NW 2704
Sound transit Brooklyn Station area
Seattle.

Work Plan
Remedial Investigation/Feasibility Study
1000 NE 45th Street
Seattle, Washington

March 7, 2013

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

Excellence. Innovation. Service. Value.
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Submitted To:
Mr. Mark Menard
Sound Transit
401 South Jackson Street
Seattle, Washington 98104-2826

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

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WORK PLAN
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
1000 NE 45TH STREET
SEATTLE, WASHINGTON

1.0 INTRODUCTION

Shannon & Wilson, Inc. (S&W) is pleased to submit this Work Plan for completing the Remedial Investigation (RI)/Feasibility Study (FS) for the property located at 1000 NE 45th Street (Site) located in Seattle, Washington. It was previously identified as the Former Key Bank Site in our Phase II Environmental Site Assessment (ESA) report (2012a). S&W is conducting our investigations under Sound Transit Work Directive #9, Contract No. RTA/LR 164-09, authorized by Roger Hansen on August 6, 2012. The site location is shown in Figure 1.

1.1 Project Background

An RI/FS is planned to support remedial action and regulatory negotiations, in anticipation of future redevelopment/sale of the property. Implementation of the first phase of remediation is anticipated to be accomplished by 2014. In situ remediation operations, if necessary, will be conducted while the site is used as a construction management (CM) office during Sound Transit North Link tunnel and station construction.

1.2 Objective

Previous environmental investigations conducted at the property identified several chemicals in soil and groundwater at concentrations that exceed cleanup levels for unrestricted site use as established under the Washington State Model Toxics Control Act (MTCA). The RI will assist in determining if the two areas of contamination would each be considered a separate "site" where hazardous substances have come to be located, as defined by the MTCA (Washington Administrative Code [WAC] 173-340).

This Work Plan has been prepared to guide the RI and to support discussions with Sound Transit and the Department of Ecology (Ecology). Sound Transit is conducting this work under the Voluntary Cleanup Program (VCP).

The objective of this RI/FS is to meet the requirements identified in the MTCA Cleanup Regulation (WAC173-340). The RI is designed to characterize site conditions in order to

complete a FS and select a cleanup action as described in WAC 173-340-360 through 173-340-390.

1.3 Site Identification

The scope of services described in this Work Plan is designed to gather information required for a RI/FS study. This Work Plan presents the approach to address occurrences of gasoline-range petroleum hydrocarbons (TPH-G) and halogenated volatile organic compounds (HVOCs) that have been identified at the Site. The Site was reported to Ecology for inclusion on the Confirmed and Suspected Contaminated Sites List. In November 2012, Ecology assigned the Site a Cleanup Site #12019. Ecology has also assigned the Site a Resources Conservation and Recovery Act (RCRA) Dangerous Waste Site Identification Number WAD058364647, as a generator of dangerous waste. Investigation-derived waste (IDW) from initial site investigations required disposal under the RCRA program. Spoils from drilling and rinse water were contaminated with spent solvents from a dry-cleaning operation, which required disposal as a Listed- Dangerous Waste (F002).

1.4 Work Plan Organization

This Work Plan is prepared using the United States Environmental Protection Agency's (EPA's) Guidance for Conducting Remedial Investigations and Feasibility Studies under the Comprehensive Environmental Response, Compensation, and Liability Act (Office of Solid Waste and Emergency Response Directive 9355.3-01) as a reference for work plan organization and content. The organization of the Work Plan is presented below:

- Section 1: Introduction – background, objective, work plan organization, and regulatory framework
- Section 2: Site Background and Physical Setting – description and history of operations and environmental setting
- Section 3: Initial Evaluation – summary of previous investigation, known and expected contaminants, and the conceptual site model (CSM)
- Section 4: Regulatory Requirements
- Section 5: Work Plan Rationale and Technical Approach – data quality objective needs and general approach, sample collection and analysis, and data validation and evaluation
- Section 6: Selection and Description of Potential Cleanup Alternatives
- Section 7: Project Management – schedule and project management staff

Boring logs from previous investigations are presented in Appendix A. The Sampling and Analysis Plan describing procedures to collect and analyze representative samples of the contaminated media is included as Appendix B. The site-specific Health and Safety Plan is found in Appendix C. Tables and figures from our Phase II ESA conducted for the Site are presented in Appendix D. Data from the Shell Oil site, which is crossgradient/downgradient of the Site is presented in Appendix E.

2.0 SITE BACKGROUND AND PHYSICAL SETTING

2.1 Site Background

The Site is located at 1000 NE 45th Street in Seattle, Washington (Figure 1). It is occupied by a one-story building, with canopies located on its north and south sides. The property encompasses an area of about ½ acre and is surrounded by a paved parking lot. A north-south-trending alley divides the parcel into two parts, an east side and a west side; the west side is larger of the two. The parking lot extends to the area east of the alley. Numerous subsurface utilities are located in the alley. The Site is located at the south end of the city block and is bordered by Roosevelt Way to the west, NE 45th Street to the south, and 11th Avenue NE to the east; site topography dips to the southeast.

Historically, the property was used by commercial businesses. The locations of former buildings, as well as the existing building, are shown in Figure 2. The west side of the property was once used as a service station. A laundry, which also appears to have performed dry-cleaning activities, was located on the east side of the property. From 1953 until 1961, a used car dealership operated on the entire site, and from 1961 until 1971, a drive-in restaurant occupied the site. In 1972, the existing bank building with drive-through teller configuration and parking was constructed; it was last occupied by Key Bank. Sound Transit acquired the property in 2001.

An ESA conducted in 2011 confirmed that soil and groundwater on the property were contaminated (S&W, 2012a). A preliminary evaluation of remedial alternatives was also prepared (S&W, 2012b). The first phase of the RI was conducted in the fall/winter of 2012/2013; results from the first phase have not yet been reported.

2.2 Geology and Hydrogeology

2.2.1 Subsurface Soils

Subsurface conditions at the site have been interpreted from available geoprobe and boring logs completed during a Phase II ESA investigation and additional site characterization (S&W, 2012a). Figure 2 shows the exploration locations, and Appendix A includes the soil boring logs. Site monitoring wells were surveyed by Lin Associates. Subsurface information from the Shell Oil site, located approximately 100 feet south of the Site, at 1013 NE 45th Street, was also reviewed. Appendix E includes a site plan, soil boring logs and well completion details, groundwater contours, analytical results, and survey data from the Shell Oil site.

Fill soils underlie much of the Site and are between 4.5 and 14 feet thick. The fill soils consist primarily of dense, gravelly, fine to medium sand, containing scattered debris. This fill is underlain by a Vashon glacial till and diamict (till-like) deposits. At the Site and in nearby borings to the south (Shell Oil), this till/diamict unit extends to depths of between 36 and 53 feet below ground surface (bgs). Beneath the till\diamict unit are Vashon glacial outwash sediments, which consist of very dense, slightly silty to silty sand with gravels to sandy silt with gravels and scattered cobbles. Interspersed within these sediments are interbeds of cleaner, fine to medium sand. Based on nearby borings advanced for design of the Sound Transit, North Link commuter rail line, a hard, silty clay to clay (glaciolacustrine clay) underlies the Vashon glacial deposits. The clay layer is discontinuous but can be up to 20 feet thick.

Geologic cross section profile transects for the site are displayed in Figure 3. Three geologic sections (A-A', B-B', and C-C') show the interpreted subsurface conditions along profiles north-south (from MW-2 to MW-10), west-east (from MW-1 to B-8), and northwest-southeast (from MW-6 to MW-12), respectively (Figures 4, 5, and 6). Five Vashon units (glacial) have been identified in Site explorations.

Unit Name	Abbrev.	General Unit Description	Soil Description
VASHON UNITS			
Recessional Outwash	Qvr	Glaciofluvial sediment deposited as glacial ice retreated	Clean to silty Sand, gravelly Sand, sandy Gravel; cobbles and boulders common; loose to very dense
Ice-Contact Deposits	Qvi	Heterogeneous soils deposited against or adjacent to ice during the wasting of glacial ice; commonly reworked	Stratified to irregular bodies of Gravel, Sand, Silt, and clay; loose to dense
Till	Qvt	Lodgment till laid down along the base of the glacial ice	Gravelly silty Sand, silty gravelly Sand ("hardpan"); cobbles and boulders; very dense
Till-like Deposits (diamict)	Qvtm	Glacial deposit intermediate between till and outwash, subglacially reworked	Silty gravelly Sand, silty Sand, sandy Gravel; highly variable over short distances; cobbles and boulders common; dense to very dense
Advance Outwash	Qva	Glaciofluvial sediment deposited as the glacial ice advanced through the Puget Lowland	Clean to silty Sand, gravelly Sand, sandy Gravel; dense to very dense

Note:
[a] The geologic units are interpretive and based on our opinion of the grouping of complex sediments and soil types into units appropriate for the project. The description of each geologic unit includes only general information regarding the environment of deposition and basic soil characteristics. For example, cobbles and boulders are only included in the description of those units where they are most prominent.

2.2.2 Shallow (Perched) Groundwater Conditions

Shallow (perched) groundwater has been measured in four of the five on-site shallow monitoring wells at depths between 16.2 and 22.4 feet bgs (Table 1). The shallow zone well depths range between 24 and 30 feet. Shallow groundwater is not present in the 30-foot-deep well MW-13, which is located approximately 20 feet downgradient (southeast) of the suspected underground storage tank (UST). However, shallow groundwater exists in well MW-1 (located in the southwest corner of the Site) at 16.2 feet bgs (elevation 166.1 feet), and in well MW-11 (located along the Site's southern boundary) at 22.7 feet bgs (elevation 157.3 feet) (Figure 7). The apparent groundwater flow direction at the Site is east-southeast. The shallowest groundwater depth measured during drilling was in geoprobe GP-3 at a depth of 13.6 feet bgs. This perched groundwater level is likely associated with coarse backfill surrounding the USTs. Groundwater was not detected in the other 48 geoprobe borings driven to similar depths.

At the Shell Oil site, the depth to groundwater in the five on-site monitoring wells in August 2011 were between 8 and 10 feet bgs (elevations 161 to 169 feet), and the local flow direction was to the southwest (Appendix E, Figure 4A). The local shallow groundwater flow

appears to be influenced by the UST basin. Therefore, the Shell Oil site perched groundwater levels are generally higher than those at the Key Bank site.

Overall, the available data indicate that groundwater in the shallow soil units is discontinuous across the Site and the area to the immediate south:

- Beneath the Site, the underlying till that perches the shallow groundwater appears to pinch out to the east of the suspected eastern UST.
- Perched groundwater encountered in or near the UST basins on the northern part of the Shell Oil site is approximately 2 feet higher than beneath the Site.
- Although some interbedded wet lenses were identified, continuous shallow groundwater is not present in several borings advanced outside the UST basins at the Shell Oil site, and east of the Shell Oil site (Appendix E, MW-23, MW-24 and MW-25).

2.2.3 Deep Groundwater Conditions

The four deep groundwater monitoring wells at the Site consist of three completed at similar depths (MW-6, MW-10, and MW-12 to elevations between 139 and 123 feet), and one well completed at a shallower depth (MW-3 screened between elevations 154 and 143 feet). However, the subsurface soils and groundwater conditions are variable between these wells:

- The groundwater elevations in three of the four deep wells range between 140 and 143 feet. The groundwater elevation in MW-6 is between 15 and 18 feet higher than the elevations in the other three deep wells.
- Soil observed in MW-6 included a 10-foot-thick, dense silt layer above the deep aquifer; this layer appears to highly confine the deep groundwater.
- A thinner (3-foot-thick) confining layer exists at well MW-10 in which the groundwater level is approximately 3.5 feet above the top of the well screen.
- No confining layer exists at wells MW-12 and MW-3, and the groundwater appears to be under unconfined conditions. Well MW-3 is screened in a shallower lens of wet sand and contains very little water. Therefore, we do not believe that the measured groundwater level is representative of the deep aquifer.

At the adjacent Shell Oil site, nine groundwater monitoring wells are completed in the deep aquifer. The groundwater levels in these wells in August 2011 ranged between elevations 145 and 137 feet, and the groundwater flow was to the east-southeast (Appendix E; Figure 4B).

When considering the deep aquifer groundwater levels for the Site (wells MW-10 and MW-12), the interpreted local groundwater flow direction is to the east (Figure 4).

Table 1 summarizes the project site monitoring well construction details and groundwater elevation data. Appendix E contains borehole logs and survey information for the Shell Oil site.

The nearest registered water well is located more than ½ mile southwest of the site. A resource protection well exists more than ½ mile southeast of the site on the University of Washington campus, but was previously incorrectly identified as a water supply well. The nearest downgradient surface water body is Portage Bay, approximately 1 mile south of the site.

2.3 Soil and Groundwater Contamination at the Shell Oil Property

The Shell Oil station reported a contaminant release to soil and groundwater in 1990. Shell Oil entered the Ecology VCP in 2008 (Shell Station 120441, Facility ID 51994197). In 2011, Shell Oil submitted a subsurface investigation report summarizing past activities and presenting recent soil and groundwater testing results (Conestoga-Rovers & Associates [CRA], 2011). Soil and groundwater still contain gasoline and related VOCs contamination at levels above MTCA Method A cleanup levels. According to the 2011 CRA report, groundwater has not been tested for HVOCs. Although select soil samples were tested for the full VOC scan, HVOCs have not been noted as a contaminant of concern at the Shell Oil station site.

Our review of available information for the Shell Oil site found the following:

- A soil vapor extraction (SVE) system, two groundwater recovery wells, and 24 monitoring wells were installed in 1992.
- The SVE system was decommissioned in 1996 because the system was no longer effectively removing hydrocarbons from soil.
- Groundwater monitoring was conducted at least annually between 1993 and 2011. However, not all results were submitted to Ecology.
- The groundwater monitoring data for five wells indicate that a shallow perched groundwater zone exists between approximately 5 to 15 feet bgs. It is uncertain whether this perched unit is the same as that identified on the NE 45th Street site.
- The Shell Oil site has 13 deep monitoring wells ranging in depth from 35 to 53 feet bgs. The groundwater elevations in August 2011 ranged between 145 and 137 feet; these are similar to those recorded in the Site's deep wells MW-10 and MW-12. The interpreted groundwater flow direction at Shell Oil is to the east-southeast (Appendix E, Figure 4B).

- Deep monitoring wells are installed south of NE 45th Street between the west side of the Shell Oil site and the alley located between 11th Avenue NE and 12th Avenue NE (Appendix E, Figure 4B). In 2011, Shell Oil attempted to install another well in the right-of-way within 11th Avenue NE, but suitable locations were not identified due to the presence of subsurface utilities.

3.0 INITIAL EVALUATION

3.1 Contaminants of Potential Concern (COPCs)

Previous environmental evaluations conducted at the property have identified several COPCs in soil and groundwater at concentrations that exceed cleanup levels for unrestricted site use as established under MTCA. The two areas of contamination are as follows:

- **Former Service Station on the West Side of the Property:** Petroleum-related soil and groundwater contamination has been encountered on the west side of the property at levels exceeding MTCA Method A cleanup levels. Based on geophysical surveys, more than one UST, the likely source of contamination, is located in the vicinity of the former station. Gasoline has been detected in groundwater at concentrations exceeding the MTCA Method A cleanup level at the southern property boundary (downgradient). HVOCs have been encountered in soil beneath the building, and may be related to degreasing activities at the former service station.
- **Former Dry-Cleaning Operation on the East Side of the Property:** A former laundromat appears to have conducted dry-cleaning activities on the east side of the property. HVOCs associated with dry-cleaning solvents were encountered in soil and groundwater on the east side of the property at levels greater than MTCA Method A cleanup levels. The HVOC concentrations are highest near an anomaly, located north of the former laundromat that was detected during the geophysical survey. The anomaly is possibly a UST or a buried drum.

3.2 Phase II Environmental Site Assessment (ESA)

A Phase II ESA was conducted at the Site in the fall of 2011 (S&W, 2012a). As part of this study, a geophysical survey was conducted to identify whether USTs were present. Four large unknown metal objects that may be USTs and seven smaller unknown metal objects were identified. One anomaly is located west of the former service station, and a second anomaly is located north of the former dry-cleaning operation. The anomalies are in are areas of higher contamination suggesting that they are related to the source areas.

Geoprobes (GP-) were advanced adjacent to the anomalies. The probes were advanced until dense soil prevented borehole advancement. One soil sample was collected from the bottom of

each of the probe explorations for environmental testing. Based on these results, three groundwater monitoring wells were installed (MW-1, MW-2, and MW-3). In well MW-1, soil samples for environmental testing were collected at 13 feet bgs, and the water table interface. Because contaminants were detected at various depths in probes advanced on the east side of the Site, soil samples from wells MW-2 and MW-3 were analyzed for potential contaminants more frequently; samples were analyzed at 5-foot intervals. Soil and groundwater samples collected from the probes, soil borings, and monitoring wells were analyzed for petroleum hydrocarbons (gasoline, diesel, and oil ranges), MTCA metals (arsenic, cadmium, chromium, lead, and mercury), and volatile organic compounds (VOCs). Select soil samples were also analyzed for polychlorinated biphenyls (PCBs) because of elevated oil-range petroleum hydrocarbon concentrations. Two samples were analyzed for Toxicity Characteristic Leaching Procedure for tetrachloroethene (PCE) for disposal characterization. The testing program is summarized in Tables 2 and 3.

3.3 Remedial Investigation (RI) (First Phase)

To further evaluate contaminant distribution and subsurface conditions, additional site characterization was conducted in the fall/winter of 2012/2013. This study was conducted in three mobilizations: a geoprobe effort of the parking lot, followed by monitoring well installation, followed by a geoprobe study of soil beneath the building. The first effort was completed to inform placement of well pairs, to be installed in shallow and deep water. Twenty-four geoprobes (KB-) were advanced in the vicinity of the two source areas to evaluate the distribution of contaminants in shallow soil. Three to five samples from each of the probes were analyzed for COPCs. As shown in Figure 2, two angle borings were advanced under the existing bank building (B-4 and B-5) to evaluate potential COPCs beneath the building. Five probes were then advanced through the floor slab to evaluate if soil beneath the building could be a potential source of gasoline, BTEX, and HVOCs. Two to three soil samples were collected from each probe.

