NW 2409

Draft Preliminary Site Investigation
Everett HOV Project
Proposed Water Quality Sites #1 and #2
Everett, Washington

October 6, 2004

NOTE: Site #2 involves the property that is the subject of this VCP Application

206.440.4612

Submitted To:
Mr. Roland Benito P.E.
WSDOT SnoKing Area Project Development
15700 Dayton Ave N, MS 139
Seattle, WA 98133-9710

By:
Shannon & Wilson, Inc.
400 N 34th Street, Suite 100
Seattle, Washington 98103

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EXECUTIVE SUMMARY

Shannon & Wilson, Inc. has completed a Preliminary Site Investigation for two properties located in Everett, Washington, designated as Proposed Water Quality Sites #1 and #2. Proposed Water Quality Site #1 (WQ-1) consists of one tax parcel, number 29053200401600, owned by the City of Everett. WQ-1 is a large parcel located approximately 1,000 feet east of the Interstate 5 (I-5) right-of-way, adjacent to and west of the Snohomish River between 49th Street and Zillah Street in the Lowell District of Everett. Proposed Water Quality Site #2 (WQ-2) consists of three tax parcels, numbers 00576000200000 and 29052900102300, which are owned by the Port of Everett; and 29052900401000, which is owned by the City of Everett. WQ-2 is located north of 36th Street and adjacent to I-5, at the addresses 2731 and 2915 36th Street in Everett, Washington.

The objectives of this Draft Preliminary Site Investigation were to evaluate potential soil and/or groundwater contamination beneath the properties in areas of the proposed Everett high-occupancy vehicle (HOV) construction, to obtain geotechnical data from WQ-2, and to obtain geotechnical data to support construction of a pedestrian footbridge at WQ-1 (provided under separate cover).

Based on explorations conducted at WQ-1 and WQ-2, we offer the following conclusions:

Proposed Water Quality Site #1

- Five of the initial 11 proposed sample locations were investigated in general accordance with the approved Sampling and Analysis Plan.
- Fill and/or building foundations were encountered in each of the borings at the site. Non-native materials including red brick, asphalt, concrete, burnt and unburnt wood fragments, and roots, were encountered to depths of around 8.5 feet below ground surface (bgs).
- Soil with a petroleum odor was encountered in boring B1A, near the location of a former underground storage tank (UST) cleanup. Although chemical concentrations in this sample did not exceed cleanup criteria, petroleum-contaminated soil may still be present in the vicinity of the former UST. Although the petroleum detection may not exceed MTCA Method A cleanup levels, soil containing petroleum may require special handling and disposal.
- Low concentrations of diesel-range petroleum hydrocarbons, lube oil-range petroleum hydrocarbons, napthalenes, carcinogenic polycyclic aromatic hydrocarbons (cPAHs),

metals, and/or volatile organic compounds (VOCs), were detected in the samples from borings B1A, B2, B4, and B5A. All concentrations were below the Model Toxics Control Act (MTCA) Method A cleanup criteria.

Proposed Water Quality Site #2

- Soil and groundwater diesel- and lube oil-range petroleum contamination above cleanup standards was encountered on the east and north parcels. The contamination source is unknown. However, it is likely located in the northwest corner of the eastern parcel. The lateral extent of this contamination is unknown.

- Gasoline-range petroleum contamination above cleanup standards was encountered in soil and groundwater in one probe on the west parcel at approximately 15.5 feet bgs. Gasoline-range petroleum hydrocarbons were not detected in the soil or groundwater of the other probes. The source and lateral extent of this contamination are unknown.

- Fill was encountered on all three parcels to depths of up to 23 feet bgs. Fill materials encountered on the southern and western portions of WQ-2 consisted of landfill or construction debris including drywall, metal, glass, plastic, wood, etc. Other locations on the property were filled with up to 11 feet of wood debris, or filled with sand/silt mixtures with gravel, clay, peat, and/or cobbles.

- Heavy metals were detected in soil and arsenic was detected in the groundwater above cleanup standards on the north and east properties. Arsenic was also detected above cleanup levels in groundwater of the west property. Low levels of heavy metals were also detected in the groundwater of the west property. These metals may be present from historical site uses and/or site fill.

- Carcinogenic PAHs were encountered in soil from the undeveloped portion of the western property at depths of 13 and 22 feet bgs above the MTCA Method A cleanup level for unrestricted land uses but below cleanup standards for industrial properties. Naphthalenes were also detected in this area below cleanup standards. These cPAHs and naphthalenes may be present from historical site uses and/or site fill.

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PROPOSED WATER QUALITY SITES #1 AND #2
EVERETT, WASHINGTON

1.0 INTRODUCTION

1.1 Authorization

Shannon & Wilson, Inc., has completed a Draft Preliminary Site Investigation for two properties located in Everett, Washington, designated as Proposed Water Quality Sites #1 and #2 (Figure 1). Proposed Water Quality Site #1 (WQ-1) consists of one tax parcel (tax parcel #29053200401600) owned by the City of Everett. Proposed Water Quality Site #2 (WQ-2) consists of three tax parcels according to current tax assessor records: tax parcel numbers 00576000200000 and 29052900102300, which are owned by the Port of Everett; and 29052900401000, which is owned by the City of Everett. This work was conducted for Washington State Department of Transportation (WSDOT) in anticipation of property acquisition and development of these sites as stormwater treatment facilities. The work was accomplished in accordance with supplement number 4 to the WSDOT agreement contract number Y-7119, and in reference to Parsons Brinckerhoff project number 25203S5. This work was authorized by Stanley M. O. T. Ching, P.E., Project Manager of Parsons Brinckerhoff, in a letter dated March 11, 2004.

1.2 Objectives and Scope

The objectives of this investigation were to evaluate potential soil and/or groundwater contamination beneath WQ-1 and WQ-2 in areas of the proposed construction, to obtain geotechnical data from WQ-2, and to obtain geotechnical data to support construction of a pedestrian footbridge at WQ-1 (provided in a data report under separate cover). We developed a Sampling and Analysis Plan (SAP) for WQ-1 (Shannon & Wilson, 2004a). The SAP included the following subtasks:

- Advance five borings at WQ-1 at 2.5-foot intervals to a depth of 3 feet below the water table, or to 5 feet, whichever is deeper.
- Drill two 60-foot-deep mud-rotary borings in the proposed location of the pedestrian foot bridge, and collect soil samples at 2.5- to 5-foot intervals to between 2.5 and 25 feet below ground surface.
- Collect and classify soil samples, and prepare a descriptive log of each probe.
- Collect soil samples for geological evaluation, soil descriptions, and geotechnical laboratory testing.
- Submit up to five soil samples from the five shallow borings for chemical analysis at OnSite Environmental, Inc.

Deviations from this SAP include the following:

- Five of the initial 11 proposed sample locations were investigated in general accordance with the approved SAP.
- Two more soil samples were collected than described in the SAP. An additional sample was collected from B1A to provide enough soil volume to conduct the required analyses. One additional sample was collected from boring SW-1 for chemical analysis, based on field indication of potential contamination.
- Discrete soil samples were collected from the borings; composite samples were requested by WSDOT after site activities had been completed.

Our scope of work at WQ-2 consisted of the following subtasks:

- Advance six geoprobes to the water table on the east and north properties, and collect continuous soil samples in 4-foot segments.
- Advance five geoprobes to the water table on the west property, and collect continuous soil samples in 4-foot intervals.
- Collect up to two soil samples and one groundwater sample from each probe location for chemical analysis by OnSite Environmental, Inc.
- Collect and classify soil samples, and prepare a descriptive log of each probe.
- Field screen the probe soil for contamination using visual and olfactory indications and monitoring with a photoionization detector (PID).
- Survey probe locations and elevations, and measure groundwater depths on the east and north properties to estimate local shallow groundwater flow direction.
- Excavate three test pits to native soil, or as deep as can be reasonably accomplished.

- Collect soil samples for geological evaluation, soil descriptions, and geotechnical laboratory testing.
- Collect soil samples from test pits for chemical analysis by OnSite Environmental, Inc., if contamination is encountered.
- Prepare this report.

The scope of work was designed to identify and document environmental concerns with significant potential to result in contamination to the subject properties. Site activities were conducted in general accordance with our Standard Field Methods provided in Appendix A. The sampling effort was considered limited in extent and served as a screening effort only. It was not intended to define the lateral extent of soil and/or groundwater contamination, if any.

2.0 SITE BACKGROUND

2.1 Proposed Water Quality Site #1

WQ-1 is located approximately 1,000 feet east of the I-5 right-of-way, on a property adjacent to, and west of, the Snohomish River between 49th Street and Zillah Street in the Lowell District of Everett (Figures 1 and 2). The site is located in the southeast quarter of Section 32, Township 29 North, Range 05 East, Willamette Meridian. The site was historically occupied by the Everett Lee Simpson Mill. It is currently undeveloped and consists of grass and shrubs, with some remaining concrete building pads. Based on the review of historical information and the Washington Department of Ecology (Ecology) files, construction activities at WQ-1 may encounter contamination. Contaminants of potential concern include: chlorinated solvents, heavy metals, dioxins, polychlorinated biphenyls (PCBs), petroleum hydrocarbons, polycyclic aromatic hydrocarbons (PAHs), and caustics (Shannon & Wilson, 2004b).

2.2 Proposed Water Quality Site #2

WQ-2 is located on three tax parcels north of 36th Street and adjacent to I-5, at the addresses 2731 and 2915 36th Street in Everett, Washington (Figure 1). The site is located in the southeast quarter of Section 29, Township 29 North, Range 05 East, Willamette Meridian. As shown in Figure 3, the west parcel, formerly occupied by GTS Drywall, is occupied by an abandoned building and parking lot. The east parcel is occupied by Diversified Industrial Services, a recycling center and woodworking business. The north parcel is occupied by Quality Plus Insulation, Inc., and includes an office building and gravel parking lot for trucks.

