Site Summary Report
Snohomish County New Jail Building
Everett, Washington

January 31, 2005

NW1155
VCP NW1156-Jail

SHANNON & WILSON, INC.

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

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21-1-09644-011

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SUBJECT	SNOHOMISH COUNTY NEW JAIL BUILDING		

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Mike –

Attached is our final report for the New Jail. This is our final deliverable for this project. Copies are also being sent to the County, as listed below.

By: Agnes Tirao

Title: Senior Engineer

c: Jeff O'Boyle (SnoCo Facilities Mgmt, 3 c)
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EXECUTIVE SUMMARY

This report summarizes actions conducted at the Snohomish County Campus New Jail Building (Jail Building) in Everett, Washington. This report will be submitted to the Washington State Department of Ecology (Ecology) under the Voluntary Cleanup Program (VCP) in support of a request for remedial grants/matching funds.

The Jail Building site is located within the city block bound by Oakes, Pacific, and Lombard Avenues, and Wall Street (Figure 1). The expansion project is currently underway and includes renovation of the existing jail, demolition of two existing buildings, and construction of a new Jail Building. The new facility will include additional beds, kitchen, laundry, office space, and accommodations for other related jail functions. During the geotechnical investigation for the project, gasoline-contaminated soil and groundwater were encountered near the Carnegie Building (Figure 2). The source of the contamination appears to have been a former gasoline underground storage tank (UST) and dispenser, located just south of the Carnegie Building.

Based on information collected during the investigation phase, the design of the building (the footprint and finished floor elevations) were modified to minimize the potential to encounter contamination during construction. As a result, no field indication of contamination was observed during construction, with the exception of a small area excavated for installation of a utility line. Little to no water was observed during mass excavation, with the exception of that observed within the lowest areas of excavation. Therefore, the extent of contamination in the vicinity of the Carnegie Building is not known. However, based on the anticipated groundwater flow direction and field screening information, an estimate of lateral extent is shown on Figure 3. Field screening during the investigation phase further indicated that contamination is present as shallow as elevation 125 feet down to elevation 116 feet, the approximate elevation of groundwater. This is visually depicted on Figure 4.

Site development in the vicinity of the area of contamination includes landscaping and a mechanical building for the New Jail Building. The entire ground surface will be covered with either pavement or vegetation, limiting any surface water infiltration and direct contact with contaminated soil. No contaminated water is expected to collect in the mechanical building footing drains (based on elevations) and shallow groundwater is not potable. The Carnegie Building is a historic landmark, and site use is not projected to change. Therefore, based on current data, human health and the environment are protected.

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SITE SUMMARY REPORT
SNOHOMISH COUNTY NEW JAIL BUILDING
EVERETT, WASHINGTON

1.0 INTRODUCTION

This report summarizes the site activities conducted and environmental data collected at the Snohomish County Campus New Jail Building (Jail Building) in Everett, Washington (Figure 1). This report will be submitted to the Washington State Department of Ecology (Ecology) under the Voluntary Cleanup Program (VCP) in support of a request for remedial grants/matching funds. Our work was performed in general accordance with our proposals dated January 7 and March 21, 2002.

2.0 BACKGROUND INFORMATION

2.1 Site Description

The general project location is shown on the Vicinity Map, Figure 1. The site is bounded by Oakes Avenue to the west, Pacific Avenue to the south, Lombard Avenue to the east, and the existing county jail and the Carnegie Building to the north. The expansion is currently in construction, as shown on the Site and Exploration Plan, Figure 2.

2.2 Project Description

Based on review of project drawings, site development includes renovation of the existing jail located at 1918 Wall Street, demolition of two existing buildings, and construction of new buildings. The new facility will include additional beds, kitchen, laundry, office space, and accommodations for other related jail functions. Finished floor elevations range between 110 to 128 feet across the site (Figure 2). Pre-construction ground elevations within the development area ranged from 140 feet at the southwest corner to 113 feet at the northeast corner.

In conjunction with work on the adjacent Administration Building, a pedestrian tunnel for transporting inmates has been constructed between the proposed Jail Building and the existing County Courthouse, located one block west of the site (see Figure 2).

3.0 PREVIOUS INVESTIGATIONS

3.1 Geotechnical Report

In 2002, the geotechnical field explorations for the project included drilling nine borings, designated B-1 through B-9 (Figure 2) (Shannon & Wilson, Inc., 2002a). While drilling boring B-6, suspected contamination was observed in soil at about 10 feet below ground surface (bgs), or at elevation 126 feet, based on field screening (described in Appendix A). A soil sample was collected and submitted for petroleum and total lead analyses because of the proximity of the boring to a former gasoline underground storage tank (UST). Results indicated that weathered gasoline-range petroleum hydrocarbons and toluene, ethylbenzene, and xylenes are present in soil near the former tank; no benzene was detected (Table 1). Gasoline was detected at a concentration above its Washington Model Toxics Control Act (MTCA) Method A cleanup criterion. All environmental laboratory analytical reports are included in Appendix B.

Following the discovery of potentially contaminated soil in boring B-6, four additional borings were later advanced (B-6A, B-6B4, B-6C, and B-6D2) to evaluate the extent of contamination. One or two environmental soil samples were collected from each boring for testing. Two monitoring wells (B-6A and B-6C) were also installed to allow evaluation of water quality. Based on field screening and anticipated groundwater flow direction, the likely source of the contamination appeared to be the gasoline UST that was removed from the vicinity in January 2002.

Soil samples were collected for petroleum and lead analytical testing. Analytical results indicated that the highest level of soil contamination was located nearest to the former tank in Boring B-6A (see attached Table 1), which appeared to decrease significantly with increasing distance from the tank. Further, field screening indicated that impacted soil is present in the vicinity of boring B-6 down to about 25 feet bgs (elevation 111 feet). The measured groundwater level was at approximately 14 feet bgs (elevation 122 feet).

Groundwater samples were collected from monitoring wells B-6A and B-6C and submitted for petroleum and lead analytical testing. Results indicate that petroleum concentrations (gasoline- and diesel-ranges) exceed MTCA Method A cleanup criteria for groundwater; no lead was detected. Results are summarized in the attached Table 1.

3.2 Phase 1 Environmental Site Assessment (ESA)

Shannon & Wilson, Inc. completed a Phase 1 ESA (2002b) for the redevelopment project, which includes the Snohomish County Administration Building site, located adjacent to the west, and

the Jail Building site. The ESA was conducted to evaluate potential sources in response to the discovery of contamination at both sites.

The ESA revealed evidence of recognized environmental conditions (RECs) in connection with historical site uses and off-site concerns at the Jail Building site:

- Prior to the New Jail Building, the site was occupied by a number of single- and multi-family homes. It is likely that one or more of the homes had heating oil USTs on their properties and could have leaked and caused a release to the site soil and groundwater.

- The parking lot to the north of the Work Release building (Building No. 3015, Figure 2) was used as a vehicle fleet maintenance area in the seventies and eighties. A gasoline UST and pump island were formerly located in this area and have been removed. (The tank is shown on Figure 2.) Sampling during the Geotechnical Investigation indicated that the soil and groundwater at the site is contaminated with gasoline-range hydrocarbons and related volatile organic compounds.

- The property to the west of the Pacific Annex (Building No. 1911, Figure 2) was occupied by auto repair shop from approximately 1965 to 1985. No spills or releases are on record at Ecology regarding this property, however, the shop ceased operations prior to the promulgation of many environmental regulations, so there is the potential for unreported releases to have occurred at the site.

3.3 Other Investigations

Ecology requested the Snohomish Health District perform a site assessment based on their records of site activity. However, because of the site's enrollment in the VCP, the site assessment process was called off. No other investigations were performed.

4.0 GEOLOGY AND HYDROGEOLOGY

4.1 Geology

Geotechnical investigations conducted at the site indicate that the area is generally underlain at depth with dense, glacially overridden sand and silty sand with local silt layers. Review of boring logs indicate that fill and loose to medium dense sand and silty sand are present to depths ranging from 2 to 10 feet. Generally, the borings that encountered fill were located along the middle (east to west) of the block and near the previously removed UST excavation. The fill is underlain by very dense, fine gravelly, silty sands to approximately 35 to 40 feet bgs, and a 10- to 20-foot-thick hard clay layer is present beneath the gravelly, silty sands.

4.2 Hydrogeology

The groundwater elevation in borings B-2, B-4, and B-9 range between about 106 and 115 feet, and groundwater in borings B-6A and B-6C range in elevation from about 119 to 120 feet (Figure 2). Measurements in the five observation wells appear to indicate that the groundwater level rises above the well screen up to its static level over time. This may indicate that the groundwater is under pressure. Groundwater levels may fluctuate seasonally. Overall, we anticipate that the groundwater gradient runs from west-southwest to east-northeast. The water-bearing zone likely varies in thickness across the site; the zone extends down to the underlying hard clay layer. Further, review of Ecology records indicate that water at this elevation is not used for potable purposes.

5.0 SITE ACTIVITIES

5.1 Extent of Contamination

Soil and groundwater contamination were discovered in the vicinity of boring B-6. Based on anticipated groundwater flow direction, the likely source of the contamination was a former gasoline UST and dispenser, which were removed in January 2002. While the lateral extent of contamination has not been determined, no field indication of contamination was observed during the drilling of boring B-4, which is located slightly down gradient of B-6, suggesting that this contamination did not migrate that far to the east. The estimated lateral extent of contamination is visually presented on Figure 3.

The vertical extent of contamination, as it is known, is presented on a generalized subsurface profile (Figure 4). Suggestive of a source, contamination was observed in shallower soils closer to the tank and down to the groundwater table; borings farther away from the tank had field indications of contamination at depth. Contamination appears to be present as shallow as elevation 125 feet down to the water table at elevation 114 feet.

5.2 Impacts to Design

Based on information collected during the geotechnical investigation and discussions with the County and the Contractor, the initial footprint of the New Jail Building was modified. Site development was modified so that no "deep" excavation would be required in the area of known contamination. Excavations in other portions of the site were deepened to make up for this loss of depth. Site development in the vicinity of the area of contamination includes landscaping and a mechanical building for the New Jail Building. The entire ground surface will be covered with

either pavement or vegetation. More specifically, the building at the eastern end of the estimated contaminant plume did not extended below elevation 125 feet; no footing drains for the central plant building would be deep enough to collect any contaminated groundwater. The Carnegie Building is a historic landmark, and site use is not projected to change.

5.3 Construction Observations

Shannon & Wilson, Inc. performed full- and part-time construction observation services between April 4, 2003, and May 17, 2004. Construction observation included evaluation and verification of subsurface conditions as they were exposed during construction, a determination that the work was accomplished in accordance with our recommendations, and on-call availability if contamination was observed during construction.

No field indication of contamination was observed during subsurface work, with the exception of some soil (approximately 2 cubic yards of material) excavated during storm drain installation. The material was discovered in the sidewalk southwest of the Carnegie Building, or just immediately northwest (up-gradient) of the former UST, by Mortenson on Friday, December 12, 2003. The following Monday, we received a call by the site superintendent requesting that we assist with characterization of the material for disposal. Based on visual and olfactory screening, we indicated that the material should be considered Class 3. We understand that the material was disposed of at Rinker. No over-excavation of any other material was conducted. No field indication of contamination was observed during mass excavation, or shoring installation.

No standing groundwater was observed in excavated portions of the site. Minimal amounts of water were observed following rain events, and primarily in the lowest excavation elevations (tower crane footings) and around granular backfill along existing utility trenches. No sheen, odor, or other indication of contamination was observed.

Footing drains for the central plant are located shallower than elevation 123.5 feet, which is above the level of contamination. Estimated groundwater elevation is below elevation 120 feet. Therefore, no contaminated groundwater is anticipated to enter these drains. As part of the Jail Building, deeper footing drains have been installed cross gradient of the area of contamination. These deeper footings are not likely to collect contaminated groundwater.

6.0 CONCLUSIONS

Based on current data, contaminated soil and groundwater are present beneath the site. The extent of contamination is not known, but has been estimated. Site development in the vicinity

of the area of contamination includes landscaping and a mechanical building for the Jail Building, resulting in the ground surface being covered with either pavement or vegetation, limiting any surface water infiltration and direct contact with contaminated soil.

No contaminated water is expected to collect in the mechanical building footing drains (based on elevations) and shallow groundwater is not potable. Deeper footing drains are being installed as part of the justice center building, but is anticipated to be cross gradient of the area of contamination. No contaminated groundwater is likely to collect in these deeper footing drains.

The Carnegie Building is a historic landmark, and site use is not projected to change. Therefore, based on current data, human health and the environment are protected.

7.0 WASTE DISPOSAL

No mass excavation of contaminated soil was performed. Therefore no disposal documentation is provided here. A de minimis amount of impacted soil was observed in a storm water utility trench. Because the County had an existing account with Rinker, these materials were disposed of directly by the Contractor; no testing was performed to support disposal.