Monitoring well pairs were advanced: adjacent to the alley (MW-10/MW-11); between the two suspected source areas (MW-6/MW-7); and on the east side of the Site (MW-12/MW-13). The wells, installed in separate boreholes, were completed in the shallow perched groundwater (MW-7, MW-11, and MW-13) and the deeper aquifer (MW-6, MW-10, and MW-12). To avoid connecting the two aquifers, the deep wells were drilled to a depth of approximately 30 feet using a large-diameter auger. A bentonite seal was placed in the bottom of the hole and the hole was then advanced through the seal using a smaller diameter auger. Soil samples for

environmental testing were collected at 5-foot intervals. The shallow well was installed adjacent to the deep monitoring well without collecting soil samples.

Monitoring well pair MW-10/MW-11 was located cross-gradient of the suspect UST on the east side and downgradient of the UST and the bank building on the west side. Monitoring well pair MW-6/MW-7 was located cross-gradient to the potential source areas. Soil samples collected from these borings were analyzed for gasoline and related VOCs, as well as HVOCs. Select soil samples were also analyzed to evaluate the aromatic and aliphatic fractions in the gasoline. Shallow groundwater was not encountered at the east property boundary, downgradient of the suspect UST (borehole B-8); consequently, the monitoring well pair (MW-12/MW-13) was moved west with the objective of installing a well in the shallow aquifer. Although lenses of wet sand were observed, no water was present in the well, which was screened in the interval between 15 and 30 feet bgs (MW-13). The explorations on the east side were analyzed for HVOCs. Select soil samples from both sides of the site were analyzed for grain size. A slight gasoline odor was noted in groundwater collected from well MW-12; consequently, the groundwater was tested for gasoline and related VOCs. Groundwater was also tested for iron, manganese, nitrate, and sulfate, and water quality parameters that affect design of the remedial alternatives. Selected analytical testing is summarized in Tables 2 and 3.

3.3.1 West Side of Site

On the west side of the property, petroleum and related VOCs were detected west to southwest of USTs associated with the former service station (Figure 2). Diesel and oil were detected in soil samples at concentrations below the MTCA Method A cleanup level; no PCBs were detected, where analyzed. Gasoline, as well as benzene, was detected near the USTs at concentrations above their respective MTCA cleanup levels of 30 milligrams per kilogram (mg/kg) and 0.03 mg/kg. An HVOC, 1-2-dichloroethene, was detected in a single soil sample collected near the UST. No other HVOCs were detected in soil samples collected on the west side of the site except beneath the building, as discussed below. Gasoline was not detected in soil samples collected from well MW-1, installed at the southern property boundary. The highest concentration of gasoline, at 10,000 mg/kg, was encountered in probe KB-102, located near the southwest corner of the building. Tables 4 and 5 summarize HVOC, gasoline, and benzene, ethylbenzene, toluene and xylenes (BTEX) results from previous investigations. Metal concentrations, including lead, were within the range of concentrations typically encountered in Washington (Dragun and Chaisson, 1991), indicating that lead had not been an added to the gasoline. Tables and figures summarizing results from the Phase II ESA are presented in Appendix D.

Two angle borings were advanced beneath the building until shallow water was encountered at approximate depths of 22 and 27 feet bgs (true depth). Gasoline and BTEX contamination extended to a depth of approximately 19 feet in both borings. The deepest sample in each boring was analyzed for HVOCs to evaluate if the soil at the water table was contaminated. HVOCs were detected; consequently, shallower samples were also tested for HVOCs. The highest concentration of PCE (1.3 mg/kg) was detected in a sample collected at a true depth of 7.8 feet bgs (B-5). Five geoprobes (KB-81 to KB-85) were subsequently advanced through the floor of the bank building to assess the HVOC and petroleum contamination beneath the building (Figure 2). PCE was detected in all of the probe locations at concentrations that ranged from 0.01 mg/kg to 0.93 mg/kg (KB-84 at a depth of 5 feet below the slab). The highest concentrations of HVOCs were encountered in probes advanced within the footprint of the former service station building, suggesting that the source was likely associated with the service station. At the range of concentrations encountered, it appears that the HVOC contamination may have been a diluted liquid, possibly related to a leaking drain, and are not indicative of a product release. Gasoline was detected in probes KB-81, KB-82, and KB-84. The highest concentration of gasoline, at 4,200 mg/kg, was encountered near the southwest corner of the building, near KB-102.

HVOC contamination was encountered in the borings advanced adjacent to the alley. In well MW-6, HVOCs were found in soil at a depth of 8 feet bgs; in well MW-10, located at the southern property, they were found in soil at the water table interface. Gasoline and related VOCs were not detected at either of these locations. Detections of HVOCs and gasoline in soil are presented in Figure 9. In a shallow groundwater sample collected from well MW-11, the concentrations of vinyl chloride (0.33 micrograms per liter [µg/L]), PCE (12 µg/L), and trichloroethene (TCE) (6.9 µg/L) exceeded MTCA cleanup levels in groundwater of 0.2, 5, and 5 µg/L, respectively. HVOCs were also detected in well MW-7 at levels below MTCA. The presence of HVOCs in shallow groundwater samples from these monitoring wells (located on the west side of the alley) may be associated with the low levels of contaminants encountered beneath the building. MW-7 is located within 25 feet of the HVOC soil contamination beneath the building and the well is crossgradient/downgradient of the service station building footprint. Given the proximity of these wells to the elevated concentrations on the east side, and the apparent lack of a significant source beneath the building, the presence of HVOCs in these wells could also be associated with lateral spreading of the HVOCs from the east side of the site.

Gasoline and related VOCs were encountered in shallow groundwater on the west side of the property. In 2011, the concentration of gasoline at MW-1 (1,100 µg/L) exceeded the MTCA

Method A cleanup level of 800 µg/L at the downgradient property boundary. Benzene was also detected in the groundwater sample from well MW-1, at a concentration well below its cleanup level. A second sample from well MW-1 was collected in November 2012; the concentration of gasoline, at 540 µg/L, was below the MTCA cleanup level.

Localized perched groundwater, likely present in coarse sand and gravel used to backfill the UST excavation, was identified in geoprobe GP-3. A sample of this water indicated that HVOCs, as well as gasoline and related VOCs, were present at concentrations above MTCA Method A cleanup levels. However, the exceedances were likely attributed to the high turbidity of the sample. Gasoline, BTEX, and an HVOC were encountered in the soil sample from this probe.

Two monitoring wells were completed in the deep aquifer on the west side of the alley (MW-6 and MW-10). Contaminants were not detected in groundwater samples collected from these wells.

3.3.2 East Side of Site

On the east side of the property, the highest concentrations of PCE and other HVOCs were encountered approximately 30 feet north of the former building, adjacent to a large geophysical anomaly that is thought to be a UST or buried drum (Figure 2). The top of the suspected UST is approximately 1.5 feet bgs. Elevated concentrations of PCE were detected in every boring or probe advanced on the east side of the site, except in the well installed at the northern property boundary (upgradient). TCE, a breakdown compound of PCE, was also detected in less than one quarter of the samples tested for HVOCs. Vinyl chloride, another breakdown compound, was detected in one soil sample (GP-15). PCE appears to extend to a depth of 46 feet on the east side of the site. HVOC detections in soil are presented in Figure 9. Results from the Phase II ESA are displayed in Figure D-4, Appendix D.

Contaminants were not encountered in shallow groundwater, upgradient of the suspected UST, as indicated by water quality results from well MW-2. Shallow groundwater was not present in the center of the east side of the site and east to the property boundary, based on subsurface conditions observed in boring B-8 and well MW-13.

PCE and gasoline were detected in deeper groundwater on the east side of the site. PCE was detected at 350 µg/L, exceeding the MTCA Method A cleanup level of 5 µg/L in a sample collected from MW-12. TCE, at 8.4 µg/L, also exceeded its cleanup level of 5 µg/L. Gasoline

was encountered at 550 µg/L, less than the MTCA cleanup level of 800 µg/L. The concentration of PCE in groundwater (130 µg/L), collected at a depth of 33 feet from well MW-3, was more than an order of magnitude above the cleanup level. Gasoline was also detected in the groundwater sample at 160 µg/L, well below the MTCA Method A cleanup level.

3.4 Conceptual Site Model (CSM)

In order to provide a framework for evaluating data gaps and subsequent analytical data, a CSM depicting potential sources of chemicals, release mechanisms, means of retention in or migration to exposure media, exposure routes, and receptors was developed for the Site. The CSM describes, in a generalized way, the interactions of potential contaminants, mechanisms of contaminant migration, and possible routes of human and ecological exposure under site-specific conditions. The CSM was developed using existing data, and will be updated as data are acquired to reflect our improved understanding of potential exposure scenarios.

A complete pathway from the source of chemicals to human or ecological receptors is necessary for chemical exposure to occur. Required elements for a complete exposure pathway include:

- A source of potentially toxic chemicals (e.g., primary sources, such as USTs or a secondary source, such as contaminated soil).
- A mechanism of chemical release to the environment (e.g., leak or spillage to the ground; discharge from a leaking drain pipe).
- A mechanism of retention in or transport to an exposure medium (e.g., adsorption to soil, or infiltration/percolation of precipitation through contaminated soil to the underlying groundwater and subsequent transport as a dissolved constituent that can volatilize, becoming a gas/vapor trapped in the soil).
- A point of contact between receptor and exposure medium (e.g., a future construction worker excavating soil).
- An intake route for the receptor (e.g., a person touching the contaminated soil- via dermal exposure).

A diagrammatic model portraying potential contaminant sources, release mechanisms, and exposure pathways to human health and ecological receptors is presented in Figure 10. The current property use and a description of the building for the Site and near-by properties are displayed in Figure 11.

Although there appear to be two separate primary sources because they are subsurface and contain volatile compounds, their migration pathways and ultimate exposure scenarios are similar.

3.4.1 Primary Contaminant Sources

The primary contaminant sources at the Site are the former service station and dry-cleaning operation. It appears that the service station, located on the west side of the site, used USTs to store petroleum. Two geophysical anomalies were identified west of the footprint of the former building, suggesting that multiple tanks may be present. HVOCs present beneath the current bank building, which overlaps the footprint of the former service station, may be associated with degreasing activities performed at the service station. The primary contaminants associated with the service station include petroleum hydrocarbons, primarily gasoline, but also diesel and oil range hydrocarbons, polycyclic aromatic hydrocarbons (PAHs), VOCs including BTEX, and solvents, primarily HVOCs. Low levels of HVOCs are present in soil beneath the current bank building, with an isolated occurrence of HVOCs in the vicinity of the USTs.

The primary contaminants on the east side of the site include HVOCs (primarily PCE). A laundromat historically operated in the former building, and the presence and distribution of HVOCs indicate that dry-cleaning operations were also conducted. The location of a geophysical anomaly proximal to the rear of the former building suggests a UST or buried drum may be present. Although high levels of PCE have been detected, the concentrations are not consistent with free product. The HVOCs may be associated with solvent-contaminated waste water that was transported to or stored in the UST or buried drum. Low levels of diesel and oil were also detected near the suspected UST and could be associated with laundry and dry-cleaning equipment maintenance activities.

3.4.2 Primary Release Mechanisms

The primary potential release mechanism for contaminants associated with the gasoline service station include leaks from fuel or lubricant storage systems (USTs, containers, piping, dispensers, etc.), and accidental spills and leaks. The footprint of the former service station is within the footprint of the existing bank building. The bank building could have been constructed over areas of soil contamination. In addition to gasoline and oil, solvents were used as a degreasing agent. Historically, spent solvents were often discharged to a drain, or temporarily stored on site in a drum or small tank. A leak of contaminated waste liquid from a

drain/sewer pipe or a storage container may explain the presence of the HVOCs beneath the building.

The likely release mechanisms associated with the dry cleaning operation also includes leaks of contaminated waste liquids from the potential UST or buried drum. The dry-cleaning operation was likely smaller, and the spent solvent was either piped directly from the building to the UST or was hand carried to the UST. Surface spills may also have occurred, as indicated by higher HVOC concentrations near the ground surface.

3.4.3 Primary Transport Mechanisms

Primary transport mechanisms for contaminants present at the Site include the following:

- Contaminants leaching from soils above and below the water table
- Leaching from separate phase liquids within soil pore spaces
- Volatilization from vadose zone (soil) and water table (groundwater)
- Groundwater to surface water transport

The degree of contaminant leaching is controlled by chemical properties of the contaminants, groundwater chemical properties, physical properties of the soil, characteristic of the groundwater flow system, and precipitation recharge. Volatilization is controlled by the concentration and chemical properties of the contaminants, physical properties of the soil, and soil gas characteristics. Groundwater to surface water transport is controlled by groundwater flow path, and the concentrations present in groundwater at the point where it discharges to surface water bodies.

The one significant difference in chemical properties between gasoline and PCE is the density. The petroleum hydrocarbons identified on the Site, including gasoline, are lighter than water and would float on the water table. PCE, however, is denser than water and in the aquifer concentrations could increase with depth. In addition, PCE has demonstrated that it can migrate through fine-grain soils such as clay/silt or till that would impede petroleum's penetration.

3.4.4 Secondary Sources and Transport

Soil and groundwater, once they are impacted by contaminants, become sources of contamination, even if the primary source is removed. Contaminants may fill soil pore space, allowing continuous release of the contaminants. Potential transport mechanisms are similar to transport from a primary source, with the exception of direct release from the UST, piping or drain.

3.4.5 Potential Pathway and Exposure Routes.

Complete exposure pathways have the following components: (a) a chemical source, (b) a transport pathway, (c) exposure point where contact can occur, and (d) an intake mechanism. Potential exposure routes for human and ecological receptors include the following:

Dermal/Direct Contact. The site is currently entirely paved. Utilities are present in the alley and contaminants have been identified on either side of the alley, suggesting that contaminants are likely present in the utility corridor. The area is zoned neighborhood commercial, which allows both commercial and residential use of the property. Dermal contact with soil on site is a potential intake mechanism for current and future on-site workers and future residents. Dermal contact with groundwater could occur during construction if dewatering is required. Shallow groundwater is approximately 16 to 22 feet bgs, with a deeper water-bearing zone at approximately 37 to 50 feet bgs. Construction workers could come in contact with the dewatering water.

The site is more than one mile from a body of surface water. Given this distance, exposure via the groundwater to surface water pathway is unlikely. Consequently this pathway will not be evaluated further.

Because the land is zoned for commercial, as well as residential use, the cleanup approach should be protective of wildlife, plants, and soil biota. The site appears to meet the criteria for a simplified terrestrial ecological evaluation. Under a future scenario, terrestrial vertebrate wildlife, such as mice or voles, could contact the contaminated soil. Plants and borrowing or ground-dwelling invertebrates (e.g., earthworms) are exposed directly to the soil.

Inhalation. Suspended particulates from soil can be transported by air and inhaled by potential on-site and off-site receptors. Emissions of volatile chemicals from soil and groundwater (human receptors only) may also be transported as vapors by air. In ambient conditions, vapors would be considered to be a secondary concern because such vapors are rapidly diluted and degraded. If a structure with underground parking or a basement is built, vapors could intrude into the structure, posing a potential risk to future site-workers or residents. Although the existing building is constructed with a slab foundation, vapors could permeate through the slab, as well as leak through gaps in the floor for utilities. Utility workers could be exposed to vapors when disturbing the coarse backfill that surrounds underground utilities, such as those located in the alley. Groundwater within the city is not used as potable water, thereby, preventing direct inhalation of vapors while taking a shower or otherwise using tap water.

Ingestion. Accidental ingestion of chemicals in site soil is a primary intake mechanism for human receptors. The site is currently paved, but the site will likely be redeveloped and could include residential use. Ingestion of chemicals in site soil is a primary intake mechanism for ecological receptors; however, under current conditions only earthworms and other invertebrates could be exposed. The nearest surface water body is approximately 1 mile downgradient of the site. No water wells are located within ½ mile of the site. Installation of wells for drinking water is prohibited by ordinance within the City of Seattle; consequently, direct ingestion of contaminated groundwater is an incomplete pathway. The following section describes specific exposure pathways of primary concern. The pathways and potential receptors are also displayed in Figure 10.

Ecological Evaluation The site does not qualify for ecological evaluation exclusion; however, other factors, including the type of contaminant, urban setting, and current and future land use indicate that the site does meet the criteria for a simplified ecological evaluation (WAC 173-340-7400). Because the site is zoned for both commercial and residential use, terrestrial wildlife as well as terrestrial plants and soil biota must be included in the evaluation. The site is paved, as are the surrounding properties. Consequently, only soil biota (earthworms) are exposed to the contaminants. Future development will also likely include large paved areas or landscaped areas, eliminating any exposure points for terrestrial wildlife and plants. PCE is not included in the list of priority contaminants of ecological concern.

Overexcavation of petroleum-contaminated soil above MTCA Method A should be protective of ecological receptors. Gasoline and diesel are included on the list of priority contaminants of ecological concern, indicating that a simplified ecological evaluation is appropriate.

Although redevelopment is anticipated, no plans or timelines have been established. Institutional controls, particularly as they pertain to ecological exposure, may be included as part of the remedial alternative.

3.4.6 Exposure Pathways of Concern

The primary complete exposure pathways by which chemicals may reach potential receptors is through the following:

Incidental ingestion of and dermal contact with contaminated soil and groundwater are complete exposure pathways for future workers while the building is under construction, and workers accessing/maintaining utilities in the alley. The site is paved, preventing transport of

surface soil via air or surface water. The pavement also precludes direct contact with the surface soil. Consequently, although not eliminating a surface release as a primary source affecting surface soil the CSM focuses on a release from a subsurface source such as a UST, buried drum, or a drain as the primary release mechanism, and associated transport and exposure evaluations. Ecological receptors are also potentially impacted by these exposure pathways.

Future human exposure to VOC-contamination would be more likely via VOCs in the vapor phase. Volatile contaminants could transform to the vapor phase in soil pores. Through continued migration in the vapor phase, the contaminants could enter buildings, in particular, underground parking or basements, or accumulate in subsurface utility corridors. Inhalation of VOCs in indoor air would be a complete exposure pathway for future building occupants (workers or residents) or utility employees. Though less likely, vapors could also enter the existing bank building since gasoline and HVOCs contaminated soil has been detected beneath the structure.

Pathways and receptors for HVOCs would be the same as the petroleum. However, because HVOCs are denser than water, the migration of these compounds in water would differ from petroleum.

4.0 REGULATORY REQUIREMENTS

Current federal, state, and local laws will be followed throughout the execution of this work.

4.1 Applicable and Relevant Regulations

Screening levels based on risk based approach were evaluated using Ecology's Cleanup Levels and Risk Calculation (CLARC) tool, a searchable database developed and maintained by Ecology. CLARC includes technical information related to the establishment of cleanup levels under the MTCA cleanup regulation WAC 173-340, last updated in September 2012.

