Soils

Letter of Transmittal

enviros

12277 - 134th Court NE • Redmond, WA 98052
(206) 820-7575 fax (206) 820-6337

To: Joe Hickey
WA. State Dept. of Ecology
NW Regional office
4350 150th Ave NE
Redmond, WA 98052-5301

Date: 3/13/91

Project No.: 901106

Activity:

We are sending you ☒ attached ☐ under separate cover via _____ the following items:

☐ Contract ☐ Workplan ☐ Draft Report ☒ Final Report

☐ Laboratory Report ☐ Specifications ☐ Other _____

These are:

☐ per your request
☒ for your files
☐ approved as noted
☐ approved as submitted
☐ for your information
☐ for your review and comment
☐ returned for corrections
☐ to be returned as noted

Comments: The sampling was completed in November, 1990 prior to the assessment/site check checklist requirement of Ecology. Please call with any questions

Sincerely,

cc: J. Quarles

Rainier Beach Automotive

Soils

enviros

SR 3/20/91 AV

SOIL SAMPLING RESULTS FROM
UNDERGROUND STORAGE TANK EXCAVATION PIT

RAINIER BEACH TEXACO

Located at:

9479 Rainier Avenue South
Seattle, Washington

Prepared for

Mr. James Campbell

January 11, 1991

Project 901106

Enviros Applied Technologies (206) 820-7575 (fax) 820-6337
12277 - 134th Court NE Redmond, Washington 98052

January 11, 1991

Mr. Jim Campbell
Rainier Beach Texaco
9479 Rainier Ave. South
Seattle, WA 98118
(206) 772-2753

RE: Summary of field work conducted on November 12, 1990 and analytical results of soil samples collected from the Rainier Beach Texaco located at 9479 Rainier Avenue South, Seattle, Washington.

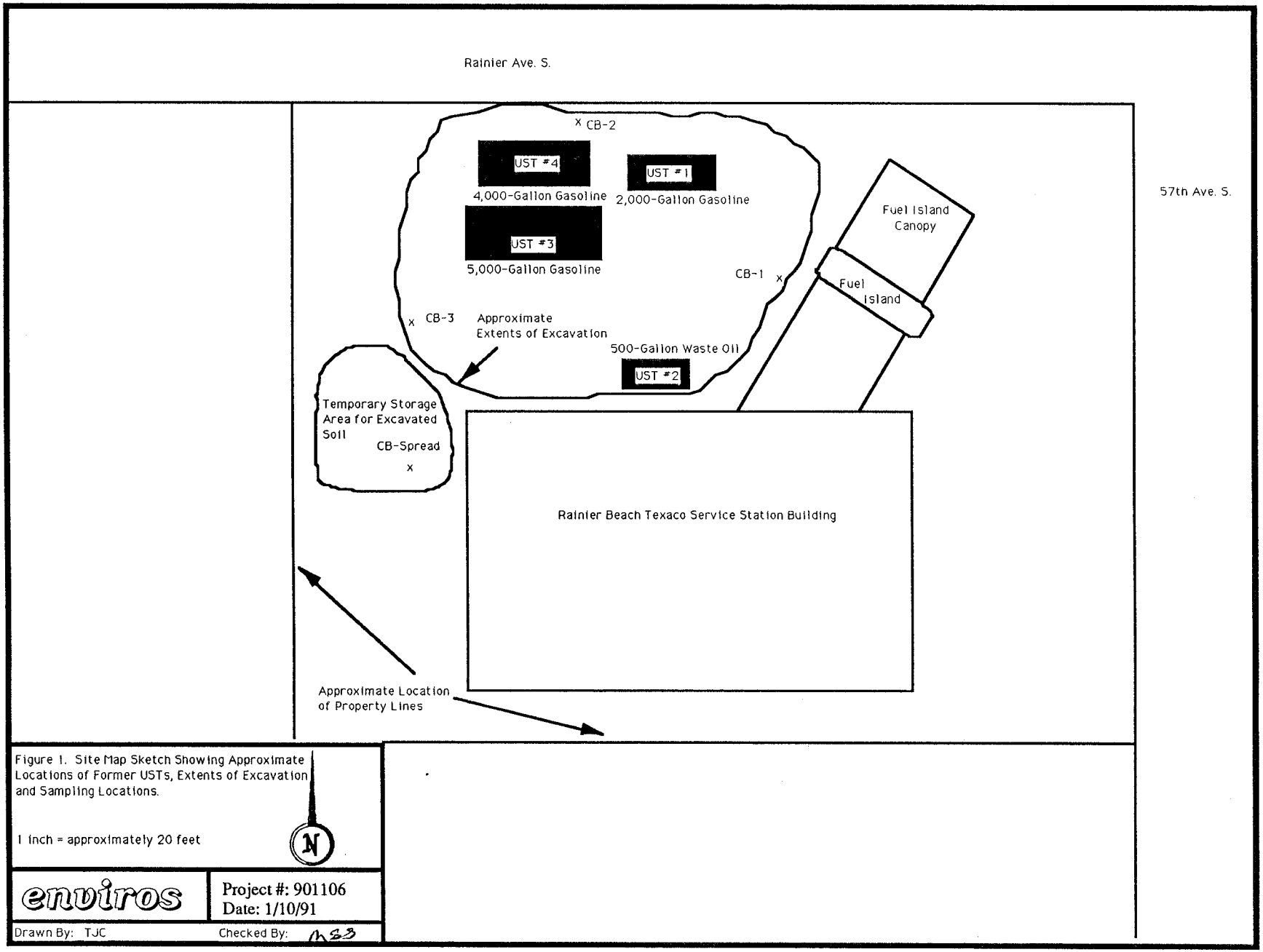
Dear Mr. Campbell:

1. INTRODUCTION

On behalf of Mr. James Campbell, Enviros Applied Technologies (Enviros) conducted soil sampling from an excavation at his Rainier Beach Texaco service station located at 9479 Rainier Avenue South in Seattle, Washington on November 12, 1990. Four underground storage tanks (USTs) were decommissioned and removed from the site on October 26, 1990 by the excavation contractor, O'Sullivan Construction, Inc., approximately two weeks prior to the date that Enviros commenced work on the site. This report summarizes field work conducted by Enviros on November 12, 1990 and presents analytical results of soil samples collected from the excavation. Enviros is not responsible for analytical data or sampling activities that were not conducted by Enviros.

2. FIELD ACTIVITIES

On October 26, 1990, O'Sullivan Construction decommissioned and removed a 2,000-gallon, 4,000-gallon and 5,000-gallon gasoline UST and one 500-gallon waste oil UST from the site. The former locations of these USTs, as reported to Enviros by Mr. Campbell and O'Sullivan personnel, are approximately shown in Figure 1. O'Sullivan proceeded to excavate an estimated 60 to 70 cubic yards of soil from the pit based on visual and olfactory indications of petroleum hydrocarbon concentrations. The excavation was terminated to the south at the edge of the service station to avoid undermining the building foundation, and was terminated to the north along the property line and Rainier


Rainier Ave. S.
CB-2
UST #4
4,000-Gallon Gasoline
UST #1
2,000-Gallon Gasoline
UST #3
5,000-Gallon Gasoline
CB-1
CB-3
Approximate
Extents of Excavation
500-Gallon Waste Oil
UST #2
Fuel Island
Canopy
Fuel
Island
57th Ave. S.
Temporary Storage
Area for Excavated
Soil
CB-Spread
Rainier Beach Texaco Service Station Building
Approximate Location
of Property Lines
Figure 1. Site Map Sketch Showing Approximate Locations of Former USTs, Extents of Excavation and Sampling Locations.
1 inch = approximately 20 feet
N
enviros
Project #: 901106
Date: 1/10/91
Drawn By: TJC
Checked By:

Avenue, to avoid jeopordizing a 24-inch diameter water main. Excavation was terminated to the east at the edge of fuel island canopy to avoid its collapse, and to the west at the end of visual and odorous indications of petroleum hydrocarbon contamination. Excavation depth was approximately eight to ten feet and apparently no groundwater was encountered.

After completing the excavation, O'Sullivan reportedly collected one soil sample from beneath each of the four former UST locations. The samples were submitted to Pacific Testing Laboratories, Inc. on October 30 for total petroleum hydrocarbon (TPH) analysis using EPA Method 418.1 and for benzene, toluene, ethylbenzene and xylenes (BTEX) analysis using EPA Method 3810 (Headspace Method).