8.0 LIMITATIONS

Shannon & Wilson, Inc. has prepared this report in a professional manner, using that level of skill and care normally exercised for similar projects under similar conditions by reputable and competent environmental consultants currently practicing in the area. Shannon & Wilson, Inc. is not responsible for conditions or consequences arising from relevant facts that were concealed, withheld, or not fully disclosed at the time the report was prepared. We also note that the facts and conditions referenced in this report may change over time, and that the conclusions and recommendations set forth here are applicable to the facts and conditions as described only at the time of this report. We believe that the conclusions stated here are factual, but no guarantee is made or implied.

This report was prepared for the exclusive use of Snohomish County and its representatives. Shannon & Wilson, Inc. has prepared Appendix C, "Important Information About Your

Environmental Report," to assist you and others understand the use and limitations of our reports.

SHANNON & WILSON, INC.

Agnes C. Tirao, P.E.
Senior Engineer

ACT:DC:JB:DET:SWG/act

9.0 REFERENCES

Shannon & Wilson, Inc., 2002a, Geotechnical report, Snohomish County campus, Justice Center, Everett, Washington: Report prepared by Shannon & Wilson, Inc., Seattle, Wash., project no. 21-1-09644-002, for Snohomish County Facilities Management, Everett, Wash., June.

Shannon & Wilson, Inc., 2002b, Phase 1 environmental site assessment, Snohomish County campus, Administration Building and Justice Center, Everett, Washington: Report prepared by Shannon & Wilson, Inc., Seattle, Wash., project no. 21-1-09644-004, for Snohomish County Facilities Management, Everett, Wash., June.

Washington State Department of Ecology (Ecology), 2001, Model Toxics Control Act cleanup regulation, Chapter 173-340 Washington Administrative Code (WAC): Olympia, Wash., Washington State Department of Ecology, publication No. 94-06, amended February 12.

TABLE 1
SUMMARY OF ANALYTICAL RESULTS
INVESTIGATION PHASE

Location	Sample Number	Sample Depth	Sample Elev.	Sample Date	Diesel	Gasoline	Benzene	Toluene	Ethybenzene	Xylenes	Lead
Soil Samples (mg/kg)											
B-6	S-2	10 feet	126 feet	2/21/2002	ND	**610**	ND	1.9	4.5	**28**	ND
B-6A	S-7	17.5 feet	118.5 feet	4/17/2002	ND	**4,400**	**2.3**	**140**	**74**	**420**	ND
B-6A	S-11	27.5 feet	108.5 feet	4/17/2002	ND	3	ND	0.06	ND	ND	ND
B-6B4	S-5	17.5 feet	118.5 feet	4/17/2002	ND	ND	ND	ND	ND	ND	ND
B-6B4	S-8	25 feet	111 feet	4/17/2002	ND	7	ND	0.11	ND	0.2	ND
B-6C	S-6	15 feet	121 feet	4/17/2002	ND	ND	ND	ND	ND	ND	ND
B-6C	S-10	25 feet	111 feet	4/17/2002	ND	4	**0.4**	0.8	0.09	0.2	ND
B-6D2	S-6	17.5 feet	118.5 feet	4/17/2002	ND	ND	ND	ND	ND	ND	ND
B-6D2	S-8	22.5 feet	113.5 feet	4/17/2002	ND	ND	0.03	ND	0.06	ND	ND
MTCA Method A					2,000	30 (1)	0.03	7	6	9	250
Groundwater Samples (µg/L)											
B-6C	S-1			5/28/2002	**1,700**	**230,000**	**7,800**	**45,000**	**4,200**	**1,700**	5
B-6A	S-2			5/28/2002	**540**	**230,000**	**10,000**	**42,000**	**3,800**	**19,000**	4
MTCA Method A					500	800	5	1,000	700	1,000	15

NOTES:

(1) Gasoline cleanup level is 30 versus 100 because of the presence of benzene.

Benzene, toluene, ethylbenzene, and xylenes by EPA Method 8021

Diesel = diesel and oil range hydrocarbons by Method NWTPH-Dx

EPA = U.S. Environmental Protection Agency

Gasoline = gasoline range hydrocarbons by Method NWTPH-Gx

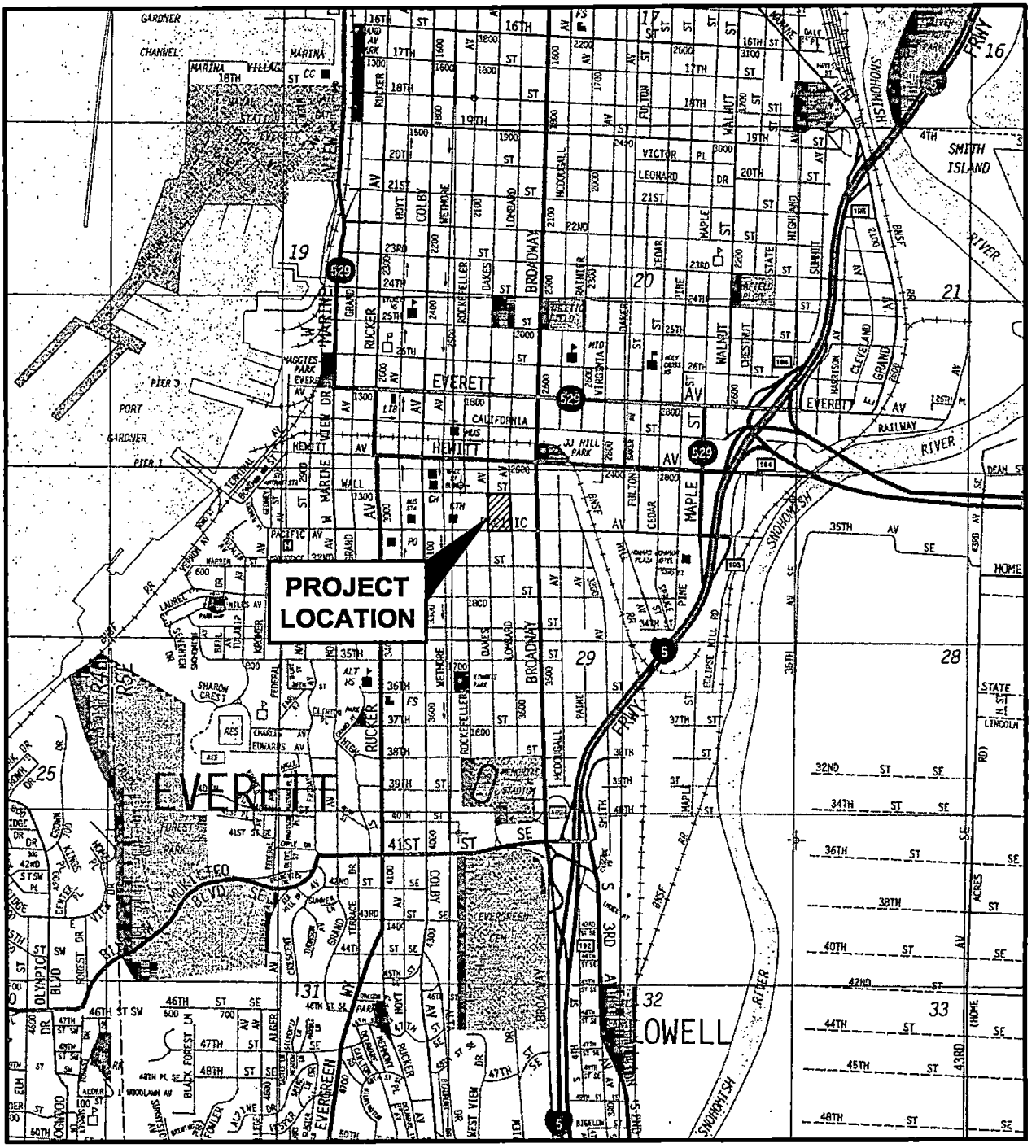
MTCA = Washington Model Toxics Control Act

ND = not detected

Soil results are reported in milligrams per kilogram (mg/kg).

Groundwater results are reported in micrograms per liter (µg/L).

Shaded text indicates detected concentration exceeds MTCA cleanup criteria.



0 1/4 1/2 1

Scale in Miles

Snohomish County Campus
New Jail Building
Everett, Washington

VICINITY MAP

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FIG. 1

NOTE

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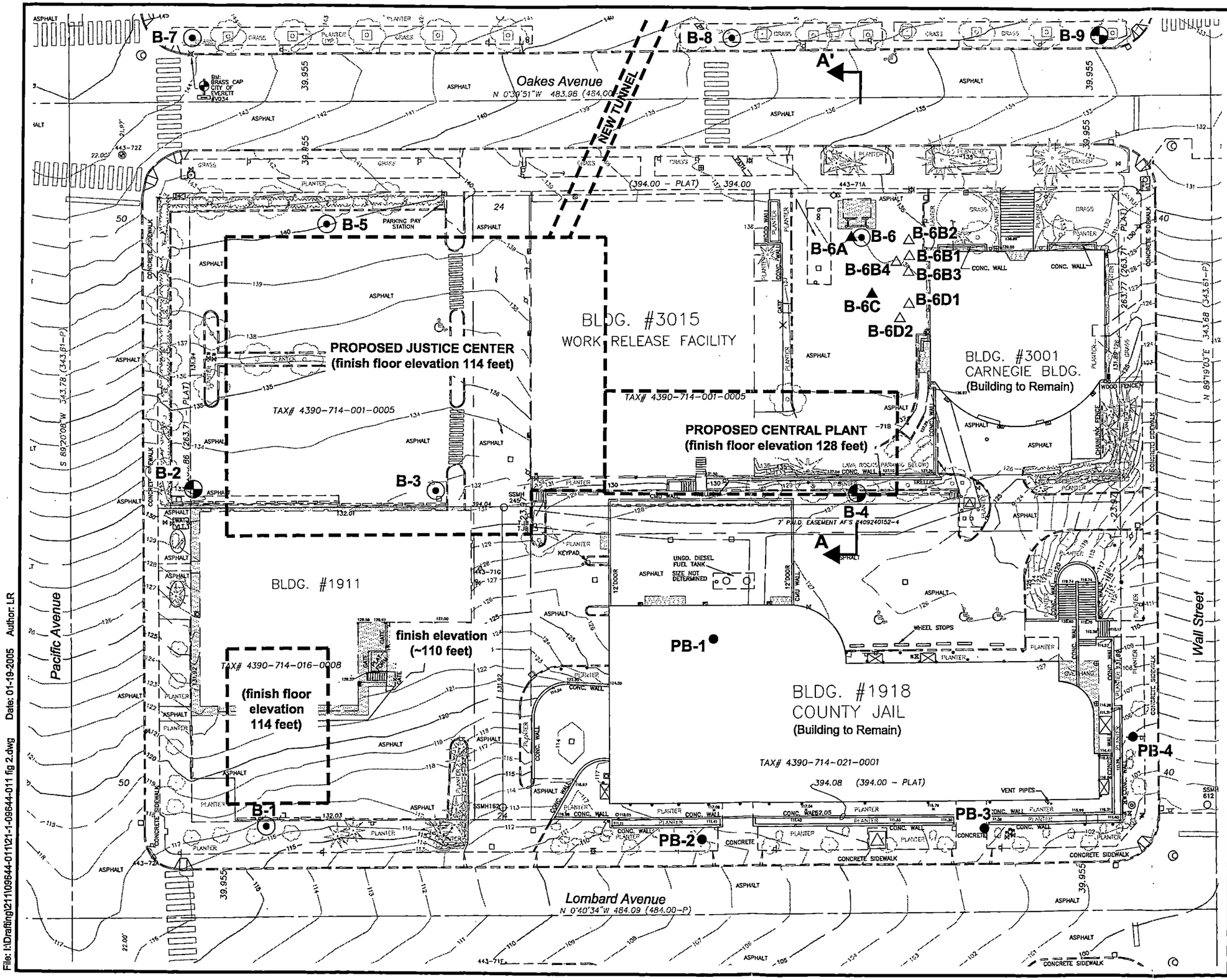

LEGEND

- Approximate Locations of Proposed Development/ Structures
- B-7 ⊙ Boring Designation and Approximate Location (2002)
- B-9 ◔ Boring Designation and Approximate Location, Completed as a Monitoring Well (2002)
- B-6A ▲ Environmental Boring Designation and Approximate Location, Completed as a Monitoring Well (2002)
- B-6B1 △ Environmental Boring Designation and Approximate Location (2002)
- PB-1 ● Previous Boring Designation and Approximate Location (1982)
- A Generalized Subsurface Profile Designation and Approximate Location (See Figure 4)

NOTES

1. This figure adapted from site topographic survey by Perteet Engineering, Inc., dated 6-2001. Vertical datum NAVD 88.
2. Boring locations are based on tape measurements from former site features or on report figures and should be considered approximate.