Federal Investigation and Cleanup Requirements

- 40 Code of Federal Regulation (CFR), Protection of Environment
- 29 CFR, Occupational Safety and Health Standards
- 49 CFR, Hazardous Materials Regulations
- 42 CFR, Public Health Safe Drinking Water Act

Washington State Investigation and Cleanup Requirements

- WAC 173, Department of Ecology
  - WAC 173-340, MTCA Cleanup
  - WAC 173-303, Dangerous Waste
- WAC 296, Labor and Industries Regulations

4.2 Conditional Point of Compliance

Under MTCA, the standard point of compliance is both soil and groundwater throughout the site from the ground surface to 15 feet bgs. Fifteen feet represents a reasonable estimate of the depth of soil that could be excavated and distributed at the surface during site development activities, resulting in exposure by future inhabitants or workers and terrestrial ecological receptors. However, under WAC 173-340-720(8), a conditional point of compliance may be set, with Ecology approval, in the event that remedial alternatives are not able to achieve the cleanup level at the standard point of compliance within a reasonable time frame and where potential exposure pathways can be protected through the use of institutional controls.

Due to the depth of contamination and the heterogeneous, fine-grained nature of impacted soils, we anticipate that even with an aggressive remedy groundwater cleanup levels may not be achievable across the site in the short term. However, potential exposure pathways could be addressed through institutional controls for impacted groundwater remaining on the property. Therefore, based on site conditions and consistent with guidance, a conditional point of compliance for groundwater is assumed to be the property boundary for the purposes of evaluating remedial alternatives.

5.0 WORK PLAN RATIONALE AND TECHNICAL APPROACH

The following section describes the general approach to the RI. The sampling approach and rationale to address these Data Quality Objectives (DQOs) are discussed below and are summarized in Table 6.

The RI will supplement the Phase II ESA that identified potential contaminants. It should be recognized that this is an iterative process and sample locations may need to be modified or additional sampling may be required pending the outcome of the proposed sampling effort. The first phase of the RI was conducted in the fall/winter of 2012/2013, and focused on source evaluation and on-site contamination. This second phase of the RI focuses on potential off-site contamination.

A preliminary CSM (see Section 3) has been developed for the site. The information provided in the CSM supports the technical approach described in this section. The CSM will be updated to reflect findings from this RI and other future work, if required.

5.1 Data Collection Objectives

The specific data collection objectives of this investigation are to collect sufficient data of known and acceptable quality to achieve the following:

- Evaluate the presence and concentrations of COPCs in the site soil and groundwater.
- Estimate the limits of soil to be excavated, and estimate contaminant concentration boundaries that correlated with criteria for waste disposal categories.
- Evaluate the presence of shallow and deeper water-bearing zones.
- Evaluate the groundwater flow direction and gradient for the water-bearing zone(s).
- Evaluate physical properties of the soil that may affect remediation alternatives.
- Evaluate the potential for off-site groundwater contamination, and estimate the extent of groundwater contamination.
- Evaluate the potential for VOCs to affect indoor air quality.

During the first phase of the RI, sufficient information has been collected to estimate the limits of soil requiring action on the east side. On the west side, the petroleum contamination has been adequately characterized to evaluate remedial alternatives. In the short-term, indoor air samples will be collected to evaluate if soil vapor is entering the existing building.

5.2 Data Quality Indicators

Data quality indicators (precision, accuracy, representativeness, comparability, completeness, and method detection limits) refer to quality control criteria established for various aspects of data gathering, sampling, or analysis activity. For this project, the data quality indicators include the sampling procedures, which determine the representativeness of a sample, and laboratory quality assurance analysis and procedures. Data will be reviewed to determine if the quality of the data is sufficient for its intended use.

The project-specific reporting limits for each parameter in each medium should be low enough to detect COPCs at or below risk-based goals and regulatory cleanup levels, if possible. The data should be may be used to support human health or ecological exposure evaluations or selection of remedial action alternatives.

The analytical methodologies for the definitive analyses and the associated project-specific reporting limits are presented in Tables 7, 8, and 9. The project-specific reporting limits are based on minimum detection levels that can be expected to be achieved reliably by the project analytical laboratory using the designated EPA and Washington State methodologies. In some cases, this is not possible because of limitations in analytical methodology, matrix interferences, or sample dilution requirements. Soil and groundwater samples will be analyzed by OnSite Environmental, and air and vapor samples will be analyzed by Air Toxics. These tables also present a comparison of the laboratory reporting limits to MTCA Method A Cleanup Goals and MTCA Method B Cleanup levels for human health risk-based goals.

5.3 Technical Approach

The following subsections present the rationale and the technical approach that will be followed to meet the data needs for each of these DQOs. In each instance, the technical approach is designed to provide flexibility in the locations and sampling requirements to allow for the uncertainty about subsurface conditions, and potential contaminants. Nevertheless, execution of these tasks may result in identification of additional data needs that would require field or laboratory activities that have not been addressed in this plan. Therefore, the S&W personnel performing the sampling and the analytical laboratory project manager will be close communication with the project manager. Revisions to the field activities may be warranted and modifications to the approach will be discussed with Sound Transit as the investigation proceeds. Data needs and uses and proposed sampling to address each are outlined in Table 6. Explorations that were completed during the first phase of the RI are included in the table, along with proposed sampling for the second phase. Proposed locations for the monitoring wells are presented in Figure 12. Activities that will be accomplished during this second phase of the RI are also described below. Primary tasks include:

- Collecting air samples within the existing building and a background air sample;
- Installing wells in the shallow and deep water-bearing units to monitor compliance with applicable regulations; and
- Installing an off-site groundwater monitoring well in the deep water-bearing unit, or sampling an existing Shell Oil monitoring well (MW-24).

5.3.1 Soil Sampling

Subsurface soil samples will be collected from hollow-stem auger borings. Sampling frequency in borings drilled with the hollow-stem auger will be increased relative to standard sampling frequency to obtain a better understanding of the variable subsurface conditions.

Soil sampling procedures are discussed in Appendix B, Sampling and Analysis Plan. Soil samples for analytical testing will be collected at 5-foot intervals to the bottom of the borings.

5.3.2 Groundwater Sampling

As part of the site investigation, monitoring wells will be installed to evaluate contaminant concentrations in the upper and lower water-bearing zones as shown in Figure 12.

Groundwater monitoring wells will be installed downgradient (south to southeast) of the suspected UST on the east side of the site. One monitoring well will be located near well MW-3, at the southern property line (MW-15). The well will be screened at approximately 15 to 25 feet bgs. The well will be developed, and a shallow groundwater sample will be collected to evaluate if contaminant concentrations exceed MTCA groundwater quality.

A monitoring well for the shallow water-bearing unit will not be installed off-site. Shallow groundwater was not encountered southeast of the site, as discussed in Section 2.2 Shallow (Perched) Groundwater.

Monitoring wells to evaluate the deeper aquifer will be installed east of well MW-12. The monitoring well for compliance monitoring will be located near the east property boundary at the southeast corner of the site (MW-14). If contaminant concentrations exceed MTCA criteria, then a downgradient well will be located near the northeast corner of the intersection of NE 45th Street and 11th Avenue NE. Based on the regional groundwater-bearing unit, groundwater flow appears to be to the east-southeast. Alternatively, Sound Transit may contact Shell Oil, to request access to their monitoring well(s) for sampling. Monitoring well SH-MW-24 is located at the southeast corner of the intersection of NE 45th Street and 11th Avenue NE. The well is completed at 45 feet bgs. The boring log for this well, and other deep wells installed by Shell Oil are located in Appendix E. Gasoline and related VOCs were not detected in off-site wells located on this block during the most recent sampling event in August 2011.

5.3.3 Air Sampling

Three air samples will be collected from the site to evaluate potential exposure to workers occupying the building. Two indoor air samples and a background sample, outside the building, will be collected over a period of 8 hours. At least 48 hours before sampling, the heating, ventilation, air-conditioning (HVAC) system will be switched on so as to simulate ventilation

conditions that would exist if the building was in use. The fan will continue to operate while the sample is being collected.

Samples will be collected where people are most likely to occupy. One air sample will be collected from the bathroom, adjacent to the closet where water pipes enter the building. The second sample will be collected from the main work space in the center of the building. The background sample will be collected outside the east side of the building. All samples will be collected at a distance of three to six feet above the ground, identified as the breathing zone. The samples will be collected in 6-liter Summa canisters to be analyzed off-site for VOCs using EPA Method TO-15 SIM. Sampling procedures are described in the Sampling and Analysis Plan, Appendix B.

Following source removal, soil vapor probes will be installed to assess the potential vapor exposure pathway from secondary sources, contaminated soil and groundwater. An addendum to this Work Plan will be prepared describing the soil vapor investigation.

5.3.4 Analytical Methods

The samples will be analyzed using designated EPA and Washington State methodologies. In some cases, achieving the risk-based goals is not possible because of limitations in analytical methodology, matrix interferences, or sample dilution requirements. Because concentrations of PCE are expected to be orders of magnitude greater than its cleanup level, detections of PCE breakdown analytes, which are present at lower concentrations, may not be accomplished due to sample dilution required to quantify the high PCE concentrations.

Samples will be tested using the following analytical testing methods:

- Gasoline by Washington State Northwest Total Petroleum Hydrocarbon – Gasoline Range Method (NWTPH-G);
- Diesel and oil by Washington State Northwest Total Petroleum Hydrocarbon – Diesel-Range Extended Method (NWTPH-Dx);
- PAHs by EPA Method 8270D-Selective Ion Monitor (SIM)
- BTEX by EPA Method 8021 (in conjunction with NWTPH-Gx);
- VOCs or HVOCs by EPA Method 8260C
- VOCs in air by EPA Method TO-15 SIM

Lubricating oil has only been detected near the USTs at both sides of the site. Limited sampling is proposed for diesel and oil because these compounds are associated with the USTs and will be addressed during UST removal. Previous sampling has indicated that PCBs are not present and concentrations of metals, including lead, are within State background levels.

5.4 Disposal of Investigation-derived Waste (IDW)

To dispose of IDW generated from the Phase II ESA, Ecology assigned the site an RCRA Dangerous Waste Site Identification Number WAD058364647, as a generator of dangerous waste. Spoils from this RI are expected to be contaminated with spent solvents from a dry-cleaning operation, requiring disposal as a Listed-Dangerous Waste (F002) under the RCRA program. An off-site exploration is planned in the city right-of-way to evaluate the extent of the HVOC plume. Alternatively, groundwater will be collected from the Shell Oil well (MW-24). If HOVC impacted soil and/or groundwater is encountered in these explorations, these spoils will also require disposal as a F002 waste.

6.0 SELECTION AND DESCRIPTION OF POTENTIAL CLEANUP ALTERNATIVES

6.1 Remedial Action Objectives

The purpose of the proposed cleanup action is to address soil and groundwater occurrences of identified chemicals of concern (COCs). The primary objectives of the remedial action are as follows:

- Reduce potential dermal exposure to soil and groundwater containing concentrations of COCs above cleanup levels.
- Reduce transport of COCs from soil to groundwater at concentrations above cleanup levels.
- Reduce transport of COCs from soil and groundwater to soil vapor at concentrations above cleanup levels.
- Reduce potential inhalation of soil vapor containing concentrations of COCs above cleanup levels.
- Reduce off-property migration of groundwater containing concentrations of COCs above cleanup levels.
- Obtain a No Further Action determination from Ecology.
- Conduct remediation, minimizing potential interference with planned use of the site as a CM office, beginning in early 2014.
- Conduct remediation without constraining property redevelopment.

6.2 Interim Actions

Source removal and removal of gross contamination is integral to all remedial alternatives and can be accomplished independent from other remedial actions. Because soil vapor is sensitive to the elevated concentrations associated with sources, the soil pathway will not be evaluated during this phase of the RI. Soil vapor sampling may be necessary following source removal, and will be addressed as an addendum to this work plan.

In addition because the building may be occupied at a future date, we will collect indoor air samples to support temporary occupancy of the building. Sub-slab depressurization or enhanced ventilation will be considered, if vapor is a concern.

6.3 Potential Remedial Alternatives

A number of proven remediation technologies are available to treat petroleum and associated VOCs, and HVOCs occurrences in soil and groundwater.

Below are six selected remedial actions and technologies that could be used to remediate soil and groundwater contamination at the site. They include:

- UST Removal
- Excavation and Off-site Disposal
- Enhanced Biodegradation
- Air Sparging/Soil Vapor Extraction (AS/SVE)
- In Situ Chemical Oxidation
- Natural Attenuation

In general, the remedial technologies above may be used to treat either unsaturated zone soil or groundwater. AS/SVE and chemical oxidation may be used to treat either or both. A discussion of these technologies was provided to Sound Transit in the Preliminary Remedial Alternatives Evaluation for Contamination at the Former Key Bank Site (S&W, 2012b). Selection of the appropriate technologies will be made after the RI is conducted.

7.0 PROJECT MANAGEMENT

7.1 Project Schedule

The main schedule constraint is imposed by the anticipated construction schedule for the north link of the transit system and the site's anticipated use as a CM office. Source removal and installation of a remediation alternative will need to be in place before the site can be used during

construction of the North Link tunnel and station. Because source removal and excavation activities are integral to all of the remedial alternatives, these interim actions could occur separate from installation of a remedial alternative. Sound Transit is requesting Ecology's review, as part of the VCP. The first phase of the RI was begun in November 2012. Based on findings from this investigation, a focused scope of work has been developed to address data gaps. The second phase of the RI, described in this plan, is scheduled to occur in the spring of 2013. A FS will be conducted to identify a preferred alternative for remediation. A Corrective Action Plan will be prepared that describes remedial measures selected for site cleanup.

7.2 Project Management Staff

Personnel involved with this project and roles are listed below:

- Roger Hansen, Sound Transit Director of Real Property
- Rick Sarkany, Sound Transit Task Manager
- Don Davis, Sound Transit, North Link Executive Project Director
- Mark Menard, Sound Transit Environmental Compliance
- Agnes Tirao, S&W Program Manager
- Scott Gaulke, S&W Principal-in-Charge, Technical Review
- Dawn Wulf, Remedial Investigation Lead
- Cody Johnson, Feasibility Study Lead
- Joseph Laprade, Health and Safety Officer
- Drilling Contractor – to be determined
- Analytical Laboratory for soil and groundwater, OnSite Environmental
- Analytical Laboratory for air and vapor, Air Toxics

8.0 LIMITATIONS

Within the limitations of the scope, schedule, and budget, the analyses, conclusions, and recommendations presented in this plan were prepared in accordance with generally accepted professional engineering principles and practices at the time this plan was prepared. We make no other warranty, either express or implied.

The analyses, conclusions, and recommendations are based on our understanding of the project, as described herein and site conditions as they existed at the time of our explorations were performed. For the purpose of presenting design recommendations, we assumed that the subsurface conditions in the project area are not significantly different from our recent boring and those disclosed by the previous explorations performed for other projects near the site.

If, during construction, subsurface conditions different from those encountered in the explorations are observed or appear to be present, we should be advised at once so that we can

review these conditions and reconsider our recommendations where necessary. If conditions have changed due to construction operations at or adjacent to the site, we recommend that our report be reviewed to determine the applicability of the conclusions and recommendations considering the changed conditions.

This report was prepared for the exclusive use of Sound Transit and Sound Transit's designated design team. It should not be made available for use by others or for purposes other than those described herein. Further, it should be relied on only for information based on factual data, such as those interpreted from the exploration logs. Unanticipated soil conditions are commonly encountered and cannot be fully determined by merely taking soil samples from explorations. Such unexpected conditions frequently require that additional expenditures be made to attain properly constructed projects.

SHANNON & WILSON, INC.

Dawn B. Wulf

Dawn B. Wulf, L.H.G.
Senior Principal Hydrogeologist

DBW: ACT/dbw

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TABLE 1. GROUNDWATER ELEVATIONS

Aquifer	Monitoring Well Designation	Ground Surface Elevation	Top of Casing Elevation	Depth to Water from TOC	Depth to Water from Ground Surface	Groundwater Elevation [1]	Screened Interval Feet BGS	Screened Interval Elevation
Shallow	MW-1	182.28	181.72	15.61	16.17	166.11	5 - 25	177-157
Shallow	MW-2	181.93	181.43	20.71	21.21	160.72	15 - 25	167-157
Deep	MW-3	177.95	177.46	34.46	34.95	143.00	25 - 35	[153-143]
Deep	MW-6	181.76	181.34	23.08	23.50	158.26	47 - 59	135-123
Shallow	MW-7	182.18	181.76	17.36	17.78	164.40	18 - 28	164-154
Deep	MW-10	179.54	179.07	39.12	39.59	139.95	47 - 57	133-123
Shallow	MW-11	179.94	179.60	22.35	22.69	157.25	17- 27	163-153
Deep	MW-12	178.91	178.43	37.96	38.44	140.47	40 - 50	139-129
Shallow	MW-13	178.45	178.00	DRY	DRY	DRY	15 - 30	163-148

= Shallow Groundwater

TOC = top of casing

BGS = below ground surface

[1] = Horizontal Datum NAD83/91, Vertical Datum NAVD 88.