Enviros was contracted on November 6, 1990 and conducted field work on November 12, 1990. On that date, Enviros, Mr. Campbell and O'Sullivan personnel were on site to expand the excavation, if possible, and collect soil samples to verify the quality of remaining soils. With assistance from the track-hoe, Enviros collected three soil samples from the excavation (CB-1, CB-2 and CB-3), and one sample was collected from excavated material (CB-spread) in locations marked on Figure 1 and at depths listed in Table 1. A sample could not be obtained from the south wall beneath the building foundation because the track-hoe bucket could not reach that area and it was not safe to enter the pit and collect the sample manually.

Surface runoff from recent rainfall events had caused the the excavation pit to flood with approximately 2 to 3 feet of standing water preventing the collection of viable soil samples from the excavation floor. Mr. Campbell had attempted to pump the pit water to the sewer via his oil-water separator, but the separator was damaged by the track-hoe during previous excavation activities.

The observed soil in the excavation pit was composed mostly of silt and clay with varying cobble and sand contents. The indigenous soil appeared to be tightly packed with probable low hydraulic conductivity properties corroborated by the slow percolation of the standing water. Soil samples were collected using new latex gloves and a decontaminated hand trowel. Decontamination was conducted prior to collection of each sample by rinsing with tap water, scrubbing with tap water and soap, rinsing in distilled water, rinsing with methanol and rinsing with distilled water again. Soil samples were submitted to the

Analytical Services, Inc. laboratory in Redmond on the date of collection for TPH analyses using EPA Method 418.1 and modified EPA Method 8015, BTEX analyses using EPA Method 8020, chlorinated organic compounds using EPA Method 8010 and metals using Toxicity Characteristics Leaching Procedure (TCLP).

While sampling was being conducted, approximately 30 cubic yards of soil with visual and olfactory indications of petroleum hydrocarbon contamination was trucked off-site. Under Mr. Campbell's direction, the soil was taken to a 6-acre parcel of property owned by Mr. Campbell located in Snohomish County, Washington. Mr. Campbell informed Enviros that he constructed a small plastic lined and bermed containment area on which the soil was to be deposited. Mr. Campbell plans to keep the contained thin-spread area covered with a plastic liner to prevent saturation and runoff of the soil and will periodically till the soil until contaminant levels drop below Washington Department of Ecology cleanup levels. Enviros understands that Mr. Campbell contacted the Snohomish Health District and Planning Department who indicated that thin-spread soil treatment did not require a permit if the total soil volume was less than 50 cubic yards. Enviros has not been involved with the soil remediation at this site.

For several reasons no further excavation or widening of the pit was conducted during the time that Enviros was on site. O'Sullivan Construction was not able to move the track-hoe from its excavation location at the northwest corner of the pit due the track-hoe's size and the limited available surface area of the site. As a result, the track-hoe arm was not able to reach the southern half of the excavation pit. Furthermore, additional excavation to the north, south and east would have jeopordized the structural integrity of the water main and Rainier Avenue, the service station foundation and canopy, respectively. The west sidewall had no visual or olfactory indications of petroleum hydrocarbon contamination and standing water and saturated and sloughing soils prevented further vertical excavation. Mr. Campbell decided to backfill the excavation with 30 to 40 cubic yards of previously excavated soil and clean, imported fill to stabilize the hole before it could flood from more predicted rainfall.

3. SOIL SAMPLE ANALYTICAL RESULTS

Analytical results are tabulated below in Table 1 and laboratory reports are contained in Attachment A. Washington State Department of Ecology (Ecology) cleanup levels for TPH and BTEX are listed below Table 1. Analytical results of soil samples collected by O'Sullivan indicate soil beneath USTs #1, #2, #3 and #4 has TPH concentrations (EPA method 418.1) exceeding the Ecology cleanup level of 100 parts per million (ppm) as gasoline. Soil beneath USTs #1 and #2 had TPH concentrations above the cleanup level of 200 ppm for diesel contaminated soils, but Mr. Campbell did not sell diesel fuel. The TPH analyses requested by O'Sullivan did not include characterization of the fuel. O'Sullivan soil samples 1, 3 and 4 also had benzene, toluene or xylenes concentrations exceeding Ecology cleanup levels. These soil samples were reportedly collected after completion of excavation and should be indicative of excavation bottom conditions beneath the former UST positions prior to backfilling.

