUDIILD-6C	1	X	X					✓		Priority
-2	↓	1240			-6N	1	X	X					✓		Priority
-3		1245			-6E	1	X	X					✓		Priority
-4		1250			-6-2XX	1				X			✓		→ PRINT OUT OF CHROMATOGRAPH REQUES
-5		1300			6-XX	1				X			✓		→ " " " "
-6		1325			PUDIILD-7-1	1	X	X					✓		Priority
-7		1330			PUDIILD-7-2	1	X	X					✓		Priority
-8	↓	1310			PUDIILDSP-5N	1			X				✓		DO NOT RUSH

RELINQUISHED BY SIGNATURE	DATE	TIME	RECEIVED BY SIGNATURE	DATE	TIME
David Broten	11-8-93		[signature]	11/8/93	3:15pm

SHIPPING NOTES

LAB NOTES

BE-34 (1/92)

Metals Laboratory Report

Lab Number : 50637

Plant/Generator Name : TECH. SERVICES - HALLS LAKE REMEDIATION
Sample Type : SOIL - PROJECT #10779, MAJOR TASK 0077
Date of Receipt : 11/08/93 Analyst: BLW/BB/EL
Date of Report : 11/09/93 QC Checked: 11/9/93
Parameters for Analysis: TOTAL, TCLP LEAD
Outside Lab : NONE Outside Lab Report No:

TOTAL LEAD BY SW-846 3050, 6010.

Metals:	PREP BLANK TOTAL MG/L	PPS-46 % RECOVERY	50637-1 TOTAL PUDIILD-6C	50637-1 DUP PUDIILD-6C DUP
Lead	<0.010	89.0	<4.5	<4.5

Comments and Conclusions:

RESULTS REPORTED AS MG/KG DRY WEIGHT.

Metals Laboratory Report

Lab Number : 50637

Plant/Generator Name : TECH. SERVICES - HALLS LAKE REMEDIATION
Sample Type : SOIL - PROJECT #10779, MAJOR TASK 0077
Date of Receipt : 11/08/93 Analyst: BLW/BB/EL
Date of Report : 11/09/93 QC Checked: 11/9/93
Parameters for Analysis: TOTAL, TCLP LEAD
Outside Lab : NONE Outside Lab Report No:

TOTAL LEAD BY SW-846 3050, 6010.

Metals:	50637-2 TOTAL PUDIILD-6N	50637-3 TOTAL PUDIILD-6E	50637-6 TOTAL PUDIILD-7-1	50637-7 TOTAL PUDIILD-7-2
Lead	17	38	66	15

Comments and Conclusions:

RESULTS REPORTED AS MG/KG DRY WEIGHT.

Metals Laboratory Report

Lab Number : 50637

Plant/Generator Name : TECH. SERVICES - HALLS LAKE REMEDIATION
Sample Type : SOIL - PROJECT #10779, MAJOR TASK 0077
Date of Receipt : 11/08/93 Analyst: BLW/~~BB~~/EL
Date of Report : 11/09/93 QC Checked: 11/9/93
Parameters for Analysis: TOTAL, TCLP LEAD
Outside Lab : NONE Outside Lab Report No:

TCLP LEAD BY SW-846 1311, 6010.

Metals:	% MATRIX SPIKE RECOVERY TOTAL	PREP BLANK TCLP	50637-8 TCLP PUDIILDSP-5N	% MATRIX SPIKE RECOVERY TCLP
Lead	89.1	<0.10	1.0	93.4

Comments and Conclusions:

RESULTS REPORTED AS MG/L IN TCLP EXTRACT.

Metals Laboratory Report

Lab Number : 50637B

Plant/Generator Name : TECH. SERVICES - HALLS LAKE REMEDIATION
Sample Type : SOIL - PROJECT #10779 MAJOR TASK 0077
Date of Receipt : 11/08/93 Analyst: BLW/EL
Date of Report : 11/11/93 QC Checked: 11/11/93
Parameters for Analysis: TOTAL LEAD
Outside Lab : NONE Outside Lab Report No:

TOTAL LEAD BY SW-846 3050, 6010.

Metals:	PREP BLANK MG/L	% LCS RECOVERY	50637-4 PUDIILD-6-2XX	50637-4 DUP -6-2XX DUP
Lead	<0.10	89.8	340	380

Comments and Conclusions:

RESULTS REPORTED AS MG/KG DRY WEIGHT.

Metals Laboratory Report

Lab Number : 50637B

Plant/Generator Name : TECH. SERVICES - HALLS LAKE REMEDIATION
Sample Type : SOIL - PROJECT #10779 MAJOR TASK 0077
Date of Receipt : 11/08/93 Analyst: BLW/EL
Date of Report : 11/11/93 QC Checked: 11/11/93
Parameters for Analysis: TOTAL LEAD
Outside Lab : NONE Outside Lab Report No:

TOTAL LEAD BY SW-846 3050, 6010.

	50637-5
Metals:	PUDIILD-6-XX
Lead	4100

Comments and Conclusions:

RESULTS REPORTED AS MG/KG DRY WEIGHT.

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CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 5699

PROJECT NAME Snohomish Co PUD Halls lake
PROJECT NUMBER 10979 MAJOR TASK 0077
SAMPLERS Brown
LAB DESTINATION BEI

SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE LOCATION	NO. OF CONTAINERS	Total Lead	TPH	TCLP	WTPH-HCID			ICED	CHEMICALS ADDED	REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE)
2037-1	11-8-93	1235			PUDIILD-6C	1	X	X					/		Priority
-2	↓	1240			-6N	1	X	X					/		Priority
-3	↓	1245			-6E	1	X	X					/		Priority
-4	↓	1250			-6-2XX	1	X			X			/		→ PRINT OUT OF CHROMATOGRAPH REQUESTED
-5	↓	1300			6-XX	1	X			X			/		→ " " " "
-6	↓	1325			PUDIILD-7-1	1	X	X					/		Priority
-7	↓	1330			PUDIILD-7-2	1	X	X					/		Priority
-8	↓	1310			PUDIILDSP-5N	1			X				/		
															DO NOT RUSH

RELINQUISHED BY

SIGNATURE	DATE	TIME
David Brown	11-8-93	

RECEIVED BY

SIGNATURE	DATE	TIME
[signature]	11/8/93	3:15pm

SHIPPING NOTES

LAB NOTES

BE-34 (1/92)

Metals Laboratory Report

Lab Number : 50637A

Plant/Generator Name : SNOHOMISH CO. PUD HALLS LAKE Pj# 10779 TASK 0077
Sample Type : SOIL
Date of Receipt : 11/08/93 Analyst: BLW, JLB
Date of Report : 12/01/93 QC Checked: 12/1/93
Parameters for Analysis: TCLP LEAD
Outside Lab : Outside Lab Report No:

TCLP BY SW-846 1311, 6010.

Metals:	PREPARATION BLANK	CONTROL SAMPLE % RECOVERY	50637-4 PUDIILD-6-2XX	50637-5 PUDIILD-6-XX
Lead	<0.10	105.6	0.11	4.7

Comments and Conclusions:

RESULTS ARE REPORTED AS MG/L IN TCLP EXTRACT.
SAMPLE RECEIVED 11/8/93, TCLP REQUESTED 11/30/93.

Metals Laboratory Report

Lab Number : 50637A

Plant/Generator Name : SNOHOMISH CO. PUD HALLS LAKE Pj# 10779 TASK 0077
Sample Type : SOIL
Date of Receipt : 11/08/93 Analyst: BLW, JLB
Date of Report : 12/01/93 QC Checked: 12/1/93
Parameters for Analysis: TCLP LEAD
Outside Lab : Outside Lab Report No:

TCLP BY SW-846 1311, 6010.

Metals:	MATRIX SPIKE % RECOVERY
Lead	124.4

Comments and Conclusions:

ESULTS ARE REPORTED IN PERCENT RECOVERY.

BURLINGTON ENVIRONMENTAL INC.
CORPORATE LABORATORY

TOTAL PETROLEUM HYDROCARBONS (TPH) ANALYSIS

Client:	**Snohomish County P.U.D. Halls Lake Phase II**		
Date of Receipt	**11/8/93**	**Date of Report:**	**11/12/93**
Date of Analysis:	**11/10/93**		
Analyst:	**Linda Lewis**	**QC Checked by:**	Kathy Krepo
Instrument:	**Nicolet 710 FTIR Spectrophotometer**		

Project	**10779**
Sample Identification	**PUDIILD-6C**
Lab Number	**50637-1**
Sample Type:	**Soil**

WTPH-418.1

TPH Conc.: **< 16 Mg/Kg**

Sample Identification	**PUDIILD-6N**
Lab Number	**50637-2**
Sample Type:	**Soil**

WTPH-418.1

TPH Conc.: **< 16 Mg/Kg**

Sample Identification	**PUDIILD-6E**
Lab Number	**50637-3**
Sample Type:	**Soil**

WTPH-418.1

TPH Conc.: **< 16 Mg/Kg**

Sample Identification	**PUDIILD-7-1**
Lab Number	**50637-6**
Sample Type:	**Soil**

WTPH-418.1

TPH Conc.: **< 16 Mg/Kg**

Sample Identification	PUDIILD-7-1
Lab Number	50637-6 Dup
Sample Type:	Soil

WTPH-418.1

TPH Conc.: < 16 Mg/Kg

Sample Identification	PUDIILD-7-2
Lab Number	50637-7
Sample Type:	Soil

WTPH-418.1

TPH Conc.: < 16 Mg/Kg

Sample Identification	B111093S
Lab Number	
Sample Type:	Method Blank

WTPH-418.1

TPH Conc.: < 16 Mg/Kg

Sample Identification	MS111093S
Lab Number	
Sample Type:	Method Spike

WTPH-418.1

TPH Conc.: 92% recovery

*Sample results determined on a dry weight basis.

BURLINGTON
ENVIRONMENTAL

210 West Sand Bank Road
P.O. Box 330
Columbia, IL 62236-0330
618/281-7173
618/281-5120 FAX

CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 5699

PROJECT NAME Snohomish Co PUD Hills lake
PROJECT NUMBER 10979 MAJOR TASK 0077
SAMPLERS Brown
LAB DESTINATION BEI

SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE LOCATION	NO. OF CONTAINERS	TYPE OF ANALYSIS: Total Lead	TPH	TCLP	WTPH-HCID				PRESERVATIVES: ICED	PRESERVATIVES: CHEMICALS ADDED	REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE)
5699-1	11-8-93	1235			PUDIILD-6C	1	X	X						✓		Priority
-2		1240			-6N	1	X	X						✓		
-3		1245			-6E	1	X	X						✓		
-4		1250			-6-2XX	1				X				✓		→ PRINT OUT OF CHROMATOGRAPH REQUIRED
-5		1300			6-XX	1				X				✓		→ " " " "
-6		1325			PUDIILD-7-1	1	X	X						✓		Priority
-7		1330			PUDIILD-7-2	1	X	X						✓		
-8	↓	1310			PUDIILDSP-5N	1			X					✓		
																DO NOT RUSH

RELINQUISHED BY SIGNATURE	DATE	TIME	RECEIVED BY SIGNATURE	DATE	TIME
David Brown	11-8-93		[signature]	11/8/93	3:15 pm

SHIPPING NOTES	LAB NOTES

BE-34 (1/92)

BURLINGTON ENVIRONMENTAL INC.
CORPORATE LABORATORY

TOTAL PETROLEUM HYDROCARBONS (TPH) ANALYSIS

Client:	**Snohomish Co Pud Halls Lake**		
Date of Receipt	**11/08/93**	**Date of Report:**	**11/12/93**
Analyst:	**Sheng Pan**	**QC by:**	DKWilson 11/15/93

Project	**Snohomish Co. PUD Halls Lake**
Sample Identification	**PUDIILD-6-2XX**
Lab Number	**50637-4**
Sample Type:	**Soil**

Date of Extraction: **11/11/93** **Date of Analysis:** **11/11/93**

WTPH-HCID

Gasoline:	**<20 mg/kg**
Diesel:	**<50 mg/kg**
Heavy Oil:	**<100 mg/kg**

Surrogates:	**% Recovery**
Bromobenzene	**124.0**
Methyl Arachidate	

Project	**Snohomish Co. PUD Halls Lake**
Sample Identification	**PUDIILD-6-XX**
Lab Number	**50637-5**
Sample Type:	**Soil**

Date of Extraction: **11/11/93** **Date of Analysis:** **11/11/93**

WTPH-HCID

Gasoline:	**<20 mg/kg**
Diesel:	**<50 mg/kg**
Heavy Oil:	**<100 mg/kg**

Surrogates:	**% Recovery**
Bromobenzene	**120.0**
Methyl Arachidate	

BURLINGTON
ENVIRONMENTAL

210 West Sand Bank Road
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618/281-7173
618/281-5120 FAX

CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 5699

PROJECT NAME Snohomish Co PUD Hells Lake
PROJECT NUMBER 10979 MAJOR TASK 0077
SAMPLERS Barth
LAB DESTINATION BEI

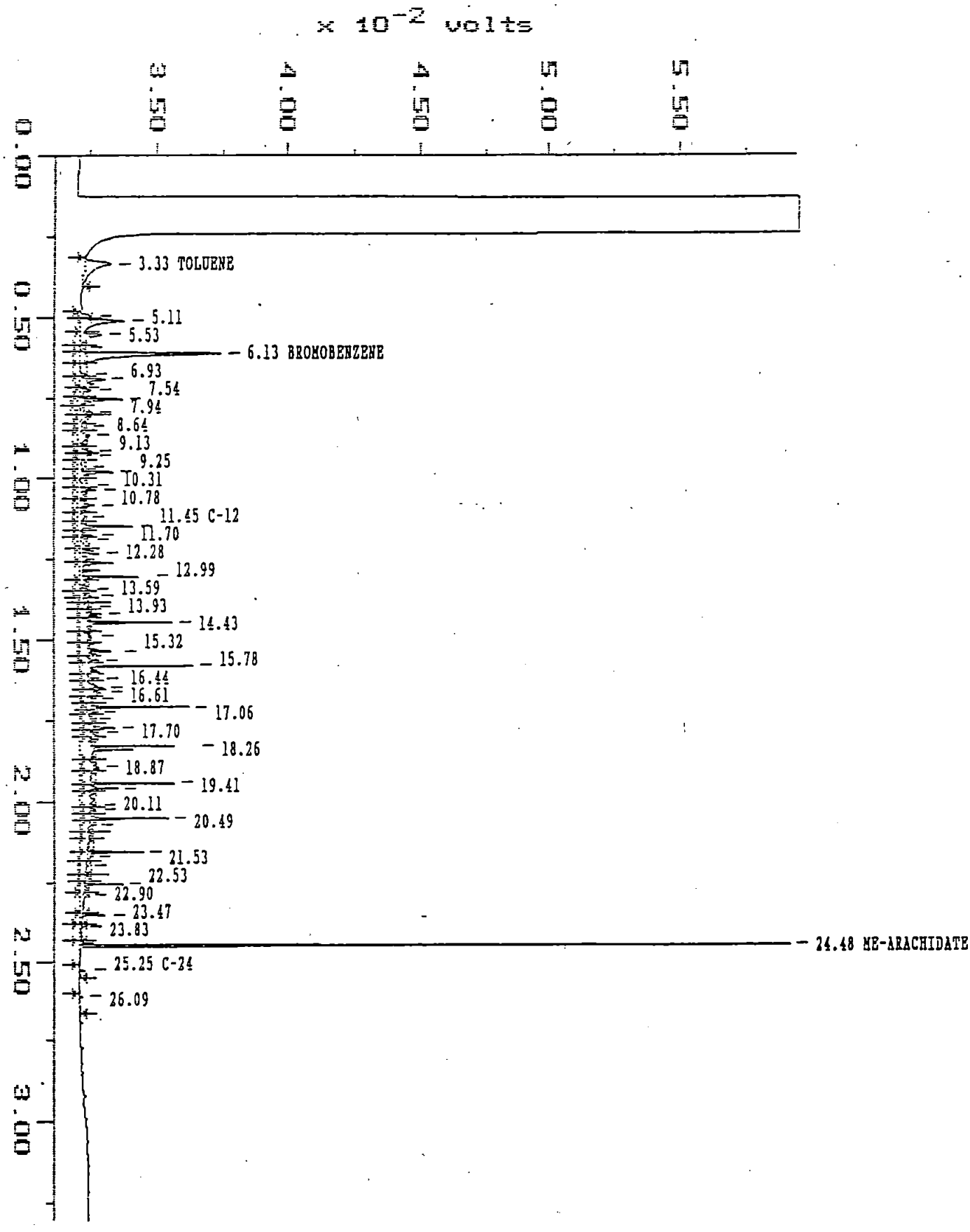
SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE LOCATION	NO. OF CONTAINERS	TYPE OF ANALYSIS: Total Lead	TPH	TCLP	WTPH-HCID				ICED	PRESERVATIVES: CHEMICALS ADDED	REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE)
5C037-1	11-8-93	1235			PUDHLD-6C	1	X	X						✓		Priority
-2		1240			-6N	1	X	X						✓		
-3		1245			-6E	1	X	X						✓		
-4		1250			-6-2XX	1			X					✓		→ PRINT OUT OF CHROMATOGRAPH REQUESTED
-5		1300			6-XX	1			X					✓		→ " " " "
-6		1325			PUDHLD-7-1	1	X	X						✓		Priority
-7		1330			PUDHLD-7-2	1	X	X						✓		
-8	↓	1310			PUDHLDSP-5N	1			X					✓		
																DO NOT RUSH