TABLE 2. SELECT SOIL ANALYTICAL TESTING FOR PREVIOUS INVESTIGATIONS

	Boring	Sample Number	Depth (feet)	Date Sampled	Sample Delivery Group	PCE	HVOCs	GAS-BTEX	VOCs	Diesel/ Oil	Metals	VPH Fractions	PCBS
Method						EPA 8260C	EPA 8260C	NWTPH-Gx- EPA 8021B	EPA 8260C	NWTPH-Dx	EPA 6010B	NW-VPH	EPA 8082
	KB-84	KB-84:5:1	5	2/26/2013	1302-160		X	X					
	KB-84	KB-84:5:2	5	2/26/2013	1302-160		X	X					
	KB-85	KB-85:2	2	2/26/2013	1302-160		X	X					
	KB-85	KB-85:5	5	2/26/2013	1302-160		X	X					
Parking lot													
	KB-101	KB-101:4.0	4	11/1/2012	1211-020			X					
	KB-101	KB-101:9.5	9.5	11/1/2012	1211-020			X					
	KB-101	KB-101:14.5	14.5	11/1/2012	1211-020			X					
	KB-102	KB-102:4.5	4.5	11/1/2012	1211-020		X	X					
	KB-102	KB-102:9.5	9.5	11/1/2012	1211-020		X	X					
	KB-102	KB-102:14.0	14	11/1/2012	1211-020		X	X					
	KB-102	KB-102:17.0	17	11/1/2012	1211-020		X	X					
	KB-103	KB-103:3.0	3	11/1/2012	1211-020			X					
	KB-103	KB-103:9.0	9	11/1/2012	1211-020			X					
	KB-103	KB-103:14.0	14	11/1/2012	1211-020			X					
	KB-104	KB-104:3.0	3	11/1/2012	1211-020			X					
	KB-104	KB-104:9.0	9	11/1/2012	1211-020			X					
	KB-104	KB-104:13.5	13.5	11/1/2012	1211-020			X					
	KB-105	KB-105:4.5	4.5	11/1/2012	1211-020			X					
	KB-105	KB-105:9.0	9	11/1/2012	1211-020			X					
	KB-105	KB-105:13.0	13	11/1/2012	1211-020			X					
	KB-106	KB-106:1.6	1.6	11/1/2012	1211-020			X					
	KB-107	KB-107:3.0	3	11/1/2012	1211-020	X	X	X					

TABLE 2. SELECT SOIL ANALYTICAL TESTING FOR PREVIOUS INVESTIGATIONS

Boring		Sample Number	Depth (feet)	Date Sampled	Sample Delivery Group	PCE	HVOCs	GAS-BTEX	VOCs	Diesel/ Oil	Metals	VPH Fractions	PCBS
Method						**EPA 8260C**	**EPA 8260C**	**NWTPH-Gx- EPA 8021B**	**EPA 8260C**	**NWTPH-Dx**	**EPA 6010B**	**NW-VPH**	**EPA 8082**
Geoprobes													
West Side													
Phase 2 Environmental Site Assessment													
	GP-1-11	GP-1-11:10	10	9/22/2011	1109-146			X	X	X	X	X	X
	GP-2-11	GP-2-11:9	9	9/22/2011	1109-146			X	X	X	X		
	GP-3-11	GP-3-11:13	13	9/22/2011	1109-146			X	X	X	X		
	GP-4-11	GP-4-11:9.5	9.5	9/22/2011	1109-146			X	X	X	X		
	GP-5-11	GP-5-11:13	13	9/22/2011	1109-146			X	X	X	X	X	X
	GP-6-11	GP-6-11:13	13	9/22/2011	1109-146			X	X	X	X	X	X
	GP-7-11	GP-7-11:14	14	9/22/2011	1109-146			X	X	X	X		
	GP-8-11	GP-8-11:14	14	9/22/2011	1109-146			X	X	X	X		
	GP-9-11	GP-9-11:13	13	9/22/2011	1109-146			X	X	X	X		
Phase 1 Remedial Investigation													
Beneath the Building													
	KB-81	KB-81:2	2	2/26/2013	1302-160		X	X					
	KB-81	KB-81:6	6	2/26/2013	1302-160		X	X					
	KB-81	KB-81:9	9	2/26/2013	1302-160		X	X					
	KB-82	KB-82:2	2	2/26/2013	1302-160		X	X					
	KB-82	KB-82:6	6	2/26/2013	1302-160		X	X					
	KB-82	KB-82:9	9	2/26/2013	1302-160		X	X					
	KB-83	KB-83:2	2	2/26/2013	1302-160		X	X					
	KB-83	KB-83:6	6	2/26/2013	1302-160		X	X					
	KB-84	KB-84:2	2	2/26/2013	1302-160		X	X					

TABLE 2. SELECT SOIL ANALYTICAL TESTING FOR PREVIOUS INVESTIGATIONS

	Boring	Sample Number	Depth (feet)	Date Sampled	Sample Delivery Group	PCE	HVOCs	GAS-BTEX	VOCs	Diesel/ Oil	Metals	VPH Fractions	PCBS
Method						EPA 8260C	EPA 8260C	NWTPH-Gx- EPA 8021B	EPA 8260C	NWTPH-Dx	EPA 6010B	NW-VPH	EPA 8082
	KB-107	KB-107:9.0	9	11/1/2012	1211-020	X	X	X					
	KB-107	KB-107:14.5	14.5	11/1/2012	1211-020	X	X	X					
	KB-108	KB-108:3.0	3	11/1/2012	1211-020			X					
	KB-108	KB-108:9.0	9	11/1/2012	1211-020			X					
	KB-108	KB-108:14.0	14	11/1/2012	1211-020			X					
	KB-109	KB-109:6.0	6	11/7/2012	1211-063			X					
	KB-109	KB-109:9.0	9	11/7/2012	1211-063			X					
	KB-109	KB-109:12	12	11/7/2012	1211-063			X					
	KB-110	KB-110:6.0	6	11/7/2012	1211-063			X					
	KB-110	KB-110:9.0	9	11/7/2012	1211-063			X					
	KB-110	KB-110:14	14	11/7/2012	1211-063			X					
East Side													
Phase 2 Environmental Site Assessment													
	GP-10-11	GP-10-11:10	10	9/22/2011	1109-146								
	GP-11-11	GP-11-11:10	10	9/22/2011	1109-146			X	X	X			
	GP-12-11	GP-12-11:10	10	9/22/2011	1109-146			X	X	X		X	X
	GP-13	GP-13:4.5	4.5	10/14/2011	1110-112			X	X	X			
	GP-13	GP-13:10.0	10	10/14/2011	1110-112		X						
	GP-14	GP-14:5.5	5.5	10/14/2011	1110-112		X						
	GP-14	GP-14:10.5	10.5	10/14/2011	1110-112		X						
	GP-15	GP-15:5.0	5	10/14/2011	1110-112		X						
	GP-15	GP-15:12.0	12	10/14/2011	1110-112		X						

TABLE 2. SELECT SOIL ANALYTICAL TESTING FOR PREVIOUS INVESTIGATIONS

	Boring	Sample Number	Depth (feet)	Date Sampled	Sample Delivery Group	PCE	HVOCs	GAS-BTEX	VOCs	Diesel/ Oil	Metals	VPH Fractions	PCBS
Method						EPA 8260C	EPA 8260C	NWTPH-Gx- EPA 8021B	EPA 8260C	NWTPH-Dx	EPA 6010B	NW-VPH	EPA 8082
	GP-16	GP-16:8.0	8	10/14/2011	1110-112		X						
	GP-16	GP-16:11.5	11.5	10/14/2011	1110-112		X						
	GP-17	GP-17:6.0	6	10/14/2011	1110-112		X						
	GP-17	GP-17:14.0	14	10/14/2011	1110-112		X						
	GP-18	GP-18:11.0	11	10/14/2011	1110-112		X						
	GP-19	GP-19:11.0	11	10/14/2011	1110-112		X						
	GP-20	GP-20:4.0	4	10/14/2011	1110-112		X						
	GP-20	GP-20:9.0	9	10/14/2011	1110-112		X						
	GP-21	GP-21:6.0	6	10/14/2011	1110-112		X						
	GP-21	GP-21:12.0	12	10/14/2011	1110-112		X						
	GP-22	GP-22:5.5	5.5	10/14/2011	1110-112		X						
	GP-22	GP-22:13.0	13	10/14/2011	1110-112		X						
Phase 1 Remedial Investigation													
	KB-51	KB-51:3.0	3	10/31/2012	1211-001		X						
	KB-51	KB-51:6.5	6.5	10/31/2012	1211-001	X							
	KB-51	KB-51:9.0	9	10/31/2012	1211-001	X							
	KB-51	KB-51:12.0	12	10/31/2012	1211-001	X							
	KB-52	KB-52:2.5	2.5	10/31/2012	1211-001		X						
	KB-52	KB-52:6.0	6	10/31/2012	1211-001	X							
	KB-52	KB-52:9.0	9	10/31/2012	1211-001	X							
	KB-52	KB-52:12.0	12	10/31/2012	1211-001	X							
	KB-53	KB-53:1.5	1.5	10/31/2012	1211-001		X						

TABLE 2. SELECT SOIL ANALYTICAL TESTING FOR PREVIOUS INVESTIGATIONS

	Boring	Sample Number	Depth (feet)	Date Sampled	Sample Delivery Group	PCE	HVOCs	GAS-BTEX	VOCs	Diesel/ Oil	Metals	VPH Fractions	PCBS
Method						EPA 8260C	EPA 8260C	NWTPH-Gx- EPA 8021B	EPA 8260C	NWTPH-Dx	EPA 6010B	NW-VPH	EPA 8082
	KB-53	KB-53:6.0	6	10/31/2012	1211-001		X						
	KB-53	KB-53:9.0	9	10/31/2012	1211-001	X							
	KB-53	KB-53:12.0	12	10/31/2012	1211-001	X							
	KB-53	KB-53:14.0	14	10/31/2012	1211-001	X							
	KB-54	KB-54:3.0	3	10/31/2012	1211-001		X						
	KB-54	KB-54:6.0	6	10/31/2012	1211-001	X							
	KB-54	KB-54:9.0	9	10/31/2012	1211-001	X							
	KB-54	KB-54:12.5	12.5	10/31/2012	1211-001	X							
	KB-55	KB-55:3.0	3	10/31/2012	1211-001		X						
	KB-55	KB-55:6.0	6	10/31/2012	1211-001	X							
	KB-55	KB-55:9.0	9	10/31/2012	1211-001	X							
	KB-55	KB-55:12.0	12	10/31/2012	1211-001	X							
	KB-56	KB-56:2.0	2	10/31/2012	1211-001		X						
	KB-56	KB-56:6.0	6	10/31/2012	1211-001	X							
	KB-56	KB-56:9.0	9	10/31/2012	1211-001	X							
	KB-56	KB-56:12.5	12.5	10/31/2012	1211-001	X							
	KB-57	KB-57:1.6	1.6	10/31/2012	1211-001		X						
	KB-58	KB-58:3.0	3	10/31/2012	1211-001								
	KB-58	KB-58:6.0	6	10/31/2012	1211-001	X							
	KB-58	KB-58:9.0	9	10/31/2012	1211-001	X							
	KB-58	KB-58:14.0	14	10/31/2012	1211-001	X							
	KB-59	KB-59:3.0	3	11/7/2012	1211-063		X						

TABLE 2. SELECT SOIL ANALYTICAL TESTING FOR PREVIOUS INVESTIGATIONS

	Boring	Sample Number	Depth (feet)	Date Sampled	Sample Delivery Group	PCE	HVOCs	GAS-BTEX	VOCs	Diesel/ Oil	Metals	VPH Fractions	PCBS
Method						EPA 8260C	EPA 8260C	NWTPH-Gx- EPA 8021B	EPA 8260C	NWTPH-Dx	EPA 6010B	NW-VPH	EPA 8082
	KB-59	KB-59:6.0	6	11/7/2012	1211-063	X							
	KB-59	KB-59:9.0	9	11/7/2012	1211-063	X							
	KB-59	KB-59:12.5	12.5	11/7/2012	1211-063	X							
	KB-60	KB-60:3.0	3	11/7/2012	1211-063		X						
	KB-60	KB-60:9.0	9	11/7/2012	1211-063	X							
	KB-60	KB-60:12	12	11/7/2012	1211-063	X							
	KB-60	KB-60:14	14	11/7/2012	1211-063	X							
	KB-61	KB-61:3.0	3	11/7/2012	1211-063		X						
	KB-61	KB-61:6.0	6	11/7/2012	1211-063	X							
	KB-61	KB-61:9.0	9	11/7/2012	1211-063	X							
	KB-61	KB-61:12	12	11/7/2012	1211-063	X							
	KB-61	KB-61:14	14	11/7/2012	1211-063	X							
	KB-62	KB-62:3.0	3	11/7/2012	1211-063		X						
	KB-62	KB-62:6.0	6	11/7/2012	1211-063	X							
	KB-62	KB-62:13	13	11/7/2012	1211-063	X							
	KB-63	KB-63:3.0	3	11/7/2012	1211-063		X						
	KB-63	KB-63:6.0	6	11/7/2012	1211-063	X							
	KB-63	KB-63:9.0	9	11/7/2012	1211-063	X							
	KB-63	KB-63:12	12	11/7/2012	1211-063	X							
	KB-64	KB-64:6.0	6	11/7/2012	1211-063		X						
	KB-64	KB-64:9.0	9	11/7/2012	1211-063	X							
	KB-64	KB-64:12	12	11/7/2012	1211-063	X							

TABLE 2. SELECT SOIL ANALYTICAL TESTING FOR PREVIOUS INVESTIGATIONS

Boring		Sample Number	Depth (feet)	Date Sampled	Sample Delivery Group	PCE	HVOCs	GAS-BTEX	VOCs	Diesel/ Oil	Metals	VPH Fractions	PCBS
Method						**EPA 8260C**	**EPA 8260C**	**NWTPH-Gx- EPA 8021B**	**EPA 8260C**	**NWTPH-Dx**	**EPA 6010B**	**NW-VPH**	**EPA 8082**
Borings/ Monitoring Wells							X						
Phase 2 Environmental Site Assessment													
West	MW-1	SW-MW1-11:13	13	10/6/2011	1110-053								
West	MW-1	SW-MW1-11:25	25	10/6/2011	1110-053			X	X	X			
East	MW-2	SW-MW2-11:5	5	10/7/2011	1110-053			X	X	X			
East	MW-2	SW-MW2-11:10	10	10/7/2011	1110-053				X				
East	MW-2	SW-MW2-11:16.5	16.5	10/7/2011	1110-053				X				
East	MW-2	SW-MW2-11:20	20	10/7/2011	1110-053			X	X	X			
East	MW-2	SW-MW2-11:25	25	10/7/2011	1110-053				X				
East	MW-3	SW-MW3-11:5	5	10/7/2011	1110-057			X	X	X			
East	MW-3	SW-MW3-11:10	10	10/7/2011	1110-057				X				
East	MW-3	SW-MW3-11:18	18	10/7/2011	1110-057			X	X	X			
East	MW-3	SW-MW3-11:25	25	10/7/2011	1110-057			X	X	X			
East	MW-3	SW-MW3-11:30	30	10/7/2011	1110-057				X				
East	MW-3	SW-MW3-11:35	35	10/7/2011	1110-057				X				
Phase 1 Remedial Investigation													
West	B-4	B-4:13	10.6	11/12/2012	1211-104				X				
West	B-4	B-4:18	14.7	11/12/2012	1211-104		X	X					
West	B-4	B-4:23	18.8	11/12/2012	1211-104			X					
West	B-4	B-4:28	22.9	11/12/2012	1211-104		X	X					
West	B-5	B-5:11	11	11/12/2012	1211-104		X	X					

TABLE 2. SELECT SOIL ANALYTICAL TESTING FOR PREVIOUS INVESTIGATIONS

Boring		Sample Number	Depth (feet)	Date Sampled	Sample Delivery Group	PCE	HVOCs	GAS-BTEX	VOCs	Diesel/ Oil	Metals	VPH Fractions	PCBS
Method						EPA 8260C	EPA 8260C	NWTPH-Gx- EPA 8021B	EPA 8260C	NWTPH-Dx	EPA 6010B	NW-VPH	EPA 8082
West	B-5	B-5:18	18	11/12/2012	1211-104		X	X					
West	B-5	B-5:23	23	11/12/2012	1211-104			X					
West	B-5	B-5:28:1	27.5	11/12/2012	1211-104		X	X					
West	B-5	B-5:28:2	27.5	11/12/2012	1211-104			X					
West	B-5	B-5:33	33	11/12/2012	1211-104			X					
West	B-5	B-5:38	38	11/12/2012	1211-104	X	X	X					
Alley	MW-6	MW-6:8.0	8	11/6/2012	1211-064	X	X	X					
Alley	MW-6	MW-6:13.0	13	11/6/2012	1211-064	X		X					
Alley	MW-6	MW-6:18.0	18	11/6/2012	1211-064	X		X					
Alley	MW-6	MW-6:23.0	23	11/6/2012	1211-064	X		X					
Alley	MW-6	MW-6:28.0	28	11/6/2012	1211-064		X	X					
Alley	MW-6	MW-6:33.0	33	11/7/2012	1211-064	X							
Alley	MW-6	MW-6:38.0	38	11/7/2012	1211-064		X	X					
Alley	MW-6	MW-6:43.0	43	11/7/2012	1211-064	X							
Alley	MW-6	MW-6:48.0	48	11/7/2012	1211-064		X						
Alley	MW-6	MW-6:53.0	53	11/7/2012	1211-064	X							
Alley	MW-6	MW-6:58.0	58	11/7/2012	1211-064	X							
East	B-8	MW-8:8.0	8	11/8/2012	1211-080		X						
East	B-8	MW-8:13.0	13	11/8/2012	1211-080	X							
East	B-8	MW-8:13:2	13	11/8/2012	1211-080	X	X						
East	B-8	MW-8:15.5	15.5	11/8/2012	1211-080								
East	B-8	MW-8:20.0	20	11/8/2012	1211-080	X							

TABLE 2. SELECT SOIL ANALYTICAL TESTING FOR PREVIOUS INVESTIGATIONS

	Boring	Sample Number	Depth (feet)	Date Sampled	Sample Delivery Group	PCE	HVOCs	GAS-BTEX	VOCs	Diesel/ Oil	Metals	VPH Fractions	PCBS
Method						EPA 8260C	EPA 8260C	NWTPH-Gx- EPA 8021B	EPA 8260C	NWTPH-Dx	EPA 6010B	NW-VPH	EPA 8082
East	B-8	MW-8:25.0	25	11/8/2012	1211-080	X							
East	B-8	MW-8:30.0	30	11/8/2012	1211-080	X							
Alley	MW-10	MW-10:5	5	11/5/2012	1211-035	X							
Alley	MW-10	MW-10:10:1	10	11/5/2012	1211-035	X		X					
Alley	MW-10	MW-10:10:2	10	11/5/2012	1211-035		X	X					
Alley	MW-10	MW-10:15	15	11/5/2012	1211-035		X	X					
Alley	MW-10	MW-10:21	21	11/5/2012	1211-035	X		X					
Alley	MW-10	MW-10:25	25	11/5/2012	1211-035		X	X					
Alley	MW-10	MW-10:30	30	11/5/2012	1211-035	X		X					
Alley	MW-10	MW-10:35	35	11/5/2012	1211-035	X		X					
Alley	MW-10	MW-10:42.5	42.5	11/5/2012	1211-035		X	X					
Alley	MW-10	MW-10:45	45	11/5/2012	1211-035	X		X					
Alley	MW-10	MW-10:50	50	11/5/2012	1211-035	X		X					
Alley	MW-10	MW-10:55	55	11/5/2012	1211-035	X		X					
East	MW-12	MW-12:16.0	16	11/8/2012	1211-080		X	X					
East	MW-12	MW-12:21.0	21	11/8/2012	1211-080	X							
East	MW-12	MW-12:26.0	26	11/8/2012	1211-080	X							
East	MW-12	MW-12:30.0	30	11/8/2012	1211-080	X							
East	MW-12	MW-12:36.0	36	11/8/2012	1211-080	X							
East	MW-12	MW-12:41.0	41	11/9/2012	1211-081	X							
East	MW-12	MW-12:46.0	46	11/9/2012	1211-081	X							
East	MW-12	MW-12:51.0	51	11/9/2012	1211-081	X							

TABLE 2. SELECT SOIL ANALYTICAL TESTING FOR PREVIOUS INVESTIGATIONS

Notes:

EPA = Environmental Protection Agency
VPH = volatile petroleum hydrocarbons
NW-TPH_Gx = Northwest petroleum hydrocarbons- gasoline
NWTPH- Dx = Northwest petroleum hydrocarbons- diesel extended
PCB = polychlorinated biphenyls
VOC = Volatile organic compounds

Exploration Designations:

SW-MW-1, -2, -3 = Phase 2 ESA, monitoring wells
KB-50 to 64 = First Phase Remedial Investigation (RI), East Side
KB - 101 to -110 = First Phase RI, West Side
KB-81 to KB-85 = First Phase RI, Beneath the Building, East Side
MW = First Phase RI - monitoring wells
B = First Phase RI, borings
PCE = tetrachloroethene
GP = Phase II Environmental Site Assessment(ESA), geoprobes

TABLE 3. GROUNDWATER ANALYTICAL TESTING FOR PREVIOUS INVESTIGATIONS

SHANNON & WILSON, INC.