The Diversified Industrial Services property is predominantly asphalt-paved, and the topography is relatively level. The topography along the south and east of this parcel slopes steeply up toward 36th Street and the adjacent property to the west. This property has been utilized as a recycling company, a sawmill, a print shop, and possibly a landfill. Potential contaminants associated with past and current property uses on the Diversified Industries Services property include creosote, petroleum hydrocarbons, metals, PAHs, and volatile organic compounds (VOCs). The GTS Drywall property, to the west of the Diversified Industrial Services property, is partially asphalt-paved and partially undeveloped. The undeveloped portion of this property, to the north and east of the site building, slopes steeply down to the east and southeast. Historically, this property was used as a sawmill. This property is listed on the state underground storage tank (UST) database. Potential contaminants associated with past and current property uses include creosote, petroleum hydrocarbons, and PAHs (Shannon & Wilson, 2004b).

3.0 SITE GEOLOGY AND HYDROGEOLOGY

3.1 Geology

Five major geologic units in the site area influence the mobility and distribution of contaminants. These are, from oldest to youngest, the pre-Vashon "transitional beds," the Vashon advance outwash, the Vashon Till, recessional outwash, and young alluvium. These deposits are briefly described in the following paragraphs, from oldest to youngest.

Pre-Vashon transitional beds are named for their stratigraphic position and gradational nature between the underlying non-glacial sediments and the overlying Vashon glacial deposits. They consist of clay, silt, and fine sand with local peat and gravel beds at their base. These deposits typically occur between sea level and an elevation of about 200 feet. Based on the predominantly fine-grained nature of these deposits, the transitional beds are relatively impervious, inhibit vertical groundwater flow, and yield little or no water.

The advance outwash deposits consist of a relatively thick layer of sand and gravel that is exposed on the slopes along the margins of the Snohomish River floodplain. Advance outwash is composed predominantly of sand that coarsens upward from fine sand, with seams and layers of silt at the base, to gravelly sand and sandy gravel locally. These deposits were overridden by

the Vashon glacier, and as a result are compacted and very dense. The advance outwash is a principal aquifer in the area, with water perching on top of the underlying transitional beds. The water table slopes gently toward the margins of the plateau where it discharges as springs and baseflow to the creek valleys and the Snohomish River.

The Vashon Till or "hardpan" is typically composed of gravelly, silty sand with scattered cobbles and boulders. The till, which was deposited below the Vashon glacier, is very dense and has relatively low permeability. Water infiltrating through overlying deposits predominantly perches on top of the till and moves laterally along the top of it; however, some groundwater is able to infiltrate the unit and accumulate in more pervious granular lenses within the till.

The recessional outwash, consisting of sand and gravel, was deposited by meltwater streams discharging from the front of the retreating Vashon glacier. It occurs locally as a thin layer on top of till. Water in the recessional outwash is perched on top of the till, and is generally discontinuous or local in extent.

Older alluvium, deposited primarily in the Snohomish River valley, consists of silt, sand, and gravel and may include some late-glacial meltwater deposits. Younger alluvium includes stream channel and floodplain deposits that have accumulated along the Snohomish River since the Vashon glacier melted. Younger alluvium may contain clay, silt, peat, sand, and gravel. The groundwater in these alluvial materials is hydraulically connected with the Snohomish River (Shannon & Wilson, 2004b).

Soil observed in WQ-1 explorations generally consisted of fill from the ground surface to at least 8.5 feet in depth. These borings were drilled to a maximum depth of 14 feet below ground surface (bgs), and soil generally consisted of very loose, gravelly, silty sand and sandy silt with red brick, asphalt, concrete, burnt and unburnt wood fragments, and roots. Organic silt and silt were also encountered in two of the borings at depths below 9 feet.

Two deep geotechnical borings to the south of WQ-1 encountered silt and fine to medium sand from ground surface to around 30 feet, overlying clayey silt, silt, and silty fine to medium sand. A peat layer was encountered in SW-1 at 30.5 to around 35.7 feet bgs (geotechnical information is provided in a data report under separate cover). Boring logs are presented in Appendix A.

Probes and test pits at WQ-2 encountered landfill debris on the east and west parcels, and fine to medium sand, silt, organic silt, peat, and wood debris in other areas of the site. Fill was observed to the bottom of all three test pits at depths of 11 and 12 feet bgs. Probe P-2, located at a higher elevation along the southern portion of the site, encountered fill at over 20 feet bgs. Probes on the west property encountered fill at depths ranging from around 15 to 23 feet bgs. Environmental boring logs, test pit logs, and geoprobe logs are provided in Appendix A.

3.2 Hydrogeology

The uppermost groundwater in the project vicinity is in the advance outwash sand, which underlies most of the Everett area and is exposed on the slopes along the margins of the Snohomish River floodplain. Most of the I-5 right-of-way is situated on the outcrop area of this deposit. As a result, groundwater in most of the project area is expected to be relatively shallow and susceptible to contamination from surface sources. Surface water and groundwater along the project corridor likely flow easterly toward the Snohomish River.

Groundwater was encountered at WQ-1 in borings ranging between 3.5 and 9 feet bgs. Although the elevations at WQ-1 were not surveyed, local groundwater flow direction is likely to the east, toward the Snohomish River. Groundwater was between approximately 3 and 8 feet bgs at the east and north parcels of WQ-2, and ranged from 12 to 22 feet bgs on the west parcel of WQ-2. Based on a relative groundwater elevation survey, the groundwater gradient at WQ-2 appears to be north-northeast.

4.0 WATER QUALITY SITE #1 EXPLORATIONS

4.1 Summary of Field Activities

To investigate site concerns discussed in Section 2.1, eight shallow borings were advanced on accessible areas of the former Everett Lee Simpson Mill property (Figure 2). Five borings were initially proposed (B1 through B5). However, three additional borings were drilled because the original designated boring locations reached refusal, or did not produce enough soil to collect for chemical analysis (Figure 2). The soil in these borings generally consisted of loose to very loose, silty sand and sandy silt. Fill was encountered to depths of at least 8.5 feet bgs in all borings. Non-native materials within the fill soil included red brick, asphalt, concrete, burnt and unburnt wood fragments, and roots. A strong petroleum odor and sheen were observed in soil collected

from near the water table in boring B1A. This boring is near a former UST cleanup conducted in 1993 (ERM-Northwest, 1993). No other evidence of contamination was observed during drilling.

Two deep borings were drilled to 60 feet bgs using hollow-stem auger and mud-rotary drilling techniques. These borings were drilled to obtain geotechnical data to support construction of a pedestrian bridge over the adjacent railroad tracks to the west of WQ-1. The locations of these borings, identified as SW-1 and SW-2, are shown in Figure 2; the boring logs are presented in Appendix A; and geotechnical findings are discussed in a data report under separate cover. Samples were field-screened for evidence of contamination. A hard black material with a strong odor was observed in an approximately ½-inch layer at around 11.3 feet bgs in boring SW-2. This material was collected for chemical analysis at OnSite Environmental, Inc. No other evidence of contamination was observed in either boring.

4.2 Analytical Testing and Results

Environmental soil samples collected from borings B1 through B5 were tested for a variety of analytes, based upon the historical use of the property. The purpose for each sampling location, analytical testing, and number of samples analyzed for each boring is summarized in Table 1. Results are summarized in Tables 2 and 3, and complete analytical results are included in Appendix B. One soil sample was collected from each boring location except boring B1A; two samples were collected from B1A to provide enough soil volume to conduct the required analyses. Generally, one sample from each boring was analyzed for chemicals of potential concern; these included metals; VOCs, semivolatile organic compounds (SVOCs) including PAHs, phenols, 1-2-4-trichlorobenzene, pentachlorophenol, and hexachlorobenzene; pesticides; dioxins; petroleum; and/or pH. One sample from boring SW-2 was analyzed for creosols, pentachlorophenol, and diesel-range petroleum hydrocarbons.

None of the samples contained analytes at concentrations above the Model Toxics Control Act (MTCA) Method A soil cleanup levels (Ecology, 2001). Low levels of diesel- and/or lube oil-range petroleum hydrocarbons were detected in borings B1A and B5A. Boring B1A also detected low levels of napthalenes and carcinogenic PAHs (cPAHs). Low levels of metals, napthalenes, VOCs and cPAHs were detected in B2-S2. Low levels of VOCs were detected in

boring B4. The sample from SW-2 did not detect any analytes, and has not been included in the attached tables.

4.3 Discussion

Soil with a low petroleum concentration was encountered in the vicinity of a former UST. Although contaminants in this sample did not exceed cleanup criteria, petroleum-contaminated soil may still be present in the vicinity of the former UST. Although the petroleum detection may not exceed MTCA Method A cleanup levels, soil containing petroleum may require special handling and disposal.

Fill was encountered to depths of around 8.5 feet bgs on this property. Fill soil contained red brick, asphalt, concrete, burnt and unburnt wood fragments, and roots. It also contained low levels of diesel-range petroleum hydrocarbons, lube oil-range petroleum hydrocarbons, napthalenes, cPAHs, metals, and/or VOCs, all below cleanup criteria. Contaminants may be encountered on this property during construction, as the scope of this investigation was limited, and only 5 of the initial 11 proposed sample locations were investigated.

5.0 WATER QUALITY SITE #2 EXPLORATIONS

Three phases of site explorations were conducted at WQ-2: two geoprobe explorations and a test pit exploration. The geoprobe explorations were undertaken to explore soil beneath paved areas, with minimal site damage, and to collect representative soil and groundwater samples for environmental characterization. To support a geotechnical evaluation of the site, test pits were excavated to determine the depth of fill, contents of fill, and to allow for collection of a large volume of soil for geotechnical testing.

5.1 Geoprobe Explorations, North and East Parcels

5.1.1 Summary of Field Activities

Six probes were advanced on accessible portions of the north and east parcels on June 24, 2004 (Figure 4). Probe locations were chosen based on proximity to potential site concerns and available access for the probe rig (Table 4). Probes ranged in depth between 8 and 20 feet bgs, and typically extended to the depth where groundwater was first encountered (Figure 4).

Probing was conducted by Holt Drilling, Inc. Fill was encountered in all probes. Probe P2 contained fill including brick pieces, glass, porcelain, and burnt wood fragments. Most probes contained wood fragments and/or peat at the bottom of the probes. A sulfur odor was observed in soil collected from P1 and P4.

