



24 August 2000

Vancouver Housing Authority
c/o Troy A. Drawz
2500 Main Street
Vancouver, Washington 98660-2697

Subject: **Phase II Underground Storage Tank Environmental Assessment**
3200 NE 62nd Avenue, Vancouver, Washington
PBS Project #70086.002

Dear Mr. Drawz:

At your request, and in accordance with our proposal dated August 3, 2000, PBS Environmental has completed a Limited Phase II Underground Storage Tank (UST) Environmental Assessment at 3200 NE 62nd Ave, Vancouver, Washington. The purpose of this assessment was to investigate the possibility of leakage at the subject property from an underground storage tank.

In July of 2000, a Phase One Environmental Site Assessment was completed by PBS, which highlighted the presence of the tank as a recognized environmental concern and subsequently recommended further work to evaluate soils adjacent to the tank for possible leakage of contents.

BACKGROUND

The site has been primarily in residential use, except during the 1980s, when Powers Excavating, apparently a commercial excavation contractor business, was present on the subject property in addition to residential usage. It is unknown what type of commercial activities were conducted on the subject property, pertaining to Powers Excavating; there is a possibility that storage and maintenance of machinery and heavy equipment occurred on the subject property. No additional commercial businesses were on file or reported concerning the subject property.

A geophysical survey, conducted by GeoPotential, indicated that a gasoline/diesel UST of approximately 675 to 1,000 gallons was present on the subject property, located along the southwest corner of the garage/shop structure, buried at an approximate depth of 1 to 1 ½ feet below the ground surface. The tank was used for a period of time to supply fuel, but is no longer in use. An associated

ENGINEERING AND ENVIRONMENTAL SOLUTIONS

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former pump station was located approximately 12 feet north of the fill and vent pipes of this tank. The actual pump, reportedly removed in 1998, was used by the previous owners of the subject property to fuel farm maintenance machines. In addition, the pump may have been used during the 1980s by Powers Excavating to dispense fuel for heavy machinery/equipment. No evidence was observed that would indicate that any past release of fuel had occurred. However, it was observed that the piping from the pump island appears to run underground.

FIELD METHODS/DISCUSSION

Field work at 3200 NE 62nd Ave. occurred on August 10, 2000 and was performed by Jason G. Cook and Tim Leavitt of PBS Environmental. The tank is located in a relatively flat area southwest of the garage/storage structure (Figure 1). Nearby underground utilities and the tank were located using magnetic and electro-magnetic subsurface surveys, conducted by GeoPotential. Following the location of the utilities, Geo-Tech Explorations of Tualatin, Oregon and PBS personnel began a subsurface soils evaluation adjacent to the tank. Four holes were advanced to a depth of 8 feet below ground surface; approximately 1 foot below the estimated base of the UST. Four holes were placed on the south (downgradient) side of the tank, 2 to 3 feet from the side of the tank.

The soil/stratigraphy in each hole was similar. Gravel and sand with some silts and clays extended to a depth of 8 feet below ground surface. Minor variances in gravel, sand, moisture percentage, plasticity, consistency, stickiness and soil color/hue were observed (see attached bore logs 1 to 4). At approximately 5 to 8 feet below ground surface, coarse, moist gray mottled sand with minor amounts of gravel and silt was encountered. Groundwater was not encountered during the investigation.

Sampling and soil characterization was completed at the 5 and 7 foot depths for each sampling bore hole as drilling progressed. Laboratory analytical characterization was completed for the samples from the bottom interval of each hole at 5 feet below ground surface. This is the zone that is expected to most likely to show contamination. The soil samples were stored on-ice and delivered to Environmental Services Laboratory in Portland, Oregon, for characterization of Total Petroleum Hydrocarbons - Hydrocarbon Identification (NWTPH-HCID).

FIELD RESULTS AND ANALYTICAL

Written results from Environmental Sciences Laboratory (August 17, 2000) indicated that gasoline and diesel-fraction petroleum hydrocarbons were detected in SS-7 (Boring #3, 5' depth). Per PBS recommendations and at the request of the Client, the sample was further analyzed by the laboratory for quantification of the petroleum hydrocarbon species (NWTPH-Dx - diesel; NWTPH-Gx - Gasoline/BTEX). In addition, sample SS-6 (Boring #3, 7' depth) was analyzed for hydrocarbon identification (NWTPH-HCID) to determine if vertical contamination extended in depth at this location.