0 40 80

Scale in Feet

Snohomish County Campus
New Jail Building
Everett, Washington

SITE AND EXPLORATION PLAN

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FIG. 2

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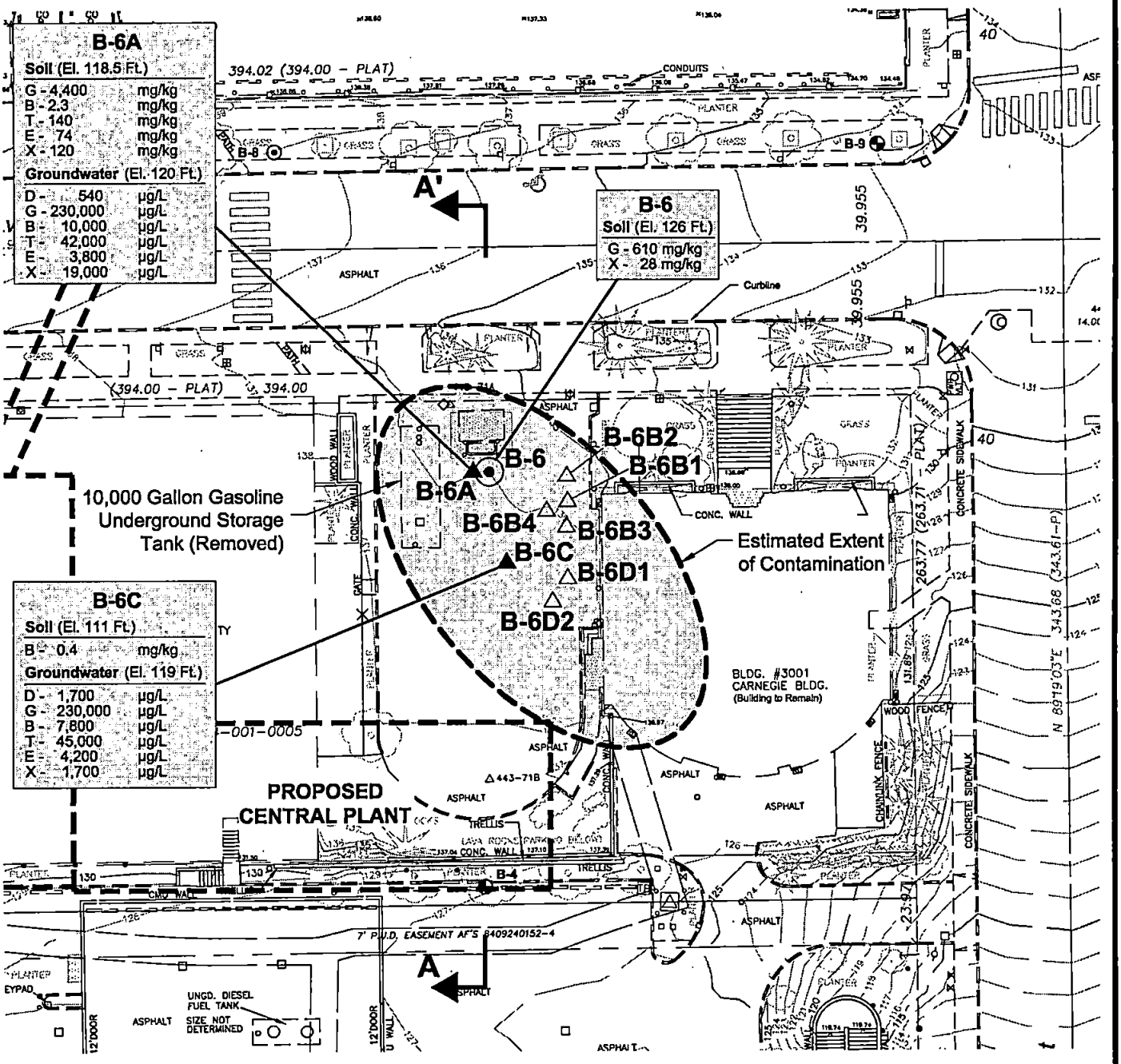

LEGEND

B-7 ⊙	Boring Designation and Approximate Location (2002)	D	Diesel
B-9 ⊕	Boring Designation and Approximate Location, Completed as a Monitoring Well (2002)	G	Gasoline
B-6A ▲	Environmental Boring Designation and Approximate Location, Completed as a Monitoring Well (2002)	B	Benzene
B-6B1 △	Environmental Boring Designation and Approximate Location (2002)	T	Toluene
		E	Ethylbenzene
		X	Xylenes
		mg/kg	Milligrams Per Kilogram
		µg/L	Micrograms Per Liter

NOTE

See Figure 2 for base map and boring data.

Snohomish County Campus
New Jail Building
Everett, Washington

APPROXIMATE EXTENT OF CONTAMINATION

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FIG. 3

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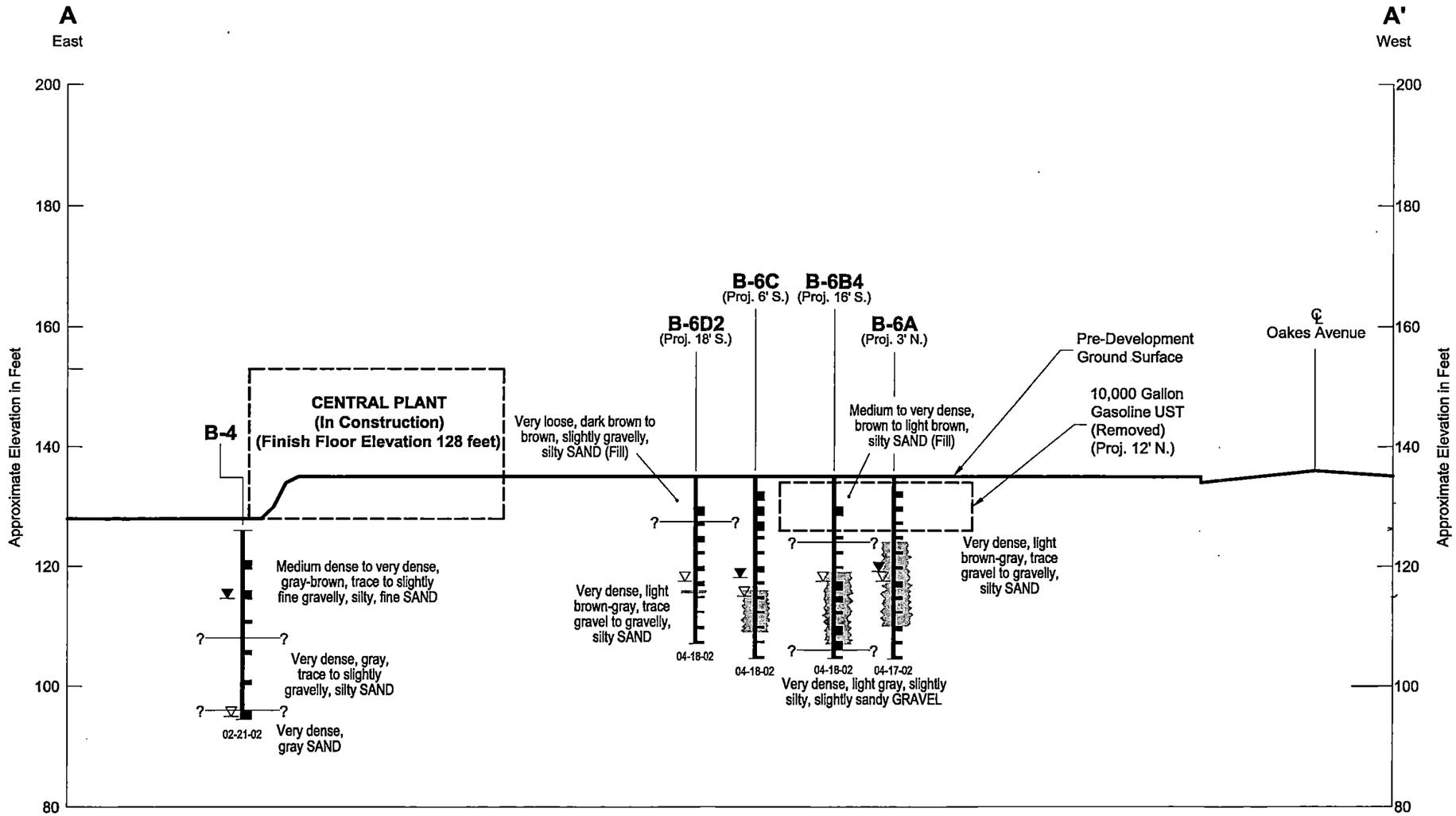

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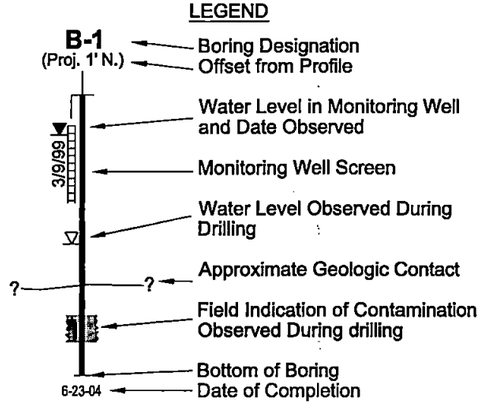

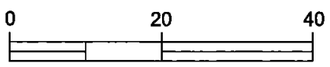

NOTES

1. This subsurface profile is generalized from materials observed in soil borings. Variations may exist between profile and actual conditions.
2. For clarity, this profile has been simplified. For detailed soil descriptions, refer to the boring logs.
3. Vertical Datum is NAVD 88.
4. Shading denotes contamination was observed during drilling.

Snohomish County Campus
New Jail Building
Everett, Washington

GENERALIZED SUBSURFACE PROFILE SECTION A-A'

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FIG. 4

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Appendix A


Appendix A

APPENDIX A

FIELD METHODOLOGY AND BORING LOGS

APPENDIX A

FIELD METHODOLOGY AND BORING LOGS

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APPENDIX A

FIELD METHODOLOGY AND BORING LOGS

A.1 GENERAL

Field methodologies used during construction observation included field screening for contamination (discussed below in Paragraph A.3); however, no samples were collected during construction observation. The field methodology presented below was primarily used during a investigation to support the geotechnical design of the Snohomish County Campus New Jail Building (Jail Building), when contamination was initially discovered on the site.

A.2 GEOTECHNICAL INVESTIGATION

The field exploration program for the Jail Building consisted of drilling and sampling 13 borings (Shannon & Wilson, Inc., 2002). A select number of these explorations are shown on the Site and Exploration Plan (Figure 2) in the main text of the report.

The exploration logs presented in Figures A-2 through A-8 represent our interpretation of the contents of the field logs and the results of laboratory testing. Figure A-1 presents a key to our classification of the materials encountered.

A.3 FIELD SCREENING AND ENVIRONMENTAL SAMPLING METHODOLOGY

During the investigation phase, soil samples were retrieved during drilling and field screened for the potential presence of contamination. Field screening methods included photoionization detector (PID) measurements; visual observations; and olfactory observations. No environmental samples were collected during the construction observation phase.

A.3.1 Photoionization Detector (PID) Measurements

PID measurements were made to screen for volatile organic vapors such as gasoline and solvents. PID measurements were obtained by passing the instrument directly over the soil or by performing a headspace measurement. Readings of 2 parts per million (ppm) or more above background were considered suspect.

A.3.2 Visual Observations

Visual observations (such as sheen, or gray or black discoloration) of soil samples and groundwater were recorded on the boring logs.

A.3.3 Olfactory Observations

Olfactory observations were recorded when noted. Soil was not intentionally smelled for contamination.

A.3.4 General Soil Sampling and Sample Handling

All environmental soil samples were collected using disposable sampling equipment and immediately placed into laboratory-provided glassware. Each sample was identified with a unique sampling number, immediately logged and sealed in plastic bags, and then placed into a cooler and maintained at 4°C (± 2°C). Sample information was recorded on chain-of-custody forms that accompanied the samples to the laboratory. Samples were maintained under chain-of-custody until delivered to the analytical laboratory, CCI Analytical Laboratory (CCIAL) of Everett, Washington.

A.4 ANALYTICAL METHODS

Selected investigation soil samples were analyzed for one or more of the following: petroleum by Methods Northwest Total Petroleum Hydrocarbons as Diesel – Extended (NWTPH-Dx) and Northwest Total Petroleum Hydrocarbons as Gasoline (NWTPH-Gx); benzene, toluene, ethylbenzene, and xylenes by U.S. Environmental Protection Agency (EPA) Method 8021B; and total lead by EPA method 7420/7421. A total of nine soil samples were submitted for testing.

Analytical work was performed by CCIAL in accordance with their in-house Quality Assurance/Quality Control Plans. Sample analyses were performed in compliance with EPA analytical methods and Washington State Department of Ecology guidelines. Samples were analyzed within specified holding times. Laboratory test results are presented Table 1 after the main report text and are contained in Appendix B.

No soil samples were collected during the construction observation phase.

A.5 REFERENCES

American Society for Testing and Materials (ASTM), 2002, Annual book of ASTM standards: Soil and rock, building stone; geosynthetics: Philadelphia, Penn., v. 04.08.