A potential indication of contamination was observed in probe P1 at 7 feet bgs. This sample contained a petroleum odor and sheen. This sample was collected for laboratory analysis. No other indications of contamination were observed.

5.1.2 Analytical Testing and Results

One soil sample and one water sample were collected for chemical analysis from each of the six probes. The analytical testing performed on each sample is summarized in Table 4. The analytical results from these samples are summarized in Tables 5 through 7, and complete analytical reports are provided in Appendix B. The analytical methods used are described in Appendix A. All soil and groundwater samples were analyzed for the following constituents: Resource Conservation and Recovery Act (RCRA) metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver); benzene, toluene, ethylbenzene, and xylenes (BTEX), VOCs; and diesel-, lube oil-, and gasoline-range petroleum hydrocarbons.

The soil sample from probe P1 had concentrations of diesel-range (2,600 milligrams per kilogram [mg/kg]) and lube oil-range (7,600 mg/kg) petroleum hydrocarbons above the cleanup criterion of 2,000 mg/kg. Arsenic (82 mg/kg) and cadmium (2.7 mg/kg) were detected in P1 above the cleanup standards 20 mg/kg, and 2 mg/kg, respectively. Lead (470 mg/kg) was detected above the MTCA Method A cleanup criterion for unrestricted land uses (250 mg/kg) but below the MTCA Method A cleanup criterion for industrial properties (1,000 mg/kg). Cadmium (5.2 mg/kg) and lead (2,600 mg/kg) were detected above cleanup standards for industrial properties in soil from probe P2. Barium (1,600 mg/kg), and silver (2.8 mg/kg) were detected in soil from P2 above background levels for metals in Washington State soil of 180 mg/kg, and 0.61 mg/kg, respectively. Soil from probe P4 contained arsenic (30 mg/kg) above the cleanup criterion. Soil from probe P6 contained lead (250 mg/kg) above the MTCA Method A cleanup criterion for unrestricted land uses, but below the MTCA Method A cleanup criterion for industrial properties. Samples also had low levels of diesel- and lube-oil range petroleum hydrocarbons, VOCs, and metals.

Groundwater samples from probes P3, P4, and P6 contained lube oil-range petroleum hydrocarbons at concentrations ranging from 640 to 910 micrograms per liter (µg/L), all above the cleanup criterion of 500 µg/L. Arsenic concentrations, ranging from 6 to 19 µg/L, were also detected above the cleanup criterion of 5 µg/L in probes P3 through P6. Low levels of VOCs, lead, barium, and arsenic were detected in all of the groundwater samples below the cleanup standards.

5.2 Test Pit Explorations

5.2.1 Summary of Field Activities

Three test pits were excavated at the site on June 30, 2004, to evaluate the depth of fill on the subject property, classify site soil, and evaluate the potential for site contamination. The test pits were placed in accessible locations to evaluate the soil conditions across the site. Test pit locations are depicted in Figure 4, and test pit logs are presented in Appendix A.

Test pit TP-1 was excavated to 11 feet bgs. This test pit was placed near probe P2, from our previous explorations. Fill was present to the bottom of this test pit. The fill soil contained porcelain, wood, glass, and metal (glass bottles, porcelain plates, a wheel rim, etc.). Groundwater was encountered at 8 feet bgs. No evidence of contamination was encountered. Upon backfilling the excavation, there was not enough soil to fill in the last approximately ½-foot of the test pit. A nearby gravel pile was used to fill the excavation.

Test pit TP-2 was excavated to 11 feet bgs. Groundwater was encountered at 3 feet bgs. Soil in this excavation was gravel and silt to approximately 3.5 feet, overlying fill consisting mainly of wood debris. The test pit was backfilled and could not be compacted because of the large volume of water and wood debris in the excavation. Approximately 5 cubic yards of quarry spalls were brought to the site to fill the excavation. The remaining wood debris was stockpiled next to the stockpile from TP-3. No evidence of contamination was encountered in this test pit, so the stockpile was not sampled for chemical analysis.

Test pit TP-3 was excavated to 12 feet bgs, entirely within fill materials. The soil consisted of gravel, sand, and clay to around 11 feet bgs, overlying wood debris from 11 to 12 feet bgs. What appeared to be petroleum contamination was encountered in this test pit at around 3.5 to 5.5 feet bgs. This soil had a PID reading of 77 parts per million (ppm). A discrete

environmental sample was collected of this soil from the sidewall of the excavation and sent to OnSite Environmental, Inc. for analysis. Groundwater was encountered at approximately 5.5 feet bgs. The groundwater had a sheen, likely from the petroleum. The test pit was backfilled, and approximately 3 cubic yards of excess soil would not fit in the hole. This soil was stockpiled on plastic, and a three-point composite sample was collected to evaluate the soil for disposal. The soil was covered in plastic that was held in place by large cobbles. This soil and the wood debris from test pit TP-2 were removed from site on October 30, 2004, by Emerald Services, Inc. and disposed at a Rabanco facility. Disposal documentation is provided in Appendix C.

5.2.2 Analytical Testing and Results

Two samples were collected during the test pit explorations; one sample was collected from potentially contaminated soil in test pit TP-3, and one sample was collected from a stockpile from this test pit. These samples were analyzed for diesel-, oil-, and gasoline-range petroleum hydrocarbons including BTEX. Analytical results are summarized in Table 8, and the analytical laboratory report is presented in Appendix B.

Both samples contained low levels of diesel- and lube oil-range petroleum hydrocarbons. The test pit sample (TP3-5') contained 1,300 mg/kg diesel-range and 780 mg/kg lube oil-range petroleum hydrocarbons, below the MTCA Method A cleanup level of 2,000 mg/kg. Low levels of ethylbenzene and xylenes below cleanup standards were also detected in this sample. Only low levels of lube oil- and diesel-range petroleum hydrocarbons were detected in the stockpile sample, TP3-SP1, below cleanup standards.

5.3 Geoprobe Explorations, West Parcel

5.3.1 Summary of Field Activities

Five probes were advanced on accessible portions of the west parcel on September 23, 2004. Probe locations, shown in Figure 5, were chosen based on proximity to potential site concerns and access for the probe rig. Probes ranged in depth between 16 and 27 feet bgs, typically to the approximate depth where groundwater was first encountered. ESN Northwest, of Lacey, Washington, conducted probing with a limited access drill rig.

Fill was encountered in all probes to around the depth at which groundwater was encountered. Fill and groundwater appeared perched above a confining silt layer. Fill encountered in probes P-GTS1, P-GTS2, and P-GTS3, consisted of brick, glass, porcelain, and wood fragments, and foot-long layers of a white powdery material that appeared to be drywall. The fill in probes P-GTS4 and P-GTS5 contained scattered burnt wood fragments and roots. A small amount of white powdery material was also observed in P-GTS4 at around 17.5 feet bgs.

Soil with a strong petroleum odor was encountered in probe P-GTS1 at 15 to 18 feet bgs. A faint petroleum odor was observed in probe P-GTS2 at 14 to 16 feet bgs, P-GTS3 at around 19 feet bgs (a wood chunk with odor), and P-GTS5 at 9 feet bgs. A sample was collected from P-GTS1 at 15.5 feet bgs to evaluate the potential for petroleum contamination. Samples of the soil with a petroleum odor were not collected for chemical analysis from the other three probes because the odor in probe P-GTS3 was confined to a piece of wood, and the odor in the other two probes was faint, and did not exhibit readings on the photoionization detector.

A slight chemical odor was observed in soil from P-GTS2 at around 13 feet bgs, and P-GTS5 at around 7.5 feet bgs. Samples were collected for chemical analysis from these depths to investigate the observed chemical odor. No other indications of contamination were observed.

5.3.2 Analytical Testing and Results

Soil and water sampling was conducted at five probes on the subject property to investigate concerns associated with historical site use and the potential for off- to on-site contaminant migration (Figure 4). Up to two soil samples and one water sample were collected from each probe for chemical analysis. A summary of the analyses performed at each sampling location is presented in Table 4. Soil samples were analyzed for diesel-, oil-, and gasoline-range petroleum hydrocarbons including BTEX, and semi-volatile organic compounds including creosols, pentachlorophenol (PCP), and PAHs. Groundwater samples were analyzed for diesel-, oil-, and gasoline-range petroleum hydrocarbons including BTEX, and priority pollutant metals. Analytical methods are described in Appendix A. The results of the analyses are summarized in Tables 9 through 11 and complete laboratory reports are included in Appendix B.

The soil sample from probe P-GTS1, collected at 15.5 feet bgs, contained concentrations of gasoline-range petroleum hydrocarbons (35 mg/kg) and benzene (0.59 mg/kg) above cleanup standards of 30 mg/kg and 0.03 mg/kg, respectively. The water sample from this probe also

contained gasoline-range petroleum hydrocarbons (13,000 ug/L), benzene (750 ug/L), and arsenic (5.3 ug/L) above cleanup standards of 800 µg/L, 5 µg/L, and 5 µg/L, respectively. Low levels of toluene, ethylbenzene, and xylenes were also detected in soil and groundwater. Soil and water samples from the other probes did not contain petroleum. Low levels of arsenic, lead, nickel, and/or zinc were detected in the groundwater from all five probe locations.

Carcinogenic PAHs were detected in the soil of probes P-GTS2 (0.27 mg/kg) and P-GTS3 (0.47 mg/kg) at 13 and 22 feet bgs, respectively, above the MTCA Method A cleanup level for unrestricted land uses (0.1 mg/kg), but below the MTCA Method A cleanup level for industrial properties (2 mg/kg). Low levels of cPAHs were detected in samples from the other three probes, two of which were placed near a railroad spur on the property. The shallow sample from P-GTS5, placed near the railroad spur, did not contain cPAHs. Low levels of naphthalenes were also detected in the soil from probes P-GTS1, P-GTS2, and P-GTS3. Creosols were not detected.