Analytical results of Enviros soil samples CB-1, CB-2 and CB-3 indicate that TPH concentrations are above Ecology cleanup levels in the north and the east walls. Sample CB-2 collected from the north wall also has BTEX concentrations exceeding cleanup levels. Concentrations of TPH and xylenes exceed cleanup levels in soil sample CB-Spread collected from the temporary containment area for excavated soil. Analyses for chlorinated compounds indicate that no analytes were present above detection limits and only barium was detected at a low concentration in the metals analysis.

Samples CB-2, CB-3 and CB-Spread were analyzed by EPA method 8015 (modified) to qualitatively assess the composition of the petroleum hydrocarbons by examination of the gas chromatogram for each sample. Samples CB-2 and CB-Spread contained heavy waste oil and heavy stoddard solvent-like contamination in addition to gasoline compounds. The presence of this heavier oil and stoddard solvent is probably related to operation and possible leakage or spillage of waste oils during transfers to the 500-gallon waste oil tank. Sample CB-3 contained low concentrations of a light waste oil.

Table 1. Analytical Results of Soil Samples Collected on October 26, and November 12, 1990.[1]

Sample No.	Sample Description	Sample Depth (feet)	TPH Concentration (418.1, ppm)	TPH Concentration as Gasoline, Diesel #1, Diesel #2 (modified 8015, ppm)	BTEX Concentration (8020, ppb) *(3810, ppm)*	Chlorinated Compound Concentration (8010, ppb)	Metals Concentration (TCLP, ppm)
1[2]	Discrete sample from beneath former UST #1 location	?	**833.7**	-	***B: >1.0*** ***T: >50.0*** *E: 10.8* ***X>30.0***	-	-
2[2]	Discrete sample from beneath former UST #2 location	?	**309.0**	-	*B: <0.05* *T: 4.4* *E: <1.0* *X: <1.5*	-	-
3[2]	Discrete sample from beneath former UST #3 location	?	**151.6**	-	*B: 0.19* *T: 13.5* *E: 4.0* ***X: >30***	-	-
4[2]	Discrete sample from beneath former UST #4 location	?	**187.3**	-	*B: <0.05* *T: 13.9* *E: 2.1* ***X: >22.0***	-	-
CB-1	Composite from 10 square feet on east wall	3-5	**140**	-	B: <5 T: <5 E: <5 X: 8, <5	<5	As: <0.1 Ba: 1.2 Cd: <0.1 Cr: <0.1 Pb: <0.1 Hg: <0.05 Se: <0.1 Ag: <0.1
CB-2	Discrete sample from north wall	9-10	-	**Gasoline: 210** Diesel #1: <25 Diesel #2: <25	**B: 2,000** T: 12,000 E: 4,600 **X: 26,000, 9,700** ok	<5	-
CB-3	Composite sample from west wall	7-8	-	Gasoline: <1 Diesel #1: <25 Diesel #2: <25	B: <5 T: 6 E: <5 X: 15, <5	<5	-
CB-Spread	Composite sample from excavated material	-	**440**	Gasoline: 90 Diesel #1: <25 Diesel #2: <25	B: 27 T: 980 E: 1,100 X: 4,200, 2,300	<5	-

1 Entries in bold and underlined exceed July 27, 1990 Model Toxics Control Act Method A compliance cleanup levels for soil which are the following: TPH as gasoline: 100 ppm, TPH as diesel: 200 ppm, B: 0.5 ppm, T: 40 ppm, E: 20 ppm, X: 20 ppm

2 Samples collected by O'Sullivan on October 26; sample depth is not known; samples submitted to Pacific Testing Laboratories for analyses on October 30, 1990; BTEX performed by EPA method 3810

4. CONCLUSIONS

5,000-gallon, 4,000-gallon and 2,000-gallon gasoline USTs and one 500-gallon waste oil UST were removed from the Rainier Beach service station on October 26, 1990 by O'Sullivan Construction. Also on that date, approximately 60 to 70 cubic yards of soil with visual or olfactory indications of petroleum hydrocarbon concentrations were excavated from around the former UST locations. After excavation was completed on October 26, 1990, O'Sullivan collected four soil samples from the excavation floor beneath the former locations of each of the four USTs for TPH and BTEX analyses.