Shannon & Wilson, Inc., 2002, Geotechnical report, Snohomish County campus, justice center, Everett, Washington: Report prepared by Shannon & Wilson, Inc., Seattle, Wash., project no. 21-1-09644-002, for Snohomish County facilities management, Everett, Wash., June.

Shannon & Wilson, Inc. (S&W), uses a soil classification system modified from the Unified Soil Classification System (USCS). Elements of the USCS and other definitions are provided on this and the following page. Soil descriptions are based on visual-manual procedures (ASTM D 2488-93) unless otherwise noted.

S&W CLASSIFICATION OF SOIL CONSTITUENTS

- MAJOR constituents compose more than 50 percent, by weight, of the soil. Major consituents are capitalized (i.e., SAND).
- Minor constituents compose 12 to 50 percent of the soil and precede the major constituents (i.e., silty SAND). Minor constituents preceded by "slightly" compose 5 to 12 percent of the soil (i.e., slightly silty SAND).
- Trace constituents compose 0 to 5 percent of the soil (i.e., slightly silty SAND, trace of gravel).

MOISTURE CONTENT DEFINITIONS

Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, from below water table

ABBREVIATIONS

ATD	At Time of Drilling
Elev.	Elevation
ft	feet
FeO	Iron Oxide
MgO	Magnesium Oxide
HSA	Hollow Stem Auger
ID	Inside Diameter
in	inches
lbs	pounds
Mon.	Monument cover
N	Blows for last two 6-inch increments
NA	Not applicable or not available
NP	Non plastic
OD	Outside diameter
OVA	Organic vapor analyzer
PID	Photo-ionization detector
ppm	parts per million
PVC	Polyvinyl Chloride
SS	Split spoon sampler
SPT	Standard penetration test
USC	Unified soil classification
WLI	Water level indicator

GRAIN SIZE DEFINITION

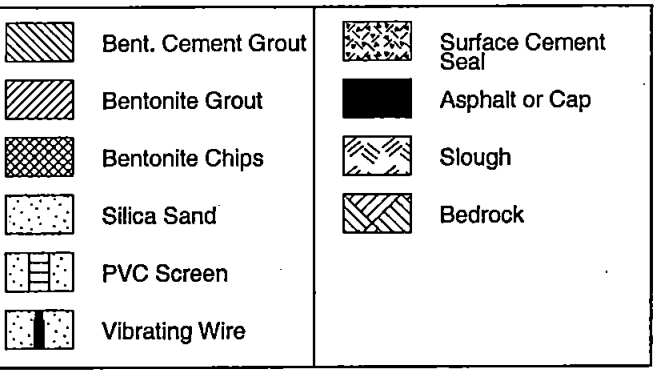
DESCRIPTION	SIEVE NUMBER AND/OR SIZE
FINES	< #200 (0.08 mm)
SAND*	
- Fine	#200 to #40 (0.08 to 0.4 mm)
- Medium	#40 to #10 (0.4 to 2 mm)
- Coarse	#10 to #4 (2 to 5 mm)
GRAVEL*	
- Fine	#4 to 3/4 inch (5 to 19 mm)
- Coarse	3/4 to 3 inches (19 to 76 mm)
COBBLES	3 to 12 inches (76 to 305 mm)
BOULDERS	> 12 inches (305 mm)

* Unless otherwise noted, sand and gravel, when present, range from fine to coarse in grain size.

RELATIVE DENSITY / CONSISTENCY

COARSE-GRAINED SOILS		FINE-GRAINED SOILS	
N, SPT, BLOWS/FT.	RELATIVE DENSITY	N, SPT, BLOWS/FT.	RELATIVE CONSISTENCY
0 - 4	Very loose	Under 2	Very soft
4 - 10	Loose	2 - 4	Soft
10 - 30	Medium dense	4 - 8	Medium stiff
30 - 50	Dense	8 - 15	Stiff
Over 50	Very dense	15 - 30	Very stiff
		Over 30	Hard

WELL AND OTHER SYMBOLS



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New Jail Building
Everett, Washington

SOIL CLASSIFICATION AND LOG KEY

January 2005 21-1-09644-011

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-1
Sheet 1 of 2

BORING_CLASS1 21-09644.GPJ SWNEW.GDT 1/17/05

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)
(From ASTM D 2487-98 & 2488-93)

MAJOR DIVISIONS			GROUP SYMBOL	GRAPHIC SYMBOL	TYPICAL DESCRIPTION
COARSE-GRAINED SOILS *(more than 50% retained on No. 200 sieve)*	Gravels *(more than 50% of coarse fraction retained on No. 4 sieve)*	Clean Gravels *(less than 5% fines)*	GW		Well-graded gravels, gravels, gravel/sand mixtures, little or no fines
			GP		Poorly graded gravels, gravel-sand mixtures, little or no fines
		Gravels with Fines *(more than 12% fines)*	GM		Silty gravels, gravel-sand-silt mixtures
			GC		Clayey gravels, gravel-sand-clay mixtures
	Sands *(50% or more of coarse fraction passes the No. 4 sieve)*	Clean Sands *(less than 5% fines)*	SW		Well-graded sands, gravelly sands, little or no fines
			SP		Poorly graded sand, gravelly sands, little or no fines
		Sands with Fines *(more than 12% fines)*	SM		Silty sands, sand-silt mixtures
			SC		Clayey sands, sand-clay mixtures
FINE-GRAINED SOILS *(50% or more passes the No. 200 sieve)*	Silts and Clays *(liquid limit less than 50)*	Inorganic	ML		Inorganic silts of low to medium plasticity, rock flour, sandy silts, gravelly silts, or clayey silts with slight plasticity
			CL		Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
		Organic	OL		Organic silts and organic silty clays of low plasticity
	Silts and Clays *(liquid limit 50 or more)*	Inorganic	MH		Inorganic silts, micaceous or diatomaceous fine sands or silty soils, elastic silt
			CH		Inorganic clays or medium to high plasticity, sandy fat clay, or gravelly fat clay
		Organic	OH		Organic clays of medium to high plasticity, organic silts
HIGHLY-ORGANIC SOILS	Primarily organic matter, dark in color, and organic odor		PT		Peat, humus, swamp soils with high organic content (see ASTM D 4427)

NOTES

1. Dual symbols *(symbols separated by a hyphen, i.e., SP-SM, slightly silty fine SAND)* are used for soils with between 5% and 12% fines or when the liquid limit and plasticity index values plot in the CL-ML area of the plasticity chart.

2. Borderline symbols *(symbols separated by a slash, i.e., CL/ML, silty CLAY/clayey SILT; GW/SW, sandy GRAVEL/gravelly SAND)* indicate that the soil may fall into one of two possible basic groups.

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Everett, Washington

SOIL CLASSIFICATION AND LOG KEY

January 2005 21-1-09644-011

SHANNON & WILSON, INC.
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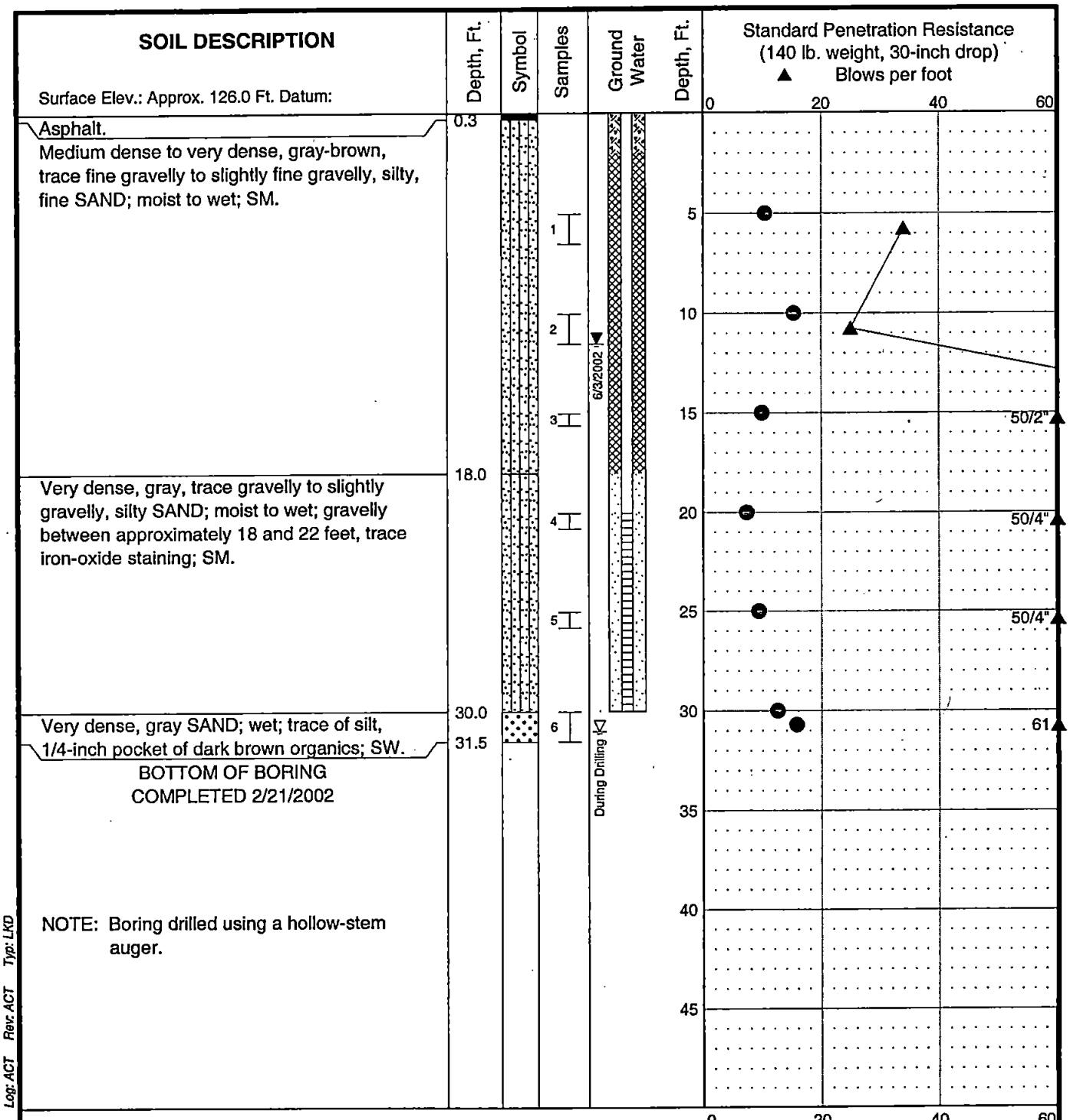
FIG. A-1
Sheet 2 of 2

BORING_CLASS2 21-09644.GPJ SWNEW.GDT 1/17/05


SOIL DESCRIPTION
Surface Elev.: Approx. 126.0 Ft. Datum:
Depth, Ft.
Symbol
Samples
Ground Water
Depth, Ft.
Standard Penetration Resistance
(140 lb. weight, 30-inch drop)
▲ Blows per foot
0
20
40
60
Asphalt.
0.3
Medium dense to very dense, gray-brown, trace fine gravelly to slightly fine gravelly, silty, fine SAND; moist to wet; SM.
18.0
Very dense, gray, trace gravelly to slightly gravelly, silty SAND; moist to wet; gravelly between approximately 18 and 22 feet, trace iron-oxide staining; SM.
30.0
Very dense, gray SAND; wet; trace of silt, 1/4-inch pocket of dark brown organics; SW.
31.5
BOTTOM OF BORING
COMPLETED 2/21/2002
NOTE: Boring drilled using a hollow-stem auger.
1
2
3
4
5
6
6/3/2002
During Drilling
5
10
15
20
25
30
35
40
45
50/2"
50/4"
50/4"
61
0
20
40
60
LEGEND
* Sample Not Recovered
Standard Penetration Test
Piezometer Screen and Sand Filter
Bentonite-Cement Grout
Bentonite Chips/Pellets
Bentonite Grout
Ground Water Level ATD
Ground Water Level in Well
● % Water Content
Plastic Limit
Liquid Limit
Natural Water Content
NOTES
1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface maerials.
3. Groundwater level, if indicated above, is for the date specified and may vary.
4. Refer to KEY for explanation of symbols, codes, and definitions.
5. USCS designation is based on visual-manual classification and selected lab testing.
Snohomish County Campus
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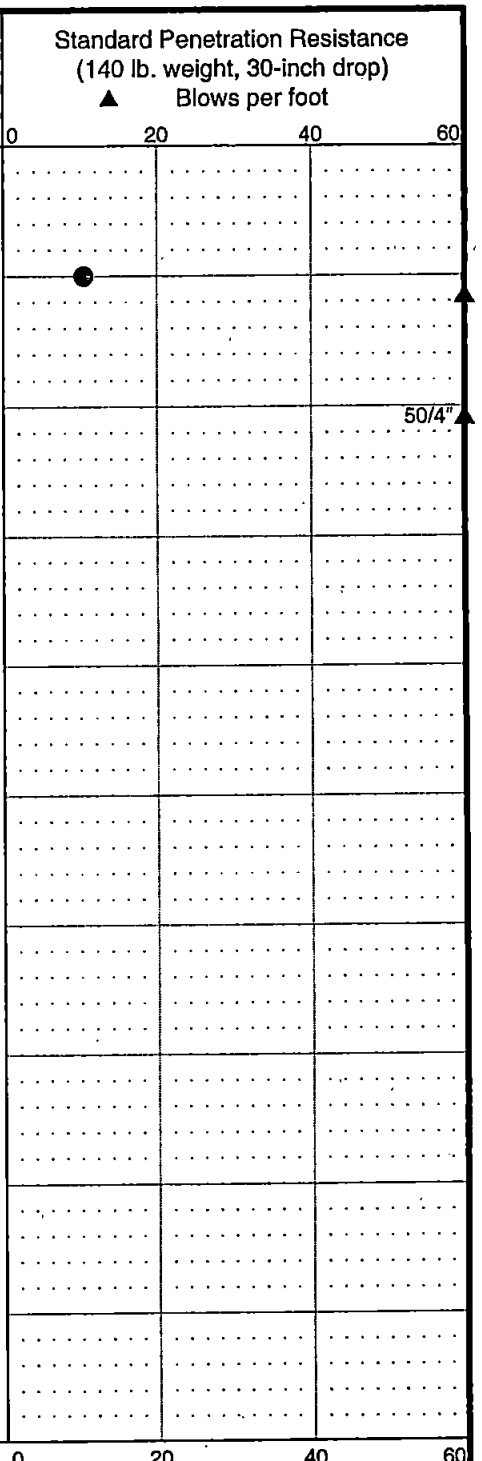
LOG OF BORING B-4
January 2005
21-1-09644-011
SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants
FIG. A-2
Log: ACT Rev: ACT Typ: LKD
MASTER_LOG2 21-09644.GPJ SHAN_WIL.GDT 1/18/05