5.4 Discussion

Diesel- and lube oil-range petroleum hydrocarbons and heavy metals were detected in soil samples collected from the boundary between the east and west parcels above cleanup standards. Diesel- and lube oil- range petroleum hydrocarbons were detected above cleanup standards in the groundwater from the north parcel, and the northern portion of the east parcel. The source of this contamination is unknown; however, the contamination may have originated near the northwest corner of the eastern parcel, where soil contamination was encountered. The groundwater plume appears to be moving northeastward, consistent with the site groundwater gradient.

Heavy metals were also detected above cleanup standards in the soil and groundwater of the probes. This metals contamination likely resulted from former site practices and site fill material.

All three parcels at Water Quality Site # 2 appear to have extensive fill. Landfill or construction debris was observed along the steeply sloping undeveloped portion of the west parcel, and the southern portion of the east parcel. Other locations on the property were filled with up to 11 feet of wood debris, or with sand/silt mixtures with gravel, clay, peat, and/or cobbles.

West Parcel N/A

Carcinogenic PAHs were detected above cleanup standards in the soil of probes P-GTS2 and P-GTS3 on the west parcel. Low levels of cPAHs were detected in samples from the other three probes. Low levels of naphthalenes were also detected in the soil from probes P-GTS1, P-GTS2, and P-GTS3. These cPAHs may be from the site fill.

Gasoline-range petroleum soil and groundwater contamination was encountered on the west parcel to the east of the GTS Drywall building. The source and extent of this contamination is unknown. However, petroleum was not detected in the soil or groundwater of other probes placed on this parcel.

6.0 CONCLUSIONS

Based on explorations conducted at WQ-1 and WQ-2, we offer the following conclusions:

6.1 Proposed Water Quality Site #1

- Five of the initial 11 proposed sample locations were investigated in general accordance with the approved Sampling and Analysis Plan.
- Fill and/or building foundations were encountered in each of the borings. Non-native materials including red brick, asphalt, concrete, burnt and unburnt wood fragments, and roots, were encountered to depths of approximately 8.5 feet bgs.
- Soil with a petroleum odor was encountered in samples from boring B1A, near the location of a former UST cleanup. Although petroleum concentrations in this sample did not exceed cleanup criteria, petroleum-contaminated soil may still be present in the vicinity of the former UST. Although the petroleum detection may not exceed MTCA Method A cleanup levels, soil containing petroleum may require special handling and disposal.
- Diesel-range petroleum hydrocarbons, lube oil-range petroleum hydrocarbons, napthalenes, cPAHs, metals, and/or VOCs were detected at concentrations below cleanup criteria in the samples from borings B1A, B2, B4, and B5A.

6.2 Proposed Water Quality Site #2

- Diesel- and lube oil-range petroleum contamination was encountered in soil and groundwater samples collected from the east and north parcels. The contamination source is unknown, but may have been located in the northwest corner of the eastern parcel. The lateral extent of this contamination is unknown.

- Gasoline-range petroleum contamination was encountered above cleanup standards in soil and groundwater in one probe on the west parcel at around 15.5 feet bgs. Gasoline-range petroleum hydrocarbons were not detected in the soil or groundwater of the other probes. The source and lateral extent of this contamination are unknown.

- Extensive fill was encountered on all three parcels to depths up to 23 feet bgs. Fill on the southern and western portions of WQ-2 consisted of landfill or construction debris including drywall, metal, glass, plastic, wood, etc. Other locations on the property were filled with up to 11 feet of wood debris, or filled with sand/silt mixtures with gravel, clay, peat, and/or cobbles.

- Heavy metals were detected above cleanup standards in soil, and arsenic was detected above the cleanup criterion in the groundwater of the north and east properties. Arsenic was detected above cleanup levels in groundwater of the west property. Heavy metals were also detected below cleanup standards in the groundwater of the west property. These metals may be the result of historical site uses and/or site fill.

- Carcinogenic PAHs were encountered in soil above cleanup standards for unrestricted land uses but below cleanup standards for industrial properties from the undeveloped portion of the western property at depths of 13 and 22 feet bgs. Low levels of naphthalenes were also detected in this area. These cPAHs and naphthalenes may be the result of historical site uses and/or site fill.

7.0 RECOMMENDATIONS

The following recommendations are offered based on the findings of the Preliminary Site Investigation.

- Contingency funds should be set aside to accommodate unforeseen delays and costs related to encountering contamination during construction. The surface soil to be excavated for this project is predominantly fill and a variety of contaminants could be encountered during construction, including heavy metals, petroleum hydrocarbons, SVOCs, VOCs, and pesticides.

- The excavated soil should be segregated, stockpiled, and tested for contaminants prior to disposal.

- All excavations should be monitored for contamination by an environmental consultant, for segregation and to assist with disposition of potentially contaminated soil and groundwater.

- Water quality ponds should be lined the with an impermeable membrane, so water does not infiltrate the soil and potentially spread contamination.

- Site workers will be required to complete their 40-hour Hazardous Waste Operations and Emergency Response training in compliance with Occupational Safety and Health Administration (OSHA) Title 29 Part 1910 Occupational Safety and Health Standards prior to conducting site work. All work should be conducted in compliance with OSHA Title 29 Part 1910 and Washington Labor and Industries (L&I).
- The owner of each property at WQ-2 should be notified of the findings of this study and be provided a copy of applicable portions of this report. We also recommend that the property owner report the release to Ecology. Property owners and facility operators are required by law to report any release (current or historical) of any hazardous substance, including petroleum products to Ecology within 90 days of discovery. This includes any discovery during excavation, or during geotechnical or environmental investigations. In our opinion, the results of this investigation of WQ-2 qualify as reportable concentrations.

8.0 LIMITATIONS

Within the limitations of scope, schedule, and budget, 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 this area.

The scope of work was intended to address only those environmental concerns with significant potential to result in contamination to the subject properties. The sampling effort was considered limited in extent and served as a screening effort only. It was not intended to absolutely define the lateral extent of soil and/or groundwater contamination, if any.

The data presented in this report is based on limited research and sampling at the two sites and should be considered representative at the time of our observations. Other areas of contamination that were not obvious during our site work could be present at the site. 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 WSDOT, Parsons Brinckerhoff, and their respective representatives, and in no way guarantees that any agency or its staff will reach the same conclusions as Shannon & Wilson, Inc. Shannon & Wilson, Inc., has prepared

Appendix D, "Important Information About Your Environmental Report," to help you and others in understanding our reports.

SHANNON & WILSON, INC.

Jennie E. Hardwick
Chemist

JEH:ACT:SWG/jeh

9.0 REFERENCES

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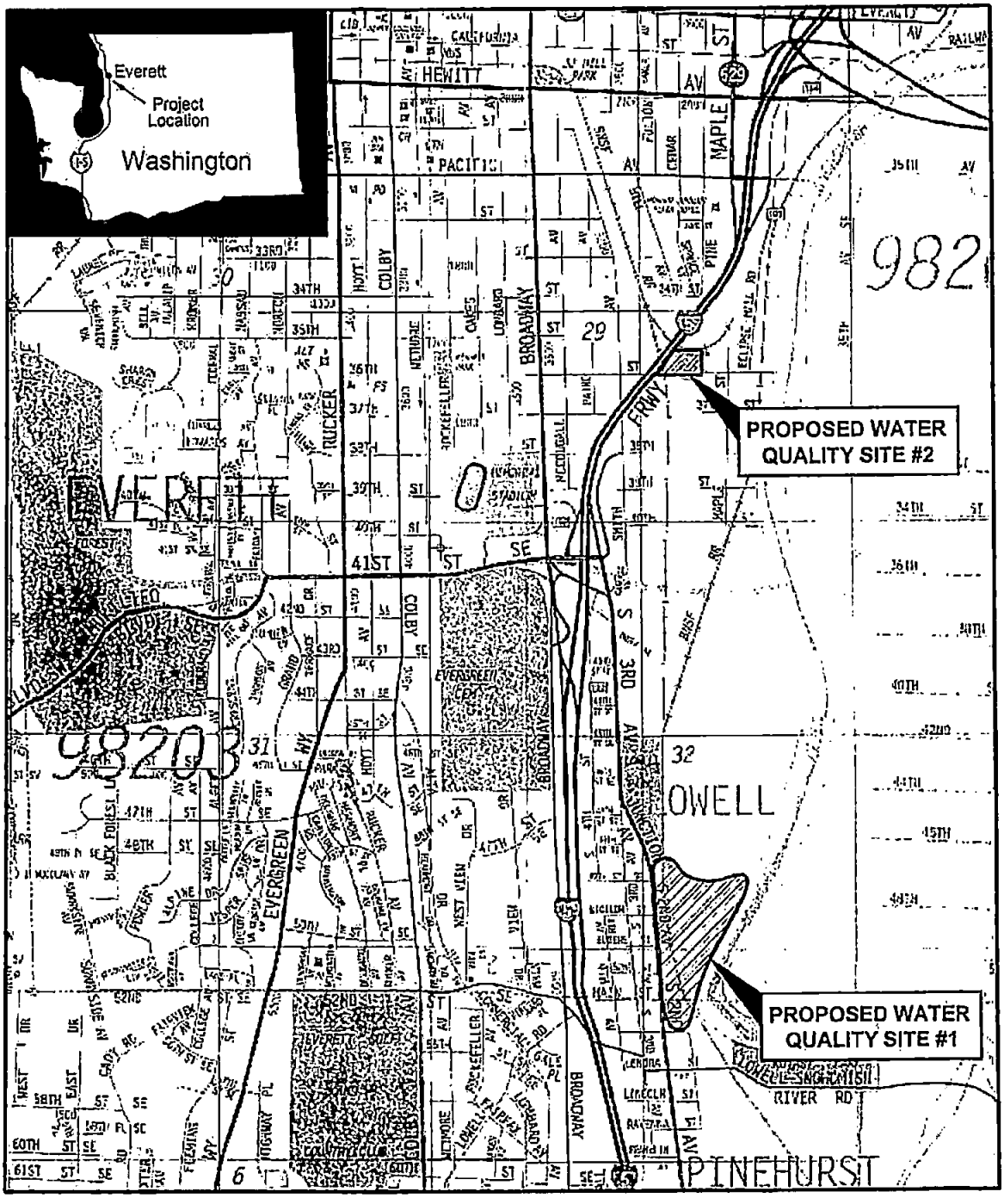