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Follow-up laboratory analysis indicated that SS-7 contained 357 milligrams per kilogram (mg/Kg) gasoline. SS-6 was a non-detect for petroleum hydrocarbons. According to the Washington Administrative Code Model Toxics Control Act (WAC 173-340), the Method A Cleanup Standard for soils contaminated with TPH (gasoline) is 100 mg/Kg.

CONCLUSIONS

The results of this assessment suggest that there has been a release of gasoline from the UST/product dispenser system. Contamination was found in one soil sample at 5 feet below ground surface near the location of the former fuel dispenser. Contamination was not detected deeper than 5' below ground surface in the same boring, suggesting that the release may be the result of leakage of product piping at the pump island or spilled fuel occurring during fueling activities.

The concentration of gasoline detected in the soil (357 mg/Kg) was in excess of the Model Toxics Control Act Method A Cleanup Standard of 100 mg/Kg, therefore some type of soil remediation is indicated.

RECOMMENDATIONS

According to the Washington Administrative Code Underground Storage Tank Regulations (WAC 173-360-360), owners/operators of USTs are required to report suspected and confirmed releases of regulated substances from underground storage tank systems (tanks, product lines, dispensers, etc.) to the Washington Department of Ecology (WDOE) within 24 hours of discovery. Since it is suspected that the discovered release may be the result of leakage from the product dispenser, the release should be reported to WDOE by the owner/operators.

Since it is no longer in use, PBS recommends that the tank be decommissioned in accordance with state regulations. The decommissioning will also involve the removal and proper treatment/disposal of all accessible petroleum-contaminated soils in excess of MTCA Method A cleanup levels. Based on the findings of the current investigation, the soil contamination does not appear to be extensive.

LIMITATIONS

This work was performed in accordance with the generally accepted practices of other consultants undertaking similar studies during the same time period and geographical area. PBS Environmental observed the same degree of care and skill generally exercised by other consultants under similar circumstances and conditions. The findings and conclusions of this report are not scientific certainties, but rather, are based on professional judgement concerning the significance of data gathered during the course of this assessment. The recommendations of this report, or lack thereof,

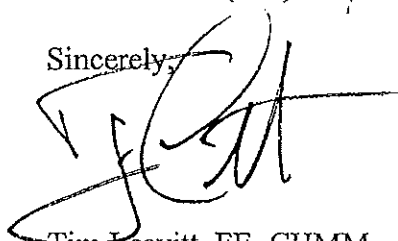
Vancouver Housing Authority
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are not to be considered a legal opinion as to the client's duty concerning due diligence relating to potential liabilities in leasing, owning, or purchasing real estate.

PBS is not able to represent that the site or adjoining land contains no hazardous waste, oil or other latent conditions beyond that detected or observed by PBS during this study. The possibility always exists for contaminants to migrate through surface water, air, or groundwater. The ability to accurately address the environmental risk associated with transport in these media is beyond the scope of this investigation.

If you have any questions concerning this report or need further information, please feel free to contact me at (360) 690,4331.