Location	Boring	Sample Number	Aquifer	Date Sampled	Sample Delivery Group	VOCs	GAS-BTEX	Diesel/Oil	Metals	Chloride	Nitrate	Sulfate
Method						**EPA 8260C**	**NWTPH-Gx, EPA 8021**	**NW-TPH-DX**	**EPA 200.7, 200.8, SW 6010B, EPA 7071A**	**SM4500-CL-E**	**EPA 353.2**	**ASTM D516-02**
Phase 2 Environmental Site Assessment												
West	MW-1	MW-1:GW	shallow	10/13/2011	1110-106	X	X	X	X			
East-Upgradient	MW-2	MW-2:GW	shallow	10/13/2011	1110-106	X	X	X	X			
East	MW-3	MW-3:GW	deep	10/13/2011	1110-106	X	X				X	X
West	GP-3-11	GP-3-11:GW	UST-perched	9/22/2011	1109-147	X	X					
Phase 1 - Remedial Investigation												
West	MW-1	MW-1:GW:2	shallow	11/20/2012	1211-176	X	X		X	X	X	X
Alley	MW-6	MW-6:GW	deep	11/20/2012	1211-176	X	X		X	X	X	X
Alley	MW-7	MW-7:GW	shallow	11/19/2012	1211-163	X	X		X	X	X	X
Alley	MW-10	MW-10:GW	deep	11/19/2012	1211-163	X	X		X	X	X	X
Alley	MW-11	MW-11:GW	shallow	11/19/2012	1211-163	X	X		X	X	X	X
East	MW-12	MW-12:GW:1	deep	11/20/2012	1211-176	X	X		X	X	X	X
East	MW-12	MW-12:GW:2	deep	11/20/2012	1211-176				X	X	X	X

Notes:

EPA = Environmental Protection Agency
NW-TPH = Northwest petroleum hydrocarbons- gasoline
NWTPH- Dx = Northwest petroleum hydrocarbons- diesel extended
PCB = polychlorinated biphenyls
VOC - Volatile organic compounds
UST = underground storage tanks
Exploration Designations:
GP = Phase 2 Environmental Site Assessment(ESA), geoprobes
MW-1, -2, -3 = Phase 2 ESA, monitoring wells
MW = Phase 1 -Remedial Investigation- monitoring wells

TABLE 4. PREVIOUS INVESTIGATIONS SOIL RESULTS

	Boring	Sample Number	Depth (ft)	Date Sampled	Tetrachloro-ethene (PCE)	1,1 Dichloro-ethene	Trichloro-ethene (TCE)	Vinyl Chloride	cis-1,2-Dichloro-ethene
Method					EPA 8260B				
MTCA Method A (mg/kg)					**0.05**	**NA**	**0.05**	**NA**	**NA**
Geoprobes									
West Side									
Beneath the Building									
	KB-81	KB-81:2	2	2/26/2013	**0.023**	0.001 U	0.001 U	0.001 U	0.001 U
	KB-81	KB-81:6	6	2/26/2013	0.063 U	0.063 U	0.063 U	0.063 U	0.063 U
	KB-81	KB-81:9	9	2/26/2013	0.057 U	0.057 U	0.057 U	0.057 U	0.057 U
	KB-82	KB-82:2	2	2/26/2013	**0.028**	0.0011 U	**0.0018**	0.0011 U	0.0011 U
	KB-82	KB-82:6	6	2/26/2013	**0.92**	0.11 U	0.11 U	0.11 U	0.11 U
	KB-82	KB-82:9	9	2/26/2013	**0.45**	0.055 U	0.055 U	0.055 U	0.055 U
	KB-83	KB-83:2	2	2/26/2013	**0.0061**	0.00099 U	0.00099 U	0.00099 U	0.00099 U
	KB-83	KB-83:6	6	2/26/2013	**0.01**	0.0011 U	0.0011 U	0.0011 U	0.0011 U
	KB-84	KB-84:2	2	2/26/2013	**0.75**	0.0011 U	**0.0017**	0.0011 U	0.0011 U
	KB-84	KB-84:5:1	5	2/26/2013	**0.31**	0.0011 U	**0.0026**	0.0011 U	0.0011 U
	KB-84	KB-84:5:2	5	2/26/2013	**0.93**	0.00096 U	**0.0022**	0.00096 U	0.00096 U
	KB-85	KB-85:2	2	2/26/2013	**0.01**	0.0015 U	0.0015 U	0.0015 U	0.0015 U
	KB-85	KB-85:5	5	2/26/2013	**0.0045**	0.00094 U	0.00094 U	0.00094 U	0.00094 U
Parking Lot									
	GP-1-11	GP-1-11:10	10	9/22/2011	0.0014 U	0.0014 U	0.0014 U	0.0014 U	0.0014 U
	GP-2-11	GP-2-11:9	9	9/22/2011	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U
	GP-3-11	GP-3-11:13	13	9/22/2011	0.0013 U	0.0013 U	0.0013 U	0.0013 U	**0.0013**
	GP-4-11	GP-4-11:9.5	9.5	9/22/2011	0.0014 U	0.0014 U	0.0014 U	0.0014 U	0.0014 U
	GP-5-11	GP-5-11:13	13	9/22/2011	0.072 U	0.072 U	0.072 U	0.072 U	0.072 U
	GP-6-11	GP-6-11:13	13	9/22/2011	0.0012 U	0.0012 U	0.0012 U	0.0012 U	0.0012 U
	GP-7-11	GP-7-11:14	14	9/22/2011	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U
	GP-8-11	GP-8-11:14	14	9/22/2011	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U
	GP-9-11	GP-9-11:13	13	9/22/2011	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U
	KB-101	KB-101:4.0	4	11/1/2012					
	KB-101	KB-101:9.5	9.5	11/1/2012					
	KB-101	KB-101:14.5	14.5	11/1/2012					
	KB-102	KB-102:4.5	4.5	11/1/2012	0.039 U	0.039 U	0.039 U	0.055 U	0.039 U
	KB-102	KB-102:9.5	9.5	11/1/2012	0.037 U	0.037 U	0.037 U	0.052 U	0.037 U
	KB-102	KB-102:14.0	14	11/1/2012	0.07 U	0.07 U	0.07 U	0.098 U	0.07 U
	KB-102	KB-102:17.0	17	11/1/2012	0.41 U	0.41 U	0.41 U	0.57 U	0.41 U
	KB-103	KB-103:3.0	3	11/1/2012					
	KB-103	KB-103:9.0	9	11/1/2012					
	KB-103	KB-103:14.0	14	11/1/2012					
	KB-104	KB-104:3.0	3	11/1/2012					

	Boring	Sample Number	Depth (ft)	Date Sampled	Tetrachloro-ethene (PCE)	1,1 Dichloro-ethene	Trichloro-ethene (TCE)	Vinyl Chloride	cis-1,2-Dichloro-ethene
Method					EPA 8260B				
MTCA Method A		**(mg/kg)**			**0.05**	**NA**	**0.05**	**NA**	**NA**
	KB-104	KB-104:9.0	9	11/1/2012					
	KB-104	KB-104:13.5	13.5	11/1/2012					
	KB-105	KB-105:4.5	4.5	11/1/2012					
	KB-105	KB-105:9.0	9	11/1/2012					
	KB-105	KB-105:13.0	13	11/1/2012					
	KB-106	KB-106:1.6	1.6	11/1/2012					
	KB-107	KB-107:3.0	3	11/1/2012	0.00055 U	0.00055 U	0.00055 U	0.00076 U	0.00055 U
	KB-107	KB-107:9.0	9	11/1/2012	0.036 U	0.036 U	0.036 U	0.051 U	0.036 U
	KB-107	KB-107:14.5	14.5	11/1/2012	0.036 U	0.036 U	0.036 U	0.05 U	0.036 U
	KB-108	KB-108:3.0	3	11/1/2012					
	KB-108	KB-108:9.0	9	11/1/2012					
	KB-108	KB-108:14.0	14	11/1/2012					
	KB-109	KB-109:6.0	6	11/7/2012					
	KB-109	KB-109:9.0	9	11/7/2012					
	KB-109	KB-109:12	12	11/7/2012					
	KB-110	KB-110:6.0	6	11/7/2012					
	KB-110	KB-110:9.0	9	11/7/2012					
	KB-110	KB-110:14	14	11/7/2012					
East Side									
	GP-10-11	GP-10-11:10	10	9/22/2011	**0.027**	0.0015 U	0.0015 U	0.0015 U	0.0015 U
	GP-11-11	GP-11-11:10	10	9/22/2011	**15**	0.0017 U	**0.0021**	0.0017 U	0.0017 U
	GP-12-11	GP-12-11:10	10	9/22/2011	**0.1**	0.0016 U	0.0016 U	0.0016 U	0.0016 U
	GP-13	GP-13:4.5	4.5	10/14/2011	**0.029**	0.00058 U	0.00058 U	0.00058 U	0.00058 U
	GP-13	GP-13:10.0	10	10/14/2011	**0.22**	0.00058 U	**0.0023**	0.00058 U	0.00058 U
	GP-14	GP-14:5.5	5.5	10/14/2011	**0.021**	0.00059 U	0.00059 U	0.00059 U	0.00059 U
	GP-14	GP-14:10.5	10.5	10/14/2011	**0.75**	0.00059 U	**0.0016**	0.00059 U	0.00059 U
	GP-15	GP-15:5.0	5	10/14/2011	**0.13**	0.00061 U	0.00061 U	0.00061 U	0.00061 U
	GP-15	GP-15:12.0	12	10/14/2011	**8.4**	**0.0013**	**0.075**	**0.00099**	**0.001**
	GP-16	GP-16:8.0	8	10/14/2011	**42**	0.00046 U	**0.002**	0.00046 U	0.00046 U
	GP-16	GP-16:11.5	11.5	10/14/2011	**4.5**	0.00097 U	**0.04**	0.00097 U	0.00097 U
	GP-17	GP-17:6.0	6	10/14/2011	**0.032**	0.00066 U	0.00066 U	0.00066 U	0.00066 U
	GP-17	GP-17:14.0	14	10/14/2011	**1.1**	0.00054 U	**0.0017**	0.00054 U	0.00054 U
	GP-18	GP-18:11.0	11	10/14/2011	**0.019**	0.00059 U	0.00059 U	0.00059 U	0.00059 U
	GP-19	GP-19:11.0	11	10/14/2011	**0.064**	0.00058 U	0.00058 U	0.00058 U	0.00058 U
	GP-20	GP-20:4.0	4	10/14/2011	**0.0092**	0.00048 U	0.00048 U	0.00048 U	0.00048 U
	GP-20	GP-20:9.0	9	10/14/2011	**0.036**	0.00063 U	0.00063 U	0.00063 U	0.00063 U
	GP-21	GP-21:6.0	6	10/14/2011	**0.18**	0.00053 U	0.00053 U	0.00053 U	0.00053 U

	Boring	Sample Number	Depth (ft)	Date Sampled	Tetrachloro-ethene (PCE)	1,1 Dichloro-ethene	Trichloro-ethene (TCE)	Vinyl Chloride	cis-1,2-Dichloro-ethene
Method					EPA 8260B				
MTCA Method A (mg/kg)					**0.05**	**NA**	**0.05**	**NA**	**NA**
	GP-21	GP-21:12.0	12	10/14/2011	**1**	0.00058 U	**0.0011**	0.00058 U	0.00058 U
	GP-22	GP-22:5.5	5.5	10/14/2011	**0.0036**	0.00065 U	0.00065 U	0.00065 U	0.00065 U
	GP-22	GP-22:13.0	13	10/14/2011	**0.0023**	0.00057 U	**0.0019**	0.00057 U	0.00057 U
	KB-51	KB-51:3.0	3	10/31/2012	**0.064**				
	KB-51	KB-51:6.5	6.5	10/31/2012	**0.2**				
	KB-51	KB-51:9.0	9	10/31/2012	**0.28**				
	KB-51	KB-51:12.0	12	10/31/2012	**0.066**	0.00064 U	0.00064 U	0.00064 U	0.00064 U
	KB-52	KB-52:2.5	2.5	10/31/2012	**6.1**				
	KB-52	KB-52:6.0	6	10/31/2012	**0.16**				
	KB-52	KB-52:9.0	9	10/31/2012	**7.6**				
	KB-52	KB-52:12.0	12	10/31/2012	**2.1**	0.00068 U	**0.0014**	0.00068 U	0.00068 U
	KB-53	KB-53:1.5	1.5	10/31/2012	**44**	0.00095 U	**1.4**	0.00095 U	**0.0012**
	KB-53	KB-53:6.0	6	10/31/2012	**0.025**				
	KB-53	KB-53:9.0	9	10/31/2012	**0.13**				
	KB-53	KB-53:12.0	12	10/31/2012	**0.96**				
	KB-53	KB-53:14.0	14	10/31/2012	**0.28**	0.00057 U	**0.0037**	0.00057 U	0.00057 U
	KB-54	KB-54:3.0	3	10/31/2012	**0.16**				
	KB-54	KB-54:6.0	6	10/31/2012	**0.12**				
	KB-54	KB-54:9.0	9	10/31/2012	**0.023**				
	KB-54	KB-54:12.5	12.5	10/31/2012	**6.2**	0.00057 U	**0.0016**	0.00057 U	0.00057 U
	KB-55	KB-55:3.0	3	10/31/2012	**0.099**				
	KB-55	KB-55:6.0	6	10/31/2012	**0.33**				
	KB-55	KB-55:9.0	9	10/31/2012	**0.82**				
	KB-55	KB-55:12.0	12	10/31/2012	**5.2**	**0.0011**	**0.034**	0.00059 U	0.00059 U
	KB-56	KB-56:2.0	2	10/31/2012	**76**				
	KB-56	KB-56:6.0	6	10/31/2012	**11**				
	KB-56	KB-56:9.0	9	10/31/2012	**0.32**				
	KB-56	KB-56:12.5	12.5	10/31/2012	**2.8**	0.00056 U	0.00056 U	0.00056 U	0.00056 U
	KB-57	KB-57:1.6	1.6	10/31/2012	**3.4**	0.00053 U	**0.00058**	0.00053 U	0.00053 U
	KB-58	KB-58:3.0	3	10/31/2012	**0.1**				
	KB-58	KB-58:6.0	6	10/31/2012	**0.21**				
	KB-58	KB-58:9.0	9	10/31/2012	**0.083**				
	KB-58	KB-58:14.0	14	10/31/2012	**0.54**	0.00053 U	**0.033**	0.00053 U	0.00053 U
	KB-59	KB-59:3.0	3	11/7/2012	**0.45**				
	KB-59	KB-59:6.0	6	11/7/2012	**0.36**				
	KB-59	KB-59:9.0	9	11/7/2012	**0.19**				
	KB-59	KB-59:12.5	12.5	41220	**0.12**	0.00088 U	0.00088 U	0.00088 U	0.00088 U

	Boring	Sample Number	Depth (ft)	Date Sampled	Tetrachloro-ethene (PCE)	1,1 Dichloro-ethene	Trichloro-ethene (TCE)	Vinyl Chloride	cis-1,2-Dichloro-ethene
Method					EPA 8260B				
MTCA Method A		**(mg/kg)**			**0.05**	**NA**	**0.05**	**NA**	**NA**
	KB-60	KB-60:3.0	3	11/7/2012	**0.28**				
	KB-60	KB-60:9.0	9	11/7/2012	**1.7**				
	KB-60	KB-60:12	12	11/7/2012	**1.6**				
	KB-60	KB-60:14	14	11/7/2012	**0.045**	0.00071 U	0.00071 U	0.00071 U	0.00071 U
	KB-61	KB-61:3.0	3	11/7/2012	**0.084**				
	KB-61	KB-61:6.0	6	11/7/2012	**0.16**				
	KB-61	KB-61:9.0	9	11/7/2012	**0.085**				
	KB-61	KB-61:12	12	11/7/2012	**3.8**				
	KB-61	KB-61:14	14	11/7/2012	**1.7**	0.00091 U	**0.023**	0.00091 U	0.00091 U
	KB-62	KB-62:3.0	3	11/7/2012	**0.087**				
	KB-62	KB-62:6.0	6	11/7/2012	**0.15**				
	KB-62	KB-62:13	13	11/7/2012	**1.4**	0.0013 U	**0.019**	0.0013 U	0.0013 U
	KB-63	KB-63:3.0	3	11/7/2012	**0.013**				
	KB-63	KB-63:6.0	6	11/7/2012	**0.04**				
	KB-63	KB-63:9.0	9	11/7/2012	**0.048**				
	KB-63	KB-63:12	12	11/7/2012	**0.67**	0.00082 U	**0.027**	0.00082 U	0.00082 U
	KB-64	KB-64:6.0	6	11/7/2012	**0.0098**				
	KB-64	KB-64:9.0	9	11/7/2012	**0.0053**				
	KB-64	KB-64:12	12	11/7/2012	**0.01**	0.001 U	0.001 U	0.001 U	0.001 U
Borings/ Monitoring Wells									
West	MW-1	SW-MW1-11:13	13	10/6/2011	0.0012 U	0.0012 U	0.0012 U	0.0012 U	0.0012 U
West	MW-1	SW-MW1-11:25	25	10/6/2011	0.0012 U	0.0012 U	0.0012 U	0.0012 U	0.0012 U
East	MW-2	SW-MW2-11:5	5	10/7/2011	0.00089 U	0.00089 U	0.00089 U	0.00089 U	0.00089 U
East	MW-2	SW-MW2-11:10	10	10/7/2011	0.0012 U	0.0012 U	0.0012 U	0.0012 U	0.0012 U
East	MW-2	SW-MW2-11:16.5	16.5	10/7/2011	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U
East	MW-2	SW-MW2-11:20	20	10/7/2011	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U
East	MW-2	SW-MW2-11:25	25	10/7/2011	0.0014 U	0.0014 U	0.0014 U	0.0014 U	0.0014 U
East	MW-3	SW-MW3-11:5	5	10/7/2011	**0.014**	0.0013 U	0.0013 U	0.0013 U	0.0013 U
East	MW-3	SW-MW3-11:10	10	10/7/2011	**0.025**	0.001 U	**0.0032**	0.001 U	0.001 U
East	MW-3	SW-MW3-11:18	18	10/7/2011	**0.096**	0.0014 U	0.0014 U	0.0014 U	0.0014 U