0 1/4 1/2 1

Scale in Miles

NOTE

WSDOT SnoKing Area Project Development
Everett HOV Project
Proposed Water Quality Sites #1 and #2
Everett, Washington

VICINITY MAP

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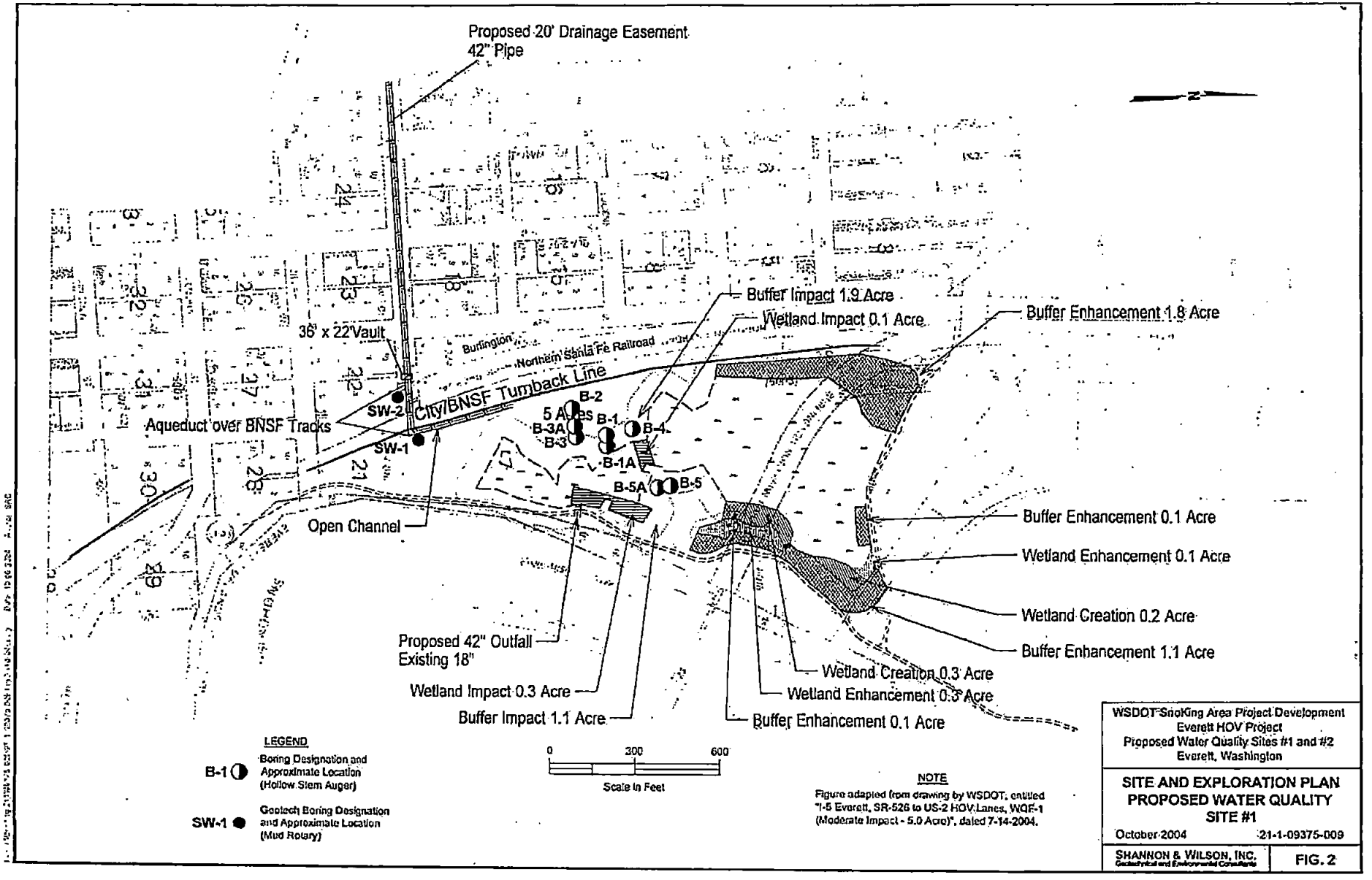
FIG. 1

File: I:\Drafting\21\09375-009\21-1-09375-009 Fig 1 (10-04).dwg Date: 10-06-2004 Author: SAC



WSDOT SnoKing Area Project Development
Everett HOV Project
Proposed Water Quality Sites #1 and #2
Everett, Washington

SITE AND EXPLORATION PLAN
PROPOSED WATER QUALITY SITE #1

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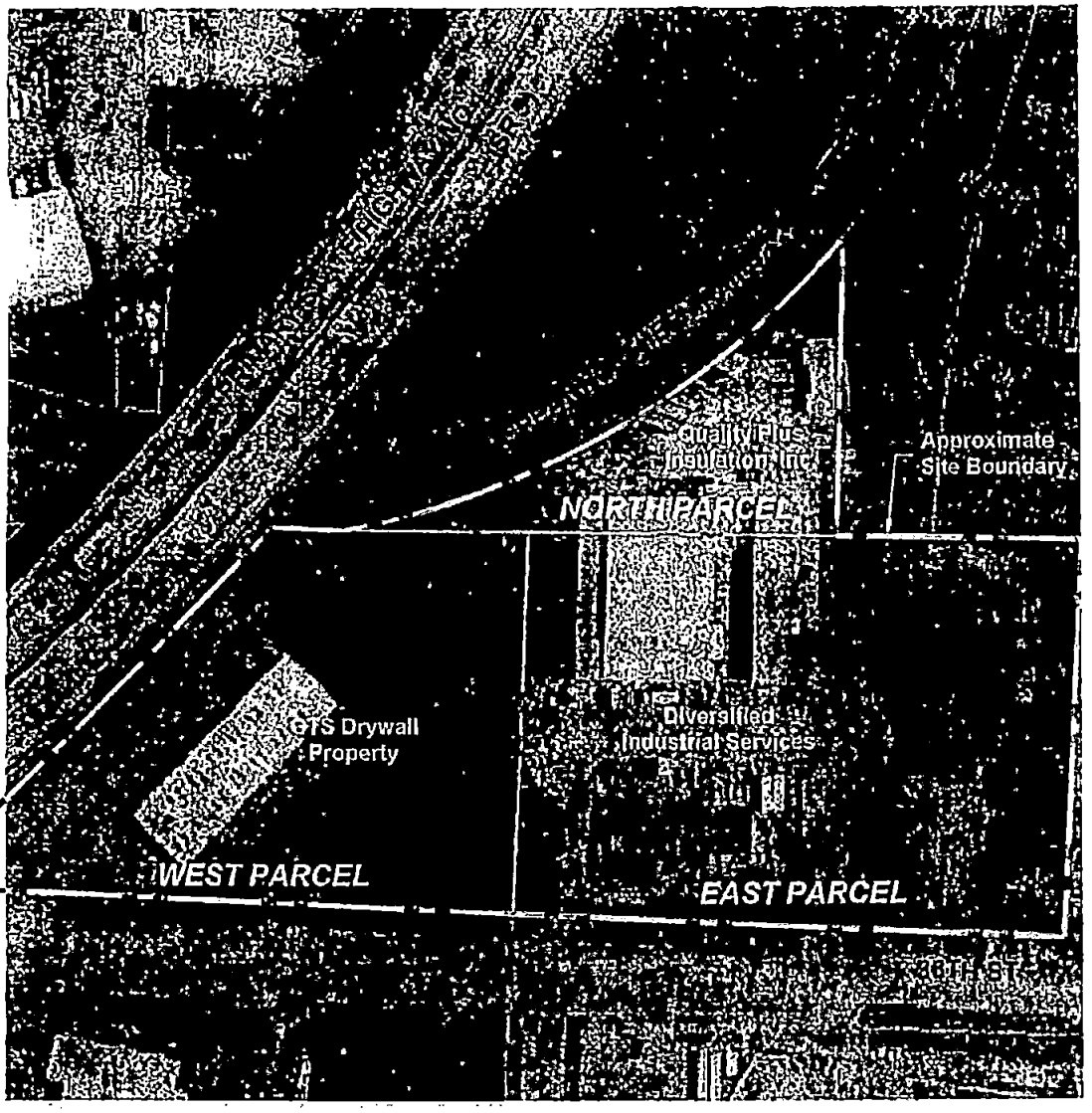
FIG. 2



WSDOT SnoKing Area Project Development
Everett HOV Project
Proposed Water Quality Sites #1 and #2
Everett, Washington