Sincerely,

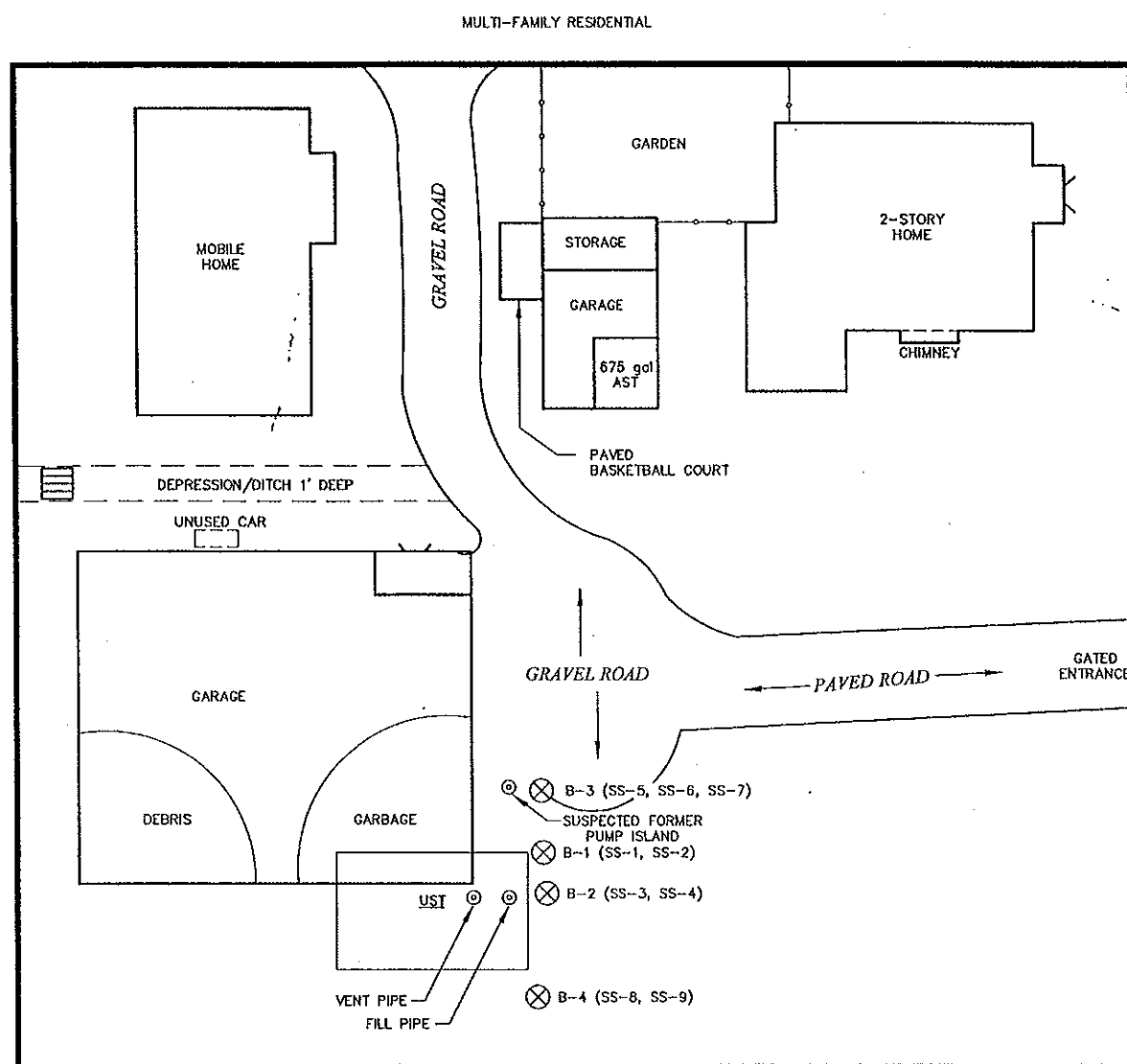
A handwritten signature in black ink, appearing to read 'Tim Leavitt', is written over the word 'Sincerely,'.

Tim Leavitt, FE, CHMM
Senior Project Manager

Reviewer: Erik Anderson, RG
WDOE Certified Site Assessor

Attachments: Figure 1
 Laboratory Report and Sample Chain-of-Custody
 Soil Boring Logs

8/17/00 16:27 P:\70000\70086\Phase Two.DWG



LEGEND

- SAMPLING POINTS
- FENCE

NOT TO SCALE

70086.002

AUGUST 2000

SITE VICINITY PLAN
3200 NE 62ND AVE.
VANCOUVER, WASHINGTON



1310 MAIN STREET
VANCOUVER, WASHINGTON
98660
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(360) 696-9054

FIGURE 1

Environmental Services Laboratory, Inc.

17400 SW Upper Boones Ferry Road • Suite 270 • Portland, OR 97224 • (503) 670-8520

August 24, 2000

Tim Leavitt
PBS Environmental
1220 SW Morrison

Portland, OR 97205

TEL: (503)248-1939

FAX (503) 248-0223

RE: 70086.002

Order No.: 0008051

Dear Tim Leavitt,

Environmental Services Laboratory received 9 samples on 8/8/00 for the analyses presented in the following report.

The Samples were analyzed for the following tests:

GAS/BTEX, Soil (8015/8021)
HCID Soil (EPA 8015)
NWTPH-Dx Soil (EPA 8015)
PERCENT MOISTURE (D2216)

There were no problems with the analyses and all data for associated QC met EPA or laboratory specifications except where noted in the Case Narrative. Results apply only to the samples analyzed. Reproduction of this report is permitted only in its entirety, without the written approval from the Laboratory.