SOIL DESCRIPTION Surface Elev.: Approx. 136.0 Ft. Datum:	Depth, Ft.	Symbol	PID, ppm	Samples	Ground Water	Depth, Ft.
Asphalt.	0.3					
Very dense, light gray-brown, slightly fine gravelly to fine gravelly, silty SAND; moist; hydrocarbon odor observed below 10 feet (PID = 40 ppm); SM.			0	1	None Observed During Drilling	
			40.4	2 E		
BOTTOM OF BORING COMPLETED 2/21/2002	10.8					

NOTES:

1. Boring was terminated at 10.8 feet because field screening suggested the presence of petroleum hydrocarbon contamination.
2. Boring drilled using a hollow-stem auger.



LEGEND

- Sample Not Recovered
- Standard Penetration Test

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface maerials.
3. Groundwater level, if indicated above, is for the date specified and may vary.
4. Refer to KEY for explanation of symbols, codes, and definitions.
5. USCS designation is based on visual-manual classification and selected lab testing.

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LOG OF BORING B-6

January 2005 21-1-09644-011

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-3

MASTER_LOG2 21-09644.GPJ SHAN WIL.GDT 1/18/05 Log: ACT Rev: ACT Typ: LKD

SOIL DESCRIPTION Surface Elev.: Approx. 136.0 Ft. Datum:	Depth, Ft.	Symbol	PID, ppm	Samples	Ground Water	Depth, Ft.	Standard Penetration Resistance (140 lb. weight, 30-inch drop) ▲ Blows per foot
ASPHALT	0.3						
Very dense, light brown, slightly gravelly to gravelly, silty SAND, trace of clay; moist; SM. Hydrocarbon odor in samples 5, 6, and 7.			0 0 0 0 800 800 1000 10 400 60 0 0	1 2 3 4 5 6 7 E 8 9 10 11 E 12	During Drilling 6/3/2002	5 10 15 20 25 30 35 40 45	52/6" 50/4" 100/5.5" 80/6" 72/6" 50/6" 50/6" 50/2" 50/4" 50/4" 60/6" 50/6"
Very dense, light brown-gray, slightly gravelly, silty SAND, trace of clay; wet to moist; SM. Hydrocarbon odor in samples 8, 9, and 10.	19.0						
BOTTOM OF BORING COMPLETED 4/17/2002 NOTE: Samples 5, 6, 7, and 9 were obtained using a 3-inch-diameter split-spoon driven by a 140-pound weight free falling 30 inches. The blow counts shown for these samples have not been converted to SPTs; however, converted SPT blow counts would also be "very dense."	30.5						

0 20 40 60

LEGEND

- • Sample Not Recovered
- I Standard Penetration Test
- III 3" O.D. Split Spoon Sample
- Piezometer Screen and Sand Filter
- Bentonite-Cement Grout
- Bentonite Chips/Pellets
- Bentonite Grout
- ▽ Ground Water Level ATD
- ▼ Ground Water Level in Well

● % Water Content

Plastic Limit ⊢●⊣ Liquid Limit

Natural Water Content

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface maerials.
3. Groundwater level, if indicated above, is for the date specified and may vary.
4. Refer to KEY for explanation of symbols, codes, and definitions.
5. USCS designation is based on visual-manual classification and selected lab testing.

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Everett, Washington

LOG OF BORING B-6A

January 2005 21-1-09644-011

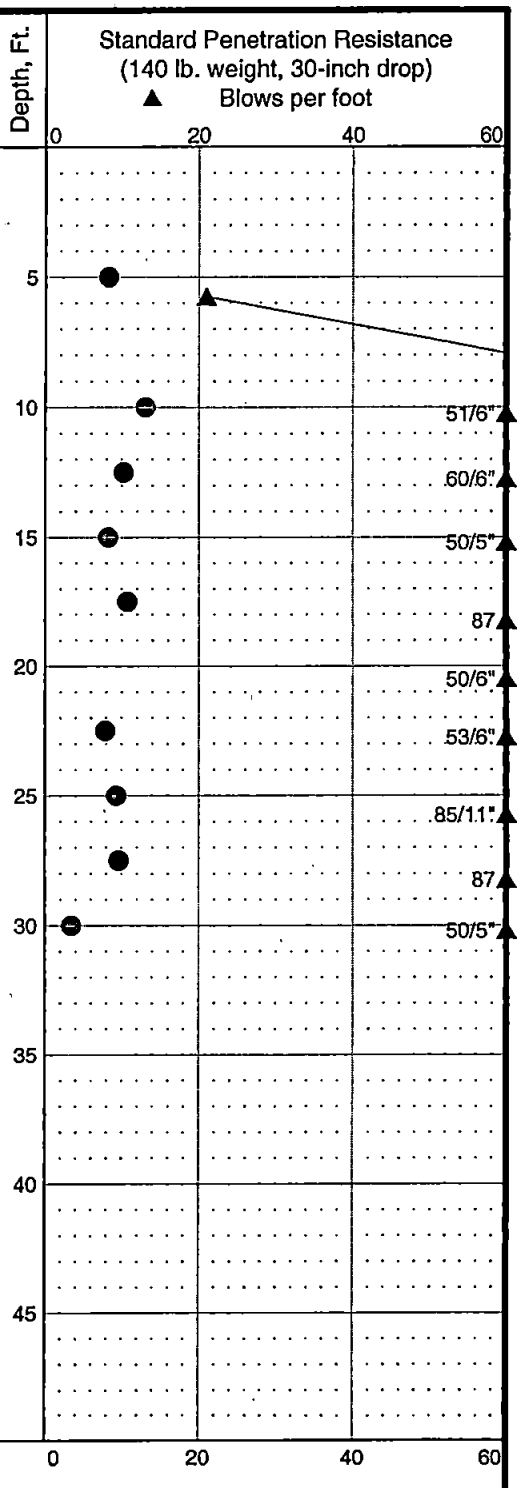
SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-4

MASTER LOG2 21-09644.GPJ SHAN WIL.GDT 1/18/05 Log: XHL Rev: CLBM Typ: LKD

SOIL DESCRIPTION Surface Elev.: Approx. 136.0 Ft. Datum:	Depth, Ft.	Symbol	PID, ppm	Samples	Ground Water	Depth, Ft.
ASPHALT	0.3					
Medium dense to very dense, brown to light brown, silty SAND, trace of gravel; moist; occasional coal chips at 10 to 10.5 feet; (Fill) SM.			0	1		
			0	2		
Very dense, light brown to light gray, slightly gravelly to gravelly, silty SAND, trace of clay; moist to wet; SM.	11.0		0	3		
			0	4		
Hydrocarbon odor in samples 5 through 9.			12	5 E	▽ During Drilling	
			40	6		
			6	7		
			40	8 E		
			12	9		
Very dense, light gray, slightly silty, sandy GRAVEL; wet; angular gravel; GP.	30.0 30.4		0	10		
BOTTOM OF BORING COMPLETED 4/18/2002						

NOTE: Sample 2 was obtained using a 3-inch-diameter split-spoon driven by a 140-pound weight free falling 30 inches. The blow count shown for this sample has not been converted to an SPT; however, the converted SPT blow count would also be "very dense."



LEGEND

- • Sample Not Recovered
- I Standard Penetration Test
- III 3" O.D. Split Spoon Sample
- ▽ Ground Water Level ATD
- ● % Water Content
- Plastic Limit ⊢●⊣ Liquid Limit
- Natural Water Content

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface maerials.
3. Groundwater level, if indicated above, is for the date specified and may vary.
4. Refer to KEY for explanation of symbols, codes, and definitions.
5. USCS designation is based on visual-manual classification and selected lab testing.

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LOG OF BORING B-6B4

January 2005 21-1-09644-011

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FIG. A-5

MASTER_LOG2 21-09644.GPJ SHAN_WIL.GDT 1/18/05 Log: XHL Rev: CLBM Typ: LKD

SOIL DESCRIPTION Surface Elev.: Approx. 136.0 Ft. Datum:	Depth, Ft.	Symbol	PID, ppm	Samples	Ground Water	Depth, Ft.	Standard Penetration Resistance (140 lb. weight, 30-inch drop) ▲ Blows per foot
Asphalt.	0.3						
Very dense, light brown, trace gravelly to slightly gravelly, silty, fine SAND, trace of clay; moist; layers of fine sandy silt; SM.			0	1			75
			0	2		5	90
			0	3			52/6"
			0	4		10	70/6"
			0	5			62/6"
			0	6 E		15	53/6"
Very dense, light brown-gray, trace gravelly to gravelly, silty, fine to medium SAND; wet; SM.	18.0		0	7			60/6"
			50	8	During Drilling 4/18/2002	20	64/6"
Hydrocarbon odor in samples 8 through 11.			80	9			80/4"
			25	10 E		25	70/5"
			12	11			70/5"
	30.4		0	12		30	75/5"
BOTTOM OF BORING COMPLETED 4/18/2002						35	
NOTE: Sample 12 was obtained using a 3-inch-diameter split-spoon driven by a 140-pound weight free falling 30 inches. The blow count shown for this sample has not been converted to an SPT; however, the converted SPT blow count would also be "very dense."						40	
						45	

0 20 40 60

LEGEND

- * Sample Not Recovered
- Standard Penetration Test
- 3" O.D. Split Spoon Sample
- Piezometer Screen and Sand Filter
- Bentonite-Cement Grout
- Bentonite Chips/Pellets
- Bentonite Grout
- Ground Water Level ATD
- Ground Water Level in Well

● % Water Content

Plastic Limit ⊢●⊣ Liquid Limit

Natural Water Content

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface maerials.
3. Groundwater level, if indicated above, is for the date specified and may vary.
4. Refer to KEY for explanation of symbols, codes, and definitions.
5. USCS designation is based on visual-manual classification and selected lab testing.