SITE PLAN
PROPOSED WATER QUALITY SITE #2

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FIG. 3

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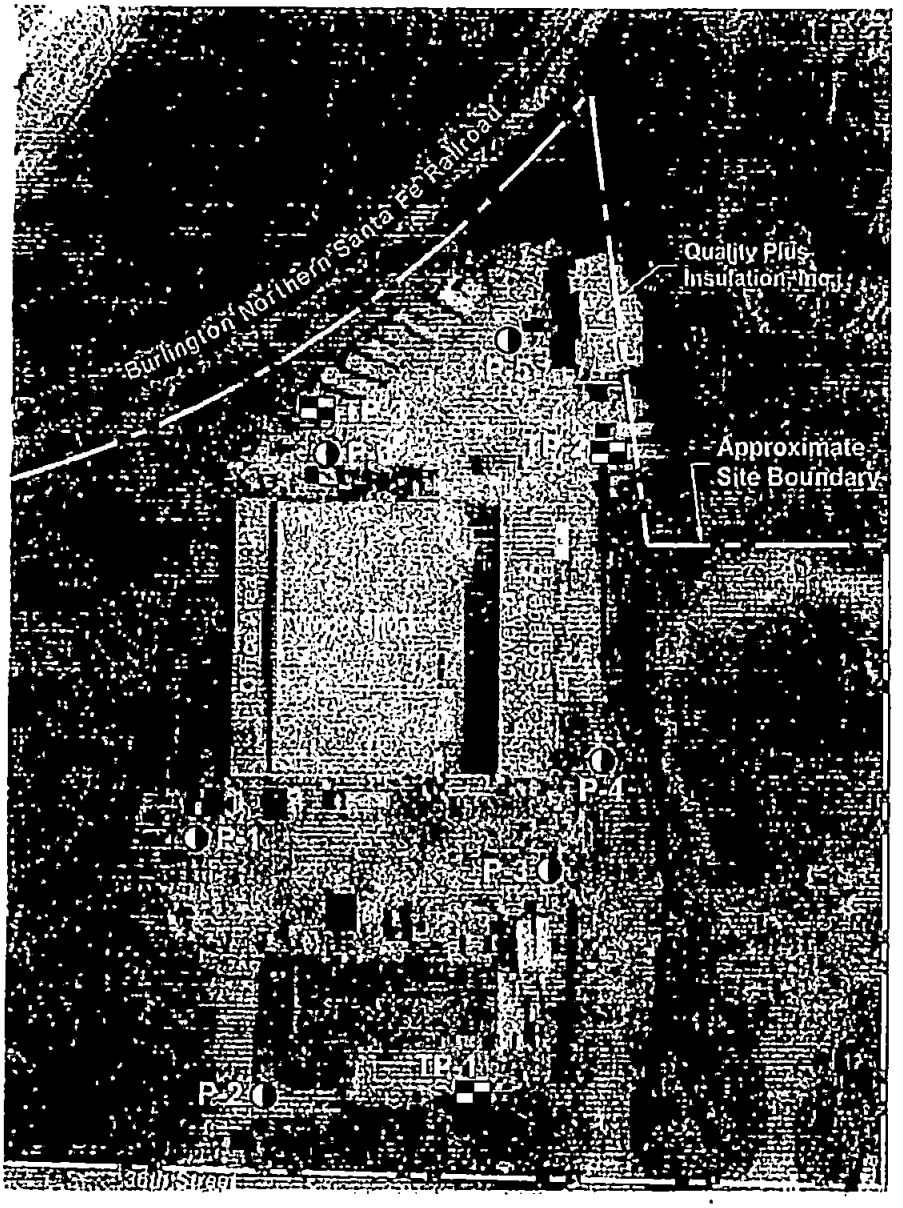

0 100 200

Scale in Feet

LEGEND

P-1 ◑ Probe Designation and Approximate Location

TP-1 ▬ Test Pit Designation and Approximate Location

NOTE

Base map adapted from TerraServer USA.

WSDOT SnoKing Area Project Development
Everett HOV Project
Proposed Water Quality Sites #1 and #2
Everett, Washington

EXPLORATION PLAN
WATER QUALITY SITE #2
NORTH AND EAST PARCELS

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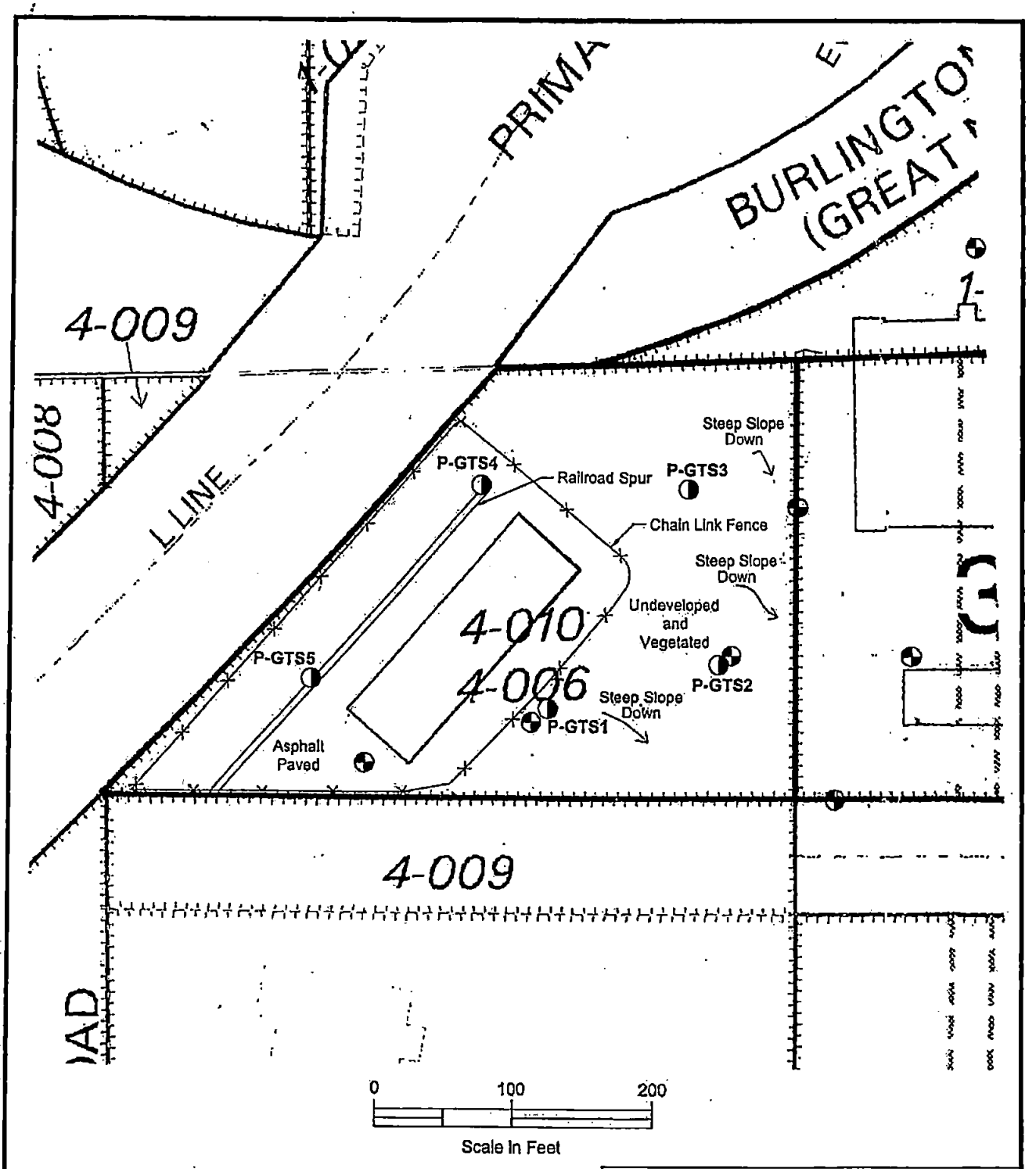
FIG. 4

File: I:\Drafting\21\09375-009\21-1-09375-009 Fig.4 (10-04).dwg Date: 10-06-2004 Author: SAC



LEGEND

Existing Piezometer

P-GTS1 Probe Designation and Approximate Location

NOTE

Base map provided by client.

WSDOT SnoKing Area Project Development
Everett HOV Project
Proposed Water Quality Sites #1 and #2
Everett, Washington

EXPLORATION PLAN
WATER QUALITY SITE #2
WEST PARCEL

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FIG. 5

File: I:\Drafting\21\109375-009\21-1-09375-009 Fig 5 (10-04).dwg Date: 10-08-2004 Author: SAC

APPENDIX A

STANDARD FIELD METHODS AND SUBSURFACE EXPLORATIONS

Stacy Pischer

From: Stacy Pischer
Sent: Tuesday, March 22, 2005 3:41 PM
To: Larry Beard
Subject: Port of Everett Water Quality Site #2

Larry,
I spoke with Jennie Hardwick at Shannon and Wilson. She said that an acid/silica-gel cleanup was performed for soil and groundwater samples but the groundwater samples were not centrifuged.
She is not positive whether the groundwater samples for metal were field filtered but she sort of thinks they were (no documentation to prove one way or another); however, she tells me the lab reported the results as total metals.
As far as she knows, no Phase I site assessment was performed for the properties of concern.

Stacy Pischer, L.G.
Senior Project Geologist
Landau Associates Inc.
Edmonds, WA
425 778 0907

TABLE 1
PROPOSED WATER QUALITY SITE #1
SAMPLING LOCATIONS AND ANALYTICAL TESTING

Boring ID No.	Purpose of Sampling	Sampling Method	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	8270 SVOC Analysis					
										[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B-1	To evaluate soil conditions in proposed pond location	Boring													
B1A	Same as B-1	Boring					1		1	1	1	1	1	1	
B-2	To evaluate soil conditions in proposed pond location	Boring	1		1	1	1	1		1	1	1	1	1	
B-3	To evaluate soil conditions in proposed pond location	Boring													
B3A	Same as B-3	Boring		1									1	1	
B-4	To evaluate soil conditions on west end of the conveyance	Boring		1	1					1	1		1		
B-5	To evaluate soil conditions on east end of the conveyance	Boring													
B5A	Same as B-5	Boring					1		1				1	1	
SW-1	To obtain geotechnical data	Boring													
SW-2	To obtain geotechnical data	Boring					1								1

Notes:
* Added during field investigation at the request of the Washington State Department of Transportation (WSDOT).
NWTPH-Dx = Northwest Total Petroleum Hydrocarbons as Diesel-extended
NWTPH-Gx = Northwest Total Petroleum Hydrocarbons as Gasoline
NWTPH-Gx/BTEX = Northwest Total Petroleum Hydrocarbons as Gasoline with benzene, toluene, ethylbenzene, and xylenes
PAHs = polyaromatic hydrocarbons
PCP = pentachlorophenol
PP Metals = priority pollutant metals
SVOC = semivolatile organic compound
VOCs = volatile organic compounds

TABLE 2
PROPOSED WATER QUALITY SITE #1
SOIL ANALYTICAL TESTING RESULTS

Sample ID	Sample Depth (feet)	Gx/BTEX	[illegible]	Diesel Range	Lube Oil Range	Pesticides	Phenols	Dioxins	pH	Detected Priority Pollutant Metals[1]			
										Cr	Cu	Ni	Zn
B1A-S4	10-11.5	ND	–	54	250	–	ND	–	–	–	–	–	–
B1A-S3	7.5-9	–	–	–	–	–	–	ND	–	–	–	–	–
B2-S2	5-6.5	–	ND	ND	ND	ND	ND	ND	–	46	24	56	45
B3A-S4	9-10.5	–	–	–	–	–	–	–	7.6	–	–	–	–
B4-S1	2.5-4	–	–	–	–	–	ND	ND	10.5	–	–	–	–
B5A-S1	2.5-4	ND	–	ND	600	–	–	–	–	–	–	–	–
MTCA Method A Unrestricted Land Uses		*		2,000	2,000	**	**	**	NA	2000[2]	***	***	***
Metals Background Levels[3]										48.15	36.36	38.19	85.06

Notes:

[1]Priority Pollutant Metals = antimony (Sb), arsenic (As), beryllium (Be), cadmium (Cd), chromium (Cr), copper (Cu), lead (Pb), mercury (Hg), nickel (Ni), selenium (Se), silver (Ag), thallium (Tl), and zinc (Zn).