If you have any questions regarding these test results, please feel free to call.

Sincerely,

Nichole Karl

Nichole Karl
Project Manager

Technical Review

ANALYTICAL SERVICES FOR THE ENVIRONMENT

Environmental Services Laboratory

Date: 24-Aug-00

CLIENT: PBS Environmental
Lab Order: 0008051
Project: 70086.002
Lab ID: 0008051-02A

Client Sample ID: SS-2
Tag Number:
Collection Date: 8/8/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
HCID SOIL		NW-TPH				Analyst: smc
Oil	ND	127		mg/Kg-dry	1	8/15/00
Gasoline	ND	25.3		mg/Kg-dry	1	8/15/00
Diesel	ND	63.3		mg/Kg-dry	1	8/15/00
Sum: O-Terphenyl	76.0	50-150		%REC	1	8/15/00
PERCENT MOISTURE		D2216				Analyst: fmh
% Moisture	21	0.		wt%	1	8/15/00

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: 24-Aug-00

CLIENT: PBS Environmental

Client Sample ID: SS-4

Lab Order: 0008051

Tag Number:

Project: 70086.002

Collection Date: 8/8/00

Lab ID: 0008051-04A

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
HCID SOIL		NW-TPH				Analyst: smc
Oil	ND	119		mg/Kg-dry	1	8/15/00
Gasoline	ND	23.8		mg/Kg-dry	1	8/15/00
Diesel	ND	59.5		mg/Kg-dry	1	8/15/00
Surr: O-Terphenyl	85.0	50-150		%REC	1	8/15/00
PERCENT MOISTURE		D2216				Analyst: tmh
% Moisture	.16	0.		wt%	1	8/15/00

Qualifiers:

- ND - Not Detected at the Reporting Limit
- J - Analyte detected below quantitation limits
- D - Analyte detected in the associated Method Blank
- * - Value exceeds Maximum Contaminant Level

- S - Spike Recovery outside accepted recovery limits
- R - RPD outside accepted recovery limits
- E - Value above quantitation range

Environmental Services Laboratory

Date: 24-Aug-00

CLIENT: PBS Environmental
Lab Order: 0008051
Project: 70086.002
Lab ID: 0008051-06A

Client Sample ID: SS-6
Tag Number:
Collection Date: 8/8/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
HCID SOIL		NW-TPH				Analyst: smc
Oil	ND	127		mg/Kg-dry	1	8/19/00
Gasoline	ND	26.3		mg/Kg-dry	1	8/19/00
Diesel	ND	63.3		mg/Kg-dry	1	8/19/00
Sum: O-Terphenyl	93.0	50-150		%REC	1	8/19/00
PERCENT MOISTURE		D2216				Analyst: smc
% Moisture	21	0.		wt%	1	8/18/00

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Value above quantitation range

Environmental Services Laboratory

Date: 24-Aug-00

CLIENT: PBS Environmental
Lab Order: 0008051
Project: 70086.002
Lab ID: 0008051-07A

Client Sample ID: SS-7
Tag Number:
Collection Date: 8/8/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
HCID SOIL						
		NW-TPH				Analyst: smc
Oil	ND	123		mg/Kg-dry	1	8/15/00
Gasoline	ND	24.7		mg/Kg-dry	1	8/15/00
Diesel	ND	61.7		mg/Kg-dry	1	8/15/00
Unidentified Hydrocarbon (Gas range)	DETECT	24.7		mg/Kg-dry	1	8/15/00
Unidentified Hydrocarbon (Diesel range)	DETECT	61.7		mg/Kg-dry	1	8/15/00
Surr: O-Terphenyl	84.0	50-150		%REC	1	8/15/00
NWTPH-DX SOIL						
		NW TPH-DX				Analyst: smc
Diesel	61.7	24.7	AC	mg/Kg-dry	1	8/22/00
Oil	ND	61.7		mg/Kg-dry	1	8/22/00
Surr: O-Terphenyl	84.0	50-150		%REC	1	8/22/00
GAS/BTEX, SOIL						
		SW-846				Analyst: sec
Benzene	ND	2.5		µg/Kg-dry	500	8/21/00
Ethylbenzene	ND	2.5		µg/Kg-dry	500	8/21/00
Toluene	ND	2.5		µg/Kg-dry	500	8/21/00
Xylenes, Total	ND	7.5		µg/Kg-dry	500	8/21/00
Gasoline	357000.0	500		µg/Kg-dry	500	8/21/00
Surr: Trifluorotoluene	97.8	70-130		%REC	500	8/21/00
PERCENT MOISTURE						
		D2216				Analyst: tmh
% Moisture	19	0.		wt%	1	8/15/00

Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

* - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

Environmental Services Laboratory

Date: 24-Aug-00

CLIENT: PBS Environmental

Client Sample ID: SS-9

Lab Order: 0008051

Tag Number:

Project: 70086.002

Collection Date: 8/8/00

Lab ID: 0008051-09A

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
HCID SOIL		NW-TPH				Analyst: smc
Oil	ND	120		mg/Kg-dry	1	8/15/00
Gasoline	ND	24.1		mg/Kg-dry	1	8/15/00
Diesel	ND	60.2		mg/Kg-dry	1	8/15/00
Surr. O-Terphenyl	78.0	50-150		%REC	1	8/15/00
PERCENT MOISTURE		D2216				Analyst: tmh
% Moisture	17	0.		wt%	1	8/15/00

Qualifiers: ND - Not Detected at the Reporting Limit
 I - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Case Narrative

ESL Job: 0008051

Aug 23, 2000

The sample 0008051-07 extracted for NWTPHD-Diesel analysis was classified as gasoline in the diesel range. This pattern extend into both the gas and diesel ranges when HCID was ran but with more thorough testing of NWTPHD-Diesel and Gas affirmed that the hydrocarbon was gasoline.

Please do not hesitate to call if there are any questions, or if we can be of further assistance in this project. Thank you.

Sarah Chapman, Chemist



1310 MAIN STREET
VANCOUVER, WASHINGTON
98660

(360) 690-4331

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(360) 696-9064

Bore Hole/Well Construction Log

Project Number:
70086.002

Boring/Well Number:
B-1

Sheet
1 of 1

Project Name: VANCOUVER HOUSING AUTHORITY
Project Location: 3200 NE 62ND AVE.
Driller/Equipment: GEOPROBE
Geologist/Engineer: JASON G. COOK
Sample Method: GRAB

TOC Elevation (feet above datum): N/A
Surface Elevation (feet above datum): N/A
Start/End Date: 8/10/2000
Hole Depth: 8'
Outer Hole Diam.: 6"

Depth (feet, BOS)	Well Construction Details	Sample Data				Lithologic Column	Soil Description	
		Sample Interval	PID Reading (ppm)	Sample Number	Blows/ft.			
1							SANDY CLAY LOAM cambic horizon, (~30%) clay content, granular peds, low PI, dry, non-sticky, slightly plastic, no odor detected (SC) Soil.	1
2								2
3								3
4							SANDY LOAM oxidation features, low plasticity, slightly sticky, low PI, damp, (SM) soil, no odor detected. SS-2 Sample collected @ 5'	4
5				SS-2				5
6							LOAMY SAND Redoxymorphic/mottled features, (SP) soil, poorly graded, non-sticky, non-plastic, low PI, moist, no odor detected. SS-1 Sample collected @ 7'	6
7				SS-1				7
8								8
9							BOTTOM OF HOLE	9
10								10
11								11
12								12
13								13
14								14
15								15
16								16
17								17
18								18
19								19
20								20

NOTES

1. SOIL INTERFACES AND DESCRIPTIONS ARE INTERPRETIVE AND ACTUAL CHANGES AND TRANSITIONS MAY BE GRADUAL.
2. WATER LEVEL IS FOR DATE SHOWN AND MAY VARY WITH TIME OF YEAR.