RELINQUISHED BY SIGNATURE	DATE	TIME	RECEIVED BY SIGNATURE	DATE	TIME
David Barth	11-8-93		[signature]	11/8/93	3:15pm

SHIPPING NOTES	LAB NOTES

BE-34 (1/92)

Sample: CAL STD (G,D,S) Channel: FID Filename: HHA91
Acquired: 11-NOV-93 11:31 Method: C:\MAX\DATA1\ECID Operator: SP



MAXIMA 820 CUSTOM REPORT

Printed: 11-NOV-1993 12:05:22

AMPLE: CAL STD (G,D,3)
#4 in Method: WTPH-HCID
Acquired: 11-NOV-1993 11:31
Rate: 2.0 points/sec
Duration: 33.000 minutes
Operator: SF

Type: UNKN
Instrument: Instrument 1
Filename: HAAA91
Index: 2

DETECTOR: PID

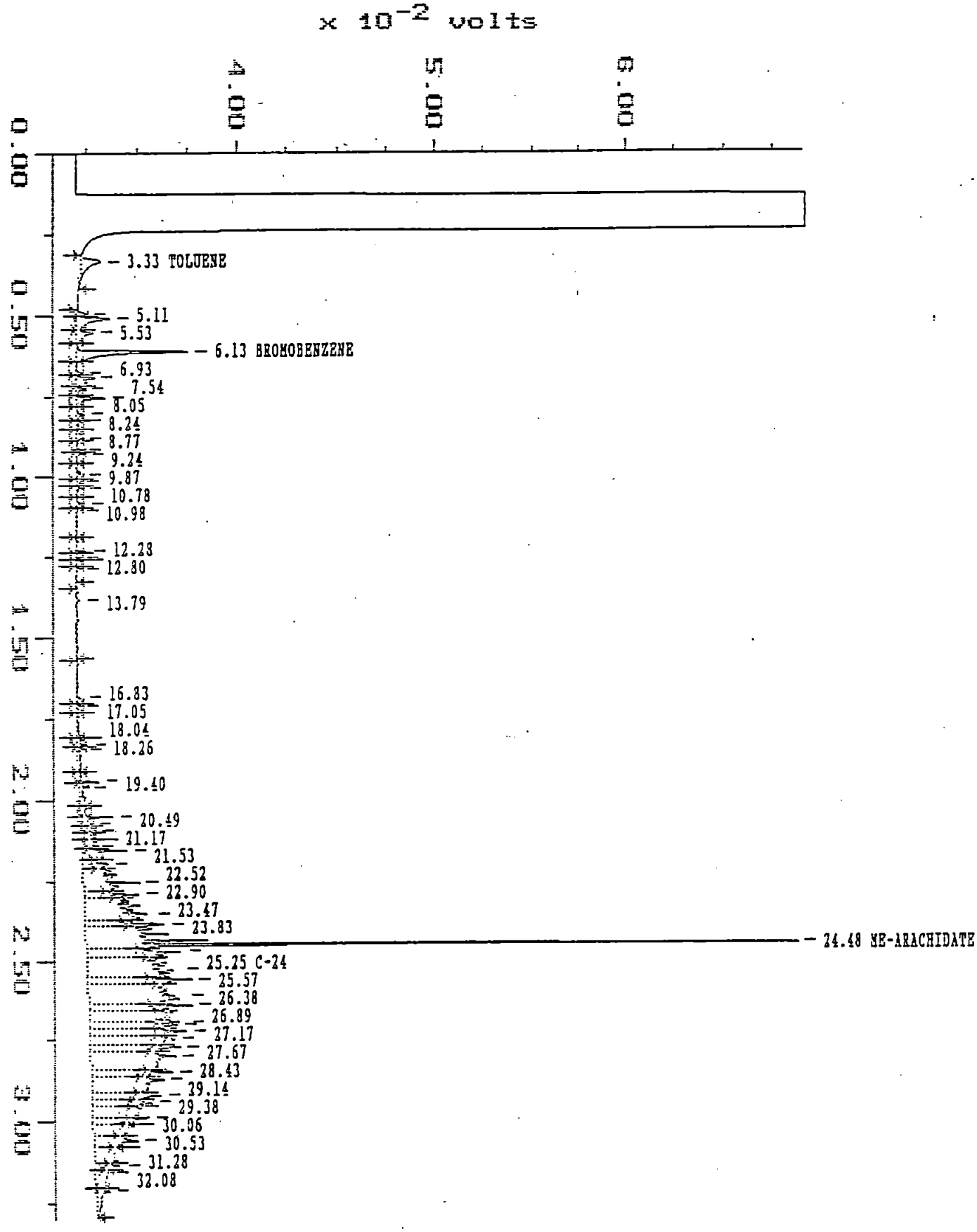
Retention Time (minutes)	Relative Time	Peak Height	Peak Area	Base	Solution Conc (ug\ml)	Component Name
3.333	0.128	956	14344	AREA		TOLUENE
4.933	0.189	396	2358			
5.108	0.196	1623	15630			
5.533	0.212	814	7255			
5.958	0.228	132	799			
6.133	0.235	5349	37274	AREA	Invalid	BROMOBENZENE
6.767	0.259	261	1855			
6.925	0.265	932	7969			
7.250	0.278	440	2988			
7.542	0.289	1607	7236			
7.942	0.304	510	2257			
8.050	0.309	471	2899			
8.400	0.322	191	1349			
8.642	0.331	389	4831			
9.133	0.350	458	2357			
9.350	0.358	486	2156			
9.600	0.368	257	1704			
9.775	0.375	1274	5541			
10.150	0.389	356	1623			
10.308	0.395	623	4754			
10.775	0.413	551	4960			
11.133	0.427	257	2574			
11.450	0.439	2002	5353	AREA		C-12
11.700	0.448	599	2215			
11.825	0.453	362	3586			
12.283	0.471	756	6735			
12.992	0.498	2632	15208			
13.408	0.514	381	3155			
13.592	0.521	526	2908			
13.792	0.529	505	2975			
13.933	0.534	511	3095			
14.142	0.542	843	7773			
14.433	0.553	3522	16684			
14.875	0.570	376	6145			

15.317	0.587	1471	12902			
15.592	0.598	714	5117			
15.783	0.605	4296	15184			
16.142	0.619	736	5231			
16.442	0.630	926	7875			
16.608	0.637	870	9508			
16.825	0.645	597	4835			
17.058	0.654	4142	12624			
17.208	0.660	620	4791			
17.492	0.667	504	6927			
17.708	0.678	1362	8904			
17.833	0.683	744	6109			
18.258	0.700	4377	29923			
18.867	0.723	760	12459			
19.408	0.744	3588	15870			
19.658	0.750	1463	8004			
20.108	0.771	666	13501			
20.192	0.774	526	5317			
20.492	0.785	3386	9815			
20.700	0.793	553	8607			
20.933	0.802	474	5374			
21.533	0.825	2425	12692			
21.658	0.830	438	4431			
21.942	0.841	326	6918			
22.258	0.853	354	3549			
22.525	0.863	1646	6209			
22.900	0.878	256	5723			
23.467	0.899	987	3482			
23.825	0.913	117	2437			
24.475	0.938	27134	47559	HGHT	Invalid	ME-ARACHIDATE
25.250	0.966	261	760	AREA		C-24
26.092	1.000	134	480			
		---	---		---	
TAL		98494	514657		0.00	

GROUP SUMMARY: FID

Group Center (minutes)	Relative Time	Peak Height	Peak Area	Base	Solution Conc (ug\ml)	Group Name
7.415	(0.284)	20335	140867	AREA	0.00	GASOLINE
17.915	(0.687)	50629	325792	AREA	0.00	DIESEL
29.165	(1.118)	134	480	AREA	0.00	HEAVY OIL
		---	---		---	
TAL		71099	466339		0.00	

Sample: CAL STD (G,M,S) Channel: FID Filename: HAAA92
Acquired: 11-NOV-93 12:13 Method: C:\MAX\DATA1\HCID Operator: SP



MAXIMA 820 CUSTOM REPORT

Printed: 11-NOV-1993 12:49:10

SAMPLE: CAL STD (G,M,S)
#5 in Method: WTPH-HOID
Acquired: 11-NOV-1993 12:13
Rate: 2.0 points/sec
Duration: 33.000 minutes
Operator: SP

Type: UNKN
Instrument: Instrument 1
Filename: HAAA92
Index: 3

DETECTOR: FID

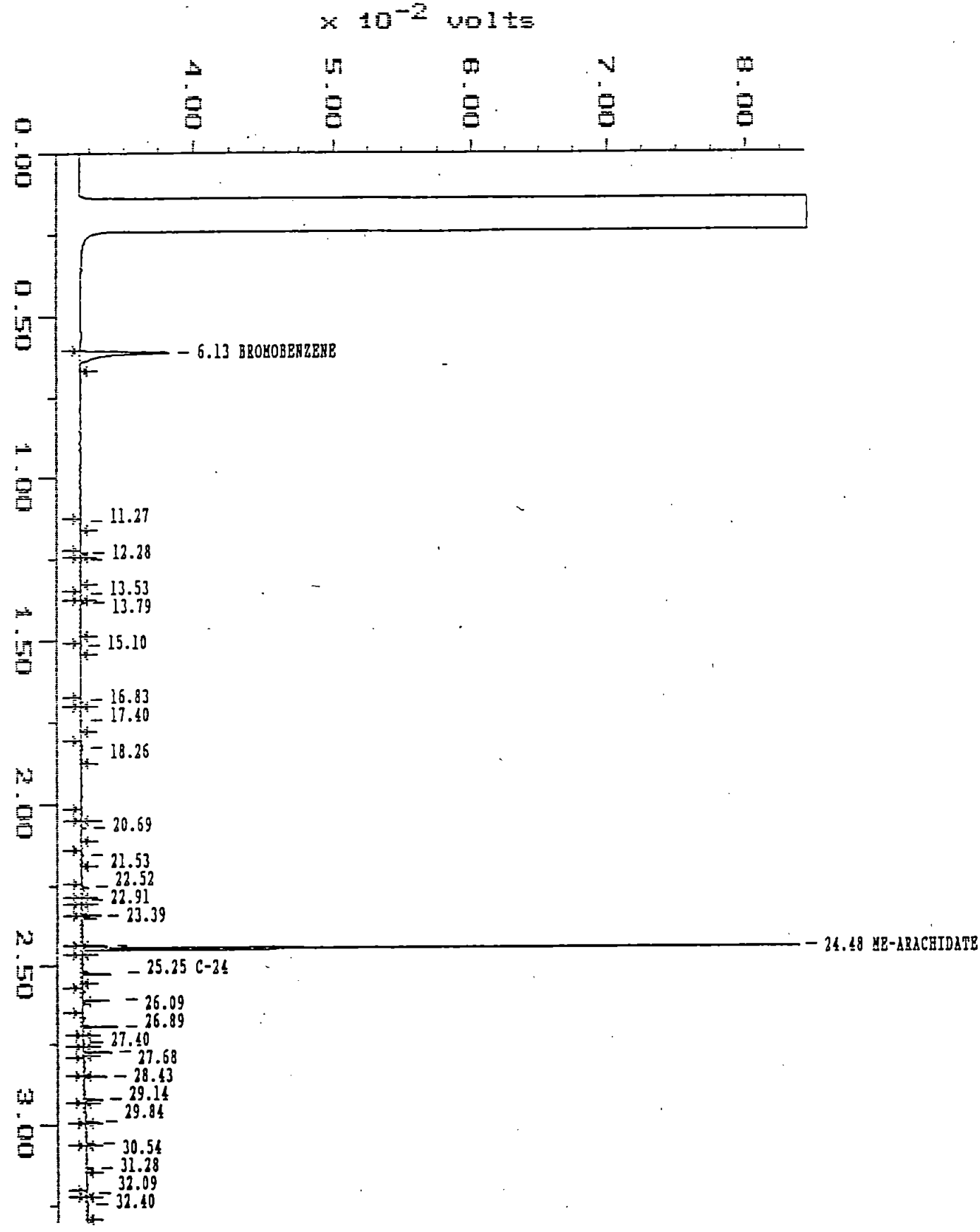
Retention Time (minutes)	Relative Time	Peak Height	Peak Area	Base	Solution Conc (ug\ml)	Component Name
3.325	0.104	985	15660	AREA		TOLUENE
4.933	0.154	393	2359			
5.108	0.159	1624	15095			
5.533	0.172	792	6786			
6.133	0.191	5500	37647	AREA	Invalid	BROMOBENZENE
6.758	0.211	226	1338			
6.925	0.216	872	7185			
7.250	0.226	360	2049			
7.542	0.235	1440	6324			
8.050	0.251	360	1940			
8.242	0.257	201	1199			
8.767	0.273	265	2375			
9.133	0.285	240	1385			
9.242	0.288	328	1244			
9.867	0.308	258	1566			
10.142	0.316	144	466			
10.308	0.321	260	1473			
10.775	0.336	336	1167			
10.983	0.342	109	1708			
12.283	0.383	506	1529			
12.475	0.389	156	481			
12.567	0.392	337	781			
12.800	0.399	166	482			
13.792	0.430	131	724			
16.825	0.524	191	899			
17.050	0.531	182	667			
18.042	0.562	156	1400			
18.258	0.569	428	1341			
18.375	0.573	150	2594			
19.400	0.605	900	2431			
19.558	0.610	367	6080			
20.492	0.639	1572	7114			
20.692	0.645	486	4737			
20.933	0.652	577	5347			

21.167	0.660	813	5314			
21.408	0.667	611	8827			
21.533	0.671	2191	16120			
21.942	0.684	1252	14644			
22.517	0.702	2805	58529			
22.900	0.714	2722	20586			
23.467	0.731	3293	89552			
23.825	0.742	3913	39975			
24.475	0.763	36334	190180	HGHT	Invalid	ME-ARACHIDATE
24.708	0.770	4690	50697			
25.250	0.787	4547	139915	AREA		C-24
25.567	0.797	5192	50793			
26.092	0.813	4751	140404			
26.383	0.822	5150	50536			
26.892	0.838	4675	91270			
26.975	0.841	4397	42674			
27.167	0.847	4810	48355			
27.417	0.855	4202	54031			
27.667	0.862	4479	49839			
27.933	0.871	4203	105128			
28.425	0.886	4048	42779			
28.667	0.894	3582	35309			
29.142	0.908	3414	30615			
29.375	0.916	1962	27719			
29.492	0.919	2276	44005			
29.842	0.930	2813	23847			
30.058	0.937	2038	37563			
30.533	0.952	2173	27097			
30.758	0.959	1286	31105			
31.275	0.975	1241	10493			
31.525	0.983	689	16032			
32.083	1.000	688	10531			
		-----------	----------		--------------	
AL		152254	1800227		0.00	

GROUP SUMMARY: FID

Group Center (minutes)	Relative Time	Peak Height	Peak Area	Base	Solution Conc (ug\ml)	Group Name
7.415	(0.231)	14693	108965	AREA	0.00	GASOLINE
17.215	(0.538)	23996	390153	AREA	0.00	DIESEL
29.165	(0.909)	69982	1020326	AREA	0.00	HEAVY OIL
		-----------	----------		--------------	
AL		107682	1519445		0.00	

Sample: B931111 BLK Channel: FID Filename: HAAA93
Acquired: 11-NOV-93 14:35 Method: C:\MAX\DATA1\HCID Operator: SP



MAXIMA 820 CUSTOM REPORT

Printed: 11-NOV-1993 15:08:46

SAMPLE: B931111 SLK
#6 in Method: WTPH-HCID
Acquired: 11-NOV-1993 14:35
Rate: 2.0 points/sec
Duration: 33.000 minutes
Operator: SP