[2]Cleanup criterion for Chromium III.

[3]90th Percentile Value for Metals in Washington State Soil (C. San Juan, 1994, Natural background soil metals concentrations in Washington State: Prepared by Charles San Juan, Toxics Cleanup Program, Department of Ecology, Olympia, Wash., Publication Number 94-115, October).

* Gasoline: 30 mg/kg; benzene: 0.03 mg/kg; toluene: 7 mg/kg; ethylbenzene: 6 mg/kg; xylenes: 9 mg/kg.

** Cleanup levels listed in MTCA Cleanup Regulation Chapter 173-340 Washington Administrative Code (WAC).

*** Unregulated analyte.

Soil sample results measured in milligrams per kilogram (mg/kg).

– indicates not tested

MTCA = Washington Model Toxics Control Act

NA = not applicable

ND = not detected

NWTPH-Gx/BTEX = Northwest Total Petroleum Hydrocarbons as Gasoline with benzene, toluene, ethylbenzene, and xylenes

TABLE 3
PROPOSED WATER QUALITY SITE #1
SOIL ANALYTICAL TESTING RESULTS
VOLATILE AND SEMIVOLATILE ORGANIC COMPOUNDS

Boring	B1A	B2	B3A	B4	B5A	
Sample Designation	B1A-S1	B2-S2	B3A-S1	B4-S1	B5A-S1	
Sample Depth (feet bgs)	9-10.5	5-6.5	9-10.5	4-5	5-6.5	TEF
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
Constituent						
Detected VOCs (Method 8260B)						
ACETONE	--	0.017	--	0.021	--	NA
CARBON DISULFIDE	--	ND	--	0.0015	--	NA
1,2,4-TRIMETHYLBENZENE	--	0.0012	--	ND	--	NA
NAPHTHALENE	--	0.12	--	0.032	--	NA
Detected SVOCs (Method 8270C)						
1,2,4-TRICHLOROBENZENE	ND	ND	ND	ND	ND	NA
HEXACHLOROBENZENE	ND	ND	ND	ND	ND	NA
NAPHTHALENE	0.014	0.10	--	--	--	NA
1-METHYLNAPHTHALENE	0.12	0.029	--	--	--	NA
2-METHYLNAPHTHALENE	0.049	0.0095	--	--	--	NA
ACENAPHTHYLENE	0.0090	ND	--	--	--	NA
ACENAPHTHENE	0.028	0.034	--	--	--	NA
FLUORENE	0.037	0.060	--	--	--	NA
PHENANTHRENE	0.12	0.063	--	--	--	NA
ANTHRACENE	0.018	0.016	--	--	--	NA
FLUORANTHENE	0.055	0.085	--	--	--	NA
PYRENE	0.059	0.070	--	--	--	NA
BENZO[A]ANTHRACENE	0.024	0.019	--	--	--	0.1
CHRYSENE	0.039	0.023	--	--	--	0.01
BENZO[B]FLUORANTHENE	0.018	0.017	--	--	--	0.1
BENZO[K]FLUORANTHENE	0.014	0.016	--	--	--	0.1
BENZO(A)PYRENE	0.016	0.018	--	--	--	1
INDENO[1,2,3-CD]PYRENE	0.011	0.012	--	--	--	0.1
BENZO[G,H,I]PERYLENE	0.015	0.015	--	--	--	NA
Naphthalenes (Cleanup Level = 5)	**0.18**	**0.14**	--	--	--	NA
cPAHs (Cleanup Level = 0.1)*	**0.023**	**0.02**	--	--	--	NA

Notes:

MTCA Method A cleanup criterion for naphthalenes is 5 mg/kg (total value for naphthalene, 1-methyl naphthalene, and 2-methyl naphthalene).

MTCA Method A cleanup criterion for cPAHs is the sum of cPAHs after applying toxic equivalency factors (TEF).

bold indicates cPAH

* Cleanup level for unrestricted land uses

-- indicates not tested

bgs = below ground surface

cPAHs = carcinogenic polycyclic aromatic hydrocarbons

mg/kg = milligrams per kilogram

MTCA = Washington Model Toxics Control Act

NA = not applicable

ND = not detected

SVOCs = semivolatile organic compounds

VOCs = volatile organic compounds

TABLE 4
PROPOSED WATER QUALITY SITE #2
SAMPLING LOCATIONS AND ANALYTICAL TESTING

Boring ID No.	Purpose of Sampling	Sampling Method	RCRA 8 Metals		Lead & Metals		BTEX		VOCs		NWTPH-Dx		NWTPH-Gx		SVOCs		
			Soil	Water	Soil	Water	Soil	Water	Soil	Water	Soil	Water	Soil	Water	Creosote	PCP	PAHs
P-1	Evaluate off- to on-site contaminant migration and historical site uses	Probe	1	1					1	1	1	1	1	1			
P-2	Evaluate potential contamination from site fill, off- to on-site contaminant migration, and historical site uses	Probe	1	1					1	1	1	1	1	1			
P-3	Evaluate potential contamination from historical site uses	Probe	1	1					1	1	1	1	1	1			
P-4	Evaluate potential contamination from asphalt slurry AST and historical site uses	Probe	1	1					1	1	1	1	1	1			
P-5	Evaluate potential contamination from historical site uses	Probe	1	1					1	1	1	1	1	1			
P-6	Evaluate potential contamination from AST, area of ground surface oil staining, and historical site uses	Probe	1	1					1	1	1	1	1	1			
TP-1	To obtain geotechnical data	Test Pit															
TP-2	To obtain geotechnical data	Test Pit															
TP-3	To obtain geotechnical data	Test Pit					1				1		1				
P-GTS1	Evaluate potential contamination from historical site uses	Probe				1	1	1			1	1	1	1	1	1	1
P-GTS2	Evaluate potential contamination from historical site uses	Probe				1	1	1			1	1	1	1	1	1	1
P-GTS3	To evaluate contamination encountered in P-1	Probe				1	1	1			1	1	1	1	1	1	1
P-GTS4	Evaluate potential contamination from railroad spur, and historical site uses	Probe				1	1	1			1	1	1	1	1	1	1
P-GTS5	Evaluate potential contamination from railroad spur, and historical site uses	Probe				1	2	1			2	1	2	1	2	2	2

Notes:
Historical site uses include a recycling company, sawmill, print shop, and possibly a landfill.
AST = aboveground storage tank
BTEX = benzene, toluene, ethylbenzene, and xylenes
NWTPH-Dx = Northwest Total Petroleum Hydrocarbons as Diesel-extended
NWTPH-Gx = Northwest Total Petroleum Hydrocarbons as Gasoline
RCRA = Resource Conservation and Recovery Act
RCRA 8 Metals = arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver
VOCs = volatile organic compounds

TABLE 5
PROPOSED WATER QUALITY SITE #2
PROBE EXPLORATION
SOIL ANALYTICAL TESTING RESULTS

Sample ID	Sample Depth (ft)	Gasoline Range	Diesel Range	Lube Oil Range	Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver
P1-S2	7-8	ND	ND	ND	ND	210	0.76	27	7.0	1.1	ND	ND
P2-S4	15.5	ND	ND	1,600	ND	160	0.52	55	2,600	0.81	ND	2.8
P3-S3	11.5	ND	ND	ND	ND	95	ND	81	22	ND	ND	ND
P4-S3	11	ND	ND	1,600	30	110	ND	38	ND	ND	ND	ND
P5-S2	6	ND	ND	1,900	ND	98	ND	28	90	ND	ND	ND
P6-S2	7.5	ND	60	390	ND	180	0.76	40	250	ND	ND	ND
MTCA Method A Unrestricted Land Use		100	2,000	2,000	20	*	2	2,000[1]	250	2	*	*
MTCA Method A Industrial Land Use		100	2,000	2,000	20	*	2	2,000[1]	1,000	2	*	*
Metals Background Levels [2]		--	--	--	--	255	--	--	--	--	0.78	0.61

Notes:

[1] Cleanup criterion for Chromium III.

[2] 90th Percentile Value for Metals in Washington State Soil (C. San Juan, 1994, Natural background soil metals concentrations in Washington State: Prepared by Charles San Juan, Toxics Cleanup Program, Department of Ecology, Olympia, Wash., Publication Number 94-115, October).

*No MTCA Method A cleanup criterion is established for this analyte.

Soil sample results measured in milligrams per kilogram (mg/kg).

Shading and bold indicate concentration exceeds MTCA cleanup criteria or metals background levels.