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LOG OF BORING B-6C

January 2005 21-1-09644-011

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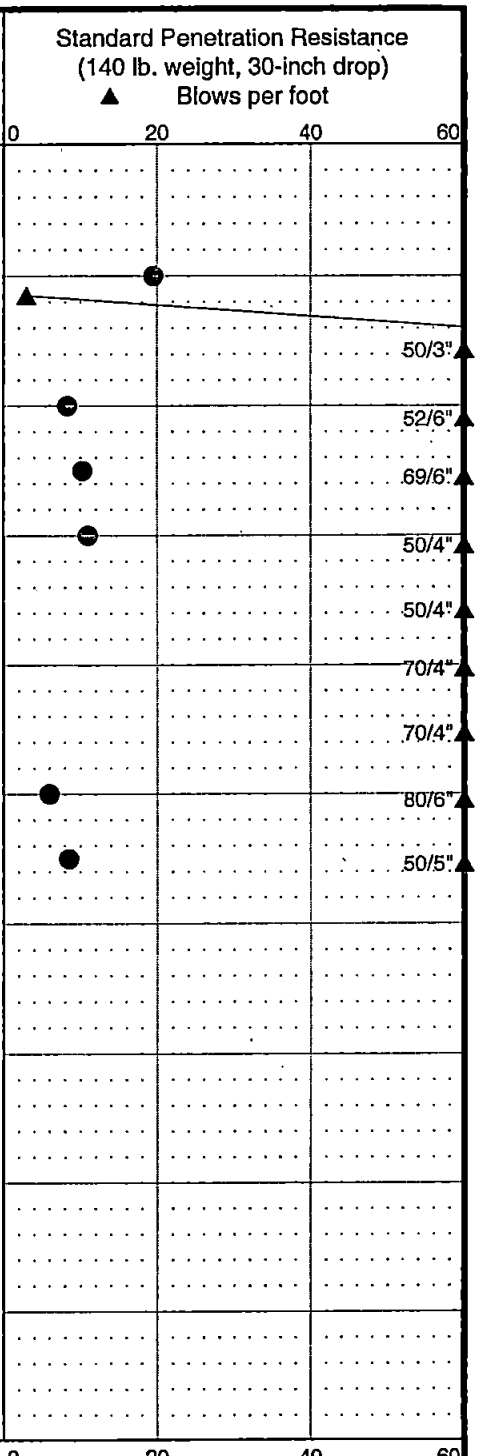
FIG. A-6

MASTER_LOG2 21-09644.GPJ SHAN_WIL.GDT 1/18/05 Log: XHL Rev: CLBM Typ: LKD

SOIL DESCRIPTION Surface Elev.: Approx. 136.0 Ft. Datum:	Depth, Ft.	Symbol	PID, ppm	Samples	Ground Water Depth, Ft.
ASPHALT	0.3				
Very loose, dark brown to brown, slightly gravelly, silty SAND; moist; numerous wood debris; (Fill) SM.			0	1	
	7.0			2*	
Very dense, light brown-gray, trace gravelly to slightly gravelly, silty SAND, trace of clay; moist to wet; layers of slightly silty sand; SM.			0	3	
			0	4	
Hydrocarbon odor in sample 7.			0	5	
			0	6 E	▽ During Drilling
			30	7	
			0	8 E	
			0	9	
	27.9		0	10	
BOTTOM OF BORING COMPLETED 4/18/2002					

NOTE: Samples 3, 4, 8, and 10 were obtained using a 3-inch-diameter split-spoon driven by a 140-pound weight free falling 30 inches. The blow counts shown for these samples have not been converted to SPTs; however, converted SPT blow counts would also be "very dense."



LEGEND

- * Sample Not Recovered
- I Standard Penetration Test
- III 3" O.D. Split Spoon Sample
- ▽ Ground Water Level ATD
- ● % Water Content
- Plastic Limit ⊢●⊣ Liquid Limit
- Natural Water Content

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
3. Groundwater level, if indicated above, is for the date specified and may vary.
4. Refer to KEY for explanation of symbols, codes, and definitions.
5. USCS designation is based on visual-manual classification and selected lab testing.

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LOG OF BORING B-6D2

January 2005 21-1-09644-011

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FIG. A-7

MASTER_LOG2 21-09644.GPJ SHAN_WIL.GDT 1/18/05 Log: XHL Rev: CLBM Typ: LKD

APPENDIX B

LABORATORY ANALYTICAL REPORTS

CCI
ANALYTICAL
LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

CLIENT: SHANNON & WILSON, INC.
400 N. 34TH STREET, SUITE 100
SEATTLE, WA 98103

DATE: 3/12/02
CCIL JOB #: 203025
CCIL SAMPLE #: 1
DATE RECEIVED: 3/6/02
WDOE ACCREDITATION #: C142

CLIENT CONTACT: AGNES TIRAO

CLIENT PROJECT ID: 21-1-09644-004 SNO CO
CLIENT SAMPLE ID: B-6, S-2 2/21/02 1352

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ANALYSIS DATE	ANALYSIS BY
TPH-VOLATILE RANGE	NWTPH-GX	610	MG/KG	3/6/02	LAH
MTBE***	EPA-8021	ND(<1.0)	MG/KG	3/6/02	LAH
BENZENE	EPA-8021	ND(<0.3)	MG/KG	3/6/02	LAH
TOLUENE	EPA-8021	1.9	MG/KG	3/6/02	LAH
ETHYLBENZENE	EPA-8021	4.5	MG/KG	3/6/02	LAH
XYLENES	EPA-8021	28	MG/KG	3/6/02	LAH
TPH-SEMIVOLATILE RANGE	NWTPH-DX	ND	MG/KG	3/6/02	RAB
LEAD	EPA-6010	ND(<6)	MG/KG	3/7/02	CMH

NOTE: CHROMATOGRAM INDICATES SAMPLE CONTAINS PRODUCT WHICH IS LIKELY HIGHLY WEATHERED GASOLINE

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
GASOLINE(VOLATILE RANGE) REPORTING LIMIT IS 30 MG/KG
DIESEL RANGE REPORTING LIMIT IS 25 MG/KG
LUBE OIL RANGE REPORTING LIMIT IS 50 MG/KG

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ANY POSITIVE MTBE RESULT SHOULD BE CONFIRMED BY GC/MS ANALYSIS

APPROVED BY: _____

8620 Holly Drive • Everett, WA 98208 • 425 356-2600 • FAX 425 356-2626 • Seattle 206 292-9059

CCI
ANALYTICAL
LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

CLIENT: SHANNON & WILSON, INC.
400 N. 34TH STREET, SUITE 100
SEATTLE, WA 98103

DATE: 3/12/02
CCIL JOB #: 203025

DATE RECEIVED: 3/6/02
WDOE ACCREDITATION #: C142

CLIENT CONTACT: AGNES TIRAO

CLIENT PROJECT ID: 21-1-09644-004 SNO CO

QUALITY CONTROL RESULTS

SURROGATE RECOVERY

CCIL SAMPLE ID	ANALYTE	SUR ID	% RECV
203025-01	NWTPH-GX	TFT	*
203025-01	EPA-8021	TFT	*
203025-01	NWTPH-DX	C25	78
203025-02	NWTPH-GX	TFT	60
203025-02	EPA-8021	TFT	87
203025-02	NWTPH-DX	C25	80
203025-03	NWTPH-GX	TFT	66
203025-03	EPA-8021	TFT	68
203025-03	NWTPH-DX	C25	65
203025-04	NWTPH-GX	TFT	83
203025-04	EPA-8021	TFT	85
203025-04	NWTPH-DX	C25	79

* SURROGATE DILUTED OUT OF CALIBRATION RANGE

APPROVED BY: 

8620 Holly Drive • Everett, WA 98208 • 425 356-2600 • FAX 425 356-2626 • Seattle 206 292-9059

CHAIN-OF-CUSTODY RECORD

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

400 N. 34th Street, Suite 100
Seattle, WA 98103
(206) 632-8020
(206) 695-6777 Fax

11500 Olive Blvd., Suite 276
St. Louis, MO 63141
(314) 872-8170
(314) 872-8178 Fax

2055 Hill Road
Fairbanks, AK 99709
(907) 479-0600
(907) 479-5691 Fax

5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907) 561-2120
(907) 561-4483 Fax

303 Wellsian Way
Richland, WA 99352
(509) 946-6309
(509) 946-6580 Fax

Laboratory CCI Page 1 of 1
Attn:

Analysis Parameters/Sample Container Description
(include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	NWTPH-G/BTEX	NTWPH-Dx	Total Pb				Total Number of Containers	Remarks/Matrix
B-6, S-2	1	1352	2/21/02		X	X	X	X	RUSH THIS ONLY (*)			2	SOIL
B-16, S-6	2	0951	3/4/02		↓	↓	↓	↓				3	↓
B-12, S-3	3	1148	3/4/02		↓	↓	↓	↓				2	↓
B-13, S-4	4	1348	3/4/02		↓	↓	↓	↓				2	↓
						test from jar (1)		test from jar (2)					

Project Information

Project Number: 21-1-09644-00
Project Name: Sno Co
Contact: A TIRAO
Ongoing Project? Yes ☒ No ☐
Sampler: ACT

Sample Receipt

Total Number of Containers: 4
COC Seals/Intact? Y/N/NA:
Received Good Cond./Cold:
Delivery Method:
(attach shipping bill, if any)

Relinquished By: 1
Signature: Agnes Tirao Time: 0930
Printed Name: AGNES TIRAO Date: 3/6/02
Company: S&W

Relinquished By: 2
Signature: Time:
Printed Name: Date:
Company:

Relinquished By: 3
Signature: Time:
Printed Name: Date:
Company:

Received By: 1
Signature: Time: 1030
Printed Name: Rick Bagan Date: 3/6/02
Company: CCIAL

Received By: 2
Signature: Time:
Printed Name: Date:
Company:

Received By: 3
Signature: Time:
Printed Name: Date:
Company:

Instructions

Requested Turnaround Time: STD - RUSH one (*) sample to meet hold times
Special Instructions: please provide copy of COC w/ final lab report

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - Job File

F-19-91/UR

fax initial/draft results to A Tirao

don't rush Pb unless req'd by hold time!

No.

CCI
ANALYTICAL
LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

CLIENT: SHANNON & WILSON, INC.
400 N. 34TH STREET, SUITE 100
SEATTLE, WA 98103

DATE: 4/29/02
CCIL JOB #: 204106
CCIL SAMPLE #: 1
DATE RECEIVED: 4/22/02
WDOE ACCREDITATION #: C142

CLIENT CONTACT: CAROLE MITCHELL

CLIENT PROJECT ID: 21-1-09644-004 SNO. CTY. FAC.
CLIENT SAMPLE ID: B-6A S-7 4/17/02 1550

DATA RESULTS

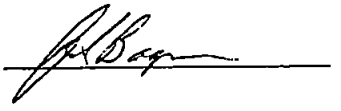
ANALYTE	METHOD	RESULTS*	UNITS**	ANALYSIS DATE	ANALYSIS BY
TPH-VOLATILE RANGE	NWTPH-GX	4400	MG/KG	4/24/02	LAH
MTBE***	EPA-8021	ND(<2)	MG/KG	4/23/02	LAH
BENZENE	EPA-8021	2.3	MG/KG	4/23/02	LAH
TOLUENE	EPA-8021	140	MG/KG	4/24/02	LAH
ETHYLBENZENE	EPA-8021	74	MG/KG	4/24/02	LAH
XYLENES	EPA-8021	420	MG/KG	4/24/02	LAH
TPH-SEMIVOLATILE RANGE	NWTPH-DX	ND	MG/KG	4/25/02	AIB
LEAD	EPA-6010	ND(<3.0)	MG/KG	4/24/02	RAB

NOTES: CHROMATOGRAM INDICATES SAMPLE CONTAINS PRODUCT WHICH IS LIKELY WEATHERED GASOLINE
DIESEL RANGE REPORTING LIMIT RAISED DUE TO VOLATILE RANGE OVERLAP

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
GASOLINE(VOLATILE RANGE) REPORTING LIMIT IS 300 MG/KG
DIESEL RANGE REPORTING LIMIT IS 50 MG/KG
LUBE OIL RANGE REPORTING LIMIT IS 50 MG/KG

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ANY POSITIVE MTBE RESULT SHOULD BE CONFIRMED BY GC/MS ANALYSIS

APPROVED BY: 

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CCI
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LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

CLIENT: SHANNON & WILSON, INC.
400 N. 34TH STREET, SUITE 100
SEATTLE, WA 98103

DATE: 4/29/02
CCIL JOB #: 204106
CCIL SAMPLE #: 3
DATE RECEIVED: 4/22/02
WDOE ACCREDITATION #: C142

CLIENT CONTACT: CAROLE MITCHELL

CLIENT PROJECT ID: 21-1-09644-004 SNO. CTY. FAC.
CLIENT SAMPLE ID: B-6B4 S-5 4/18/02 1635

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ANALYSIS DATE	ANALYSIS BY
TPH-VOLATILE RANGE	NWTPH-GX	ND	MG/KG	4/24/02	LAH
MTBE***	EPA-8021	ND(<0.1)	MG/KG	4/24/02	LAH
BENZENE	EPA-8021	ND(<0.03)	MG/KG	4/24/02	LAH
TOLUENE	EPA-8021	ND(<0.05)	MG/KG	4/24/02	LAH
ETHYLBENZENE	EPA-8021	ND(<0.05)	MG/KG	4/24/02	LAH
XYLENES	EPA-8021	ND(<0.2)	MG/KG	4/24/02	LAH
TPH-SEMIVOLATILE RANGE	NWTPH-DX	ND	MG/KG	4/25/02	AIB
LEAD	EPA-6010	ND(<3.1)	MG/KG	4/24/02	RAB

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
GASOLINE(VOLATILE RANGE) REPORTING LIMIT IS 3 MG/KG
DIESEL RANGE REPORTING LIMIT IS 25 MG/KG
LUBE OIL RANGE REPORTING LIMIT IS 50 MG/KG

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ANY POSITIVE MTBE RESULT SHOULD BE CONFIRMED BY GC/MS ANALYSIS

APPROVED BY: _____

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CCI
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LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