Type: UNKN
Instrument: Instrument 1
Filename: HAAA93
Index: 4

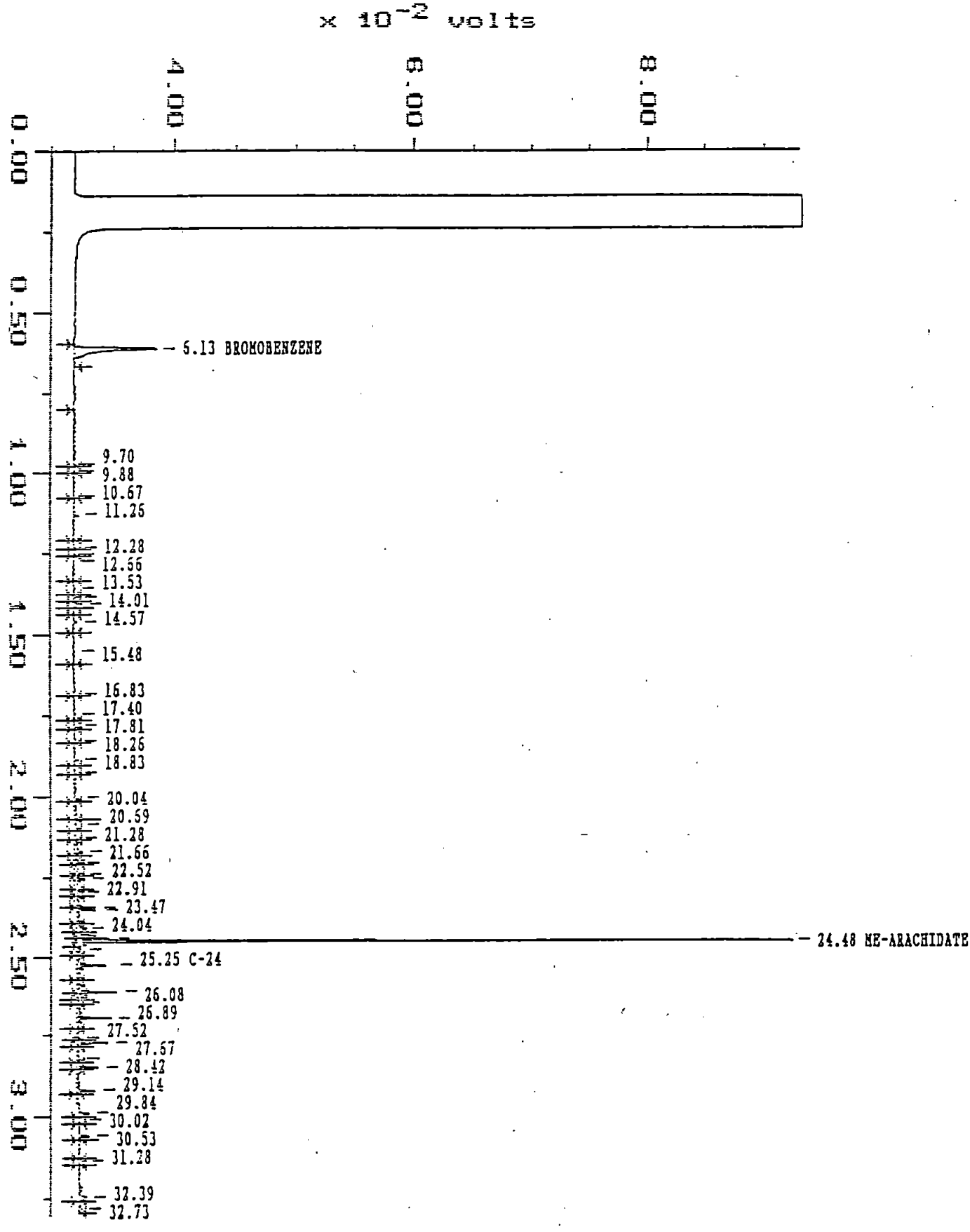
DETECTOR: PID

Retention Time (minutes)	Relative Time	Peak Height	Peak Area	Base	Solution Conc (ug\ml)	Component Name
6.133	0.189	6448	44752	AREA	Invalid	BROMOBENZENE
11.267	0.349	148	269			
12.283	0.379	376	722			
12.475	0.385	127	469			
13.525	0.417	152	320			
13.792	0.426	294	1252			
15.100	0.466	112	344			
16.033	0.520	163	395			
17.400	0.537	130	575			
18.253	0.554	114	1369			
20.492	0.632	128	592			
20.692	0.639	298	549			
21.533	0.665	122	416			
22.517	0.695	463	1206			
22.908	0.707	203	611			
23.392	0.722	1342	2379			
24.375	0.752	1895	6329			
24.492	0.756	51348	89224	HGHT	Invalid	MP-ARACHIDATE
25.258	0.779	2755	6296	AREA		C-24
25.092	0.805	2579	4479			
26.892	0.830	2467	4795			
27.400	0.846	131	638			
27.675	0.854	2026	3509			
28.425	0.877	1607	3528			
29.142	0.899	1306	2973			
29.242	0.921	1031	2583			
30.542	0.943	714	2853			
31.383	0.966	433	2136			
32.092	0.990	261	623			
32.408	1.000	123	999			
TOTAL		79782	187419		0.00	

GROUP SUMMARY: PID

Group Center (minutes)	Relative Time	Peak Height	Peak Area	Base	Solution Conc (ug\ml)	Group Name
7.415	(0.229)	6396	45022	AREA	0.00	GASOLINE
17.915	(0.553)	4024	11281	AREA	0.00	DIESEL
29.165	(0.900)	12665	29217	AREA	0.00	HEAVY OIL
TOTAL		23284	85520		0.00	

Sample: 33637-4 Channel: FID Filename: HAAA94
Acquired: 11-NOV-93 15:16 Method: C:\MAX\DATA1\HCID Operator: SP



MAXIMA 820 CUSTOM REPORT

Printed: 11-NOV-1993 15:53:32

AMPLE: 50637-4 Type: UNKN
97 in Method: WTPH-HCID Instrument: Instrument 1
Acquired: 11-NOV-1993 15:16 Filename: HA1194
Rate: 2.0 points/sec Index: 5
Duration: 33.000 minutes
Operator: SP

DETECTOR: FID

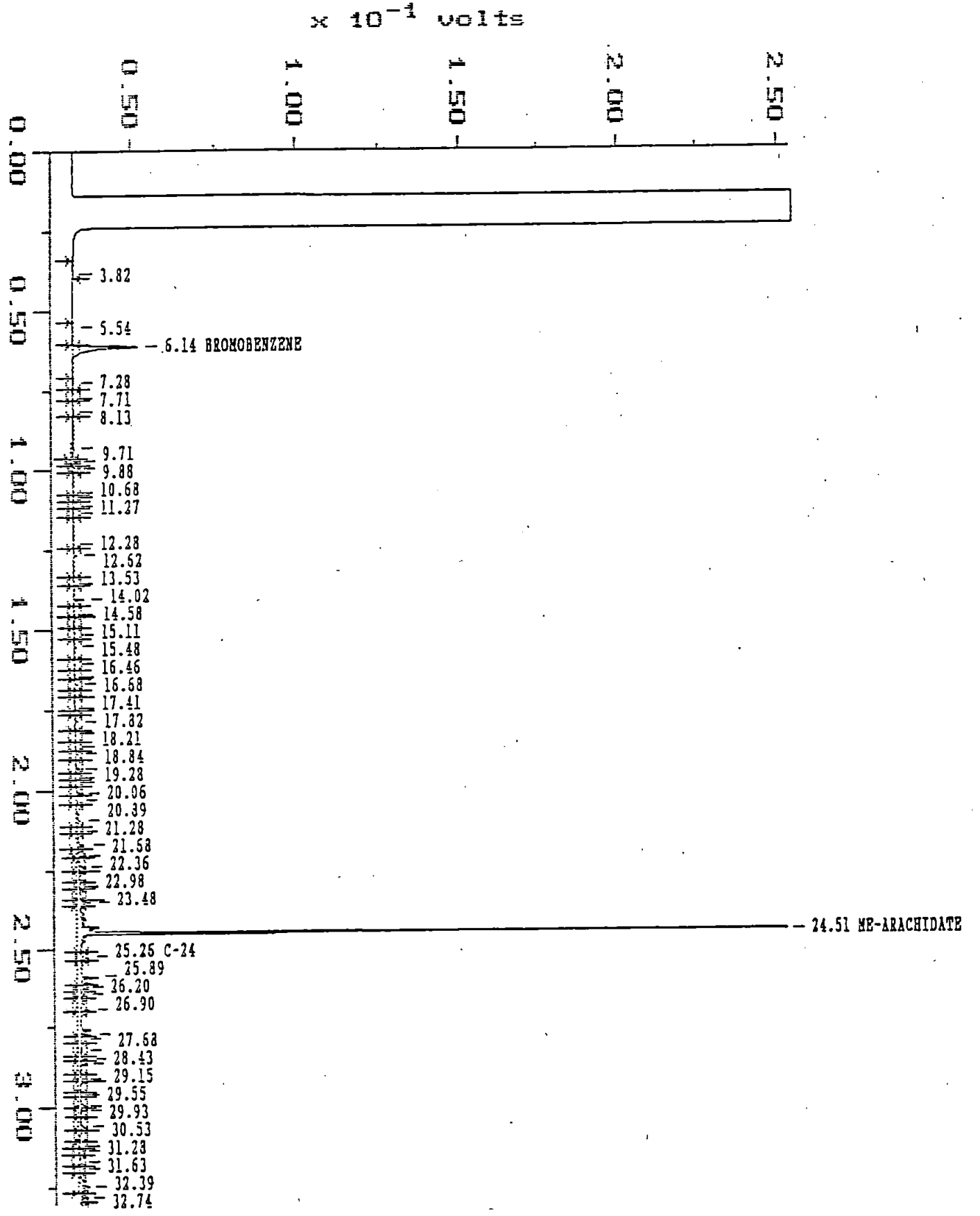
Retention Time (minutes)	Relative Time	Peak Height	Peak Area	Base	Solution Conc (ug\ml)	Component Name
6.133	0.187	6709	46230	AREA	Invalid	BROMOBENZENE
9.700	0.296	162	1952			
9.875	0.302	118	357			
10.667	0.326	155	854			
11.258	0.344	356	1974			
12.283	0.375	191	576			
12.475	0.381	147	382			
12.658	0.387	159	1269			
13.525	0.413	179	515			
13.783	0.421	347	781			
14.008	0.428	638	1225			
14.183	0.433	119	323			
14.367	0.445	301	1103			
15.475	0.473	104	1413			
16.825	0.514	210	1760			
17.400	0.532	129	1050			
17.808	0.544	217	659			
18.258	0.558	156	1131			
18.833	0.575	278	1484			
19.267	0.589	232	701			
20.042	0.612	297	2197			
20.592	0.632	464	2971			
20.875	0.638	306	1642			
21.283	0.650	154	1575			
21.658	0.662	563	3859			
22.008	0.672	340	2029			
22.350	0.683	440	3284			
22.517	0.688	706	4879			
22.908	0.700	359	2032			
23.392	0.715	1572	5179			
23.467	0.717	1922	9402			
24.042	0.734	600	4329			
24.375	0.745	2684	13757			
24.475	0.748	60404	106633	HGHT	Invalid	ME-ARACHIDATE

24.725	0.755	219	903			
25.250	0.771	2988	14152	AREA		C-24
25.983	0.797	3235	9867			
26.175	0.800	430	2111			
26.433	0.808	217	1239			
26.892	0.822	2796	8979			
27.517	0.841	219	2421			
27.667	0.845	2433	4806			
28.158	0.860	217	1523			
28.417	0.868	1708	3285			
29.142	0.890	1401	4800			
29.842	0.912	393	3802			
30.017	0.917	204	1145			
30.533	0.933	802	2984			
30.592	0.938	131	1474			
31.275	0.955	394	909			
32.392	0.990	634	5311			
32.733	1.000	265	1358			
TAL		100905	381567		0.00	

GROUP SUMMARY: FID

Group Center (minutes)	Relative Time	Peak Height	Peak Area	Base	Solution Conc (ug\ml)	Group Name
7.415	(0.227)	7500	51367	AREA	0.00	GASOLINE
17.915	(0.547)	11131	58750	AREA	0.00	DIESEL
29.165	(0.891)	15980	56105	AREA	0.00	HEAVY OIL
TAL		34611	166222		0.00	

Sample: 50637-4 4:1 Channel: FID Filename: HAAA96
Acquired: 12-NOV-93 9:26 Method: C:\MAX\DATA1\ECID Operator: SP



MAXIMA 820 CUSTOM REPORT

Printed: 12-NOV-1993 11:09:28

AMPLE: 50637-4 4:1
89 in Method: WTPH-HCID
Acquired: 12-NOV-1993 9:26
Rate: 2.0 points/sec
Duration: 33.000 minutes
Operator: SP

Type: UNKN
Instrument: Instrument 1
Filename: HA1A9F
Index: 7

DETECTOR: FID

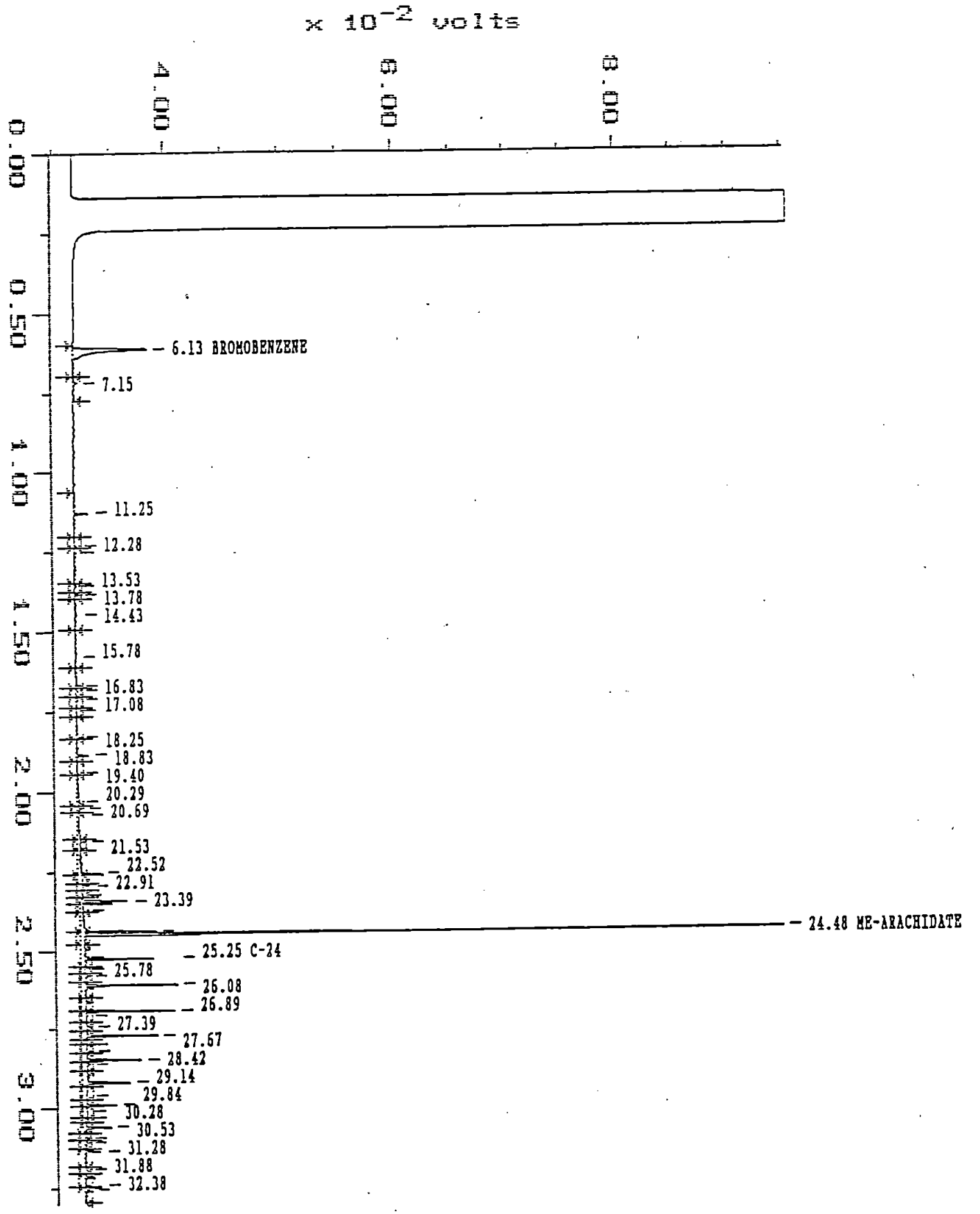
Retention Time (minutes)	Relative Time	Peak Height	Peak Area	Base	Solution Conc (ug\ml)	Component Name
5.817	0.117	127	1438			
5.542	0.169	103	1686			
6.142	0.188	19883	133280	AREA	Invalid	BROMOBENZENE
7.283	0.222	108	719			
7.708	0.235	115	1038			
8.125	0.248	386	2240			
9.300	0.284	201	3190			
9.708	0.297	1036	2993			
9.863	0.302	722	2072			
10.675	0.326	672	2353			
10.783	0.329	190	622			
11.058	0.338	125	550			
11.267	0.344	298	892			
12.283	0.375	384	1490			
12.617	0.385	960	4625			
13.533	0.413	430	935			
14.017	0.428	3138	8140			
14.467	0.442	236	941			
14.575	0.445	1089	2644			
15.108	0.461	226	1557			
15.483	0.473	472	2556			
16.058	0.490	138	556			
16.458	0.503	293	1107			
16.683	0.510	915	2795			
17.058	0.521	128	772			
17.408	0.532	148	1285			
17.533	0.536	115	495			
17.817	0.544	874	3250			
18.208	0.556	307	2492			
18.633	0.569	246	1527			
18.842	0.575	747	2424			
19.283	0.589	1193	5515			
19.567	0.598	253	1231			
19.742	0.603	466	2620			

20.058	0.613	1644	6631			
20.300	0.620	501	4618			
20.892	0.638	1276	18019			
21.283	0.650	636	7404			
21.675	0.662	2846	19253			
22.017	0.672	1544	12230			
22.358	0.683	2090	19195			
22.525	0.688	1424	20339			
22.975	0.702	937	9653			
23.400	0.715	2595	25186			
23.483	0.717	4272	17625			
24.508	0.749	119237	520756	HGHT	Invalid	ME-ARACHIDATE
25.258	0.771	3473	29771	AREA		C-24
25.892	0.791	5262	69498			
26.200	0.800	1804	14660			
25.442	0.808	1697	13062			
26.900	0.822	3213	32605			
27.675	0.845	4127	51736			
27.817	0.850	952	10615			
28.137	0.860	964	15934			
28.425	0.868	2395	9219			
28.575	0.873	2120	18219			
29.042	0.887	1189	7521			
29.150	0.890	3431	12558			
29.550	0.903	597	5398			
29.925	0.914	1472	12881			
30.025	0.917	1346	7460			
30.533	0.933	1758	11473			
30.700	0.938	589	4277			
31.158	0.952	168	866			
31.283	0.955	322	1229			
31.625	0.966	643	2613			
31.883	0.974	188	575			
32.393	0.989	2729	11346			
32.742	1.000	1636	3265			
		----------	----------		--------------	
TAL		317894	1307310		0.00	