On November 12, 1990, Enviros conducted work entailing the collection of four additional soil samples from the north, east and west sidewalls and from the stockpiled excavated soil. Samples were analyzed for TPH, BTEX and chlorinated organics. One sample was analyzed for metals using TCLP. Also on that date, in consultation with O'Sullivan Construction and Mr. Campbell, Enviros concurred with the others' opinions that further excavation in the northern, southern and eastern portions of the excavation pit would jeopardize the water main along Rainier Avenue and stability of site structures. Visual and olfactory indications implied that the west wall of the excavation had petroleum hydrocarbon concentrations below cleanup levels and further vertical excavation was not practical because of standing rainwater and collapsing saturated soils in the excavation. Based on these observed site conditions Mr. Campbell terminated further excavation in the pit.

Also on that date, Mr. Campbell had approximately 30 cubic yards of excavated material trucked to his Snohomish County property for long term treatment by aeration. The remaining soil, totaling approximately 30 to 40 cubic yards of excavated material was mixed with clean fill and was backfilled into the excavation pit.

Chemical analyses indicate that soil left in-place along the north wall and on the floor of the excavation have TPH and select BTEX compound concentrations exceeding Ecology recommended soil cleanup criteria. In addition, there is evidence of residual TPH contamination in the east wall of the former excavation pit. Chemical analyses also indicate

that approximately 30 to 40 cubic yards of backfill material had TPH concentrations exceeding Ecology cleanup criteria.

It has been a pleasure to assist you with this project. If you have any questions, please contact us.

Sincerely,

Michael S. Surowiec
Geologist and Environmental Engineer

Kathleen Goodman, R.G.
Principal Geoscientist

cc: J. Quarles

ATTACHMENT A
LABORATORY REPORT

asi

November 27, 1990

Mike Surowiec, Project Manager
Enviros Applied Technologies, Inc.
12277 134th Court N.E.
Suite 200
Redmond, WA 98052

Dear Mike:

Enclosed are the results of the analyses of samples submitted on November 12, 1990 from Project 901106/Rainier Beach.

We appreciate this opportunity to be of service to you on this project. If you have any questions regarding this material, or if you just want to discuss any aspect of your projects, please do not hesitate to contact me.

Sincerely,

Thomas M. Stapp
Chemist

TMS:so

Enclosures

Analytical Services, Inc. (206) 820-4551 (fax) 820-6337
12277 - 134th Court NE Redmond, Washington 98052

Date of Report: November 27, 1990
Date Submitted: November 12, 1990
Project: 901106/Rainier Beach

RESULTS OF ANALYSES OF ENVIRONMENTAL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS BY IR (MODIFIED EPA METHOD 418.1)

Sample #	Matrix	Dilution Factor	Total Petroleum Hydrocarbons (ppm)
CB-1 1:05	Soil	2	140
CB-Spread 11:50	Soil	4	440
Quality Assurance			
Method Blank			<20
CB-1 1:05 (Duplicate)	Soil	2	320

asi

Date of Report: November 27, 1990
Date Submitted: November 12, 1990
Project: 901106/Rainier Beach

RESULTS OF ANALYSES OF ENVIRONMENTAL SAMPLES
FOR BTX AND ETHYLBENZENE
USING PURGE AND TRAP (EPA METHOD 602/8020)
Results Reported as ng/g (ppb)

Sample I.D.	Dilution Factor	Benzene	Toluene	Et-Benzene	Xylene m,p	Xylene o
CB-1 1:05	5	<5	<5	<5	8	<5
CB-2 1:25	1,000	2,000	12,000	4,600	26,000	9,700
CB-3 1:35	5	<5	6	<5	15	<5
CB-Spread 11:50	5	27	980	1,100	4,200	2,300
Quality Assurance						
Method Blank	5	<5	<5	<5	<5	<5
CB-1 1:05 (Duplicate)	5	<5	<5	<5	6	<5
CB-1 1:05 (Matrix Spike) Spiked @ 1,000 ppb Recovery		87%	87%	96%	90%	91%
CB-1 1:05 (Matrix Spike Duplicate) Spiked @ 1,000 ppb Recovery		88%	87%	97%	90%	92%

asi

Date of Report: November 27, 1990
Date Submitted: November 12, 1990
Project: 901106/Rainier Beach