CLIENT: SHANNON & WILSON, INC.
400 N. 34TH STREET, SUITE 100
SEATTLE, WA 98103

DATE: 4/29/02
CCIL JOB #: 204106
CCIL SAMPLE #: 4
DATE RECEIVED: 4/22/02
WDOE ACCREDITATION #: C142

CLIENT CONTACT: CAROLE MITCHELL

CLIENT PROJECT ID: 21-1-09644-004 SNO. CTY. FAC.
CLIENT SAMPLE ID: B-6B4 S-8 4/18/02 1655

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ANALYSIS DATE	ANALYSIS BY
TPH-VOLATILE RANGE	NWTPH-GX	7	MG/KG	4/24/02	LAH
MTBE***	EPA-8021	ND(<0.1)	MG/KG	4/24/02	LAH
BENZENE	EPA-8021	ND(<0.03)	MG/KG	4/24/02	LAH
TOLUENE	EPA-8021	0.11	MG/KG	4/24/02	LAH
ETHYLBENZENE	EPA-8021	ND(<0.05)	MG/KG	4/24/02	LAH
XYLENES	EPA-8021	0.2	MG/KG	4/24/02	LAH
TPH-SEMIVOLATILE RANGE	NWTPH-DX	ND	MG/KG	4/25/02	AIB
LEAD	EPA-6010	ND(<2.8)	MG/KG	4/24/02	RAB

NOTE: CHROMATOGRAM INDICATES SAMPLE CONTAINS PRODUCT WHICH IS LIKELY HIGHLY WEATHERED GASOLINE

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
GASOLINE(VOLATILE RANGE) REPORTING LIMIT IS 3 MG/KG
DIESEL RANGE REPORTING LIMIT IS 25 MG/KG
LUBE OIL RANGE REPORTING LIMIT IS 50 MG/KG

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ANY POSITIVE MTBE RESULT SHOULD BE CONFIRMED BY GC/MS ANALYSIS

APPROVED BY: _____

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CCI
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CERTIFICATE OF ANALYSIS

CLIENT: SHANNON & WILSON, INC.
400 N. 34TH STREET, SUITE 100
SEATTLE, WA 98103

DATE: 4/29/02
CCIL JOB #: 204106
CCIL SAMPLE #: 5
DATE RECEIVED: 4/22/02
WDOE ACCREDITATION #: C142

CLIENT CONTACT: CAROLE MITCHELL

CLIENT PROJECT ID: 21-1-09644-004 SNO. CTY. FAC.
CLIENT SAMPLE ID: B-6C S-6 4/18/02 1027

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ANALYSIS DATE	ANALYSIS BY
TPH-VOLATILE RANGE	NWTPH-GX	ND	MG/KG	4/24/02	LAH
MTBE***	EPA-8021	ND(<0.1)	MG/KG	4/24/02	LAH
BENZENE	EPA-8021	ND(<0.03)	MG/KG	4/24/02	LAH
TOLUENE	EPA-8021	ND(<0.05)	MG/KG	4/24/02	LAH
ETHYLBENZENE	EPA-8021	ND(<0.05)	MG/KG	4/24/02	LAH
XYLENES	EPA-8021	ND(<0.2)	MG/KG	4/24/02	LAH
TPH-SEMIVOLATILE RANGE	NWTPH-DX	ND	MG/KG	4/25/02	AIB
LEAD	EPA-6010	ND(<3.1)	MG/KG	4/24/02	RAB

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
GASOLINE(VOLATILE RANGE) REPORTING LIMIT IS 3 MG/KG
DIESEL RANGE REPORTING LIMIT IS 25 MG/KG
LUBE OIL RANGE REPORTING LIMIT IS 50 MG/KG

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ANY POSITIVE MTBE RESULT SHOULD BE CONFIRMED BY GC/MS ANALYSIS

APPROVED BY: _____

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LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

CLIENT: SHANNON & WILSON, INC.
400 N. 34TH STREET, SUITE 100
SEATTLE, WA 98103

DATE: 4/29/02
CCIL JOB #: 204106
CCIL SAMPLE #: 6
DATE RECEIVED: 4/22/02
WDOE ACCREDITATION #: C142

CLIENT CONTACT: CAROLE MITCHELL

CLIENT PROJECT ID: 21-1-09644-004 SNO. CTY. FAC.
CLIENT SAMPLE ID: B-6C S-10 4/18/02 1100

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ANALYSIS DATE	ANALYSIS BY
TPH-VOLATILE RANGE	NWTPH-GX	4	MG/KG	4/25/02	LAH
MTBE***	EPA-8021	ND(<0.1)	MG/KG	4/25/02	LAH
BENZENE	EPA-8021	0.4	MG/KG	4/25/02	LAH
TOLUENE	EPA-8021	0.8	MG/KG	4/25/02	LAH
ETHYLBENZENE	EPA-8021	0.09	MG/KG	4/25/02	LAH
XYLENES	EPA-8021	0.2	MG/KG	4/25/02	LAH
TPH-SEMIVOLATILE RANGE	NWTPH-DX	ND	MG/KG	4/25/02	AIB
LEAD	EPA-6010	ND(<2.8)	MG/KG	4/24/02	RAB

NOTE: CHROMATOGRAM INDICATES SAMPLE CONTAINS UNIDENTIFIED VOLATILE RANGE PRODUCT

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
GASOLINE(VOLATILE RANGE) REPORTING LIMIT IS 3 MG/KG
DIESEL RANGE REPORTING LIMIT IS 25 MG/KG
LUBE OIL RANGE REPORTING LIMIT IS 50 MG/KG

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ANY POSITIVE MTBE RESULT SHOULD BE CONFIRMED BY GC/MS ANALYSIS

APPROVED BY: _____

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CERTIFICATE OF ANALYSIS

CLIENT: SHANNON & WILSON, INC.
400 N. 34TH STREET, SUITE 100
SEATTLE, WA 98103

DATE: 4/29/02
CCIL JOB #: 204106
CCIL SAMPLE #: 7
DATE RECEIVED: 4/22/02
WDOE ACCREDITATION #: C142

CLIENT CONTACT: CAROLE MITCHELL

CLIENT PROJECT ID: 21-1-09644-004 SNO. CTY. FAC.
CLIENT SAMPLE ID: B-6D2 S-6 4/18/02 1505

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ANALYSIS DATE	ANALYSIS BY
TPH-VOLATILE RANGE	NWTPH-GX	ND	MG/KG	4/25/02	LAH
MTBE***	EPA-8021	ND(<0.1)	MG/KG	4/25/02	LAH
BENZENE	EPA-8021	ND(<0.03)	MG/KG	4/25/02	LAH
TOLUENE	EPA-8021	ND(<0.05)	MG/KG	4/25/02	LAH
ETHYLBENZENE	EPA-8021	ND(<0.05)	MG/KG	4/25/02	LAH
XYLENES	EPA-8021	ND(<0.2)	MG/KG	4/25/02	LAH
TPH-SEMIVOLATILE RANGE	NWTPH-DX	ND	MG/KG	4/25/02	AIB
LEAD	EPA-6010	ND(<2.6)	MG/KG	4/24/02	RAB

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT; REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
GASOLINE(VOLATILE RANGE) REPORTING LIMIT IS 3 MG/KG
DIESEL RANGE REPORTING LIMIT IS 25 MG/KG
LUBE OIL RANGE REPORTING LIMIT IS 50 MG/KG

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ANY POSITIVE MTBE RESULT SHOULD BE CONFIRMED BY GC/MS ANALYSIS

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CLIENT: SHANNON & WILSON, INC.
400 N. 34TH STREET, SUITE 100
SEATTLE, WA 98103

DATE: 4/29/02
CCIL JOB #: 204106
CCIL SAMPLE #: 8
DATE RECEIVED: 4/22/02
WDOE ACCREDITATION #: C142

CLIENT CONTACT: CAROLE MITCHELL

CLIENT PROJECT ID: 21-1-09644-004 SNO. CTY. FAC.
CLIENT SAMPLE ID: B-6D2 S-8 4/18/02 1518

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ANALYSIS DATE	ANALYSIS BY
TPH-VOLATILE RANGE	NWTPH-GX	ND	MG/KG	4/25/02	LAH
MTBE***	EPA-8021	ND(<0.1)	MG/KG	4/25/02	LAH
BENZENE	EPA-8021	0.03	MG/KG	4/25/02	LAH
TOLUENE	EPA-8021	ND(<0.05)	MG/KG	4/25/02	LAH
ETHYLBENZENE	EPA-8021	0.06	MG/KG	4/25/02	LAH
XYLENES	EPA-8021	ND(<0.2)	MG/KG	4/25/02	LAH
TPH-SEMIVOLATILE RANGE	NWTPH-DX	ND	MG/KG	4/25/02	AIB
LEAD	EPA-6010	ND(<3.1)	MG/KG	4/24/02	RAB

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
GASOLINE(VOLATILE RANGE) REPORTING LIMIT IS 3 MG/KG
DIESEL RANGE REPORTING LIMIT IS 25 MG/KG
LUBE OIL RANGE REPORTING LIMIT IS 50 MG/KG

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ANY POSITIVE MTBE RESULT SHOULD BE CONFIRMED BY GC/MS ANALYSIS

APPROVED BY: _____

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CERTIFICATE OF ANALYSIS

CLIENT: SHANNON & WILSON, INC.
400 N. 34TH STREET, SUITE 100
SEATTLE, WA 98103

DATE: 4/29/02
CCIL JOB #: 204106

DATE RECEIVED: 4/22/02
WDOE ACCREDITATION #: C142

CLIENT CONTACT: CAROLE MITCHELL

CLIENT PROJECT ID: 21-1-09644-004 SNO. CTY. FAC.

QUALITY CONTROL RESULTS

SURROGATE RECOVERY

CCIL SAMPLE ID	ANALYTE	SUR ID	% RECV
204106-01	NWTPH-GX	TFT	*
204106-01	EPA-8021	TFT	*
204106-01	NWTPH-DX	C25	115
204106-02	NWTPH-GX	TFT	101
204106-02	EPA-8021	TFT	103
204106-02	NWTPH-DX	C25	116
204106-03	NWTPH-GX	TFT	89
204106-03	EPA-8021	TFT	93
204106-03	NWTPH-DX	C25	98
204106-04	NWTPH-GX	TFT	81
204106-04	EPA-8021	TFT	89
204106-04	NWTPH-DX	C25	114
204106-05	NWTPH-GX	TFT	101
204106-05	EPA-8021	TFT	95
204106-05	NWTPH-DX	C25	101
204106-06	NWTPH-GX	TFT	89
204106-06	EPA-8021	TFT	83
204106-06	NWTPH-DX	C25	110
204106-07	NWTPH-GX	TFT	90
204106-07	EPA-8021	TFT	78
204106-07	NWTPH-DX	C25	104
204106-08	NWTPH-GX	TFT	83
204106-08	EPA-8021	TFT	85
204106-08	NWTPH-DX	C25	94

* SURROGATE DILUTED OUT OF CALIBRATION RANGE

APPROVED BY: 

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SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

400 N. 34th Street, Suite 100
Seattle, WA 98103
(206) 632-8020
(206) 695-6777 Fax

11500 Olive Blvd., Suite 276
St. Louis, MO 63141
(314) 872-8170
(314) 872-8178 Fax

2055 Hill Road
Fairbanks, AK 99709
(907) 479-0600
(907) 479-5691 Fax

5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907) 561-2120
(907) 561-4483 Fax

303 Wellsian Way
Richland, WA 99352
(509) 946-6309
(509) 946-6580 Fax

CHAIN-OF-CUSTODY RECORD

Laboratory CCL Page 1 of 1
Attn:

Analysis Parameters/Sample Container Description
(include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	NWTPH-BTEX	NWTPH-DX	Total Lead				Total Number of Containers	Remarks/Matrix
B-6A S-7	1	1550	4/17/02		X	X	X	X				2	
B-6A S-11	2	1630	4/17/02		X	X	X	X				2	
B-6B4 S-5	3	1635	4/18/02		X	X	X	X				2	
B-6B4 S-8	4	1655	4/18/02		X	X	X	X				2	
B-6C S-6	5	1027	4/18/02		X	X	X	X				2	
B-6C S-10	6	1100	4/18/02		X	X	X	X				2	
B-6D2 S-6	7	1505	4/18/02		X	X	X	X				2	
B-6D2 S-8	8	1518	4/18/02		X	X	X	X				2	

Project Information

Project Number: 21-1-06444-004
Project Name: Snoho Cty Fac
Contact: Carol Mitchell
Ongoing Project? Yes ☐ No ☒
Sampler: XHL

Sample Receipt

Total Number of Containers:
COC Seals/Intact? Y/N/NA:
Received Good Cond./Cold:
Delivery Method:
(attach shipping bill, if any)

Instructions

Requested Turnaround Time: Standard
Special Instructions:

Relinquished By: 1	Relinquished By: 2	Relinquished By: 3
Signature: Time: 1500	Signature: Time:	Signature: Time:
Printed Name: Cody Johnson Date: 4/21/02	Printed Name: Date:	Printed Name: Date:
Company: Shannon Wilson	Company:	Company:

Received By: 1	Received By: 2	Received By: 3
Signature: Time: 10.00	Signature: Time:	Signature: Time:
Printed Name: Rick Bagan Date: 4/22/02	Printed Name: Date:	Printed Name: Date:
Company: CCL	Company:	Company:

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - Job File

E-19-91/UR

No.