GROUP SUMMARY: FID

Group Center (minutes)	Relative Time	Peak Height	Peak Area	Base	Solution Conc (ug\ml)	Group Name
7.415	(0.226)	23967	153671	AREA	0.00	GASOLINE
17.915	(0.547)	32434	210101	AREA	0.00	DIESEL
29.165	(0.891)	38722	333010	AREA	0.00	HEAVY OIL
		----------	----------		--------------	
TAL		95124	696783		0.00	

Sample: 50637-5 Channel: FID Filename: HAAA95
Acquired: 11-NOV-93 15:58 Method: C:\MAE\DATA1\RCID Operator: SP



MAXIMA 820 CUSTOM REPORT

Printed: 11-NOV-1993 16:43:54

SAMPLE: 50637-5

#8 in Method: WTPH-ECID
Acquired: 11-NOV-1993 15:58
Rate: 2.0 points/sec
Duration: 33.000 minutes
Operator: SP

Type: UNKN
Instrument: Instrument 1
Filename: HAAA95
Index: 6

DETECTOR: FID

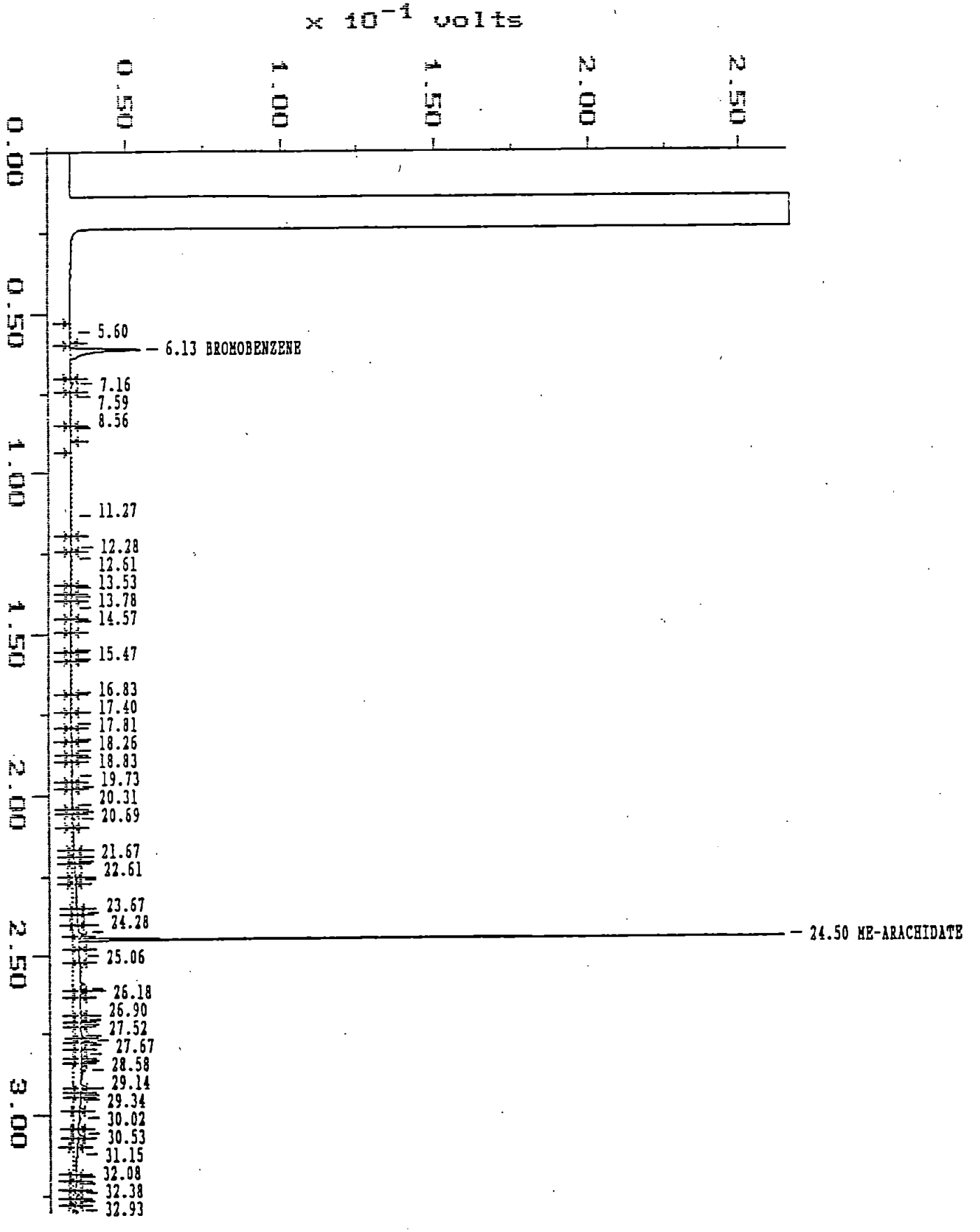
Retention Time (minutes)	Relative Time	Peak Height	Peak Area	Base	Solution Conc (ug\ml)	Component Name
6.133	0.189	6471	44746	AREA	Invalid	BROMOBENZENE
7.150	0.220	344	2478			
11.250	0.346	1209	3850			
12.275	0.378	233	732			
12.475	0.384	141	1491			
13.525	0.416	180	425			
13.783	0.424	372	1035			
14.425	0.444	223	1593			
15.775	0.485	130	1481			
16.633	0.512	221	1190			
16.825	0.518	263	646			
17.075	0.525	192	1007			
17.400	0.535	146	547			
18.250	0.562	327	2136			
18.833	0.579	1032	3444			
19.400	0.597	142	938			
20.292	0.624	162	1791			
20.483	0.630	369	1525			
20.692	0.637	490	5943			
21.525	0.662	497	3600			
22.517	0.693	1895	10813			
22.608	0.696	554	5288			
22.908	0.705	884	5009			
23.250	0.715	369	3081			
23.392	0.720	4238	16161			
23.583	0.725	429	4946			
24.175	0.743	5790	25212			
24.475	0.753	62823	112839	HGHT	Invalid	ME-ARACHIDATE
25.250	0.777	3542	34684	AREA		C-24
25.608	0.788	441	3727			
25.783	0.793	698	3640			
26.083	0.803	3578	14457			
26.392	0.812	8197	14283			
27.025	0.831	302	[illegible]			

27.191	0.849	750	7449		
27.387	0.851	5665	15917		
27.956	0.869	555	4973		
28.150	0.866	761	7507		
28.417	0.874	5217	13336		
28.567	0.879	597	7542		
29.142	0.897	4118	17414		
29.592	0.911	542	9535		
29.842	0.918	2977	8121		
30.017	0.924	357	5156		
30.263	0.932	354	2779		
30.533	0.939	2361	8522		
30.867	0.950	349	2807		
31.000	0.954	246	2792		
31.275	0.962	1402	6030		
31.975	0.984	310	1338		
32.383	0.996	1424	6764		
32.500	1.000	481	2558		
		147565	500392		0.00

GROUP SUMMARY: FID

Group Center (minutes)	Relative Time	Peak Height	Peak Area	Base	Solution Conc (ug\ml)	Group Name
7.415	(0.228)	8025	51073	AREA	0.00	GASOLINE
17.915	(0.551)	13485	76822	AREA	0.00	DIESEL
29.165	(0.897)	47900	199761	AREA	0.00	HEAVY OIL
		69410	327657		0.00	

Sample: 50637-5 4:1 Channel: FID Filename: HAAA97
Acquired: 12-NOV-93 10:08 Method: C:\MAX\DATA1\HCID Operator: SP



MAXIMA 820 CUSTOM REPORT

Printed: 12-NOV-1993 10:42:54

SAMPLE: 50637-5 4:1
#10 in Method: WTPH-HCID
Acquired: 12-NOV-1993 10:08
Rate: 2.0 points/sec
Duration: 33.000 minutes
Operator: SP

Type: UNKN
Instrument: Instrument 1
Filename: HAAA97
Index: 8

DETECTOR: PID

Retention Time (minutes)	Relative Time	Peak Height	Peak Area	Base	Solution Conc (ug\ml)	Component Name
5.600	0.170	107	1698			
6.133	0.186	22774	155854	AREA	Invalid	BROMOBENZENE
7.158	0.217	1231	6847			
7.592	0.231	99	1931			
8.558	0.260	98	502			
11.267	0.342	260	1936			
12.275	0.373	756	2302			
12.608	0.383	521	3063			
13.525	0.411	517	1188			
13.783	0.419	691	1680			
14.183	0.431	169	1845			
14.567	0.442	150	1357			
15.467	0.470	277	2200			
15.775	0.479	168	1157			
16.825	0.511	440	4730			
17.490	0.531	236	3034			
17.808	0.541	226	3097			
18.258	0.555	398	4618			
18.625	0.566	375	4855			
18.833	0.572	533	3106			
19.400	0.589	393	9882			
19.733	0.599	742	3728			
20.308	0.617	804	15425			
20.433	0.621	741	5852			
20.692	0.628	1011	12978			
21.667	0.658	1378	31592			
21.975	0.668	1034	10199			
22.038	0.669	1181	9611			
22.512	0.684	1728	31277			
22.838	0.694	1855	15534			
23.467	0.713	2695	68261			
23.867	0.725	2365	21097			
24.042	0.730	2356	42129			
24.333	0.739	3727	54579			

24.504	0.744	121504	502075	HGHT	Invalid	ME-ARACHIDATE
25.036	0.761	2423	54827			
26.081	0.792	4204	149152			
26.175	0.795	4751	34351			
26.900	0.817	3386	99829			
27.017	0.821	3351	38497			
27.192	0.826	2855	27435			
27.517	0.836	3555	54045			
27.667	0.840	5546	36626			
27.838	0.845	3073	36951			
28.102	0.854	3029	41699			
28.306	0.860	2922	28354			
28.575	0.868	4171	128239			
29.142	0.885	4235	29834			
29.342	0.891	2710	27009			
29.483	0.895	2580	53795			
30.017	0.912	2671	69621			
30.533	0.927	2475	30945			
30.683	0.932	1781	31887			
31.150	0.946	1620	60317			
31.883	0.968	1045	12396			
32.075	0.974	1094	12767			
32.375	0.983	2172	22066			
32.633	0.991	1029	9514			
32.925	1.000	1581	12597			
		-----------	----------		--------------	
TOTAL		351061	2134174		0.00	

GROUP SUMMARY: FID

Group Center (minutes)	Relative Time	Peak Height	Peak Area	Base	Solution Conc (ug\ml)	Group Name
7.415	(0.225)	24570	158768	AREA	0.00	GASOLINE
17.915	(0.544)	22938	315949	AREA	0.00	DIESEL
29.165	(0.886)	65849	1037972	AREA	0.00	HEAVY OIL
		-----------	----------		--------------	
TOTAL		113357	1522689		0.00	

BURLINGTON
ENVIRONMENTAL

210 West Sand Bank Road
P.O. Box 330
Columbia, IL 62236-0330
618/281-7173
618/281-5120 FAX

CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 6367

PROJECT NAME Snohomish Co PUD Halls Lake
PROJECT NUMBER 10779 MAJOR TASK 0077
SAMPLERS Broten
LAB DESTINATION BEI

SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE LOCATION	NO. OF CONTAINERS	TYPE OF ANALYSIS: Total Lead	TPH	TCLP Lead					PRESERVATIVES: ICED	PRESERVATIVES: CHEMICALS ADDED	REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE)
5064-1	11-5-93	0840			PUD II LD SP-4EC	1			X					✓		
-2		1500			PUD II LD-SP-2AE	1			X					✓		
-3		1502			PUD II LD-SP-2AW	1			X					✓		
-4		1505			PUD II LD-SP-3E	1			X					✓		
-5		1509			PUD II LD SP-3W	1			X					✓		
-6		1512			PUD II LD SP-4E	1			X					✓		
-7		1515			PUD II LD SP-4W	1			X					✓		
-8		1520			PUD II LD-2E	1	X	X						✓		Priority 24 hour Turn Around
-9		1522			PUD II LD-2W	1	X	X						✓		
-10		1524			PUD II LD-2S	1	X	X						✓		
-11		1526			PUD II LD-2C	1	X	X						✓		
-12		1530			PUD II LD-3N	1	X	X						✓		
-13		1532			PUD II LD-3C	1	X	X						✓		
-14		1534			PUD II LD-3S	1	X	X						✓		

RELINQUISHED BY: SIGNATURE	DATE	TIME	RECEIVED BY: SIGNATURE	DATE	TIME
Karen Albert	11-5-93	1700	[illegible]	11/5/93	5:05p

SHIPPING NOTES Weekend Questions on Priority samples
Call Karen Rose-Albert at 338-1013

LAB NOTES

BURLINGTON
ENVIRONMENTAL

210 West Sand Bank Road
P.O. Box 330
Columbia, IL 62236-0330
618/281-7173
618/281-5120 FAX

CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 6366

PROJECT NAME Snohomish Co PUD - Halls Lake Phase II
PROJECT NUMBER 10779 MAJOR TASK 0077
SAMPLERS Broten
LAB DESTINATION BET

SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE LOCATION	NO. OF CONTAINERS	TYPE OF ANALYSIS: Total Lead	TPH						PRESERVATIVES: ICED	PRESERVATIVES: CHEMICALS ADDED	REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE)
50614-15	11-5-93	1536			PUDLD - 4W	1	X	X						✓		
-16		1538			- 4C	1	X	X						✓		
-17		1542			- 4S	1	X	X						✓		PRIORITY
-18		1544			- 5N	1	X	X						✓		24 hour Turnaround
-19		1546			- 5S	1	X	X						✓		
-20		1548			5C	1	X	X						✓		
-21		1550			5W	1	X	X						✓		
-22		1552			-2XX	1	X							✓		
-23		1554			-3XX	1	X							✓		
-24		1556			-4XX	1	X							✓		
-25	↓	1559			-5XX	1	X							✓		

RELINQUISHED BY: SIGNATURE	DATE	TIME	RECEIVED BY: SIGNATURE	DATE	TIME
David Broten	11-5-93	1700 ~~15~~	AM Lipnicki	11/5/93	505pm

SHIPPING NOTES Questions during weeking call Karen Rose-Albert at 338-1013

LAB NOTES

BE-34 (1/92)

Metals Laboratory Report

Lab Number : 50614

Plant/Generator Name : TS Pj#10779 TASK 0077 HALLS LAKE REMEDIATION
Sample Type : SOIL
Date of Receipt : 11/05/93 Analyst: BB, EL, BLW
Date of Report : 11/09/93 QC Checked: 11/9/93
Parameters for Analysis: TCLP AND TOTAL LEAD
Outside Lab : NONE Outside Lab Report No:

TCLP LEAD BY SW-846 1311, 6010.

Metals:	TCLP PREP. BLANK	TCLP LCS % RECOVERY	50614-1 TCLP PUDIILDSP-4 EC	50614-1 MS % RECOVERY
Lead	<0.10	108.6	11	107.2

Comments and Conclusions:

TCLP RESULTS REPORTED AS MG/L IN TCLP EXTRACT.

Metals Laboratory Report

Lab Number : 50614

Plant/Generator Name : TS Pj#10779 TASK 0077 HALLS LAKE REMEDIATION
Sample Type : SOIL
Date of Receipt : 11/05/93 Analyst: BB, EL, BLW
Date of Report : 11/09/93 QC Checked: 11/9/93
Parameters for Analysis: TCLP AND TOTAL LEAD
Outside Lab : NONE Outside Lab Report No:

TCLP LEAD BY SW-846 1311, 6010.

Metals:	50614-2 TCLP PUDIILDSP-2 AE	50614-3 TCLP PUDIILDSP-2 AW	50614-4 TCLP PUDIILDSP-3 E	50614-5 TCLP PUDIILDSP-3 W
Lead	14	4.3	9.2	2.3

Comments and Conclusions:

TCLP RESULTS REPORTED AS MG/L IN TCLP EXTRACT.

Metals Laboratory Report

Lab Number : 50614

Plant/Generator Name : TS Pj#10779 TASK 0077 HALLS LAKE REMEDIATION
Sample Type : SOIL
Date of Receipt : 11/05/93 Analyst: BB, EL, BLW
Date of Report : 11/09/93 QC Checked: 11/9/93
Parameters for Analysis: TCLP AND TOTAL LEAD
Outside Lab : NONE Outside Lab Report No:

TCLP LEAD BY SW-846 1311, 6010.

Metals:	50614-6 TCLP PUDIILDSP-4 E	50614-7 TCLP PUDIILDSP-4 W	TOTAL PREP. BLANK (MG/L)	TOTAL LCS % RECOVERY
Lead	0.42	4.3	<0.10	91.4

Comments and Conclusions:

TCLP RESULTS REPORTED AS MG/L IN TCLP EXTRACT.

Metals Laboratory Report

Lab Number : 50614

Plant/Generator Name : TS Pj#10779 TASK 0077 HALLS LAKE REMEDIATION
Sample Type : SOIL
Date of Receipt : 11/05/93 Analyst: BB, ~~EL~~, BLW
Date of Report : 11/09/93 QC Checked: 11/9/93
Parameters for Analysis: TCLP AND TOTAL LEAD
Outside Lab : NONE Outside Lab Report No:

TOTAL LEAD BY SW-846 3050, 6010.