RESULTS OF ANALYSES OF SAMPLES FOR GASOLINE, DIESEL #1 AND DIESEL #2 BY MODIFIED EPA METHOD 8015

Sample #	Matrix	Dilution Factor	Gasoline (ppm)	Diesel #1 (ppm)	Diesel #2 (ppm)
CB-2[A,B] 1:25	Soil	15	210	<25	<25
CB-3[C] 1:35	Soil	1	<1	<25	<25
CB-[A,B] Spread 11:50	Soil	1	90	<25	<25
Quality Assurance					
Method Blank			<1	<25	<25
CB-3 1:35 (Duplicate)	Soil	1	<1	<25	<25
CB-3 1:35 (Matrix Spike) Spiked @ 100 ppm Recovery			110%	----	130%
CB-3 1:35 (Matrix Spike Duplicate) Spiked @ 100 ppm Recovery			110%	----	130%

[A] Heavy waste oil contamination evident

[B] Heavy stoddard solvent-like contamination; quantified as gasolines

[C] Light waste oil contamination evident

asi

Date of Report: November 27, 1990
Date Submitted: November 12, 1990
Project: 901106/Rainier Beach

ANALYSIS OF ENVIRONMENTAL SAMPLES
FOR CHLORINATED ORGANIC COMPOUNDS
BY EPA METHOD 8010
Results Reported as ng/g (ppb)
Quality Assurance

Sample #:	CB-1 1:05 Duplicate	CB-1 1:05 Matrix Spike @ 1,000 ppb	CB-1 1:05 Matrix Spike Duplicate @ 1,000 ppb	Method Blank
Matrix	Soil	Soil	Soil	Soil
Dilution Factor	5	5	5	5
Analyte:				
Methylene Chloride	<5	88%	89%	<5
t-Dichloroethylene	<5	86%	90%	<5
1,1-Dichloroethane	<5	92%	96%	<5
Chloroform	<5	95%	97%	<5
1,1,1-Trichloroethane	<5	88%	86%	<5
Carbon Tetrachloride	<5	88%	94%	<5
1,2-Dichloroethane	<5	90%	89%	<5
Trichloroethylene	<5	91%	90%	<5
Tetrachloroethylene	<5	84%	93%	<5
Tetrachloroethane	<5	96%	87%	<5

asi

Date of Report: November 27, 1990
Date Submitted: November 12, 1990
Project: 901106/Rainier Beach

RESULTS OF ANALYSIS OF SOIL SAMPLES FOR TCLP METALS IN ACCORDANCE WITH FEDERAL REGISTER, NOVEMBER 7, 1988
Results Reported in mg/l (ppm)

	Concentration
Sample Number:	CB-1 1:05
Analyte	
Arsenic	<0.1
Barium	1.2
Cadmium	<0.1
Chromium	<0.1
Lead	<0.1
Mercury	<0.05
Selenium	<0.1
Silver	<0.1

Analyses performed by subcontract.

asi

Enviros Analytical Services
12277 134th Court NE, Suite 200
Redmond, Washington 98052
(206) 820-7575 fax 820-6337

Chain of Custody Record

REPORT TO BE SENT TO: Mike Surowiec

SAMPLED BY: Mike Surowiec DATE: 11/12/90

PROJECT NAME: Campbell

PROJECT LOCATION: Rainier Beach ~~9211106~~

SITE NUMBER: 901106

Sample Number	Date/Time Sampled	Type of Samples	# of Containers	Analyses Required	Comments
CB-1	11/12/90 1:05	soil	3	Org-Pb, 8020, ~~8015~~ 8010, 418.1m	if hits/hot then TCL
CB-2	11/12/90 1:25	soil	3	Org-Pb, 8020, 8015m	
CB-3	11/12/90 1:35	soil	3	Org-Pb, 8020, 8015m, [redacted]	
CB-Spread	11/12/90 11:50	soil	2	8015m, 418.1m, 8020	

Relinquished by: (Signature)
NAME: Enviros
FIRM:
Date: 11/12/90
Time: 3:20 p.m.

Received by: (Signature)
NAME: Analytical Bay
FIRM:
Date: 11/12/90
Time: 3:30 PM

PACIFIC TESTING LABORATORIES

EXECUTIVE OFFICES
3220 - 17th Avenue West
Seattle, WA 98119-1790
(206) 282-0666
FAX (206) 282-0710

TACOMA DIVISION
2402 Pacific Highway East
Tacoma, WA 98424
(206) 922-9298
FAX (206) 922-1512

November 1, 1990
Certificate No. 9010-7280

Mr. James Cazort
O'SULLIVAN CONSTRUCTION, INC.
3214 16th Avenue S.W.
Seattle, WA 98134