	Boring	Sample Number	Depth (ft)	Date Sampled	Tetrachloro-ethene (PCE)	1,1 Dichloro-ethene	Trichloro-ethene (TCE)	Vinyl Chloride	cis-1,2-Dichloro-ethene
Method					EPA 8260B				
MTCA Method A (mg/kg)					0.05	NA	0.05	NA	NA
East	MW-3	SW-MW3-11:25	25	10/7/2011	**0.048**	0.0013 U	0.0013 U	0.0013 U	0.0013 U
East	MW-3	SW-MW3-11:30	30	10/7/2011	**0.038**	0.0016 U	0.0016 U	0.0016 U	0.0016 U
East	MW-3	SW-MW3-11:35	35	10/7/2011	**0.033**	0.0025 U	0.0025 U	0.0025 U	0.0025 U
West	B-4	B-4:13	10.6	11/12/2012	0.033 UJ	0.033 UJ	0.033 UJ	0.033 UJ	0.033 UJ
West	B-4	B-4:18	14.7	11/12/2012					
West	B-4	B-4:23	18.8	11/12/2012	0.034 UJ	0.00052 UJ	0.00052 UJ	0.00052 UJ	**0.0023 J**
West	B-4	B-4:28	22.9	11/12/2012	0.032 U	0.00054 U	0.00054 U	0.00054 U	**0.0036**
West	B-5	B-5:11	7.8	11/12/2012	**1.3 J**	0.037 UJ	**0.068 J**	0.037 UJ	0.037 UJ
West	B-5	B-5:18	12.7	11/12/2012					
West	B-5	B-5:23	16.2	11/12/2012	**0.2 J**	0.034 UJ	0.034 UJ	0.034 UJ	0.034 UJ
West	B-5	B-5:28:1	19.7	11/12/2012					
West	B-5	B-5:28:2	19.7	11/12/2012					
West	B-5	B-5:33	23.3	11/12/2012	**0.032 J**	**0.00056 UJ**	**0.0025 J**	0.00056 UJ	**0.0088 J**
West	B-5	B-5:38	26.8	11/12/2012	0.00079 U	0.00079 U	**0.0044**	0.00079 U	**0.05**
Alley	MW-6	MW-6:8.0	8	11/6/2012	**0.00074**				
Alley	MW-6	MW-6:13.0	13	11/6/2012	0.00051 U				
Alley	MW-6	MW-6:18.0	18	11/6/2012	0.00054 U				
Alley	MW-6	MW-6:23.0	23	11/6/2012	0.00053 U	0.00053 U	0.00053 U	0.00053 U	0.00053 U
Alley	MW-6	MW-6:28.0	28	11/6/2012	0.00049 U				
Alley	MW-6	MW-6:33.0	33	11/7/2012	0.0012 U	0.0012 U	0.0012 U	0.0012 U	0.0012 U
Alley	MW-6	MW-6:38.0	38	11/7/2012	0.0005 U				
Alley	MW-6	MW-6:43.0	43	11/7/2012	0.00054 U	0.00054 U	0.00054 U	0.00054 U	0.00054 U
Alley	MW-6	MW-6:48.0	48	11/7/2012	0.00048 U				
Alley	MW-6	MW-6:53.0	53	11/7/2012	0.00066 U				
Alley	MW-6	MW-6:58.0	58	11/7/2012	0.00058 U	0.00058 U	0.00058 U	0.00058 U	0.00058 U
East	B-8	MW-8:8.0	8	11/8/2012	**0.12**				
East	B-8	MW-8:13.0	13	11/8/2012	**0.39**	0.00065 U	**0.0047**	0.00065 U	**0.0012**
East	B-8	MW-8:13:2	13	11/8/2012	**0.16**	0.00061 U	**0.0023**	0.00061 U	0.00061 U
East	B-8	MW-8:15.5	15.5	11/8/2012	**0.099**				
East	B-8	MW-8:20.0	20	11/8/2012	**0.97**				
East	B-8	MW-8:25.0	25	11/8/2012	**0.025**				
East	B-8	MW-8:30.0	30	11/8/2012	**0.037**				
Alley	MW-10	MW-10:5	5	11/5/2012	0.00096 U				
Alley	MW-10	MW-10:10:1	10	11/5/2012	0.00098 U	0.00098 U	0.00098 U	0.00098 U	0.00098 U
Alley	MW-10	MW-10:10:2	10	11/5/2012	0.00095 U	0.00095 U	0.00095 U	0.00095 U	0.00095 U

TABLE 4. PREVIOUS INVESTIGATIONS SOIL RESULTS

	Boring	Sample Number	Depth (ft)	Date Sampled	Tetrachloro-ethene (PCE)	1,1 Dichloro-ethene	Trichloro-ethene (TCE)	Vinyl Chloride	cis-1,2-Dichloro-ethene
Method					EPA 8260B				
MTCA Method A (mg/kg)					**0.05**	**NA**	**0.05**	**NA**	**NA**
Alley	MW-10	MW-10:15	15	11/5/2012	0.00098 U				
Alley	MW-10	MW-10:21	21	11/5/2012	**0.0012**	0.00099 U	0.00099 U	0.00099 U	0.00099 U
Alley	MW-10	MW-10:25	25	11/5/2012	**0.0032**				
Alley	MW-10	MW-10:30	30	11/5/2012	**0.0018**				
Alley	MW-10	MW-10:35	35	11/5/2012	**0.0019**	0.00093 U	0.00093 U	0.00093 U	**0.0048**
Alley	MW-10	MW-10:42.5	42.5	11/5/2012	0.00091 U				
Alley	MW-10	MW-10:45	45	11/5/2012	0.0011 U				
Alley	MW-10	MW-10:50	50	11/5/2012	0.00099 U				
Alley	MW-10	MW-10:55	55	11/5/2012	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
East	MW-12	MW-12:16.0	16	11/8/2012	**4.6**				
East	MW-12	MW-12:21.0	21	11/8/2012	**1.8**				
East	MW-12	MW-12:26.0	26	11/8/2012	**1.4**				
East	MW-12	MW-12:30.0	30	11/8/2012	**0.079**				
East	MW-12	MW-12:36.0	36	11/8/2012	**0.078**				
East	MW-12	MW-12:41.0	41	11/9/2012	**0.078**				
East	MW-12	MW-12:46.0	46	11/9/2012	**0.062**				
East	MW-12	MW-12:51.0	51	11/9/2012	0.00049 U	0.00049 U	0.00049 U	0.00049 U	0.00049 U

	Boring	Sample Number	Depth (ft)	Benzene	Ethyl-benzene	Toluene	m,p-Xylene	o-xylene	Gaso-line	Diesel	Lube Oil
Method				EPA 8260B					NWPTH-Gx	NWTPH-Dx	NWTPH-Dx
MTCA Method A (mg/kg)				0.03	6	7	91	91	302	2,0003	2,0003
Geoprobes											
West Side											
Beneath the Building											
	KB-81	KB-81:2	2	0.02 U	0.061 U	0.061 U	0.061 U	0.061 U	6.1 U		
	KB-81	KB-81:6	6	0.02 U	**0.24**	0.069 U	**0.5**	0.35 U	**160**		
	KB-81	KB-81:9	9	**0.27**	**2.5**	**0.16**	**4.2**	0.65 U	**720**		
	KB-82	KB-82:2	2	0.02 U	0.065 U	0.065 U	0.065 U	0.065 U	6.5 U		
	KB-82	KB-82:6	6	**0.41**	**8.5**	**1.1**	**11**	**5.4**	**4200**		
	KB-82	KB-82:9	9	**0.2**	**2.2**	**0.17**	**3.3**	**0.54**	**590**		
	KB-83	KB-83:2	2	0.02 U	0.063 U	0.063 U	0.063 U	0.063 U	6.3 U		
	KB-83	KB-83:6	6	0.02 U	0.061 U	0.061 U	0.061 U	0.061 U	6.1 U		
	KB-84	KB-84:2	2	0.02 U	0.057 U	0.057 U	0.057 U	0.057 U	**19**		
	KB-84	KB-84:5:1	5	0.02 U	0.058 U	0.058 U	0.058 U	0.058 U	**40**		
	KB-84	KB-84:5:2	5	0.02 U	0.062 U	0.062 U	0.0048 U	0.062 U	**170**		
	KB-85	KB-85:2	2	0.02 U	0.065 U	0.065 U	0.0073 U	0.065 U	6.5 U		
	KB-85	KB-85:5	5	0.02 U	0.056 U	0.056 U	0.0047 U	0.056 U	5.6 U		
Parking Lot											
	GP-1-11	GP-1-11:10	10	0.0014 U	0.0014 U	0.0068 U	0.0027 U	0.0014 U	6.3 U	58 U	660
	GP-2-11	GP-2-11:9	9	0.0013 U	0.0013 U	0.0067 U	0.0027 U	0.0013 U	6.4 U	28 U	57 U
	GP-3-11	GP-3-11:13	13	0.0013 U	**0.022**	0.0067 U	**0.061**	**0.021**	**830**	89 U	58 U
	GP-4-11	GP-4-11:9.5	9.5	0.0014 U	0.0014 U	0.007 U	0.0028 U	0.0014 U	7.6 U	30 U	61 U
	GP-5-11	GP-5-11:13	13	0.072 U	0.072 U	0.36 U	0.14 U	0.072 U	**410**	38 U	**77**
	GP-6-11	GP-6-11:13	13	0.0012 U	0.0012 U	0.0061 U	0.0024 U	0.0012 U	6.2 U	29 U	**330**
	GP-7-11	GP-7-11:14	14	0.064 U	**0.092**	0.32 U	0.13 U	0.064 U	**60**	300 U	58 U
	GP-8-11	GP-8-11:14	14	0.0013 U	**0.2**	0.0066 U	**0.21**	**0.0042**	**50**	540 U	57 U
	GP-9-11	GP-9-11:13	13	0.0017 U	0.0017 U	0.0087 U	0.0035 U	0.0017 U	6.2 U	27 U	55 U
	KB-101	KB-101:4.0	4	0.02 U	0.054 U	0.054 U	0.054 U	0.054 U	5.4 U		
	KB-101	KB-101:9.5	9.5	0.02 U	**0.12**	0.1 U	**0.55**	0.1 U	**140**		
	KB-101	KB-101:14.5	14.5	**1**	**13**	**0.49**	**15**	2.3 U	**2300**		
	KB-102	KB-102:4.5	4.5	0.021 U	0.1 U	0.1 U	0.1 U	0.1 U	**220**		
	KB-102	KB-102:9.5	9.5	0.02 U	0.1 U	0.1 U	0.1 U	0.1 U	**54**		
	KB-102	KB-102:14.0	14	**0.78**	**12**	**0.64**	**5.5**	**27**	**1900**		
	KB-102	KB-102:17.0	17	**6.4**	**83**	**3.5**	**12**	**83**	**10000**		
	KB-103	KB-103:3.0	3	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	5 U		
	KB-103	KB-103:9.0	9	0.02 U	0.063 U	0.063 U	0.063 U	0.063 U	**16**		
	KB-103	KB-103:14.0	14	**0.15**	**1.7**	0.09 U	**2.3**	0.45 U	**420**		
	KB-104	KB-104:3.0	3	0.02 U	0.056 U	0.056 U	0.056 U	0.056 U	5.6 U		

	Boring	Sample Number	Depth (ft)	Benzene	Ethyl-benzene	Toluene	m,p-Xylene	o-xylene	Gaso-line	Diesel	Lube Oil
Method				EPA 8260B					NWPTH-Gx	NWTPH-Dx	NWTPH-Dx
MTCA Method A (mg/kg)				**0.03**	**6**	**7**	**91**	**91**	**302**	**2,0003**	**2,0003**
	KB-104	KB-104:9.0	9	0.02 U	0.049 U	0.049 U	0.049 U	0.049 U	4.9 U		
	KB-104	KB-104:13.5	13.5	0.02 U	0.097 U	0.097 U	0.097 U	0.097 U	9.7 U		
	KB-105	KB-105:4.5	4.5	**0.084**	**1**	0.1 U	**2.1**	1 U	**550**		
	KB-105	KB-105:9.0	9	0.02 U	0.05 U	0.05 U	0.05 U	0.05 U	**6.6**		
	KB-105	KB-105:13.0	13	**1.3**	**14**	**0.73**	**32**	**3.7**	**3300**		
	KB-106	KB-106:1.6	1.6	0.02 U	0.049 U	0.049 U	0.049 U	0.049 U	4.9 U		
	KB-107	KB-107:3.0	3	0.02 U	0.051 U	0.051 U	0.051 U	0.051 U	5.1 U		
	KB-107	KB-107:9.0	9	**0.22**	**1.2**	0.098 U	**2.2**	0.49 U	**450**		
	KB-107	KB-107:14.5	14.5	**0.36**	**11**	**0.31**	**25**	2.6 U	**2200**		
	KB-108	KB-108:3.0	3	0.02 U	0.055 U	0.055 U	0.055 U	0.055 U	5.5 U		
	KB-108	KB-108:9.0	9	0.02 U	0.056 U	0.056 U	0.056 U	0.056 U	5.6 U		
	KB-108	KB-108:14.0	14	0.023 U	**0.31**	0.12 U	**0.64**	0.12 U	**180**		
	KB-109	KB-109:6.0	6	0.02 U	0.058 U	0.058 U	0.058 U	0.058 U	5.8 U		
	KB-109	KB-109:9.0	9	0.02 U	0.064 U	0.064 U	0.064 U	0.064 U	6.4 U		
	KB-109	KB-109:12	12	0.02 U	**0.13**	0.052 U	**0.2**	0.052 U	**58**		
	KB-110	KB-110:6.0	6	0.02 U	0.068 U	0.068 U	0.068 U	0.068 U	**10**		
	KB-110	KB-110:9.0	9	0.02 U	0.051 U	0.051 U	0.051 U	0.051 U	**11**		
	KB-110	KB-110:14	14	0.02 U	0.046 U	0.046 U	0.046 U	0.046 U	4.6 U		
East Side											
	GP-10-11	GP-10-11:10	10	0.0015 U	0.0015 U	0.0074 U	0.003 U	0.0015 U	7.2 U	30 U	61 U
	GP-11-11	GP-11-11:10	10	0.0017 U	0.0017 U	0.0086 U	0.0034 U	0.0017 U	**15**	30 U	60 U
	GP-12-11	GP-12-11:10	10	0.0016 U	0.0016 U	0.0082 U	0.0033 U	0.0016 U	7.8 U	29 U	**59**
	GP-13	GP-13:4.5	4.5								
	GP-13	GP-13:10.0	10								
	GP-14	GP-14:5.5	5.5								
	GP-14	GP-14:10.5	10.5								
	GP-15	GP-15:5.0	5								
	GP-15	GP-15:12.0	12								
	GP-16	GP-16:8.0	8	0.00046 U	0.00046 U	0.0023 U	0.00092 U	0.00046 U			
	GP-16	GP-16:11.5	11.5								
	GP-17	GP-17:6.0	6								
	GP-17	GP-17:14.0	14								
	GP-18	GP-18:11.0	11								
	GP-19	GP-19:11.0	11								
	GP-20	GP-20:4.0	4								
	GP-20	GP-20:9.0	9								
	GP-21	GP-21:6.0	6								

	Boring	Sample Number	Depth (ft)	Benzene	Ethyl-benzene	Toluene	m,p-Xylene	o-xylene	Gaso-line	Diesel	Lube Oil
Method				EPA 8260B					NWPTH-Gx	NWTPH-Dx	NWTPH-Dx
MTCA Method A		(mg/kg)		0.03	6	7	91	91	302	2,0003	2,0003
	GP-21	GP-21:12.0	12								
	GP-22	GP-22:5.5	5.5								
	GP-22	GP-22:13.0	13								
	KB-51	KB-51:3.0	3								
	KB-51	KB-51:6.5	6.5								
	KB-51	KB-51:9.0	9								
	KB-51	KB-51:12.0	12								
	KB-52	KB-52:2.5	2.5								
	KB-52	KB-52:6.0	6								
	KB-52	KB-52:9.0	9								
	KB-52	KB-52:12.0	12								
	KB-53	KB-53:1.5	1.5	0.00095 U	**0.087**	0.0047 U	**1.2**	**0.071**			
	KB-53	KB-53:6.0	6								
	KB-53	KB-53:9.0	9								
	KB-53	KB-53:12.0	12								
	KB-53	KB-53:14.0	14								
	KB-54	KB-54:3.0	3								
	KB-54	KB-54:6.0	6								
	KB-54	KB-54:9.0	9								
	KB-54	KB-54:12.5	12.5								
	KB-55	KB-55:3.0	3								
	KB-55	KB-55:6.0	6								
	KB-55	KB-55:9.0	9								
	KB-55	KB-55:12.0	12								
	KB-56	KB-56:2.0	2								
	KB-56	KB-56:6.0	6								
	KB-56	KB-56:9.0	9								
	KB-56	KB-56:12.5	12.5								
	KB-57	KB-57:1.6	1.6								
	KB-58	KB-58:3.0	3								
	KB-58	KB-58:6.0	6								
	KB-58	KB-58:9.0	9								
	KB-58	KB-58:14.0	14								
	KB-59	KB-59:3.0	3								
	KB-59	KB-59:6.0	6								
	KB-59	KB-59:9.0	9								
	KB-59	KB-59:12.5	12.5								