Metals:	50614-8 TOTAL PUDIILD-2 E	50614-8 TOTAL DUPLICATE	50614-9 TOTAL PUDIILD-2 N	50614-9 MS % RECOVERY
Lead	51	54	<4.5	85.7

Comments and Conclusions:

TOTAL RESULTS REPORTED IN MG/KG DRY WEIGHT.
TOTAL LCS = PPS46 "PRIORITY POLLUTANT/CLP" QC
STANDARD FROM ERA.

Metals Laboratory Report

Lab Number : 50614

Plant/Generator Name : TS Pj#10779 TASK 0077 HALLS LAKE REMEDIATION
Sample Type : SOIL
Date of Receipt : 11/05/93 Analyst: BB, EL, BLW
Date of Report : 11/09/93 QC Checked: 11/9/93
Parameters for Analysis: TCLP AND TOTAL LEAD
Outside Lab : NONE Outside Lab Report No:

TOTAL LEAD BY SW-846 3050, 6010.

Metals:	50614-10 TOTAL PUDIILD-2 S	50614-11 TOTAL PUDIILD-2 C	50614-12 TOTAL PUDIILD-3 N	50614-13 TOTAL PUDIILD-3 C
Lead	120	120	<7.6	<8.8

Comments and Conclusions:

RESULTS REPORTED IN MG/KG DRY WEIGHT.

Metals Laboratory Report

Lab Number : 50614

Plant/Generator Name : TS Pj#10779 TASK 0077 HALLS LAKE REMEDIATION
Sample Type : SOIL
Date of Receipt : 11/05/93 Analyst: BB, EL, BLW
Date of Report : 11/09/93 QC Checked: 11/9/93
Parameters for Analysis: TCLP AND TOTAL LEAD
Outside Lab : NONE Outside Lab Report No:

TOTAL LEAD BY SW-846 3050, 6010.

Metals:	50614-14 TOTAL PUDIILD-3 S	50614-15 TOTAL PUDIILD-4 N	50614-16 TOTAL PUDIILD-4 C	50614-17 TOTAL PUDIILD-4 S
Lead	120	7.6	74	300

Comments and Conclusions:

RESULTS ARE REPORTED IN MG/KG DRY WEIGHT.

Metals Laboratory Report

Lab Number : 50614

Plant/Generator Name : TS Pj#10779 TASK 0077 HALLS LAKE REMEDIATION
Sample Type : SOIL
Date of Receipt : 11/05/93 Analyst: BB, ~~EL~~, BLW
Date of Report : 11/09/93 QC Checked: 11/9/93
Parameters for Analysis: TCLP AND TOTAL LEAD
Outside Lab : NONE Outside Lab Report No:

TOTAL LEAD BY SW-846 3050, 6010.

Metals:	50614-18 TOTAL PUDIILD-5 N	50614-19 TOTAL PUDIILD-5 S	50614-20 TOTAL PUDIILD-5 C	50614-21 TOTAL PUDIILD-5 W
Lead	30	18	14	11

Comments and Conclusions:

RESULTS ARE REPORTED IN MG/KG DRY WEIGHT.

Metals Laboratory Report

Lab Number : 50614

Plant/Generator Name : TS Pj#10779 TASK 0077 HALLS LAKE REMEDIATION
Sample Type : SOIL
Date of Receipt : 11/05/93 Analyst: BB, EL, BLW
Date of Report : 11/09/93 QC Checked: 11/9/93
Parameters for Analysis: TCLP AND TOTAL LEAD
Outside Lab : NONE Outside Lab Report No:

TOTAL LEAD BY SW-846 3050, 6010.

Metals:	50614-22 TOTAL PUDIILD-2 XX	50614-23 TOTAL PUDIILD-3 XX	50614-24 TOTAL PUDIILD-4 XX	50614-25 TOTAL PUDIILD-5 XX
Lead	8700	16000	4600	11000

Comments and Conclusions:

RESULTS ARE REPORTED IN MG/KG DRY WEIGHT.

BURLINGTON ENVIRONMENTAL INC.
CORPORATE LABORATORY

TOTAL PETROLEUM HYDROCARBONS (TPH) ANALYSIS

Client: Snohomish County P.U.D. Halls Lake Phase II
Date of Receipt: 11/05/93 **Date of Report:** 11/09/93
Date of Analysis: 11/08/93

Analyst: Linda Lewis **QC Checked by:** DK Wilson 11/9/93
Instrument: Nicolet 710 FTIR Spectrophotometer

Project 10779
Sample Identification PUDIILD-2E
Lab Number 50614-8
Sample Type: Soil

WTPH-418.1

TPH Conc.: < 16 Mg/Kg

Sample Identification PUDIILD-2N
Lab Number 50614-9
Sample Type: Soil

WTPH-418.1

TPH Conc.: < 16Mg/Kg

Sample Identification PUDIILD-2C
Lab Number 50614-11
Sample Type: Soil

WTPH-418.1

TPH Conc.: < 16 Mg/Kg

Sample Identification	**PUDIILD-3N**
Lab Number	**50614-12**
Sample Type:	**Soil**

WTPH-418.1

TPH Conc.: < 16 Mg/Kg

Sample Identification	**PUDIILD-3C**
Lab Number	**50614-13**
Sample Type:	**Soil**

WTPH-418.1

TPH Conc.: < 16 Mg/Kg

Sample Identification	**PUDIILD-4N**
Lab Number	**50614-15**
Sample Type:	**Soil**

WTPH-418.1

TPH Conc.: < 16 Mg/Kg

Sample Identification	**PUDIILD-4C**
Lab Number	**50614-16**
Sample Type:	**Soil**

WTPH-418.1

TPH Conc.: < 16 Mg/Kg

Sample Identification	**PUDIILD-4C**
Lab Number	**50614-16Dupe**
Sample Type:	**Soil**

WTPH-418.1

TPH Conc.: **< 16 Mg/Kg**

Sample Identification	**PUDIILD-5N**
Lab Number	**50614-18**
Sample Type:	**Soil**

WTPH-418.1

TPH Conc.: **62 Mg/Kg**

Sample Identification	**PUDIILD-5C**
Lab Number	**50614-20**
Sample Type:	**Soil**

WTPH-418.1

TPH Conc.: **< 16 Mg/ Kg**

Sample Identification	**PUDIILD-5W**
Lab Number	**50614-21**
Sample Type:	**Soil**

WTPH-418.1

TPH Conc.: **< 16 Mg/Kg**

Sample Identification B110793S
Lab Number
Sample Type: Method Blank

WTPH-418.1

TPH Conc.: < 16 Mg/Kg

Sample Identification MS110793S
Lab Number
Sample Type: Method Spike

WTPH-418.1

TPH Conc.: 84% Recovery

***Results are determined on a dry weight basis.**

BURLINGTON ENVIRONMENTAL INC.
CORPORATE LABORATORY

TOTAL PETROLEUM HYDROCARBONS (TPH) ANALYSIS

Client:	**Snohomish County P.U.D. Halls Lake Phase II**		
Date of Receipt	**11/05/93**	**Date of Report:**	**11/09/93**
Analysis Date:	**11/09/93**		
Analyst:	**Linda Lewis**	**QC Checked by:**	DKwilan 11/9/93
Instrument:	**Nicolet 710 FTIR Spectrophotometer**		

Project	**10779**
Sample Identification	**PUDIILD-2S**
Lab Number	**50614-10**
Sample Type:	**Soil**

WTPH-418.1

TPH Conc.: **< 16 Mg/kg**

Sample Identification	**PUDIILD-3S**
Lab Number	**50614-14**
Sample Type:	**Soil**

WTPH-418.1

TPH Conc.: **< 16 Mg/Kg**

Sample Identification	**PUDIILD4S**
Lab Number	**50614-17**
Sample Type:	**Soil**

WTPH-418.1

TPH Conc.: **< 16 Mg/Kg**

Sample Identification	**PUDIILD-5S**
Lab Number	**50614-19**
Sample Type:	**Soil**

WTPH-418.1

TPH Conc.: **< 16 Mg/Kg**

Sample Identification	**PUDIILD-5S**
Lab Number	**50614-19D**
Sample Type:	**Soil**

WTPH-418.1

TPH Conc.: **< 16 Mg/Kg**

Sample Identification	**MS110993s**
Lab Number	
Sample Type:	**Method Spike**

WTPH-418.1

TPH Conc.: **90% Recovery**

Sample Identification	**B110993s**
Lab Number	
Sample Type:	**Method Blank**

WTPH-418.1

TPH Conc.: **< 16 Mg/Kg**

***Results are reported on a dry weight basis.**

BURLINGTON ENVIRONMENTAL

210 West Sand Bank Road
P.O. Box 330
Columbia, IL 62236-0330
618/281-7173
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CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 6367

PROJECT NAME Snohomish Co PUD Walls Lake
PROJECT NUMBER 10779 MAJOR TASK 0077
SAMPLERS Broten
LAB DESTINATION BEI

SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE LOCATION	NO. OF CONTAINERS	TYPE OF ANALYSIS: Total Lead	TPH	TCLP Lead	PRESERVATIVES: ICED	CHEMICALS ADDED	REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE)
1614-1	11-5-93	0840			PUD II LD SP-4EC	1			X	✓		
-2		1500			PUD II LD-SP-24E	1			X	✓		
-3		1502			PUD II LD-SP-24W	1			X	✓		
-4		1505			PUD II LD-SP-3E	1			X	✓		
-5		1509			PUD II LD SP-3W	1			X	✓		
-6		1512			PUD II LD SP-4E	1			X	✓		
-7		1515			PUD II LD SP-4W	1			X	✓		
-8		1520			PUD II LD (2E)	1	X	X		✓		Priority 24 hour Turn Around
-9		1522			PUD II LD-2W	1	X	X		✓		Priority Sample
-10		1524			PUD II LD-2S	1	X	X		✓		for Lou Fillo
-11		1526			PUD II LD (2C)	1	X	X		✓		
-12		1530			PUD II LD (3W)	1	X	X		✓		
-13		1532			PUD II LD (3C)	1	X	X		✓		
-14		1534			PUD II LD - 3S	1	✓	✓		✓		

RELINQUISHED BY: SIGNATURE	DATE	TIME	RECEIVED BY: SIGNATURE	DATE	TIME
Richard Broten	11-5-93	1700	[illegible]	11/5/93	5:05pm

SHIPPING NOTES Weekend Questions on Priority Sample
Call Karen Rose-Albert at 338-1013

LAB NOTES

BURLINGTON
ENVIRONMENTAL

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CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 6366

PROJECT NAME Snohomish Co PUD Halls Lake Phase II
PROJECT NUMBER 10779 MAJOR TASK 0077
SAMPLERS Boden
LAB DESTINATION BET

SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE LOCATION	NO. OF CONTAINERS	TYPE OF ANALYSIS: Total Lead	TPH	ICED	PRESERVATIVES: CHEMICALS ADDED	REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE)
506144-15	11-5-93	1536			PUDELO - 4W	1	X	X	—		PRIORITY
-16		1538			- 4C	1	X	X	—		24 hour Turnaround
-17		1542			- 4S	1	X	X	—		
-18		1544			5W	1	X	X	—		
-19		1546			- 5S	1	X	X	—		
-20		1548			5C	1	X	X	—		
-21		1550			5W	1	X	X	—		
-22		1552			-2XX	1	X		—		
-23		1554			-3XX	1	X		—		
-24		1556			-4XX	1	X		—		
-25	↓	1559			-5XX	1	X		—		

RELINQUISHED BY

SIGNATURE	DATE	TIME
David Boden	11-5-93	1700

RECEIVED BY

SIGNATURE	DATE	TIME
AM Lipnicki	11/5/93	505pm

SHIPPING NOTES Questions during weeking call
Karen Rose-Albert at 338-1013

LAB NOTES

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CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 6367

PROJECT NAME Snohomish Co PUD Halls Lake
PROJECT NUMBER 10779 MAJOR TASK 0077
SAMPLERS Broten
LAB DESTINATION BEI

SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE LOCATION	NO. OF CONTAINERS	Total Lead	TPH	TCLP Lead				ICED	CHEMICALS ADDED	REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE)
50614-1	11-5-93	0840			PUD II LDSP-4EC	1			X				/		Bruce - do the
-2	↓	1500			PUD II LD-SP-2AE	1			X				/		First 7 for
-3		1502			PUD II LD-SP-2AW	1			X				/		TCLP - in the Friday
-4		1505			PUD II LD-SP-3E	1			X				/		with the others.
-5		1509			PUD II LDSP-3W	1			X				/		Jennifer
-6		1512			PUD II LDSP-4E	1			X				/		
-7		1515			PUD II LDSP-4W	1			X				/		
-8		1520			PUD II LD-2E	1	X	X					/		Priority
-9		1522			PUD II LD-2N	1	X	X					/		24 hour Turn Around
-10		1524			PUD II LD-2S	1	X	X					/		
-11		1526			PUD II LD-2C	1	X	X					/		
-12		1530			PUD II LD-3N	1	X	X					/		
-13		1532			PUD II LD-3C	1	X	X					/		
-14	↓	1534			PUD II LD-3S	1	X	✓					/		

PRESERVATIVES

RELINQUISHED BY SIGNATURE	DATE	TIME	RECEIVED BY SIGNATURE	DATE	TIME
[signature]	11-5-93	1700	[signature]	11/5/93	5:05pm

SHIPPING NOTES Weekend Questions on Priority samples call Karen Rose-Albert at 338-1013

LAB NOTES

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CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 6366

PROJECT NAME Snohomish Co PUD Hells Lake Phase II
PROJECT NUMBER 10779 MAJOR TASK 0077
SAMPLERS Broten
LAB DESTINATION BEI

SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE LOCATION	NO. OF CONTAINERS	TYPE OF ANALYSIS: Total Lead	TPH	ICED	PRESERVATIVES: CHEMICALS ADDED	REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE)
5066 14-15	11-5-93	1536			PUDELD - 4W	1	X	X	✓		
-16		1538			- 4C	1	X	X	✓		
-17		1542			- 4S	1	X	X	✓		PRIORITY
-18		1544			- 5N	1	X	X	✓		24 hour Turnaround
-19		1546			- 5S	1	X	X	✓		
-20		1548			5C	1	X	X	✓		
-21		1550			5W	1	X	X	✓		
-22		1552			-2XX	1	X		✓		
-23		1554			-3XX	1	X		✓		
-24		1556			-4XX	1	X		✓		
-25		1559			-5XX	1	X		✓		

RELINQUISHED BY: SIGNATURE	DATE	TIME	RECEIVED BY: SIGNATURE	DATE	TIME
David Broten	11-5-93	1700 ~~15~~	AM Lipnicki	11/5/93	505pm

SHIPPING NOTES Questions during weeking call Karen Rose-Albert at 338-1013

LAB NOTES

BE-34 (1/92)

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CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 6458

PROJECT NAME Snohomish Co PUD Hells Lake Phase II
PROJECT NUMBER 10779 MAJOR TASK 0077
SAMPLERS Broten
LAB DESTINATION BEI

SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE LOCATION	NO. OF CONTAINERS	TYPE OF ANALYSIS: Total Lead	TYPE OF ANALYSIS: TPH	PRESERVATIVES: ICED	PRESERVATIVES: CHEMICALS ADDED	REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE)
5056-1	11-4-93	1533		-	PUD II LD-1-E	1	X	X	-		PRIORITY Analyses
-2	"	1534		-	PUD II LD-1-N	1	X	X	-		
-3		1539		-	PUD II LD-1-C	1	X	X	-		
-4		1542		-	PUD II LD-1-S	1	X	X	-		
-5		1545		-	PUD II LD-1-XX	1	X	X	-		
-6		1600		-	PUD II LDSP-1 E	1	X		-		
-7		1550		-	PUD II LDSP-1 W	1	X		-		24 hour Turn Around for Priority
-8		1645		-	PUD II LDSP-2 EC	1	X		-		
-9		1647		-	PUD II LDSP-2 E	1	X		-		
-10		1649		-	PUD II LDSP-2 W	1	X		-		
-11	"	1651		-	PUD II LDSP-2 WC	1	X		-		

RELINQUISHED BY SIGNATURE	DATE	TIME	RECEIVED BY SIGNATURE	DATE	TIME
David Broten	11-4-93	1750	D Kwilas	11/4/93	1755

SHIPPING NOTES

LAB NOTES

BE-34 (1/92)

Metals Laboratory Report

Lab Number : 50590

Plant/Generator Name : TECH. SERVICES - HALLS LAKE PHASE 2 REMEDIATION
Sample Type : SOIL - PROJECT #10779
Date of Receipt : 11/04/93 Analyst: BB/EL
Date of Report : 11/05/93 QC Checked: 11/5/93
Parameters for Analysis: TOTAL LEAD
Outside Lab : NONE Outside Lab Report No:

TOTAL LEAD BY SW-846 3050, 6010.

Metals:	PREP BLANK MG/L	% LCS RECOVERY	50590-1 PUDIILD-1-E	50590-1 DUP PUDIILD-1-E DUP
Lead	<0.10	86.5	1100	850

Comments and Conclusions:

RESULTS REPORTED AS MG/KG DRY WEIGHT.

Metals Laboratory Report

Lab Number : 50590

Plant/Generator Name : TECH. SERVICES - HALLS LAKE PHASE 2 REMEDIATION
Sample Type : SOIL - PROJECT #10779
Date of Receipt : 11/04/93 Analyst: BB/EL
Date of Report : 11/05/93 QC Checked: L Bulthon 11/5/93
Parameters for Analysis: TOTAL LEAD
Outside Lab : NONE Outside Lab Report No:

TOTAL LEAD BY SW-846 3050, 6010.