3. SOIL DESCRIPTIONS NOT INTENDED TO BE USED FOR GEOTECHNICAL DESIGN PURPOSES.

B-1



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Bore Hole/Well Construction Log

Project Number:
70086.002

Boring/Well Number:
B-2

Sheet
1 of 1

Project Name: VANCOUVER HOUSING AUTHORITY
Project Location: 3200 NE 62ND AVE.
Driller/Equipment: GEOPROBE
Geologist/Engineer: JASON G. COOK
Sample Method: GRAB

TOC Elevation (feet above datum): N/A
Surface Elevation (feet above datum): N/A
Start/End Date: 8/10/2000
Hole Depth: 8"
Outer Hole Diam.: 6"

Depth (feet, BGS)	Well Construction Details	Sample Data				Lithologic Column	Soil Description	
		Sample Interval	PID Reading (ppm)	Sample Number	Blows/ft			
1							SANDY CLAY LOAM cambic horizon, (~30%) clay content, granular peds, low PI, dry, non-sticky, slightly plastic, no odor detected (SC) Soil.	1
2								2
3								3
4							SANDY LOAM oxidation features, low plasticity, slightly sticky, low PI, damp, (SM) soil, no odor detected. SS-4 Sample collected @ 5'	4
5				SS-4				5
6								6
7				SS-3			LOAMY SAND Redoxymorphic/mottled features, (SP) soil, poorly graded, non-sticky, non-plastic, low PI, moist, no odor detected. SS-3 Sample collected @ 7'	7
8								8
9								9
10							BOTTOM OF HOLE	10
11								11
12								12
13								13
14								14
15								15
16								16
17								17
18								18
19								19
20								20

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B-2



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98660

(360) 690-4331

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Bore Hole/Well Construction Log

Project Number:
70086.002

Boring/Well Number:
B-3

Sheet
1 of 1

Project Name: VANCOUVER HOUSING AUTHORITY
Project Location: 3200 NE 62ND AVE.
Driller/Equipment: GEOPROBE
Geologist/Engineer: JASON G. COOK
Sample Method: GRAB

TOC Elevation (feet above datum): N/A
Surface Elevation (feet above datum): N/A
Start/End Date: 8/10/2000
Hole Depth: 8"
Outer Hole Diam.: 6"

Depth (feet, BGS)	Well Construction Details	Sample Data				Lithologic Column	Soil Description	
		Sample Interval	PID Reading (ppm)	Sample Number	Blows/ft.			
1				SS-5			SS-5 Sample collected SANDY CLAY LOAM cambic horizon, (~30%) clay content, granular peds. low PI. dry, non-sticky, slightly plastic, no odor detected (SC) Soil.	1
2								2
3								3
4							SANDY LOAM oxidation features, low plasticity, slightly sticky, low PI. damp. (SM) soil, no odor detected. SS-7 Sample collected @ 5'	4
5				SS-7				5
6								6
7				SS-6			LOAMY SAND Redoxymorphic/mottled features, (SP) soil, poorly graded, non-sticky, non-plastic, low PI, moist, no odor detected. SS-6 Sample collected @ 7'	7
8								8
9								9
10							BOTTOM OF HOLE	10
11								11
12								12
13								13
14								14
15								15
16								16
17								17
18								18
19								19
20								20

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B-3



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Bore Hole/Well Construction Log

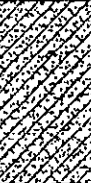



Project Number:
70086.002

Boring/Well Number:
B-4

Sheet
1 of 1

Project Name: VANCOUVER HOUSING AUTHORITY
Project Location: 3200 NE 62ND AVE.
Driller/Equipment: GEOPROBE
Geologist/Engineer: JASON G. COOK
Sample Method: GRAB

TOC Elevation (feet above datum): N/A
Surface Elevation (feet above datum): N/A
Start/End Date: 8/10/2000
Hole Depth: 8'
Outer Hole Diam.: 6"

Depth (feet, BGS)	Well Construction Details	Sample Data				Blows/ft.	Lithologic Column	Soil Description
		Sample Interval	PID Reading (ppm)	Sample Number				
1							SANDY CLAY LOAM cambic horizon, (~30%) clay content, granular peds, low PI, dry, non-sticky, slightly plastic, no odor detected (SC) Soil.	
2								
3								
4							SANDY LOAM oxidation features, low plasticity, slightly sticky, low PI, damp, (SM) soil, no odor detected. SS-9 Sample collected @ 5'	
5				SS-9				
6							LOAMY SAND Redoxymorphic/mottled features, (SP) soil, poorly graded, non-sticky, non-plastic, low PI, moist, no odor detected. SS-8 Sample collected @ 7'	
7				SS-8				
8								
9							BOTTOM OF HOLE	
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

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