	Boring	Sample Number	Depth (ft)	Benzene	Ethyl-benzene	Toluene	m,p-Xylene	o-xylene	Gaso-line	Diesel	Lube Oil
Method				EPA 8260B					NWPTH-Gx	NWTPH-Dx	NWTPH-Dx
MTCA Method A (mg/kg)				0.03	6	7	91	91	302	2,0003	2,0003
	KB-60	KB-60:3.0	3								
	KB-60	KB-60:9.0	9								
	KB-60	KB-60:12	12								
	KB-60	KB-60:14	14								
	KB-61	KB-61:3.0	3								
	KB-61	KB-61:6.0	6								
	KB-61	KB-61:9.0	9								
	KB-61	KB-61:12	12								
	KB-61	KB-61:14	14								
	KB-62	KB-62:3.0	3								
	KB-62	KB-62:6.0	6								
	KB-62	KB-62:13	13								
	KB-63	KB-63:3.0	3								
	KB-63	KB-63:6.0	6								
	KB-63	KB-63:9.0	9								
	KB-63	KB-63:12	12								
	KB-64	KB-64:6.0	6								
	KB-64	KB-64:9.0	9								
	KB-64	KB-64:12	12								
Borings/ Monitoring Wells											
West	MW-1	SW-MW1-11:13	13	0.0012 U	0.0012 U	0.0058 U	0.0023 U	0.0012 U	5.6 U	27 U	54 U
West	MW-1	SW-MW1-11:25	25	0.0012 U	0.0012 U	0.0058 U	0.0023 U	0.0012 U	6.3 U	29 U	58 U
East	MW-2	SW-MW2-11:5	5								
East	MW-2	SW-MW2-11:10	10								
East	MW-2	SW-MW2-11:16.5	16.5	0.0015 U	0.0015 U	0.0075 U	0.003 U	0.0015 U	6.1 U	29 U	58 U
East	MW-2	SW-MW2-11:20	20								
East	MW-2	SW-MW2-11:25	25	0.0014 U	0.0014 U	0.007 U	0.0028 U	0.0014 U	6.3 U	31 U	61 U
East	MW-3	SW-MW3-11:5	5								
East	MW-3	SW-MW3-11:10	10	0.001 U	0.001 U	0.0052 U	0.0021 U	0.001 U	6.6 U	30 U	60 U
East	MW-3	SW-MW3-11:18	18	0.0014 U	0.0014 U	0.0068 U	0.0027 U	0.0014 U	6.3 U	30 U	59 U

TABLE 4. PREVIOUS INVESTIGATIONS SOIL RESULTS

	Boring	Sample Number	Depth (ft)	Benzene	Ethyl-benzene	Toluene	m,p-Xylene	o-xylene	Gaso-line	Diesel	Lube Oil
Method				EPA 8260B					NWPTH-Gx	NWTPH-Dx	NWTPH-Dx
MTCA Method A		**(mg/kg)**		**0.03**	**6**	**7**	**91**	**91**	**302**	**2,0003**	**2,0003**
East	MW-3	SW-MW3-11:25	25								
East	MW-3	SW-MW3-11:30	30								
East	MW-3	SW-MW3-11:35	35								
West	B-4	B-4:13	10.6	**0.15**	**2.7**	**0.13**	**6.6**	**0.25**	**620**		
West	B-4	B-4:18	14.7	0.02 U	0.1 U	0.1 U	0.1 U	0.1 U	10 U		
West	B-4	B-4:23	18.8	0.02 U	**0.15**	0.097 U	**0.38**	0.097 U	**84**		
West	B-4	B-4:28	22.9	0.02 U	0.085 U	0.085 U	0.085 U	0.085 U	8.5 U		
West	B-5	B-5:11	7.8	**0.02**	0.097 U	0.097 U	**0.48**	0.097 U	**130**		
West	B-5	B-5:18	12.7	0.02 U	**0.12**	0.087 U	**0.25**	0.087 U	**68**		
West	B-5	B-5:23	16.2	**0.19**	**1.7**	**0.13**	**1.9**	0.85 U	**610**		
West	B-5	B-5:28:1	19.7	0.021 U	0.1 U	0.1 U	0.1 U	0.1 U	**14**		
West	B-5	B-5:28:2	19.7	0.02 U	0.085 U	0.085 U	0.085 U	0.085 U	8.5 U		
West	B-5	B-5:33	23.3	0.02 U	0.078 U	0.078 U	0.078 U	0.078 U	7.8 U		
West	B-5	B-5:38	26.8	0.02 U	0.079 U	0.079 U	0.079 U	0.079 U	7.9 U		
Alley	MW-6	MW-6:8.0	8	0.02 U	0.055 U	0.055 U	0.055 U	0.055 U	5.5 U		
Alley	MW-6	MW-6:13.0	13	0.02 U	0.056 U	0.056 U	0.056 U	0.056 U	5.6 U		
Alley	MW-6	MW-6:18.0	18	0.02 U	0.037 U	0.037 U	0.037 U	0.037 U	3.7 U		
Alley	MW-6	MW-6:23.0	23	0.02 U	0.036 U	0.036 U	0.0011 U	0.036 U	3.6 U		
Alley	MW-6	MW-6:28.0	28								
Alley	MW-6	MW-6:33.0	33	0.02 U	0.039 U	0.039 U	0.0024 U	0.039 U	3.9 U		
Alley	MW-6	MW-6:38.0	38								
Alley	MW-6	MW-6:43.0	43	0.00054 U	0.00054 U	0.0027 U	0.0011 U	0.00054 U			
Alley	MW-6	MW-6:48.0	48								
Alley	MW-6	MW-6:53.0	53								
Alley	MW-6	MW-6:58.0	58	0.00058 U	0.00058 U	0.0029 U	0.0012 U	0.00058 U			
East	B-8	MW-8:8.0	8								
East	B-8	MW-8:13.0	13								
East	B-8	MW-8:13:2	13								
East	B-8	MW-8:15.5	15.5								
East	B-8	MW-8:20.0	20								
East	B-8	MW-8:25.0	25								
East	B-8	MW-8:30.0	30								
Alley	MW-10	MW-10:5	5	0.02 U	0.048 U	0.048 U	0.048 U	0.048 U	4.8 U		
Alley	MW-10	MW-10:10:1	10	0.02 U	0.057 U	0.057 U	0.057 U	0.057 U	5.7 U		
Alley	MW-10	MW-10:10:2	10	0.02 U	0.058 U	0.058 U	0.058 U	0.058 U	5.8 U		

	Boring	Sample Number	Depth (ft)	Benzene	Ethyl-benzene	Toluene	m,p-Xylene	o-xylene	Gaso-line	Diesel	Lube Oil
Method				EPA 8260B					NWPTH-Gx	NWTPH-Dx	NWTPH-Dx
MTCA Method A (mg/kg)				0.03	6	7	91	91	302	2,0003	2,0003
Alley	MW-10	MW-10:15	15	0.02 U	0.058 U	0.058 U	0.058 U	0.058 U	5.8 U		
Alley	MW-10	MW-10:21	21	0.02 U	0.059 U	0.059 U	0.059 U	0.059 U	5.9 U		
Alley	MW-10	MW-10:25	25	0.02 U	0.06 U	0.06 U	0.06 U	0.06 U	6 U		
Alley	MW-10	MW-10:30	30	0.02 U	0.056 U	0.056 U	0.056 U	0.056 U	5.6 U		
Alley	MW-10	MW-10:35	35	0.02 U	0.049 U	0.049 U	0.049 U	0.049 U	4.9 U		
Alley	MW-10	MW-10:42.5	42.5	0.02 U	0.053 U	0.053 U	0.053 U	0.053 U	5.3 U		
Alley	MW-10	MW-10:45	45	0.02 U	0.069 U	0.069 U	0.069 U	0.069 U	6.9 U		
Alley	MW-10	MW-10:50	50	0.02 U	0.055 U	0.055 U	0.055 U	0.055 U	5.5 U		
Alley	MW-10	MW-10:55	55	0.02 U	0.058 U	0.058 U	0.058 U	0.058 U	5.8 U		
East	MW-12	MW-12:16.0	16								
East	MW-12	MW-12:21.0	21								
East	MW-12	MW-12:26.0	26								
East	MW-12	MW-12:30.0	30								
East	MW-12	MW-12:36.0	36								
East	MW-12	MW-12:41.0	41								
East	MW-12	MW-12:46.0	46								
East	MW-12	MW-12:51.0	51								

Notes:

EPA = Environmental Protection Agency
VPH = volatile petroleum hydrocarbons
NW-TPH = Northwest petroleum hydrocarbons- gasoline
NWTPH- Dx = Northwest petroleum hydrocarbons- diesel extended
PCB = polychlorinated biphenyls
VOC - Volatile organic compounds
VPH = volatile pet

Exploration Designations:
SW-MW-1, -2, -3 = Phase 2 ESA, monitoring wells
KB-50 to 64 = First Phase Remedial Investigation (RI), East Side
KB - 81 to 85 = First Phase RI, West Side, Beneath the Building
KB - 101 to -110 = First Phase RI, West Side
MW = First Phase RI - monitoring wells
B = First Phase RI, borings
PCE = tetrachloroethene
GP = Phase 2 Environmental Site Assessment(ESA), geoprobes

TABLE 5. PREVIOUS INVESTIGATIONS - GROUNDWATER RESULTS

SHANNON & WILSON, INC.

Location	Boring	Sample Number	Aquifer	Date Sampled	Tetra-chloro-ethene	1,1 Dichloro-ethene	Trichloro-ethene	Vinyl Chloride	cis-1,2-Dichloro-ethene	Benzene	Ethyl-benzene
MTCA Cleanup Level ug/L					**5**		**5**	**0.2**		**5**	**700**
West	MW-1	MW-1:GW	shallow	10/13/2011	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	**0.63**	**17**
West	MW-1	MW-1:GW:2	shallow	11/20/2012	0.2U *	0.2 U	0.2 U	0.2 U	0.2 U	**0.38**	**9.4**
East-	MW-2	MW-2:GW	shallow	10/13/2011	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
East	MW-3	MW-3:GW	deep	10/13/2011	**130**	1 U	**1.8**	1 U	1 U	1 U	1 U
Alley	MW-6	MW-6:GW	deep	11/20/2012	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Alley	MW-7	MW-7:GW	shallow	11/19/2012	0.2 U	0.2 U	**0.97**	0.2 U	**0.62**	0.2 U	0.2 U
Alley	MW-10	MW-10:GW	deep	11/19/2012	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Alley	MW-11	MW-11:GW	shallow	11/19/2012	**12**	0.34	**6.9**	0.2 U	**24**	0.2 U	0.2 U
East	MW-12	MW-12:GW:1	deep	11/20/2012	**350**	2 U	**8.4**	2 U	2 U	2 U	2 U
East	MW-12	MW-12:GW:2	deep	11/20/2012	**350**	2 U	**7.7**	2 U	2 U	2 U	2 U
Geoprobe											
West	GP-3-11	GP-3-11:GW		9/22/2011	**11**	10 U	10 U	10 U	**44**	**10 U**	**1100**

Location	Boring	Sample Number	Aquifer	Toluene	m,p-Xylene	o-Xylene	Gasoline	Diesel	Lube Oil	Lead - Dissolved	Lead - Total
MTCA Cleanup Level ug/L				**1,000**	**1,000**		**800**	**500**	**500**	**15**	**15**
West	MW-1	MW-1:GW	shallow	1 U	**11**	**1.1**	**1100**	0.29 U	0.46 U	1 U	**10**
West	MW-1	MW-1:GW:2	shallow	1 U	6.5	0.61	**540**				
East-	MW-2	MW-2:GW	shallow	1 U	0.4 U	0.2 U	400 U	0.26 U	0.42 U	1 U	**5.2**
East	MW-3	MW-3:GW	deep	5 U	2 U	1 U	**160**				
Alley	MW-6	MW-6:GW	deep	1 U	0.4 U	0.2 U	100 U				
Alley	MW-7	MW-7:GW	shallow	1 U	0.4 U	0.2 U	100 U				
Alley	MW-10	MW-10:GW	deep	1 U	0.4 U	0.2 U	100 U				
Alley	MW-11	MW-11:GW	shallow	1 U	0.4 U	0.2 U	100 U				
East	MW-12	MW-12:GW:1	deep	10 U	4 U	2 U	**550**				
East	MW-12	MW-12:GW:2	deep	10 U	4 U	2 U	**540**				
Geoprobe											
West	GP-3-11	GP-3-11:GW		**150**	**3000**	**990**	**54000**				

Notes:

* MW-1 was resampled following the first Phase of the RI. The original result was 1.6 ppb. However, after a review of the data, the result appears to be cross-contamination from the sample (MW-12, at 350 ppb, collected and analyzed immediately before MW-1.

MTCA = Model Toxics Control Act

ug/l = micrograms per liter

mg/l = milligrams per liter

TABLE 6. DATA QUALITY OBJECTIVES AND DATA USE

Data Need Target Analyte	Data Use(s) Regulatory Program or Nature and Citation	Specific use (i.e. Identify if IDW is Hazardous Waste)	Sampling Approach	Designation and Sample Depths
West Side				
Phase 1 RI (first phase of field work has been conducted)				
Evaluate nature and extent of petroleum, and related VOCs	Compare contaminant concentrations detected in samples to current risk-based and regulatory screening levels. Evaluate mass of contaminants (gross contamination).	Evaluate limits of the excavation on the west side (less costly to excavate than to treat in-situ) (100 mg/kg threshold).	Two days of probing (10 probes)	KB-101-110, 3 soil samples per probe = 30 samples (appr. 5, 10, and TD (13-15 ft)
Evaluate if petroleum has migrated under the building	Establish the eastern extent of gross contamination for excavation and eastern extent of contamination for in-situ treatment for petroleum. Plan for disposal costs, if soil is excavated as part of future development.		Directional Drilling - Hollow-stem auger to water table (approximately 20- 25 feet bgs true depth); Total depth from ground surface will be greater.	Boreholes B-4 and B-5, soil sampling every 2.5 ft to 20 ft, every 5 ft to 40 feet (TD), probes KB-81 to KB-85 through the floor slab; samples collected at 2, 6 and 9 ft below the slab.
Evaluate nature and extent of HVOCs identified beneath the building	Compare contaminant concentrations detected in samples to current risk-based and regulatory screening levels.		One day of probing (5 probes) beneath the building slab.	Probes KB-81 to KB-85 through the floor slab; samples collected at 2, 6 and 9 ft below the slab.

Data Need	Data Use(s)		Sampling Approach	Designation and Sample Depths
Target Analyte	**Regulatory Program or Nature and Citation**	**Specific use (i.e. Identify if IDW is Hazardous Waste)**		
Phase 2 RI				
Evaluate nature and extent of HVOCs identified beneath the building (cont.)	Evaluate potential exposure risks to human and ecological receptors.		Collect two air samples over a period of 8 hours within the building using SUMMA canisters. The ventialation system will have been operat ing at least 48 hours prior to sampling. Collect a background air sample outside the building.	A-1, A-2 and A-3
	Evaluate mass of contaminants (gross contamination).	Evaluate remedial alternatives		
Evaluate if HVOCs are present in indoor air in the existing building	If contaminants encountered, evaluate if contaminants in indoor air exceed MTCA criteria.	Evaluate if engineering controls are necessary to improve indoor air quality, before the building is occupied.		
East Side				
Phase 1 RI (first phase of field work has been conducted)				
Evaluate nature and extent of HVOCs	Evaluate mass of contaminants (gross contamination)	Evaluate limits of the excavation on the east side (less costly to excavate than to treat in-situ).	Phase 1 - 2 days of probing (14 probes)	KB-51 to KB-64, 3 to 5 soil samples per probe = 70 samples
Evaluate nature and extent of HVOCs (cont.)	Compare contaminant concentrations detected in samples to current risk-based and regulatory screening levels.			
	Evaluate potential exposure risks to human and ecological receptors.			

Data Need	Data Use(s)		Sampling Approach	Designation and Sample Depths
Target Analyte	Regulatory Program or Nature and Citation	Specific use (i.e. Identify if IDW is Hazardous Waste)		
Support construction planning and cost estimating of excavation and soil disposal for current RI/FS and for future redevelopment		Select waste category based on concentration: dangerous with pretreatment required (F002), dangerous -direct landfilled (F002), contained out, no detections "clean".		
	Establish boundaries for detectable levels of HVOCs.	Soil that is excavated, and contains HVOCs from the dry-cleaning operation is subject to RCRA, and will always be a listed dangerous waste (F002), at any concentration.	Install monitoring wells and/or borings at the property boundaries.	Monitoring wells MW-12 and -13, and B-8
Phase 2 RI				
Evaluate if HVOCs are moving off-site at concentrations exceeding MTCA cleanup levels.	Compare contaminant concentrations detected in samples to current risk-based and regulatory screening levels.		Install monitoring wells in the deep and shallow aquifers at the downgradient property boundary.	MW-14 (deep - approximately 40 to 50 feet bgs), and MW-15 (shallow- approximately 20 feet bgs). Soil samples collected at 5 feet -interval

Data Need	Data Use(s)		Sampling Approach	Designation and Sample Depths
Target Analyte	Regulatory Program or Nature and Citation	Specific use (i.e. Identify if IDW is Hazardous Waste)		
	Evaluate potential exposure risks to human and ecological receptors.		Install monitoring wells in the deep aquifer at the northeast corner of the intersection of NE 45th Street and NE 11th Street	MW-16 (deep)
After Source Removal				
Evaluate potential soil vapor pathway	Evaluate potential exposure risks to human and ecological receptors.		If necessary, collect soil vapor from geoprobes	
Aquifer(s) Characterization				
Phase 1 RI (first phase of field work has been conducted)				
Evaluate water-bearing zone(s) to establish if there are two separate zones	Evaluate if there is perched water and if so, the limits of the perched zone.			
Evaluate groundwater flow direction	Evaluate where groundwater remediation alternatives should be conducted.	Use to place monitoring wells in downgradient locations	Explore at mid property, immediately west edge of alley (appr. lateral to UST locations)	MW-6 and MW-7, interval of 5 feet to bottom of the hole.
Evaluate concentration of contaminants at the property boundaries (downgradient)	Evaluate if contaminants are moving off-site at concentrations greater than MTCA Cleanup criteria.		Explore at east property boundary, south of east UST	B-8 interval of 5 feet to bottom of the hole.