Metals:	50590-2 PUDIILD-1-N	50590-3 PUDIILD-1-C	50590-4 PUDIILD-1-S	50590-5 PUDIILD-1-XX
Lead	700	470	410	5200

Comments and Conclusions:

RESULTS REPORTED AS MG/KG DRY WEIGHT.

Metals Laboratory Report

Lab Number : 50590

Plant/Generator Name : TECH. SERVICES - HALLS LAKE PHASE 2 REMEDIATION
Sample Type : SOIL - PROJECT #10779
Date of Receipt : 11/04/93 Analyst: BB/EL
Date of Report : 11/08/93 QC Checked: BB 11/8/93
Parameters for Analysis: TOTAL LEAD, TCLP LEAD
Outside Lab : NONE Outside Lab Report No:

TCLP LEAD BY SW-846 1311, 6010.-

Metals:	% MATRIX SPIKE RECOVERY	% PDS * RECOVERY	50590-6 TCLP PUDIILDSP-1 E	50590-7 TCLP PUDIILDSP-1 W
Lead	54.8	72.0	5.8	66

Comments and Conclusions:

* PDS = POST-DIGESTION SPIKE.
TCLP RESULTS ARE REPORTED IN MG/L IN TCLP EXTRACT.

Metals Laboratory Report

Lab Number : 50590

Plant/Generator Name : TECH. SERVICES - HALLS LAKE PHASE 2 REMEDIATION
Sample Type : SOIL - PROJECT #10779
Date of Receipt : 11/04/93 Analyst: BB/EL
Date of Report : 11/08/93 QC Checked: 11/8/93
Parameters for Analysis: TOTAL LEAD, TCLP LEAD
Outside Lab : NONE Outside Lab Report No:

TCLP LEAD BY SW-846 1311, 6010.

Metals:	50590-8 TCLP PUDIILDSP-2 EC	50590-9 TCLP PUDIILDSP-2 E	50590-10 TCLP PUDIILDSP-2 W	50590-11 TCLP PUDIILDSP-2 WC
Lead	0.16	3.9	0.77	2.7

Comments and Conclusions:

CLP RESULTS REPORTED AS MG/L IN TLCP EXTRACT.

Metals Laboratory Report

Lab Number : 50590

Plant/Generator Name : TECH. SERVICES - HALLS LAKE PHASE 2 REMEDIATION
Sample Type : SOIL - PROJECT #10779
Date of Receipt : 11/04/93 Analyst: BB/EL
Date of Report : 11/08/93 QC Checked: 11/8/93
Parameters for Analysis: TOTAL LEAD, TCLP LEAD
Outside Lab : NONE Outside Lab Report No:

TCLP LEAD BY ~~SW~~-846 1311, 6010.-

Metals:	TCLP PREP. BLANK	TCLP LCS % RECOVERY
Lead	<0.10	94.4

Comments and Conclusions:

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CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 6158

PROJECT NAME Snohomish Co PUD Hills Lake Phase II
PROJECT NUMBER 0779 MAJOR TASK 0077
SAMPLERS Brown
LAB DESTINATION BEI

SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE LOCATION	NO. OF CONTAINERS	TYPE OF ANALYSIS: Pb Lead	TPH	TCLP Cd	ICED	PRESERVATIVES: CHEMICALS ADDED	REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE)
5056-1	11-4-93	1533		-	PUD II LD-1-E	1	X	X		-		PRIORITY => 24 hour TAT Analyses
-2		1534		-	PUD II LD-1-N	1	X	X		-		
-3		1539		-	PUD II LD-1-C	1	X	X		-		
-4		1542		-	PUD II LD-1-S	1	X	X		-		
-5		1545		-	PUD II LD-1-XX	1	X	X		-		
-6		1600		-	PUD II LDSP-1 E	1	X	X	X	-		24 hour Turn Around for Priority
-7		1550		-	PUD II LDSP-1 W	1	X	X	X	-		
-8		1645		-	PUD II LDSP-2 EC	1	X	X	X	-		
-9		1647		-	PUD II LDSP-2 E	1	X	X	X	-		
-10		1649		-	PUD II LDSP-2 W	1	X	X	X	-		
-11		1651		-	PUD II LDSP-2 WC	1	X	X	X	-		BY 11:30

RELINQUISHED BY: SIGNATURE	DATE	TIME	RECEIVED BY: SIGNATURE	DATE	TIME
David Brown	11-4-93	1750	D K Wilson	11/4/93	1755

SHIPPING NOTES

LAB NOTES: Refrigerator B-4

BE-34 (1/92)

Sample Identification	**PUDIILD-1-S**
Lab Number	**50590-4D**
Sample Type:	**Soil**

WTPH-418.1

TPH Conc.: **< 16 Mg/Kg**

Sample Identification	**PUDIILD-1-XX**
Lab Number	**50590-5**
Sample Type:	**Soil**

WTPH-418.1

TPH Conc.: **170 Mg/Kg**

Sample Identification	**B110593S**
Lab Number	
Sample Type:	**Method Blank**

WTPH-418.1

TPH Conc.: **< 16 Mg/ Kg**

Sample Identification	**MS110593S**
Lab Number	
Sample Type:	**Method Spike**

WTPH-418.1

TPH Conc.: **88% Recovery**

***Results are reported on a dry weight basis.**

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CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 6458

PROJECT NAME Snohomish Co PUD Hills Lake Phase II
PROJECT NUMBER 0779 MAJOR TASK 0077
SAMPLERS Brown
LAB DESTINATION BEI

SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE LOCATION	NO. OF CONTAINERS	TYPE OF ANALYSIS: Total Lead	TPH	TCLP Cd					ICED	PRESERVATIVES: CHEMICALS ADDED	REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE)
5059-1	11-4-93	1533		-	PUDIILD-1-E	1	X	X						-		PRIORITY → BY TODAY Analyses
-2		1534		-	PUDIILD-1-N	1	X	X						-		
-3		1539		-	PUDIILD-1-C	1	X	X						-		
-4		1542		-	PUDIILD-1-S	1	X	X						-		
-5		1545		-	PUDIILD-1-XX	1	X	X						-		
-6		1600		-	PUDIILDSP-1E	1	X	X	X					-		24 hour Turnaround for Priority
-7		1550		-	PUDIILDSP-1W	1	X	X	X					-		
-8		1645		-	PUDIILDSP-2EC	1	X	X	X					-		
-9		1647		-	PUDIILDSP-2E	1	X	X	X					-		
-10		1649		-	PUDIILDSP-2W	1	X	X	X					-		
-11		1651		-	PUDIILDSP-2WC	1	X	X	X					-		By 10am

RELINQUISHED BY: SIGNATURE	DATE	TIME	RECEIVED BY: SIGNATURE	DATE	TIME
David Brott	11-4-93	1750	D K Wilson	11/4/93	1755

SHIPPING NOTES

LAB NOTES: Refrigerator B-4

BE-34 (1/92)

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CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 6361

PROJECT NAME: Snohomish Co Halls Lake Phase II

PROJECT NUMBER: 10779 MAJOR TASK: 0077

SAMPLERS: Broten

LAB DESTINATION: BET

SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE LOCATION	NO. OF CONTAINERS	TYPE OF ANALYSIS: Total Lead						PRESERVATIVES: ICED	PRESERVATIVES: CHEMICALS ADDED	REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE)
50523	11-2-93	0855		✓	HLSB-5-7-9	1	1						✓		24 Hour Turnaround. Hold for further analyses pending results.

RELINQUISHED BY

SIGNATURE	DATE	TIME
David Broten	11-3-93	1000

RECEIVED BY

SIGNATURE	DATE	TIME
[signature]	11/3/93	1000 am

SHIPPING NOTES

LAB NOTES

BE-34 (1/92)

Metals Laboratory Report

Lab Number : 50523

Plant/Generator Name : TECH. SERVICES / HALLS LAKE PHASE 2 REMEDIATION
Sample Type : SOIL - PROJECT #10779
Date of Receipt : 11/03/93 Analyst: BLW/~~EL~~
Date of Report : 11/04/93 QC Checked: 11/4/93
Parameters for Analysis: TOTAL LEAD
Outside Lab : NONE Outside Lab Report No:

TOTAL LEAD BY SW-846 3050, 6010.

Metals:	PREP BLANK MG/L	50523 HLSB-5-7-9	% MATRIX SPIKE RECOVERY
Lead	<0.10	<7.5	89.5

Comments and Conclusions:

RESULTS REPORTED AS MG/KG DRY WEIGHT.

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CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 6360

PROJECT NAME Snohomish Co. Hall's Lake Phase II
PROJECT NUMBER 10779 MAJOR TASK 0077
SAMPLERS Broten
LAB DESTINATION BEI

SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE LOCATION	NO. OF CONTAINERS	TYPE OF ANALYSIS: Total Lead	ICED	PRESERVATIVES: CHEMICALS ADDED	REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE)
50518-1	11-2-93	840		✓	HLSB-5-1-3			✓		
-2		845		✓	HLSB-5-3.5			✓		
-3		0950		✓	HLSB-6-1-3			✓		24 hour Turnaround
-4		1000		✓	HLSB-6-3-5			✓		
-5		1005		✓	HLSB-6-5-7			✓		Hold samples for
-6		1055		✓	HLSB-7-1-3			✓		further analyses pending
-7		1100		✓	HLSB-7-3-5			✓		results
-8		1105		✓	HLSB-7-5-7			✓		
-9		1145		✓	HLSB-8-1-3			✓		
-10		1150		✓	HLSB-8-3-5			✓		
-11	↓	1155		✓	HLSB-8-5-7			✓		

RELINQUISHED BY SIGNATURE	DATE	TIME	RECEIVED BY SIGNATURE	DATE	TIME
Raneed Broten	11-2-93	1435	[signature]	11/2/93	2:40 pm

SHIPPING NOTES

LAB NOTES

BE-34 (1/92)

Metals Laboratory Report

Lab Number : 50518

Plant/Generator Name : TECH. SERVICES / HALLS LAKE PHASE 2 REMEDIATION
Sample Type : SOIL - PROJECT #10779
Date of Receipt : 11/02/93 Analyst: BLW/EL
Date of Report : 11/04/93 QC Checked:
Parameters for Analysis: TOTAL LEAD
Outside Lab : NONE Outside Lab Report No:

TOTAL LEAD BY SW-846 3050, 6010.

Metals:	PREP BLANK MG/L	50518-1 HLSB-5-1-3	50518-1 DUP HLSB-5-1-3 DUP	50518-2 HLSB-5-3-5
Lead	<0.10	14	18	18

Comments and Conclusions:

RESULTS REPORTED AS MG/KG DRY WEIGHT.

Metals Laboratory Report

Lab Number : 50518

Plant/Generator Name : TECH. SERVICES / HALLS LAKE PHASE 2 REMEDIATION
Sample Type : SOIL - PROJECT #10779
Date of Receipt : 11/02/93 Analyst: BLW/EL
Date of Report : 11/04/93 QC Checked: 11/4/93
Parameters for Analysis: TOTAL LEAD
Outside Lab : NONE Outside Lab Report No:

TOTAL-LEAD BY SW-846 3050, 6010

Metals:	50518-3 HLSB-6-1-3	50518-4 HLSB-6-3-5	50518-5 HLSB-6-5-7	50518-6 HLSB-7-1-3
Lead	20	6.7	16	24

Comments and Conclusions:

RESULTS REPORTED AS MG/KG DRY WEIGHT.

Metals Laboratory Report

Lab Number : 50518

Plant/Generator Name : TECH. SERVICES / HALLS LAKE PHASE 2 REMEDIATION
Sample Type : SOIL - PROJECT #10779
Date of Receipt : 11/02/93 Analyst: BLW/EL
Date of Report : 11/04/93 QC Checked:
Parameters for Analysis: TOTAL LEAD
Outside Lab : NONE Outside Lab Report No:

TOTAL LEAD BY SW-846 3050, 6010

Metals:	50518-7 HLSB-7-3-5	50518-8 HLSB-7-5-7	50518-9 HLSB-8-1-3	50518-10 HLSB-8-3-5
Lead	14	16	26	18

Comments and Conclusions:

RESULTS REPORTED AS MG/KG DRY WEIGHT.

Metals Laboratory Report

Lab Number : 50518

Plant/Generator Name : TECH. SERVICES / HALLS LAKE PHASE 2 REMEDIATION
Sample Type : SOIL - PROJECT #10779
Date of Receipt : 11/02/93 Analyst: BLW/EL
Date of Report : 11/04/93 QC Checked: 11/4/93
Parameters for Analysis: TOTAL LEAD
Outside Lab : NONE Outside Lab Report No:

TOTAL LEAD BY SW-846 3050, 6010.

Metals:	50518-11 HLSB-8-5-7	% MATRIX SPIKE RECOVERY
Lead	9.7	89.5

Comments and Conclusions:

RESULTS REPORTED AS MG/KG DRY WEIGHT.

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CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 6360

PROJECT NAME Snohomish Co. Hall's Lake Phase II
PROJECT NUMBER 10779 MAJOR TASK 0077
SAMPLERS Braten
LAB DESTINATION BEI

SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE LOCATION	NO. OF CONTAINERS	TYPE OF ANALYSIS: Total Lead	PRESERVATIVES: ICED	PRESERVATIVES: CHEMICALS ADDED	REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE)
305180-1	11-2-93	840		✓	HLSB-5-1-3			✓		
-2		845		✓	HLSB-5-3.5			✓		
-3		0950		✓	HLSB-6-1-3			✓		24 hour Turnaround
-4		1000		✓	HLSB-6-3-5			✓		
-5		1005		✓	HLSB-6-5-7			✓		Hold samples for further
-6		1055		✓	HLSB-7-1-3			✓		analyses pending results
-7		1100		✓	HLSB-7-3-5			✓		
-8		1105		✓	HLSB-7-5-7			✓		
-9		1145		✓	HLSB-8-1-3			✓		
-10		1150		✓	HLSB-8-3-5			✓		
-11	↓	1155		✓	HLSB-8-5-7			✓		

RELINQUISHED BY: SIGNATURE	DATE	TIME	RECEIVED BY: SIGNATURE	DATE	TIME
Raneed Braten	11-2-93	1435	[signature]	11/2/93	2:40 pm

SHIPPING NOTES

LAB NOTES

BE-34 (1/92)

BURLINGTON
ENVIRONMENTAL

210 West Sand Bank Road
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Columbia, IL 62236-0330
618/281-7173
618/281-5120 FAX

CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 6359

PROJECT NAME Hills Lake Phase II Remediation
PROJECT NUMBER 10779 MAJOR TASK 0077
SAMPLERS Peale, Broten
LAB DESTINATION BET

SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE LOCATION	NO. OF CONTAINERS	TYPE OF ANALYSIS: Total Lead	ICED	PRESERVATIVES: CHEMICALS ADDED	REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE)
5049B-1	11-1-93	0935		✓	HLSB-1-1-3	1	✓	✓		
-2		0950		✓	HLSB-1-3-5	1	✓	✓		
-3		1000		✓	HLSB-1-5-7	1	✓	✓		
-4		1055		✓	HLSB-2-1-3	1	✓	✓		24 hour Turn around
-5		1105		✓	HLSB-2-3-5	1	✓	✓		ARCHIVE SAMPLES —
-6		1115		✓	HLSB-2-5-7	1	✓	✓		HOLD FOR POSSIBLE
-7		1245		✓	HLSB-3-1-3	1	✓	✓		FURTHER ANALYSIS
-8		1258 ~~1325~~		✓	HLSB-3-3-5	1	✓	✓		
-9		1325		✓	HLSB-3-5-7	1	✓	✓		
-10		1415		✓	HLSB-4-1-3	1	✓	✓		
-11		1425		✓	HLSB-4-3-5	1	✓	✓		
-12	↓	1435		✓	HLSB-4-5-7	1	✓	✓		

RELINQUISHED BY SIGNATURE	DATE	TIME	RECEIVED BY SIGNATURE	DATE	TIME
David Broten	11-1-93	1550	AM Sprunk	11/1/93	3:50

SHIPPING NOTES	LAB NOTES

BE-34 (1/92)

Metals Laboratory Report

Lab Number : 50498

Plant/Generator Name : TECH. SERVICES / HALLS LAKE PHASE II REMEDIATION
Sample Type : SOIL - PROJECT #10779
Date of Receipt : 11/01/93 Analyst: BB/EL
Date of Report : 11/03/93 QC Checked: 11/3/93
Parameters for Analysis: TOTAL LEAD
Outside Lab : NONE Outside Lab Report No:

TOTAL LEAD BY SW-846 3050, 6010.

Metals:	PREP BLANK MG/L	% LCS RECOVERY	50498-1 HLSB-1-1-3	50498-1 DUP HLSB-1-1-3 DUP
Lead	<0.10	90.3	97	120

Comments and Conclusions:

RESULTS REPORTED AS MG/KG DRY WEIGHT.

Metals Laboratory Report

Lab Number : 50498

Plant/Generator Name : TECH. SERVICES / HALLS LAKE PHASE II REMEDIATION
Sample Type : SOIL - PROJECT #10779
Date of Receipt : 11/01/93 Analyst: BB/EL
Date of Report : 11/03/93 QC Checked: 11/3/93
Parameters for Analysis: TOTAL LEAD
Outside Lab : NONE Outside Lab Report No:

TOTAL LEAD BY SW-846 3050, 6010.