Subject: Contamination Testing of Soil

Dear Mr. Cazort:

On October 30, 1990, the Chemistry Department of Pacific Testing Laboratories received four soil samples from your P.O. No. 22779 for Job No. 2190-068 sampled October 25, 1990. The samples were analyzed on October 31, 1990, for total petroleum hydrocarbons, EPA Method 418.1, using a Perkin Elmer 1600 Series FTIR (S/N 135991) results are presented in ppm per dry weight. Benzene, toluene, ethyl-benzene, and xylenes (BTEX) content were determined by EPA Method 3810 (Headspace Method), using a Hewlett-Packard 5890A gas chromatograph (2429 A03040). Results are presented in ppm total weight. Results of this analysis, in parts per million (ppm), are presented in Table 1.

Table 1. Analytical Results for Soil Samples (ppm)

Sample I.D.	% of Water	Total Petroleum Hydrocarbons	Benzene	Toluene	Ethyl Benzene	Total Xylenes
1	14.6	833.7	>1.0	>50.0	10.8	>30.0
2	14.8	309.0	<0.05	4.4	<1.0	<1.5
3	16.8	151.6	0.19	13.5	4.0	>30.0
4	19.3	187.3	<0.05	13.9	2.1	>22.0

The EPA regulated maximum set for total petroleum hydrocarbons in soil is 0.020 weight percent (200 ppm). Based on this criteria, samples no. 1 and 2 were found to be in excess the limit for total petroleum hydrocarbons.

This test has been made and report prepared based upon the specific sample provided to us by the client for testing. We assume no responsibility for variations in quality of samples made by persons or under conditions over which we have no control.

This report is provided for the information of the client only. The reproduction of this report by any method and its transmittal by any means to a third party without the written permission of Pacific Testing Laboratories is prohibited.

If you have any questions, please contact us at (206) 282-0666.