MTCA = Washington Model Toxics Control Act

ND = not detected

TABLE 6
PROPOSED WATER QUALITY SITE #2
PROBE EXPLORATION
DETECTED VOC ANALYTICAL RESULTS

Soil Results	Methyl-tert-Butyl Ether	Benzene	Toluene	Ethylbenzene	Xylenes	Carbon Disulfide	Bromomethane	p-Isopropyltoluene	Acetone	2-Butanone	Trimethylbenzene
P1-S2 (mg/kg)	ND	ND	ND	ND	ND	0.0057	ND	ND	0.81	0.2	0.011
P2-S4 (mg/kg)	ND	ND	ND	ND	ND	ND	ND	ND	0.019	ND	ND
P3-S3 (mg/kg)	ND	ND	ND	ND	ND	0.0043	ND	ND	0.18	0.045	ND
P4-S3 (mg/kg)	ND	ND	ND	ND	ND	0.013	ND	ND	2.6	0.44	ND
P5-S2 (mg/kg)	ND	ND	ND	ND	ND	ND	ND	0.015	1.2	0.22	ND
P6-S2 (mg/kg)	ND	ND	0.0024	ND	ND	ND	ND	ND	0.13	0.023	ND
MTCA Method A*	**	0.03	7	6	9	**	**	**	**	**	**
Groundwater Results	**Methyl-tert-Butyl Ether**	**Benzene**	**Toluene**	**Ethylbenzene**	**Xylenes**	**Carbon Disulfide**	**Bromomethane**	**p-Isopropyltoluene**	**Acetone**	**2-Butanone**	**Trimethylbenzene**
P1-GW (ug/L)	0.79	ND	3.8	ND	ND	ND	ND	ND	ND	ND	ND
P2-GW (ug/L)	ND	3.6	2	0.3	0.92	ND	ND	ND	ND	ND	ND
P3-GW (ug/L)	ND	ND	0.36	ND	ND	0.34	ND	ND	ND	ND	ND
P4-GW (ug/L)	ND	ND	0.36	ND	ND	0.5	ND	ND	ND	ND	ND
P5-GW (ug/L)	ND	ND	0.5	ND	ND	ND	0.26	2.5	ND	ND	ND
P6-GW (ug/L)	ND	ND	1.6	ND	ND	ND	ND	4	7.9	ND	ND
MTCA Method A	**	5	1,000	700	1,000	**	**	**	**	**	**

Notes:
Only detected volatile organic compounds (VOCs) are included in the table.
* Cleanup level for unrestricted land uses
**No MTCA Method A cleanup criterion is established for this analyte.
ug/L = micrograms per liter
mg/kg = milligrams per kilogram
MTCA = Washington Model Toxics Control Act
ND = not detected

TABLE 7
PROPOSED WATER QUALITY SITE #2
PROBE EXPLORATION
GROUNDWATER ANALYTICAL TESTING RESULTS

Sample ID	Gasoline Range	Diesel Range	Lube Oil Range	Metals							
				Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver
P1-GW	ND	ND	ND	ND	63	ND	ND	ND	ND	ND	ND
P2-GW	ND	ND	ND	4.4	100	ND	ND	4.7	ND	ND	ND
P3-GW	ND	ND	[redacted]	[redacted]	150	ND	ND	8.8	ND	ND	ND
P4-GW	ND	ND	[redacted]	[redacted]	240	ND	ND	ND	ND	ND	ND
P5-GW	ND	ND	ND	[redacted]	250	ND	ND	ND	ND	ND	ND
P6-GW	ND	ND	[redacted]	[redacted]	320	ND	ND	3.7	ND	ND	ND
MTCA Method A	1000	500	500	5	*	5	50	15	2	*	*

Notes:
*No MTCA Method A cleanup criterion is established for this analyte.
Shading and bold indicate concentration exceeds MTCA cleanup criteria or metals background levels.
Water sample results measured in micrograms per liter (ug/L).
MTCA = Washington Model Toxics Control Act
ND = not detected

TABLE 8
PROPOSED WATER QUALITY SITE #2
TEST PIT EXPLORATION
SOIL ANALYTICAL TESTING RESULTS

Sample ID	Sample Depth (feet)	Gasoline	Benzene	Toluene	Ethylbenzene	Xylenes	Diesel Range	Lube Oil Range	Comments
TP3-SP1	0.5	ND	ND	ND	ND	ND	52	670	Collected from stockpile
TP3-5'	5	ND	ND	ND	0.23	0.91	1300	780	Collected from test pit
MTCA Method A Unrestricted Land Use		100	0.03	7	6	9	2,000	2,000	–

Notes:
Soil sample results measured in milligrams per kilogram (mg/kg).
MTCA = Washington Model Toxics Control Act
ND = not detected

TABLE 9 GTS Drywall
PROPOSED WATER QUALITY SITE #2, WEST PROPERTY
SOIL ANALYTICAL TESTING RESULTS

Sample ID	Sample Depth (feet)	Gasoline	Benzene	Toluene	Ethylbenzene	Xylenes	Diesel Range	Lube Oil Range
P-GTS1-S4	15.5	35	0.59	0.16	1.7	3.07	ND	79
P-GTS2-S4	13	ND	ND	ND	ND	ND	ND	460
P-GTS3-S6	22	ND	ND	ND	ND	ND	ND	130
P-GTS4-S1	0.3	ND	ND	ND	ND	ND	ND	140
P-GTS5-S1	0.3	ND	ND	ND	ND	ND	ND	180
P-GTS5-S2	7.5	ND	ND	ND	ND	ND	ND	ND
MTCA Method A Unrestricted Land Use and Industrial Properties		30	0.03	7	6	9	2,000	2,000

Notes:
Soil sample results measured in milligrams per kilogram (mg/kg)
Bold indicates above MTCA cleanup level
MTCA = Washington Model Toxics Control Act
ND = not detected

TABLE 10 GTS Drywall
PROPOSED WATER QUALITY SITE #2, WEST PROPERTY
SOIL ANALYTICAL TESTING RESULTS
SEMIVOLATILE ORGANIC COMPOUNDS

Probe	P-GTS1	P-GTS2	P-GTS3	P-GTS4	P-GTS5	P-GTS6	
Sample Designation	P-GTS1-S4	P-GTS2-S4	P-GTS3-S6	P-GTS4-S1	P-GTS5-S1	P-GTS6-S2	
Sample Depth (feet bgs)	16.5	15	24	0.4	0.3	2.5	
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
Constituent							TEF
o-Cresol	ND	ND	ND	ND	ND	ND	NA
m,p-Cresol	ND	ND	ND	ND	ND	ND	NA
NAPHTHALENE	0.052	0.015	0.02	ND	ND	0.01	NA
2-METHYLNAPHTHALENE	ND	0.01	0.016	ND	ND	ND	NA
1-METHYLNAPHTHALENE	ND	ND	0.013	ND	ND	ND	NA
ACENAPHTHYLENE	0.013	0.052	0.038	ND	ND	ND	NA
ACENAPHTHENE	ND	ND	ND	ND	ND	ND	NA
FLUORENE	ND	0.014	ND	ND	ND	ND	NA
PENTACHLOROPHENOL	ND	ND	ND	ND	ND	ND	
PHENANTHRENE	0.054	0.23	0.27	0.011	ND	0.16	NA
ANTHRACENE	ND	0.032	0.053	ND	ND	ND	NA
FLUORANTHENE	0.09	0.34	0.57	0.021	ND	0.024	NA
PYRENE	0.087	0.36	0.51	0.024	ND	0.021	NA
BENZO[A]ANTHRACENE	0.035	0.12	0.32	0.01	ND	0.0091	0.1
CHRYSENE	0.064	0.22	0.4	0.018	ND	0.015	0.01
BENZO[B]FLUORANTHENE	0.055	0.26	0.47	0.011	ND	0.012	0.1
BENZO[K]FLUORANTHENE	0.056	0.091	0.15	0.012	ND	0.011	0.1
BENZO(A)PYRENE	0.061	0.21	0.35	0.013	ND	0.0087	1
INDENO[1,2,3-CD]PYRENE	0.051	0.15	0.21	0.0084	ND	0.0092	0.1
DIBENZ[A,H]ANTHRACENE	0.015	0.042	0.078	ND	ND	ND	NA
BENZO[G,H,I]PERYLENE	0.068	0.21	0.25	0.011	ND	0.013	NA
Naphthalenes (Cleanup Level = 5)	**0.052**	**0.025**	**0.049**	**ND**	**ND**	**0.01**	NA
cPAHs (Cleanup Level = 0.1 for unrestricted land uses, and 2 for industrial properties)	**0.08**	**0.27**	**0.47**	**0.017**	**ND**	**0.013**	NA

Notes:

MTCA Method A cleanup criterion for naphthalenes is 5 mg/kg (total value for naphthalene, 1-methyl naphthalene, and 2-methyl naphthalene).

MTCA Method A cleanup criterion for cPAHs is the sum of cPAHs after applying TEFs.

bold indicates cPAH

bgs = below ground surface

cPAHs = carcinogenic polycyclic aromatic hydrocarbons

mg/kg = milligrams per kilogram

MTCA = Washington Model Toxics Control Act

NA = not applicable

ND = not detected

TEF = toxic equivalency factor

TABLE 11
GTS Drywall
PROPOSED WATER QUALITY SITE #2, WEST PROPERTY
GROUNDWATER ANALYTICAL TESTING RESULTS

Sample ID	Gasoline	Benzene	Toluene	Ethylbenzene	Xylenes	Diesel Range	Lube Oil Range	Detected Priority Pollutant Metals[1]			
								Arsenic	Lead	Nickel	Zinc
P-GTS1-GW	13,000	750	63	540	459.1	ND	ND	53	3.6	42	28
P-GTS2-GW	ND	ND	ND	ND	ND	ND	ND	ND	3.1	ND	460
P-GTS3-GW	ND	ND	ND	ND	ND	ND	ND	4.4	ND	27	29
P-GTS4-GW	ND	ND	ND	ND	ND	ND	ND	4.8	3.4	ND	31
P-GTS5-GW	ND	ND	ND	ND	ND	ND	ND	4.8	3.2	ND	ND
MTCA Method A	800	5	1,000	700	1,000	500	500	5	15	*	*

Notes:

[1]Priority Pollutant Metals = antimony, arsenic, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, thallium, and zinc.

*No MTCA Method A cleanup levels for this analyte

Soil sample results measured in micrograms per liter (ug/L)

Shading and bold indicate concentrations above MTCA cleanup level

MTCA = Washington Model Toxics Control Act

ND = not detected