Metals:	50498-2 HLSB-1-3-5	50498-3 HLSB-1-5-7	50498-4 HLSB-2-1-3	50498-5 HLSB-2-3-5
Lead	210	350	190	580

Comments and Conclusions:

RESULTS REPORTED AS MG/KG DRY WEIGHT.

Metals Laboratory Report

Lab Number : 50498

Plant/Generator Name : TECH. SERVICES / HALLS LAKE PHASE II REMEDIATION
Sample Type : SOIL - PROJECT #10779
Date of Receipt : 11/01/93 Analyst: BB/~~EL~~
Date of Report : 11/03/93 QC Checked: 11/3/93
Parameters for Analysis: TOTAL LEAD
Outside Lab : NONE Outside Lab Report No:

TOTAL LEAD BY SW-846 3050, 6010.

Metals:	50498-6 HLSB-2-5-7	50498-7 HLSB-3-1-3	50498-8 HLSB-3-3-5	50498-9 HLSB-3-5-7
Lead	17	78	99	140

Comments and Conclusions:

RESULTS REPORTED AS MG/KG DRY WEIGHT.

Metals Laboratory Report

Lab Number : 50498

Plant/Generator Name : TECH. SERVICES / HALLS LAKE PHASE II REMEDIATION
Sample Type : SOIL - PROJECT #10779
Date of Receipt : 11/01/93 Analyst: BB/EL
Date of Report : 11/03/93 QC Checked: 11/3/93
Parameters for Analysis: TOTAL LEAD
Outside Lab : NONE Outside Lab Report No:

TOTAL LEAD BY SW-846 3050, 6010.

Metals:	50498-10 HLSB-4-1-3	50498-11 HLSB-4-3-5	50498-12 HLSB-4-5-7	% MATRIX SPIKE RECOVERY
Lead	61	210	43	108.4

Comments and Conclusions:

RESULTS REPORTED AS MG/KG DRY WEIGHT.

Metals Laboratory Report

Lab Number : 50498B

Plant/Generator Name : TECH. SERVICES - HALLS LAKE REMEDIATION
Sample Type : SOIL
Date of Receipt : 11/19/93 Analyst: BLW/EL
Date of Report : 11/23/93 QC Checked: 11/23/93
Parameters for Analysis: TCLP LEAD
Outside Lab : NONE Outside Lab Report No:

TCLP LEAD BY ~~SW~~-846 1311, 6010.-

Metals:	PREP BLANK	% LCS RECOVERY	50498-3 HLSB-1-5-7	50498-3 DUP HLSB-1-5-7-DUP
Lead	<0.10	101.1	<0.10	0.12

Comments and Conclusions:

RESULTS REPORTED AS MG/L IN TCLP EXTRACT.

Metals Laboratory Report

Lab Number : 50498B

Plant/Generator Name : TECH. SERVICES - HALLS LAKE REMEDIATION
Sample Type : SOIL
Date of Receipt : 11/19/93 Analyst: BLW/EL
Date of Report : 11/23/93 QC Checked: BLW 11/23/93
Parameters for Analysis: TCLP LEAD
Outside Lab : NONE Outside Lab Report No:

TCLP LEAD BY ~~SW~~-846 1311, 6010.-

Metals:	50498-5 HLSB-2-3-5	% MATRIX SPIKE RECOVERY
Lead	0.12	98.4

Comments and Conclusions:

RESULTS REPORTED AS MG/L IN TCLP EXTRACT.

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CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. _____

PROJECT NAME Hills Lake Phase II Remediation
PROJECT NUMBER 10779 MAJOR TASK C077
SAMPLERS Peale, Brotin
LAB DESTINATION BET

SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE LOCATION	NO. OF CONTAINERS	TYPE OF ANALYSIS: Total Lead	ICED	PRESERVATIVES: CHEMICALS ADDED	REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE)
5049B-1	11-1-93	0935		✓	HLSB-1-1-3	1	✓	✓		
-2		0950		✓	HLSB-1-3-5	1	✓	✓		
-3		1000		✓	HLSB-1-5-7	1	✓	✓		
-4		1055		✓	HLSB-2-1-3	1	✓	✓		
-5		1105		✓	HLSB-2-3-5	1	✓	✓		24 hour turn around
-6		1115		✓	HLSB-2-5-7	1	✓	✓		
-7		1215		✓	HLSB-3-1-3	1	✓	✓		
-8		1255 ~~1325~~		✓	HLSB-3-3-5	1	✓	✓		
-9		1325		✓	HLSB-3-5-7	1	✓	✓		
-10		1415		✓	HLSB-4-1-3	1	✓	✓		
-11		1425		✓	HLSB-4-3-5	1	✓	✓		
-12	↓	1435		✓	HLSA-4-5-7	1	✓	✓		

RELINQUISHED BY

SIGNATURE	DATE	TIME
Wanda Brotin	11-1-93	1550

RECEIVED BY

SIGNATURE	DATE	TIME
[signature]	11/1/93	3:50

SHIPPING NOTES

LAB NOTES

BE-34 (1/92)

BURLINGTON
ENVIRONMENTAL

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618/281-5120 FAX

CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 5689

PROJECT NAME Halls Lake Phase II Remediation
PROJECT NUMBER 10779 MAJOR TASK 0077
SAMPLERS Peale, Broten
LAB DESTINATION BET

SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE LOCATION	NO. OF CONTAINERS	TYPE OF ANALYSIS: Total Lead	TPH						ICED	PRESERVATIVES: CHEMICALS ADDED	REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE)
50466-1	10-29-93	0840	✓		PUD II SS-16	1	X	X						✓		
-2		0845	✓		PUD II SS-7	1	X	X						✓		
-3		0900	✓		PUD II SS-8	1	X	X						✓		24 Hour Rush
-4		0915	✓		PUD II SS-9	1	X	✓						✓		
-5		0925	✓		PUD II SS-10	1	X	X						✓		
-6		0945	✓		PUD II SS-11	1	X	X						✓		
-7		1030	✓		PUD II SS-13	1	X	X						✓		
-8		1040	✓		PUD II SS-14	1	X	X						✓		
-9		1055	✓		PUD II SS-15	1	X	X						✓		
-10		1105	✓		PUD II SS-12	1	X	X						✓		
-11		1150	✓		PUD II LD#4-01	1	X	✓						✓		
-12	↓	1155	✓		PUD II LD#4-1-2	1	1	1								
TRIP BLANK																

RELINQUISHED BY: SIGNATURE	DATE	TIME	RECEIVED BY: SIGNATURE	DATE	TIME
David Broten	10-29-93	1500	[signature]	10/29/93	5:00pm

SHIPPING NOTES

LAB NOTES

BE-34 (1/92)

BURLINGTON
ENVIRONMENTAL

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618/281-7173
618/281-5120 FAX

CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 6341

PROJECT NAME Hills Lake Phase II Remediation
PROJECT NUMBER 10779 MAJOR TASK 0077
SAMPLERS Broten, Peale
LAB DESTINATION BEI

SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE LOCATION	NO. OF CONTAINERS	TYPE OF ANALYSIS: Total Lead	TPH						ICED	PRESERVATIVES: CHEMICALS ADDED	REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE)
-13	10-29-93	1220			PUD II LD 3-0-1	1	X	X								
-14		1220			PUD II LD 3-1-2	1	X	X								24 hour RUSH
-15		1220			PUD II LD 3X	1	X	X								
-16		1230			PUD II LD 2-0-1	1	X	X								
-17		1230			PUD II LD 2-1-2	1	X	X								
-18		1225			PUD II LD 2X	1	X	X								
-19		1245			PUD II LD 1-0-1	1	X	X								
-20		1250			PUD II LD 1-1-2	1	X	X								
-21		1240			PUD II LD 1X	1	X	X								

RELINQUISHED BY SIGNATURE	DATE	TIME	RECEIVED BY SIGNATURE	DATE	TIME
David Broten	10-29-93	1500	[signature]	10/29/93	3:00 pm

SHIPPING NOTES	LAB NOTES

BE-34 (1/92)

Metals Laboratory Report

Lab Number : 50466

Plant/Generator Name : TECH. SERVICES / HALLS LAKE PHASE II REMEDIATION
Sample Type : SOIL - PROJECT #10779
Date of Receipt : 10/29/93 Analyst: BLW/EL
Date of Report : 11/02/93 QC Checked: 11/3/93
Parameters for Analysis: TOTAL LEAD
Outside Lab : NONE Outside Lab Report No:

TOTAL LEAD BY SW-846 3050, 6010.

Metals:	PREP BLANK MG/L	% LCS RECOVERY	50466-1 PUDIISS-16	50466-1 DUP PUDIISS-16 DUP
Lead	<0.10	82.9	23000	15000

Comments and Conclusions:

RESULTS REPORTED AS MG/KG DRY WEIGHT.

Metals Laboratory Report

Lab Number : 50466

Plant/Generator Name : TECH. SERVICES / HALLS LAKE PHASE II REMEDIATION
Sample Type : SOIL - PROJECT #10779
Date of Receipt : 10/29/93 Analyst: BLW/EL
Date of Report : 11/02/93 QC Checked: 11/3/93
Parameters for Analysis: TOTAL LEAD
Outside Lab : NONE Outside Lab Report No:

TOTAL LEAD BY SW-846 3050, 6010.

Metals:	50466-2 PUDIISS-7	50466-3 PUDIISS-8	50466-4 PUDIISS-9	50466-5 PUDIISS-10
Lead	355	57000	250	390

Comments and Conclusions:

RESULTS REPORTED AS MG/KG DRY WEIGHT.

Metals Laboratory Report

Lab Number : 50466

Plant/Generator Name : TECH. SERVICES / HALLS LAKE PHASE II REMEDIATION
Sample Type : SOIL - PROJECT #10779
Date of Receipt : 10/29/93 Analyst: BLW/EL
Date of Report : 11/02/93 QC Checked: 11/2/93
Parameters for Analysis: TOTAL LEAD
Outside Lab : NONE Outside Lab Report No:

TOTAL LEAD BY SW-846 3050, 6010.

Metals:	50466-6 PUDIISS-11	50466-7 PUDIISS-13	50466-8 PUDIISS-14	50466-9 PUDIISS-15
Lead	69	150	110	150

Comments and Conclusions:

RESULTS REPORTED AS MG/KG DRY WEIGHT.

Metals Laboratory Report

Lab Number : 50466

Plant/Generator Name : TECH. SERVICES / HALLS LAKE PHASE II REMEDIATION
Sample Type : SOIL - PROJECT #10779
Date of Receipt : 10/29/93 Analyst: BLW/EL
Date of Report : 11/02/93 QC Checked: 11/3/93
Parameters for Analysis: TOTAL LEAD
Outside Lab : NONE Outside Lab Report No:

TOTAL LEAD BY SW-846 3050, 6010.

Metals:	50466-10 PUDIISS-12	50466-11 PUDIILD#4-0-1	PREP BLANK MG/L	50466-12 PUDIILD#4-1-2
Lead	61	1400	<0.10	140

Comments and Conclusions:

RESULTS REPORTED AS MG/KG DRY WEIGHT.

Metals Laboratory Report

Lab Number : 50466

Plant/Generator Name : TECH. SERVICES / HALLS LAKE PHASE II REMEDIATION
Sample Type : SOIL - PROJECT #10779
Date of Receipt : 10/29/93 Analyst: BLW/~~EL~~
Date of Report : 11/02/93 QC Checked: 11/2/93
Parameters for Analysis: TOTAL LEAD
Outside Lab : NONE Outside Lab Report No:

TOTAL LEAD BY SW-846 3050, 6010.

Metals:	50466-12 DUP PUDIILD#4-1-2 D	50466-13 PUDIILD3-0-1	50466-14 PUDIILD3-1-2	50466-15 PUDIILD3X
Lead	420	8400	2300	39000

Comments and Conclusions:

RESULTS REPORTED AS MG/KG DRY WEIGHT.

Metals Laboratory Report

Lab Number : 50466

Plant/Generator Name : TECH. SERVICES / HALLS LAKE PHASE II REMEDIATION
Sample Type : SOIL - PROJECT #10779
Date of Receipt : 10/29/93 Analyst: BLW/EL
Date of Report : 11/02/93 QC Checked: 11/3/93
Parameters for Analysis: TOTAL LEAD
Outside Lab : NONE Outside Lab Report No:

TOTAL LEAD BY SW-846 3050, 6010

Metals:	50466-16 PUDIILD2-0-1	50466-17 PUDIILD2-1-2	50466-18 PUDIILD2X	50466-19 PUDIILD1-0-1
Lead	5000	420	19000	660

Comments and Conclusions:

ESULTS REPORTED AS MG/KG DRY WEIGHT.

Metals Laboratory Report

Lab Number : 50466

Plant/Generator Name : TECH. SERVICES / HALLS LAKE PHASE II REMEDIATION
Sample Type : SOIL - PROJECT #10779
Date of Receipt : 10/29/93 Analyst: BLW/~~EL~~
Date of Report : 11/02/93 QC Checked: 11/2/93
Parameters for Analysis: TOTAL LEAD
Outside Lab : NONE Outside Lab Report No:

TOTAL-LEAD BY ~~-~~SW-846 3050, 6010.

Metals:	50466-20 PUDIILD1-1-2	50466-21 PUDIILD1X	% MATRIX SPIKE RECOVERY #1	% MATRIX SPIKE RECOVERY #2
Lead	1100	44000	99.8 *	**

Comments and Conclusions:

ESULTS REPORTED AS MG/KG DRY WEIGHT.
POST-DIGESTION SPIKE.
* LEVEL OF ANALYTE IN THE SAMPLE WAS GREATER THAN
TIMES THE LEVEL OF SPIKE ADDED.

BURLINGTON ENVIRONMENTAL INC.
CORPORATE LABORATORY

TOTAL PETROLEUM HYDROCARBONS (TPH) ANALYSIS

Client:	Snohomish P.U.D. Halls Lake Phase II Remediation		
Date of Receipt	10/29/93	Date of Report:	11/02/93
Analyst:	LINDA LEWIS	QC Checked by:	DKwila
INSTRUMENT:	NICOLET 710 FTIR SPECTROMETER		

Project	# 10779
Sample Identification	PUDIISS-16
Lab Number	50466-1
Sample Type:	Soil

WTPH-418.1

TPH Conc.: 6900 Mg/Kg

Sample Identification	PUDIISS-16
Lab Number	50466-1D
Sample Type:	Soil

WTPH-418.1

TPH Conc.: 5770 Mg/Kg

Sample Identification	PUDIISS-7
Lab Number	50466-2
Sample Type:	Soil

WTPH-418.1

TPH Conc.: 26 Mg/Kg

Sample Identification	PUDIISS-8
Lab Number	50466-3
Sample Type:	Soil

WTPH-418.1

TPH Conc.: 5120 Mg/Kg

Sample Identification PUDIISS-9
Lab Number 50466-4
Sample Type: Soil

WTPH-418.1

TPH Conc.: 590 Mg/Kg

Sample Identification PUDIISS-10
Lab Number 50466-5
Sample Type: Soil

WTPH-418.1

TPH Conc.: <16 Mg/Kg

Sample Identification PUDIISS-11
Lab Number 50466-6
Sample Type: Soil

WTPH-418.1

TPH Conc.: < 16 Mg/Kg

Sample Identification PUDIISS-13
Lab Number 50466-7
Sample Type: Soil

WTPH-418.1

TPH Conc.: < 16 Mg/Kg

Sample Identification	PUDIISS-14
Lab Number	50466-8
Sample Type:	Soil

WTPH-418.1

TPH Conc.: < 16 Mg/Kg

Sample Identification	PUDIISS-15
Lab Number	50466-9
Sample Type:	Soil

WTPH-418.1

TPH Conc.: < 16 Mg/Kg

Sample Identification	PUDIISS-12
Lab Number	50466-10
Sample Type:	Soil

WTPH-418.1

TPH Conc.: < 16 Mg/Kg

Sample Identification	PUDIILD#4-0-1
Lab Number	50466-11
Sample Type:	Soil

WTPH-418.1

TPH Conc.: 43 Mg/Kg

Sample Identification	PUDIILD#4-1-2
Lab Number	50466-12
Sample Type:	Soil

WTPH-418.1

TPH Conc.: < 16 Mg/Kg

Sample Identification	PUDIILD3-0-1
Lab Number	50466-13
Sample Type:	Soil

WTPH-418.1

TPH Conc.: 770 Mg/Kg

Sample Identification	PUDIILD3-1-2
Lab Number	50466-14
Sample Type:	Soil

WTPH-418.1

TPH Conc.: 44 Mg/Kg

Sample Identification	PUDIILD3X
Lab Number	50466-15
Sample Type:	Soil

WTPH-418.1

TPH Conc.: 870 Mg/Kg

Sample Identification: PUDIILD2-0-1
Lab Number: 50466-16
Sample Type: Soil

WTPH-418.1

TPH Conc.: 200 Mg/Kg

Sample Identification: PUDIILD2-1-2
Lab Number: 50466-17
Sample Type: Soil

WTPH-418.1

TPH Conc.: 23 Mg/Kg

Sample Identification: PUDIILD2X
Lab Number: 50466-18
Sample Type: Soil

WTPH-418.1

TPH Conc.: 280 Mg/Kg

Sample Identification: PUDIILD2X
Lab Number: 50466-18D
Sample Type: Soil

WTPH-418.1

TPH Conc.: 280 Mg/Kg

Sample Identification	PUDIILD1-0-1
Lab Number	50466-19
Sample Type:	Soil

WTPH-418.1

TPH Conc.: 44 Mg/Kg

Sample Identification	PUDIILD1-1-2
Lab Number	50466-20
Sample Type:	Soil

WTPH-418.1

TPH Conc.: < 16 Mg/Kg

Sample Identification	PUDIILD1X
Lab Number	50466-21
Sample Type:	Soil

WTPH-418.1

TPH Conc.: 1300 Mg/Kg

Sample Identification	MS110193S
Lab Number	
Sample Type:	METHOD SPIKE

WTPH-418.1

TPH Conc.: 84% RECOVERY

Sample Identification: MS110193S2
Lab Number
Sample Type: METHOD SPIKE

WTPH-418.1

TPH Conc.: 93%

Sample Identification: B110193S
Lab Number
Sample Type: METHOD BLANK

WTPH-418.1

TPH Conc.: < 16 MG/KG

Sample Identification: B110193S2
Lab Number
Sample Type: METHOD BLANK 2

WTPH-418.1

TPH Conc.: < 16 MG/KG

TPH RESULTS ARE DETERMINED BY % DRY WEIGHT.