Prepared by: Mark A. Dubach, Chemist, Chemistry Department MAD

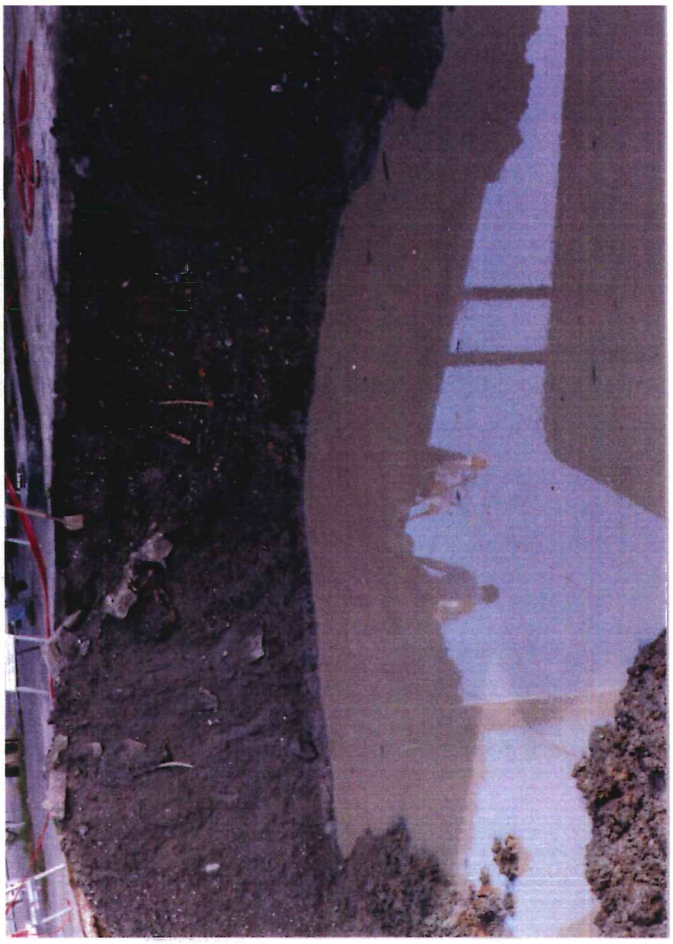
Sincerely,

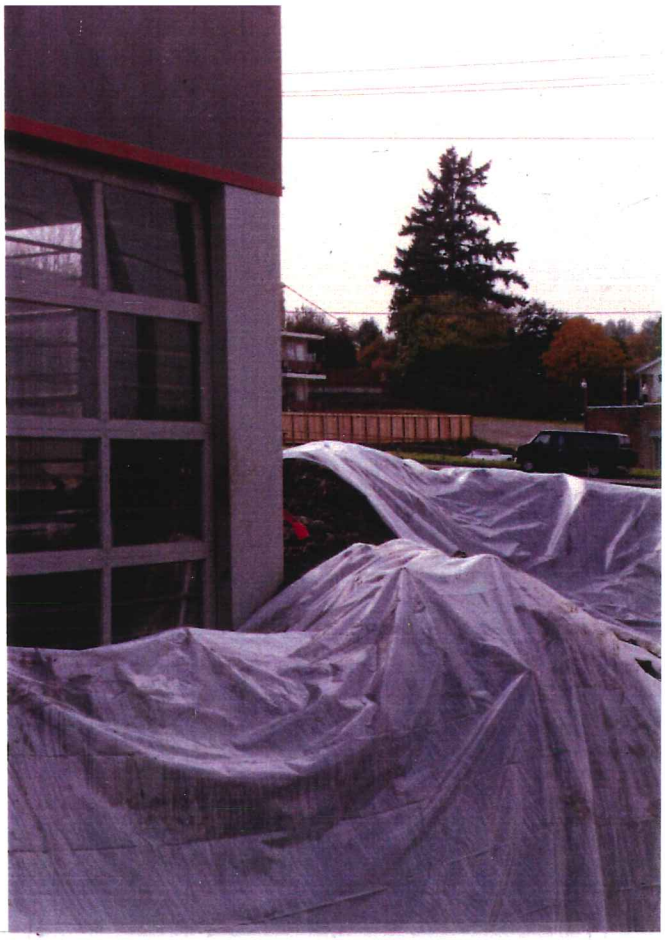
Robert Allen Bartlett

Robert A. Bartlett, Manager
Chemistry Department

MAD/ras

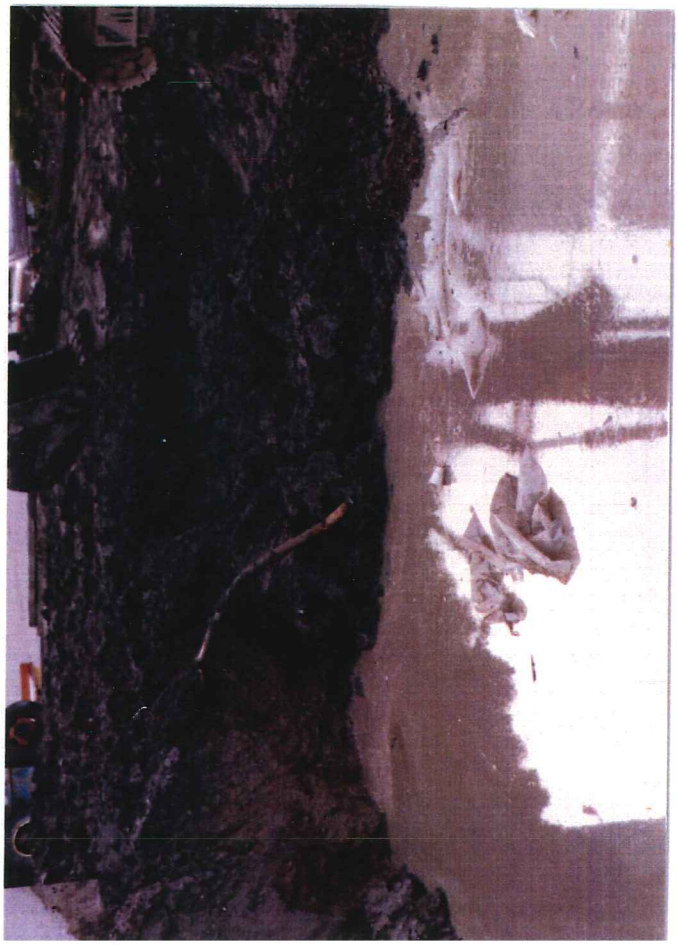
ATTACHMENT B
PHOTOGRAPHS





1. Rain filled UST excavation pit.
2. Rain filled UST excavation pit.

3. Stockpiled soils along corner of excavation pit.
4. Stockpiled soils, facing Rainier Aveneue South.



5. Water in excavation pit and stockpiled soils.
6. Excavation along Rainier Avenue South.