CCI
ANALYTICAL
LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

CLIENT: SHANNON & WILSON, INC.
400 N. 34TH STREET, SUITE 100
SEATTLE, WA 98103

DATE: 6/5/02
CCIL JOB #: 205150
CCIL SAMPLE #: 1
DATE RECEIVED: 5/28/02
WDOE ACCREDITATION #: C142

CLIENT CONTACT: CAROLE MITCHELL

CLIENT PROJECT ID: 21-1-09644-004 SNOHOMISH JUSTICE CTR
CLIENT SAMPLE ID: S-1 5/28/02 1125

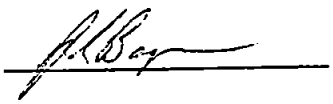
DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ANALYSIS DATE	ANALYSIS BY
TPH-VOLATILE RANGE	NWTPH-GX	250000	UG/L	5/31/02	LAH
BENZENE	EPA-8021	7800	UG/L	5/31/02	LAH
TOLUENE	EPA-8021	45000	UG/L	5/31/02	LAH
ETHYLBENZENE	EPA-8021	4200	UG/L	5/31/02	LAH
XYLENES	EPA-8021	25000	UG/L	5/31/02	LAH
TPH-SEMIVOLATILE RANGE	NWTPH-DX	1700	UG/L	6/1/02	CMH
LEAD	EPA-7421	0.005	MG/L	5/31/02	RAB

NOTE: CHROMATOGRAM INDICATES SAMPLE CONTAINS PRODUCTS WHICH ARE LIKELY LIGHTLY WEATHERED GASOLINE AND DIESEL FUEL
SEMIVOLATILE RANGE RESULT BIASED HIGH DUE TO VOLATILE RANGE OVERLAP

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
GASOLINE(VOLATILE RANGE) REPORTING LIMIT IS 25000 UG/L
DIESEL RANGE REPORTING LIMIT IS 130 UG/L
LUBE OIL RANGE REPORTING LIMIT IS 250 UG/L

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

APPROVED BY: 

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CCI
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LABORATORIES, INC.

CERTIFICATE OF ANALYSIS

CLIENT: SHANNON & WILSON, INC.
400 N. 34TH STREET, SUITE 100
SEATTLE, WA 98103

DATE: 6/5/02
CCIL JOB #: 205150
CCIL SAMPLE #: 2
DATE RECEIVED: 5/28/02
WDOE ACCREDITATION #: C142

CLIENT CONTACT: CAROLE MITCHELL

CLIENT PROJECT ID: 21-1-09644-004 SNOHOMISH JUSTICE CTR
CLIENT SAMPLE ID: S-2 5/28/02 1322

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ANALYSIS DATE	ANALYSIS BY
TPH-VOLATILE RANGE	NWTPH-GX	230000	UG/L	5/31/02	LAH
BENZENE	EPA-8021	10000	UG/L	5/31/02	LAH
TOLUENE	EPA-8021	42000	UG/L	5/31/02	LAH
ETHYLBENZENE	EPA-8021	3800	UG/L	5/31/02	LAH
XYLENES	EPA-8021	19000	UG/L	5/31/02	LAH
TPH-SEMIVOLATILE RANGE	NWTPH-DX	540	UG/L	6/1/02	CMH
LEAD	EPA-7421	0.004	MG/L	5/31/02	RAB

NOTE: CHROMATOGRAM INDICATES SAMPLE CONTAINS PRODUCTS WHICH ARE LIKELY LIGHTLY WEATHERED GASOLINE AND DIESEL FUEL
SEMIVOLATILE RANGE RESULT BIASED HIGH DUE TO VOLATILE RANGE OVERLAP

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
GASOLINE(VOLATILE RANGE) REPORTING LIMIT IS 25000 UG/L
DIESEL RANGE REPORTING LIMIT IS 130 UG/L
LUBE OIL RANGE REPORTING LIMIT IS 250 UG/L

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

APPROVED BY: _____

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CERTIFICATE OF ANALYSIS

CLIENT: SHANNON & WILSON, INC.
400 N. 34TH STREET, SUITE 100
SEATTLE, WA 98103

DATE: 6/5/02
CCIL JOB #: 205150

DATE RECEIVED: 5/28/02
WDOE ACCREDITATION #: C142

CLIENT CONTACT: CAROLE MITCHELL

CLIENT PROJECT ID: 21-1-09644-004 SNOHOMISH JUSTICE CTR

QUALITY CONTROL RESULTS

SURROGATE RECOVERY

CCIL SAMPLE ID	ANALYTE	SUR ID	% RECV
205150-01	NWTPH-GX	TFT	104
205150-01	EPA-8021	TFT	103
205150-01	NWTPH-DX	C25	91
205150-02	NWTPH-GX	TFT	97
205150-02	EPA-8021	TFT	97
205150-02	NWTPH-DX	C25	90

APPROVED BY: 

8620 Holly Drive • Everett, WA 98208 • 425 356-2600 • FAX 425 356-2626 • Seattle 206 292-9059

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

CHAIN OF CUSTODY RECORD

Page 1 of 1
Laboratory CCI
Attn:

400 N. 34th Street, Suite 100
Seattle, WA 98103
(206) 632-8020

11500 Olive Blvd., Suite 276
St. Louis, MO 63141
(314) 872-8170

2055 Hill Road
Fairbanks, AK 99709
(907) 479-0600

5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907) 561-2120

303 Wellsian Way
Richland, WA 99352
(509) 946-6309

Analysis Parameters/Sample Container Description (include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	NWTPH-GX	BTEX	NWTPH-DX	TOTAL LEAD			Total Number of Containers	Remarks/Matrix
S-1		1125	5/28/02		✓	X	X	X	X			5	H_2O
S-2		1322	5/28/02		✓	X	X	X	X			5	H_2O

Project Information	
Project Number:	21-1-09644-004
Project Name:	Snohomish Justice Ctr
Contact:	Carole Mitchel
Ongoing Project?	Yes ☐ No ☑
Sampler:	WAYNE LINDELL

Sample Receipt	
Total Number of Containers	10
COC Seals/Intact? Y/N/NA	
Received Good Cond./Cold	
Delivery Method: (attach shipping bill, if any)	

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: [signature] Time: 1400	Signature: Time:	Signature: Time:
Printed Name: WAYNE R. LINDELL Date: 5/28/02	Printed Name: Date:	Printed Name: Date:
Company:	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: [signature] Time: 1420	Signature: Time:	Signature: Time:
Printed Name: C Rowell Date: 5-28-02	Printed Name: Date:	Printed Name: Date:
Company: CCIL	Company:	Company:

Instructions	
Requested Turn Around Time:	STANDARD
Special Instructions:	

Distribution: White - w/shipment - returned to Shannon & Wilson w/ Laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - Job File

F-19-91/UR

No. 25306

Appendix C

Appendix C

APPENDIX C

IMPORTANT INFORMATION ABOUT YOUR ENVIRONMENTAL REPORT

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

Attachment to and part of Report 21-1-09644-011

Date: January 31, 2005
To: Mr. Mike Rehder
NBBJ

IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL/ENVIRONMENTAL REPORT

CONSULTING SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES AND FOR SPECIFIC CLIENTS.

Consultants prepare reports to meet the specific needs of specific individuals. A report prepared for a civil engineer may not be adequate for a construction contractor or even another civil engineer. Unless indicated otherwise, your consultant prepared your report expressly for you and expressly for the purposes you indicated. No one other than you should apply this report for its intended purpose without first conferring with the consultant. No party should apply this report for any purpose other than that originally contemplated without first conferring with the consultant.

THE CONSULTANT'S REPORT IS BASED ON PROJECT-SPECIFIC FACTORS.

A geotechnical/environmental report is based on a subsurface exploration plan designed to consider a unique set of project-specific factors. Depending on the project, these may include: the general nature of the structure and property involved; its size and configuration; its historical use and practice; the location of the structure on the site and its orientation; other improvements such as access roads, parking lots, and underground utilities; and the additional risk created by scope-of-service limitations imposed by the client. To help avoid costly problems, ask the consultant to evaluate how any factors that change subsequent to the date of the report may affect the recommendations. Unless your consultant indicates otherwise, your report should not be used: (1) when the nature of the proposed project is changed (for example, if an office building will be erected instead of a parking garage, or if a refrigerated warehouse will be built instead of an unrefrigerated one, or chemicals are discovered on or near the site); (2) when the size, elevation, or configuration of the proposed project is altered; (3) when the location or orientation of the proposed project is modified; (4) when there is a change of ownership; or (5) for application to an adjacent site. Consultants cannot accept responsibility for problems that may occur if they are not consulted after factors which were considered in the development of the report have changed.

SUBSURFACE CONDITIONS CAN CHANGE.

Subsurface conditions may be affected as a result of natural processes or human activity. Because a geotechnical/environmental report is based on conditions that existed at the time of subsurface exploration, construction decisions should not be based on a report whose adequacy may have been affected by time. Ask the consultant to advise if additional tests are desirable before construction starts; for example, groundwater conditions commonly vary seasonally.

Construction operations at or adjacent to the site and natural events such as floods, earthquakes, or groundwater fluctuations may also affect subsurface conditions and, thus, the continuing adequacy of a geotechnical/environmental report. The consultant should be kept apprised of any such events, and should be consulted to determine if additional tests are necessary.

MOST RECOMMENDATIONS ARE PROFESSIONAL JUDGMENTS.

Site exploration and testing identifies actual surface and subsurface conditions only at those points where samples are taken. The data were extrapolated by your consultant, who then applied judgment to render an opinion about overall subsurface conditions. The actual interface between materials may be far more gradual or abrupt than your report indicates. Actual conditions in areas not sampled may differ from those predicted in your report. While nothing can be done to prevent such situations, you and your consultant can work together to help reduce their impacts. Retaining your consultant to observe subsurface construction operations can be particularly beneficial in this respect.

A REPORT'S CONCLUSIONS ARE PRELIMINARY.

The conclusions contained in your consultant's report are preliminary because they must be based on the assumption that conditions revealed through selective exploratory sampling are indicative of actual conditions throughout a site. Actual subsurface conditions can be discerned only during earthwork; therefore, you should retain your consultant to observe actual conditions and to provide conclusions. Only the consultant who prepared the report is fully familiar with the background information needed to determine whether or not the report's recommendations based on those conclusions are valid and whether or not the contractor is abiding by applicable recommendations. The consultant who developed your report cannot assume responsibility or liability for the adequacy of the report's recommendations if another party is retained to observe construction.

THE CONSULTANT'S REPORT IS SUBJECT TO MISINTERPRETATION.

Costly problems can occur when other design professionals develop their plans based on misinterpretation of a geotechnical/environmental report. To help avoid these problems, the consultant should be retained to work with other project design professionals to explain relevant geotechnical, geological, hydrogeological, and environmental findings, and to review the adequacy of their plans and specifications relative to these issues.

BORING LOGS AND/OR MONITORING WELL DATA SHOULD NOT BE SEPARATED FROM THE REPORT.

Final boring logs developed by the consultant are based upon interpretation of field logs (assembled by site personnel), field test results, and laboratory and/or office evaluation of field samples and data. Only final boring logs and data are customarily included in geotechnical/environmental reports. These final logs should not, under any circumstances, be redrawn for inclusion in architectural or other design drawings, because drafters may commit errors or omissions in the transfer process.

To reduce the likelihood of boring log or monitoring well misinterpretation, contractors should be given ready access to the complete geotechnical engineering/environmental report prepared or authorized for their use. If access is provided only to the report prepared for you, you should advise contractors of the report's limitations, assuming that a contractor was not one of the specific persons for whom the report was prepared, and that developing construction cost estimates was not one of the specific purposes for which it was prepared. While a contractor may gain important knowledge from a report prepared for another party, the contractor should discuss the report with your consultant and perform the additional or alternative work believed necessary to obtain the data specifically appropriate for construction cost estimating purposes. Some clients hold the mistaken impression that simply disclaiming responsibility for the accuracy of subsurface information always insulates them from attendant liability. Providing the best available information to contractors helps prevent costly construction problems and the adversarial attitudes that aggravate them to a disproportionate scale.

READ RESPONSIBILITY CLAUSES CLOSELY.

Because geotechnical/environmental engineering is based extensively on judgment and opinion, it is far less exact than other design disciplines. This situation has resulted in wholly unwarranted claims being lodged against consultants. To help prevent this problem, consultants have developed a number of clauses for use in their contracts, reports and other documents. These responsibility clauses are not exculpatory clauses designed to transfer the consultant's liabilities to other parties; rather, they are definitive clauses that identify where the consultant's responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses are likely to appear in your report, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to your questions.

The preceding paragraphs are based on information provided by the
ASFE/Association of Engineering Firms Practicing in the Geosciences, Silver Spring, Maryland