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CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. _____

PROJECT NAME Halls Lake Phase II Remediation
PROJECT NUMBER 10779 MAJOR TASK 0077
SAMPLERS Peale, Broten
LAB DESTINATION BET

SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE LOCATION	NO. OF CONTAINERS	TYPE OF ANALYSIS: Total Lead	TPH						ICED	PRESERVATIVES: CHEMICALS ADDED	REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE)
0466-1	10-29-93	0840	~		PUD II SS-16	1	X	X						~		
-2		0845	~		PUD II SS-7	1	X	X						~		24 Hour Rush
-3		0900	~		PUD II SS-8	1	X	X						~		
-4		0915	~		PUD II SS-9	1	X	✓						~		
-5		0925	~		PUD II SS-10	1	X	X						~		
-6		0945	~		PUD II SS-11	1	X	X						~		
-7		1030	~		PUD II SS-13	1	X	X						~		
-8		1040	~		PUD II SS-14	1	X	X						~		
-9		1055	~		PUD II SS-15	1	X	X						~		
-10		1105	~		PUD II SS-12	1	X	X						~		
-11		1150	~		PUD II LD#4-01	1	X	✓						~		
-12		1155	~		PUD II LD#4-1-2	1	1	1								
MW																

RELINQUISHED BY: SIGNATURE	DATE	TIME	RECEIVED BY: SIGNATURE	DATE	TIME
David Broten	10-29-93	1500	[illegible]	10/29/93	3:00pm

SHIPPING NOTES

LAB NOTES

BE-34 (1/92)

BURLINGTON
ENVIRONMENTAL

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Columbia, IL 62236-0330
618/281-7173
618/281-5120 FAX

CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. _____

PROJECT NAME Hills Lake Phase II Remediation
PROJECT NUMBER 10779 MAJOR TASK 0077
SAMPLERS Broten, Peale
LAB DESTINATION BEI

SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE LOCATION	NO. OF CONTAINERS	TYPE OF ANALYSIS: Total Lead	TPH	PRESERVATIVES: ICED	CHEMICALS ADDED	REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE)
-13	10-29-93	1220			PUD II LD 3-0-1	1	X	X			24 hour RUSH
-14	↓	1220			PUD II LD 3-1-2	1	X	X			
-15		1220			PUD II LD 3X	1	X	X			
-16		1230			PUD II LD 2-0-1	1	X	X			
-17		1230			PUD II LD 2-1-2	1	X	X			
-18		1225			PUD II LD 2X	1	X	X			
-19		1245			PUD II LD 1-0-1	1	X	X			
-20		1250			PUD II LD 1-1-2	1	X	X			
-21	↓	1240			PUD II LD 1X	1	X	X			

RELINQUISHED BY: SIGNATURE	DATE	TIME	RECEIVED BY: SIGNATURE	DATE	TIME
David Broten	10-29-93	1500	[signature]	10/29/93	3:00 pm

SHIPPING NOTES

LAB NOTES

BE-34 (1/92)

APPENDIX B

Boring Logs

RECORD OF SUBSURFACE EXPLORATION

Borehole No.
Well No. HLSB-1

PROJECT NAME: Snohomish Co PUD Hall's Lake Phase II Remediation PROJECT NO: 10779
ELEVATION: _____ BOREHOLE LOCATION/COORDINATES: _____
LOGGED BY: D. Bracken / J. Dale GWL: depth _____ date/time _____
DRILLED BY: John Dolan GWL: depth _____ date/time _____
DRILLING/RIG METHODS: _____
DATE/TIME STARTED: 11-1-93 DATE/TIME COMPLETION (S): _____
AIR MONITORING TYPE: HNU / PID bg = 1ppm BZ = Breathing Zone; BH = Borehole; S = Sample

DEPTH (feet)	SAMPLE NUMBER	SAMPLE INTERVAL	SAMP TYPE RECOV. (in)	SAMPLE DESCRIPTION CLASSIFICATION SYSTEM:	USCS SYMBOL	DEPTH CHNG (feet)	AIR MONITORING UNITS BZ / BH / S	DRILLING CONDITIONS AND (BLOW COUNTS)
1								
2	1-3		16	Silt, some F-C gravel, brown, dry				10/10/8/6
3								
4	3-5		10	Silt, Reddish-brown, dry				3/3/4/4
5	5-7		10	As above, trace fine sand				4/7/6/15
7	7-9		18	Silt and fine sand, color as above Silt and fine sand, grey trace coarse to fine gravel				10/45/50-5"
9	9-11		12	As above 8-9', some Silt/F. sand as 7-8'				50-5½

COMMENTS: HNU Background = 1 ppm

GEOLOGIST SIGNATURE David Bracken

RECORD OF SUBSURFACE EXPLORATION

Borehole No.
Well No. HLSB-2

PROJECT NAME: Snohomish Co PUD Hells Lake Phase II PROJECT NO: 10779
ELEVATION: _____ BOREHOLE LOCATION/COORDINATES: _____
LOGGED BY: D Bates / J. Peale GWL: depth _____ date/time _____
DRILLED BY: John Dolan GWL: depth _____ date/time _____
DRILLING/RIG METHODS: _____
DATE/TIME STARTED: 11-1-93 DATE/TIME COMPLETION (S): _____
AIR MONITORING TYPE: Hnu / PID BG = 1 ppm BZ = Breathing Zone; BH = Borehole; S = Sample

DEPTH (feet)	SAMPLE NUMBER	SAMPLE INTERVAL	SAMP TYPE RECOV. (in)	SAMPLE DESCRIPTION CLASSIFICATION SYSTEM: _____	USCS SYMBOL	DEPTH CHNG (feet)	AIR MONITORING UNITS _____ BZ / BH / S	DRILLING CONDITIONS AND (BLOW COUNTS)
1								
2	1-3		12	Silt, little fine sand, some f-c gravel, brown, dry				10/11/21/15
3								
4	3-5		14	Silt, reddish-brown, moist, few wood fragments				1/4/4/6
5								
6	5-7		18	Silt and sand, color as above				6/6/10/12
7				Silt and fine sand				
8	7-9		19	f-m sand, silt, grey color				14/16/20/19
9				f-m sand, grey, moist.				
10	9-11		13	Silt, fine sand as 5-7', some fine to coarse gravel, moist.				10/14/23/27

COMMENTS: _____

GEOLOGIST SIGNATURE David Bates

RECORD OF SUBSURFACE EXPLORATION

Borehole No.
Well No. HLSB-3

PROJECT NAME: Snohomish Co PUD Hall's Lake Phase II PROJECT NO: 10779
ELEVATION: _____ BOREHOLE LOCATION/COORDINATES: _____
LOGGED BY: D. Barton / J Peale GWL: depth _____ date/time _____
DRILLED BY: John Dolan GWL: depth _____ date/time _____
DRILLING/RIG METHODS: _____
DATE/TIME STARTED: 11-1-93 DATE/TIME COMPLETION (S): _____
AIR MONITORING TYPE: HNU 101D BG = 1ppm BZ = Breathing Zone; BH = Borehole; S = Sample

DEPTH (feet)	SAMPLE NUMBER	SAMPLE INTERVAL	SAMP TYPE RECOV. (in)	SAMPLE DESCRIPTION CLASSIFICATION SYSTEM: _____	USCS SYMBOL	DEPTH CHNG (feet)	AIR MONITORING UNITS _____ BZ	BH	S	DRILLING CONDITIONS AND (BLOW COUNTS)
1				Silt and fine sand, some f-c gravel, reddish-brown, dry						15/7/4/1
2	1-3		8							
3				Silt, some f-c gravel,						
4	3-5		8	brown, dry						5/5/5/4
5				As above, except moist						
6	5-7		18	Silt, some fine sand, f-c gravel reddish-brown, moist						3/4/6/4
7				As 6-7' above						
8	7-9		11	Fine to med. sand, silt, grey moist						6/16/12/13
9				Fine to med. sand, silt, grey						
10	9-11		16	color; some f-c gravel, wet.						12/14/15/15

COMMENTS: _____

GEOLOGIST SIGNATURE Edward Barton

RECORD OF SUBSURFACE EXPLORATION

Borehole No.
Well No. HLSB-4

PROJECT NAME: Snohomish Co. PUD Hall's Lake Phase II PROJECT NO: 10779
ELEVATION: _____ BOREHOLE LOCATION/COORDINATES: _____
LOGGED BY: D. Braten / J. Peale GWL: depth _____ date/time _____
DRILLED BY: John Dolan GWL: depth _____ date/time _____
DRILLING/RIG METHODS: _____
DATE/TIME STARTED: 11-1-93 DATE/TIME COMPLETION (S): _____
AIR MONITORING TYPE: HNu / PID BH=1 ppm BZ = Breathing Zone; BH = Borehole; S = Sample

DEPTH (feet)	SAMPLE NUMBER	SAMPLE INTERVAL	SAMP TYPE RECOV. (in)	SAMPLE DESCRIPTION CLASSIFICATION SYSTEM:	USCS SYMBOL	DEPTH CHNG (feet)	AIR MONITORING UNITS: BZ / BH / S	DRILLING CONDITIONS AND (BLOW COUNTS)
2	1-3		5	Silt, some fine sand and f-m gravel, grey color, dry				21/9/4/2
4	3-5		12	Silt and fine sand, some f-c gravel, damp, brown, some wood fragments				5/4/3/4
6	5-7		8	As above but no wood fragments				3/8/5/3
7				Silt, trace fine sand, brown, some f-c gravel, wet.				
8	7-9		20	Silt, some fine sand, f-c gravel dark brown, wet.				1/1/2/3
9								
10	9-11		7	Silt and fine sand, f-c gravel reddish-brown, wet.				7/6/11/14

COMMENTS: _____

GEOLOGIST SIGNATURE David Braten

RECORD OF SUBSURFACE EXPLORATION

Borehole No.
Well No. HLSB-5

PROJECT NAME: Snohomish Co PUD Halls Lake Phase II PROJECT NO: 10779
ELEVATION: _____ BOREHOLE LOCATION/COORDINATES: _____
LOGGED BY: D. Barten GWL: depth _____ date/time _____
DRILLED BY: John Dolan GWL: depth _____ date/time _____
DRILLING/RIG METHODS: _____
DATE/TIME STARTED: 11-2-93 DATE/TIME COMPLETION (S): _____
AIR MONITORING TYPE: HNU / PID BG=1ppm BZ = Breathing Zone; BH = Borehole; S = Sample

DEPTH (feet)	SAMPLE NUMBER	SAMPLE INTERVAL	SAMP TYPE RECOV. (in)	SAMPLE DESCRIPTION CLASSIFICATION SYSTEM:	USCS SYMBOL	DEPTH CHNG (feet)	AIR MONITORING UNITS: BZ	BH	S	DRILLING CONDITIONS AND (BLOW COUNTS)
1										
2	1-3		8	Silt, some fine sand, f-c gravel, reddish-brown, dry						14/8/4/2
3										
4	3.5'		9	As above, hit wood, large 5" fragment						1/8/5 for 3
5										
6	5-7		0	Refusal wood only, 2" plug						5/1/3/4
7				Silt, trace fine sand, brown, damp						
8	7-9		18	Silt, reddish-brown, damp						1/1/2
9										
10	9-11		11	Fine sand and silt, grey, wet.						6/11/18/30

COMMENTS: _____

GEOLOGIST SIGNATURE David Barten

RECORD OF SUBSURFACE EXPLORATION

Borehole No.
Well No. HLSB-6

PROJECT NAME: Snohomish Co. PUD Halls Lake Phase II PROJECT NO: 10779
ELEVATION: _____ BOREHOLE LOCATION/COORDINATES: _____
LOGGED BY: D. Braten GWL: depth _____ date/time _____
DRILLED BY: John Dolan GWL: depth _____ date/time _____
DRILLING/RIG METHODS: _____
DATE/TIME STARTED: 11-2-93 DATE/TIME COMPLETION (S): _____
AIR MONITORING TYPE: HNU | PID Background BZ = Breathing Zone; BH = Borehole; S = Sample

DEPTH (feet)	SAMPLE NUMBER	SAMPLE INTERVAL	SAMP TYPE RECOV. (in)	SAMPLE DESCRIPTION CLASSIFICATION SYSTEM: _____	USCS SYMBOL	DEPTH CHNG (feet)	AIR MONITORING UNITS _____ BZ / BH / S	DRILLING CONDITIONS AND (BLOW COUNTS)
2	1-3		4	Silt, some f-m sand, c-f gravel reddish-brown, dry				11/6/6/4
4	3-5		8	As above w/ a 1" dark grey layer of silt and organic debris at 3.5'				4/4/3/2
6	5-7		14	Silt, some f-m sand, f-c gravel reddish-brown, damp Silt, some fine sand, dark brown with red veins, damp				1/2/2/2
8	7-9		18	Silt, dark brown, moist, soft. Silt and sand, dark brown, moist				1/1
10	9-11		12	Silt, reddish-brown, damp Silt and f-m sand, some f-c gravel, grey, damp.				1/17/17

COMMENTS: _____

GEOLOGIST SIGNATURE David Braten

RECORD OF SUBSURFACE EXPLORATION

Borehole No.
Well No. HLSB-7

PROJECT NAME: Snohomish Co. PUD Hall's Lake Phase II PROJECT NO: 10779
ELEVATION: _____ BOREHOLE LOCATION/COORDINATES: _____
LOGGED BY: D. Bratin GWL: depth _____ date/time _____
DRILLED BY: John Delan GWL: depth _____ date/time _____
DRILLING/RIG METHODS: _____
DATE/TIME STARTED: 11-2-93 DATE/TIME COMPLETION (S): _____
AIR MONITORING TYPE: HNu / PID 36=1 ppm BZ = Breathing Zone; BH = Borehole; S = Sample

DEPTH (feet)	SAMPLE NUMBER	SAMPLE INTERVAL	SAMP TYPE RECOV. (in)	SAMPLE DESCRIPTION CLASSIFICATION SYSTEM:	USCS SYMBOL	DEPTH CHNG (feet)	AIR MONITORING UNITS BZ / BH / S	DRILLING CONDITIONS AND (BLOW COUNTS)
1								
2	1-3		7	Silt, some f-m sand, some f-c gravel, reddish-brown, dry				8/5/7/9
3								
4	3-5		1	Silt, f-m sand, dry - Very little recovery.				8/4/2/1
5								
6	5-7		12	Silt, some f-c gravel, dark brown/black, moist				1/1/1/1
7				Silt, and f-m sand, some f-c gravel, reddish-brown, moist				
8	7-9		4	Silt, and f-m sand, some f-c gravel, reddish-brown, moist				1/1/5
9								
10	9-11		8	Silt and sand, f-c gravel grey, moist.				8/10/20/25

COMMENTS: _____

GEOLOGIST SIGNATURE David Bratin

RECORD OF SUBSURFACE EXPLORATION

Borehole No.
Well No. HLSB-8

PROJECT NAME: Snohomish Co PUD Hall's Lake Phase II PROJECT NO: 10779
ELEVATION: _____ BOREHOLE LOCATION/COORDINATES: _____
LOGGED BY: D. Broten GWL: depth _____ date/time _____
DRILLED BY: John Dolan GWL: depth _____ date/time _____
DRILLING/RIG METHODS: _____
DATE/TIME STARTED: 11-2-93 DATE/TIME COMPLETION (S): _____
AIR MONITORING TYPE: HNU / PID BG = 1 ppm BZ = Breathing Zone; BH = Borehole; S = Sample

DEPTH (feet)	SAMPLE NUMBER	SAMPLE INTERVAL	SAMP TYPE RECOV. (in)	SAMPLE DESCRIPTION CLASSIFICATION SYSTEM:	USCS SYMBOL	DEPTH CHNG (feet)	AIR MONITORING UNITS BZ / BH / S	DRILLING CONDITIONS AND (BLOW COUNTS)
1								
2	1-3		8	Silt, and f-m sand, f-c gravel, reddish-brown, dry				11/7/5/5
3								
4	3-5		8	As above with wood fragments				1/1/2/2
5								
6	5-7		10	Silt, some f-m sand, f-c gravel, reddish-brown, moist				1/1/1
7								
8	7-9		5	Silt and fine sand, some wood fragments, brown, wet				1/1
9								
10	9-11		16	Silt and sand, reddish-brown, moist Silt and sand, f-c gravel, grey, wet.				4/8/12/17

COMMENTS: _____

GEOLOGIST SIGNATURE David Broten