Data Need	Data Use(s)		Sampling Approach	Designation and Sample Depths
Target Analyte	Regulatory Program or Nature and Citation	Specific use (i.e. Identify if IDW is Hazardous Waste)		
Evaluate subsurface conditions	Evaluate soil characteristics for use in evaluating transport mechanisms and suitability of potential remedial alternatives.	Identify levels that may affect design of the remedial alternative		
	Evaluate if HVOCs have migrated west of the alley, and if the soil and groundwater are contaminated with gasoline and BTEX, and HVOCs from the east side, as well as from beneath the building.	Use to design appropriate remedial alternatives	South property boundary, west of alley	MW-10 and MW-11 interval of 5 feet to bottom of the hole.
Phase 2 RI				
Further evaluate subsurface conditions on and off- site	Understand contaminant migration	Use to design appropriate remedial alternatives	Install monitoring wells on the site in the shallow aquifer. Install a well on- and off-site in the deep aquifer.	MW-14 (deep), and MW-15 (shallow), and MW-16 (deep), and potentially MW-9 (shallow) depending on the distribution and concentrations of PCE beneath the building.

Notes BTEX = benzene, ethylbenzene, toluene, xylenes
bgs = below ground surface
HVOCs = halogenated volatile organic compounds
MTCA = Model Toxics Control Act
NE = northeast
RI = Remedial Investigation
UST = underground storage tank
TD + total depth
PCE = tetrachloroethene
VOCs = Volatile organic compounds

TABLE 7. SOIL COMPARISON OF REPORTING LIMITS TO REGULATORY DATA

SHANNON & WILSON, INC.

Analyte	MDL	PQL	Units	Soil, MTCA Method A, Unrestricted Land Use	MTCA Method B, Carcinogen	MTCA Method B, Non-carcinogen
NWTPH-Gx mg/kg						
Gasoline (PID)	0.838	0.838	ppm	NA	NA	NA
Gasoline (FID)	0.565		ppm	NA	NA	NA
NWTPH-Dx (ppm)						
Diesel Fuel #2	8.364	25	ppm	NA	NA	NA
Lube Oil	12.629	50	ppm	NA	NA	NA
Volatiles by Method 8021B mg/kg						
MTBE	0.012	0.05	ppm	NA	NA	NA
Benzene	0.004	0.02	ppm	0.03	18.2	320
Toluene	0.007	0.05	ppm	7	NR	6400
Ethylbenzene	0.003	0.05	ppm	6	NR	8000
m,p-Xylene	0.004	0.05	ppm	NA	NA	NA
o-Xylene	0.003	0.05	ppm	No Data	NR	16000
Volatiles by Method 8260B						
(cis) 1,2-Dichloroethene	0.150	1	ppb	NA	NA	NA
(cis) 1,3-Dichloropropene	0.107	1	ppb	NA	NA	NA
(trans) 1,2-Dichloroethene	0.178	1	ppb	NA	NA	NA
(trans) 1,3-Dichloropropene	0.143	1	ppb	NA	NA	NA
1,1,1,2-Tetrachloroethane	0.181	1	ppb	No Data	38462	2400000
1,1,1-Trichloroethane	0.174	1	ppb	2000	NR	160000000
1,1,2,2-Tetrachloroethane	0.119	1	ppb	No Data	5000	1600000
1,1,2-Trichloroethane	0.158	1	ppb	No Data	17544	320000
1,1-Dichloroethane	0.142	1	ppb	No Data	NR	16000000
1,1-Dichloroethene	0.264	1	ppb	NA	NA	NA
1,1-Dichloropropene	0.259	1	ppb	NA	NA	NA
1,2,3-Trichlorobenzene	0.299	1	ppb	NA	NA	NA
1,2,3-Trichloropropane	0.184	1	ppb	No Data	33	320000
1,2,4-Trichlorobenzene	0.187	1	ppb	NA	NA	NA
1,2,4-Trimethylbenzene	0.181	1	ppb	NR	NR	No Data
1,2-Dibromo-3-chloropropane	0.286	5	ppb	No Data	1250	16000
1,2-Dibromoethane	0.134	1	ppb	NA	NA	NA
1,2-Dichlorobenzene	0.116	1	ppb	No Data	NR	7200000
1,2-Dichloroethane	0.189	1	ppb	No Data	10989	1600000
1,2-Dichloropropane	0.177	1	ppb	No Data	No Data	NR
1,3,5-Trimethylbenzene	0.120	1	ppb	NR	NR	800000
1,3-Dichlorobenzene	0.122	1	ppb	NR	NR	NR
1,3-Dichloropropane	0.164	1	ppb	NA	NA	NA
1,4-Dichlorobenzene	0.142	1	ppb	No Data	No Data	NR
2,2-Dichloropropane	0.181	1	ppb	NA	NA	NA
2-Butanone	0.787	5	ppb	NA	NA	NA
2-Chloroethyl Vinyl Ether	0.237	5	ppb	NA	NA	NA
2-Chlorotoluene	0.144	1	ppb	No Data	NR	1600000
2-Hexanone	0.261	5	ppb	NA	NA	NA
4-Chlorotoluene	0.190	1	ppb	NA	NA	NA
Acetone	1.664	5	ppb	No Data	NR	72000000
Benzene	0.174	1	ppb	30	18182	320000

TABLE 7. SOIL COMPARISON OF REPORTING LIMITS TO REGULATORY DATA

SHANNON & WILSON, INC.

Analyte	MDL	PQL	Units	Soil, MTCA Method A, Unrestricted Land Use	MTCA Method B, Carcinogen	MTCA Method B, Non-carcinogen
Bromobenzene	0.138	1	ppb	NA	NA	NA
Bromochloromethane	0.202	1	ppb	NA	NA	NA
Bromodichloromethane	0.130	1	ppb	No Data	16129	1600000
Bromoform	0.168	1	ppb	No Data	126582	1600000
Bromomethane	0.515	1	ppb	No Data	NR	112000
Carbon Disulfide	0.178	1	ppb	No Data	NR	8000000
Carbon Tetrachloride	0.167	1	ppb	No Data	14300	320000
Chlorobenzene	0.119	1	ppb	No Data	NR	1600000
Chloroethane	0.374	5	ppb	No Data	No Data	No Data
Chloroform	0.168	1	ppb	No Data	No Data	800000
Chloromethane	0.257	5	ppb	No Data	No Data	NR
Dibromochloromethane	0.248	1	ppb	No Data	11905	1600000
Dibromomethane	0.174	1	ppb	No Data	NR	800000
Dichlorodifluoromethane	0.200	1	ppb	No Data	NR	16000000
Ethylbenzene	0.136	1	ppb	6000	NR	8000000
Hexachlorobutadiene	0.301	5	ppb	No Data	12821	80000
Iodomethane	0.595	5	ppb	NA	NA	NA
Isopropylbenzene	0.128	1	ppb	No Data	NR	8000000
m,p-Xylene	0.253	2	ppb	NA	NA	NA
Methyl Isobutyl Ketone	0.245	5	ppb	NA	NA	NA
Methyl t-Butyl Ether	0.135	1	ppb	NA	NA	NA
Methylene Chloride	1.140	5	ppb	20	133333	4800000
Naphthalene	0.184	1	ppb	5000	NR	1600000
n-Butylbenzene	0.205	1	ppb	NR	NR	NR
n-Propylbenzene	0.157	1	ppb	NR	NR	8000000
o-Xylene	0.122	1	ppb	No Data	NR	16000000
p-Isopropyltoluene	0.129	1	ppb	NA	NA	NA
sec-Butylbenzene	0.113	1	ppb	NR	NR	NR
Styrene	0.112	1	ppb	No Data	No Data	16000000
tert-Butylbenzene	0.126	1	ppb	NR	NR	NR
Tetrachloroethene	0.178	1	ppb	50	476000	480000
Toluene	0.103	5	ppb	7000	NR	6400000
Trichloroethene	0.185	1	ppb	30	11500	40000
Trichlorofluoromethane	0.133	1	ppb	NA	NA	NA
Vinyl Acetate	0.704	5	ppb	NA	NA	NA
Vinyl Chloride	0.209	1	ppb	No Data	670	240000
Metals 6010B (mg/kg)						
Arsenic	0.048	10.000	ppm	20	1	24
Cadmium	0.015	0.500	ppm	No Data	NR	80
Chromium	0.025	0.500	ppm	2000	NR	120000
Iron	5.000	10.000	ppm	No Data	NR	56000
Lead	0.024	5.000	ppm	250	NR	NR
Manganese	0.024	0.500	ppm	No Data	NR	11200
Mercury	0.001	0.250	ppm	2	NR	No Data

Notes: MDL = method detection limit, PID = photoionization detector
PQL = practical quantitation limit FID = flame ionization detector
EPA = Envrionmental Protection Agency
ppb = part per billion = ug/kg = micrograms per kilogram
ppm = parts per million = mg/kg = milligrams per kilogram
NA = not available MTCA = Model Toxics
NR = not reported Control Act
Soil, MTCA Method B, Carcinogen, Standard Formula Value Direct
Soil, Method B, Non-carcinogen, Standard Formula Value Direct Contact
Soil, Method B, Carcinogen, Standard Formula Value, Direct Contact
Soil, Method B, Carcinogen, Standard Formula Value, Direct Contact
Soil, Method B, Non-carcinogen, Standard Formula Value, Direct Contact
Source: CLARCiSelect Reference database, Department of Ecology

TABLE 8. GROUNDWATER COMPARISON OF REPORTING LIMITS TO REGULATORY CRITERIA

	MDL	PQL	Units	MTCA Method A	MTCA Method B, Carcinogen	MTCA Method B, Non-carcinogen
NWTPH-Gx (ug/l)						
Gasoline (PID)	9.14	100	ppb	NA	NA	NA
Gasoline (FID)	20.7	100	ppb	NA	NA	NA
NWTPH-Dx (ppm)				NA	NA	NA
Diesel Fuel #2	0.051395	0.25	ppm	NA	NA	NA
Lube Oil	0.148684	0.4	ppm	NA	NA	NA
Volatiles by Method 8021B (ug/l)						
MTBE	0.31651	10	ppb	NA	NA	NA
Benzene	0.02579	1	ppb	5	0.795	32
Toluene	0.050531	1	ppb	1000	NR	640
Ethylbenzene	0.036954	1	ppb	700	NR	800
m,p-Xylene	0.054464	1	ppb	NA	NA	NA
o-Xylene	0.039334	1	ppb	No Data	NR	1600
Volatiles by Method 8260B (ug/l)						
(cis) 1,2-Dichloroethene	0.030	0.2	ppb	NA	NA	NA
(cis) 1,3-Dichloropropene	0.027	0.2	ppb	NA	NA	NA
(trans) 1,2-Dichloroethene	0.031	0.2	ppb	NA	NA	NA
(trans) 1,3-Dichloropropene	0.040	0.2	ppb	NA	NA	NA
1,1,1,2-Tetrachloroethane	0.055	0.2	ppb	No Data	1.683	240
1,1,1-Trichloroethane	0.042	0.2	ppb	200	NR	16000
1,1,2,2-Tetrachloroethane	0.062	0.2	ppb	No Data	0.219	160
1,1,2-Trichloroethane	0.059	0.2	ppb	No Data	0.768	32
1,1-Dichloroethane	0.027	0.2	ppb	No Data	NR	1600
1,1-Dichloroethene	0.046	0.2	ppb	NA	NA	NA
1,1-Dichloropropene	0.040	0.2	ppb	NA	NA	NA
1,2,3-Trichlorobenzene	0.040	0.2	ppb	NA	NA	NA
1,2,3-Trichloropropane	0.085	0.2	ppb	No Data	0.001	32
1,2,4-Trichlorobenzene	0.050	0.2	ppb	NA	NA	NA
1,2,4-Trimethylbenzene	0.041	0.2	ppb	NR	NR	No Data
1,2-Dibromo-3-chloropropane	0.483	1	ppb	No Data	0.055	1.6
1,2-Dibromoethane	0.070	0.2	ppb	NA	NA	NA
1,2-Dichlorobenzene	0.042	0.2	ppb	No Data	NR	720
1,2-Dichloroethane	0.053	0.2	ppb	5	0.481	160
1,2-Dichloropropane	0.059	0.2	ppb	No Data	No Data	NR
1,3,5-Trimethylbenzene	0.030	0.2	ppb	NR	NR	80
1,3-Dichlorobenzene	0.048	0.2	ppb	NR	NR	NR
1,3-Dichloropropane	0.048	0.2	ppb	NA	NA	NA
1,4-Dichlorobenzene	0.035	0.2	ppb	No Data	No Data	NR
2,2-Dichloropropane	0.048	0.2	ppb	NA	NA	NA
2-Butanone	0.257	5	ppb	NA	NA	NA
2-Chloroethyl Vinyl Ether	0.310	1	ppb	NA	NA	NA

TABLE 8. GROUNDWATER COMPARISON OF REPORTING LIMITS TO REGULATORY CRITERIA

	MDL	PQL	Units	MTCA Method A	MTCA Method B, Carcinogen	MTCA Method B, Non-carcinogen
2-Chlorotoluene	0.061	0.2	ppb	No Data	NR	160
2-Hexanone	0.128	2	ppb	NA	NA	NA
4-Chlorotoluene	0.047	0.2	ppb	NA	NA	NA
Acetone	0.506	5	ppb	No Data	NR	7200
Benzene	0.024	0.2	ppb	5	0.80	32
Bromobenzene	0.084	0.2	ppb	NA	NA	NA
Bromochloromethane	0.044	0.2	ppb	NA	NA	NA
Bromodichloromethane	0.047	0.2	ppb	No Data	0.71	160
Bromoform	0.114	1	ppb	No Data	5.54	160
Bromomethane	0.069	0.2	ppb	No Data	NR	11.2
Carbon Disulfide	0.039	0.2	ppb	No Data	NR	800
Carbon Tetrachloride	0.066	0.2	ppb	No Data	0.625	32
Chlorobenzene	0.030	0.2	ppb	No Data	NR	160
Chloroethane	0.065	1	ppb	No Data	No Data	No Data
Chloroform	0.039	0.2	ppb	No Data	No Data	80
Chloromethane	0.037	1	ppb	No Data	No Data	NR
Dibromochloromethane	0.122	0.2	ppb	No Data	0.52	160
Dibromomethane	0.059	0.2	ppb	No Data	NR	80
Dichlorodifluoromethane	0.148	0.2	ppb	No Data	NR	1600
Ethylbenzene	0.030	0.2	ppb	700	NR	800
Hexachlorobutadiene	0.068	0.2	ppb	No Data	0.56	8
Iodomethane	0.207	1	ppb	NA	NA	NA
Isopropylbenzene	0.029	0.2	ppb	No Data	NR	800
m,p-Xylene	0.049	0.4	ppb	NA	NA	NA
Methyl Isobutyl Ketone	0.104	2	ppb	NA	NA	NA
Methyl t-Butyl Ether	0.045	0.2	ppb	NA	NA	NA
Methylene Chloride	0.149	1	ppb	5	5.83	480
Naphthalene	0.049	1	ppb	160	NR	160
n-Butylbenzene	0.039	0.2	ppb	NR	NR	NR
n-Propylbenzene	0.033	0.2	ppb	NR	NR	800
o-Xylene	0.034	0.2	ppb	No Data	NR	1600
p-Isopropyltoluene	0.035	0.2	ppb	NA	NA	NA
sec-Butylbenzene	0.032	0.2	ppb	NR	NR	NR
Styrene	0.033	0.2	ppb	No Data	No Data	1600
tert-Butylbenzene	0.037	0.2	ppb	NR	NR	NR
Tetrachloroethene	0.069	0.2	ppb	5	20.8	48
Toluene	0.022	1	ppb	1000	NR	640
Trichloroethene	0.048	0.2	ppb	5	0.54	4
Trichlorofluoromethane	0.066	0.2	ppb	NA	NA	NA
Vinyl Acetate	0.049	2	ppb	NA	NA	NA
Vinyl Chloride	0.029	0.2	ppb	0.2	0.029	24

TABLE 8. GROUNDWATER COMPARISON OF REPORTING LIMITS TO REGULATORY CRITERIA

	MDL	PQL	Units	MTCA Method A	MTCA Method B, Carcinogen	MTCA Method B, Non-carcinogen
Metals 6010B/EPA 200.8/200.7 (ug/l)						
Arsenic	0.886	3.3	ppb	5	0.058	4.8
Cadmium	0.056	4.4	ppb	5	NR	16
Chromium	0.474	11	ppb	No Data	NR	24000
Iron			ppb	No Data	NR	11200
Lead	0.101	1.1	ppb	15	NR	NR
Manganese	0.270	11	ppb	No Data	NR	2240
Mercury	0.008	0.5	ppb	2	NR	No Data

Notes: MDL = method detection limit,
PQL = practical quantitation limit
EPA = Envrionmental Protection Agency
ppb = part per billion
ppm = parts per million
MTCA = Model Toxics Control Act
PID = photoionization detector
FID = flame ionization detector
NA = not available
NR = Not researched
Ground Water, MTCA Method B, Carcinogen, Standard Formula Value
Ground Water, MTCA Method B, Non-carcinogen, Standard Formula Value

Source: CLARC Select Reference database Department of Ecolgoy

TABLE 9
COMPARISON OF REPORTING LIMITS TO REGULATORY CRITERIA FOR INDOOR AIR AND SOIL VAPOR SAMPLES

Analyte	CAS#	Matrix	Method	MDL (ug/m3)	Base RL (ug/m3)*	Adjusted RL (ug/m3)**	Washington Indoor Air Clean Up Levels Method B - Carcinogen (ug/m3)	Washington Indoor Air Clean Up Levels Method B - Non-Carcinogen (ug/m3)	Washington Soil Gas Screening Levels Method B-Carcinogen (ug/m3)***	Washington Soil Gas Screening Levels Method B - Non-Carcinogen (ug/m3)***
Volatile Organic Compounds (VOCs)										
1,1,1-Trichloroethane	71-55-6	Vapor	TO-15	0.011	0.11	0.165		4800		48000/480000
1,1,2,2-Tetrachloroethane	79-34-5	Vapor	TO-15	0.007	0.11	0.165	0.043		0.43/4.3	
1,1,2-Trichloroethane	79-00-5	Vapor	TO-15	0.005	0.11	**0.165**	0.16		1.6/16	
1,1-Dichloroethane	75-34-3	Vapor	TO-15	0.008	0.082	0.123		320		3200/32000
1,1-Dichloroethene	75-35-4	Vapor	TO-15	0.008	0.04	0.06			732	0.164
1,2-Dichloroethane	107-06-2	Vapor	TO-15	0.004	0.082	0.123	0.096	2.2	0.96/9.6	22/220
Benzene	71-43-2	Vapor	TO-15	0.013	0.16	0.24	0.32	14	3.2/32	140/1400
Carbon tetrachloride	56-23-5	Vapor	TO-15	0.006	0.64	**0.96**	0.17		1.7/17	
cis-1,2-Dichloroethene	156-59-2	Vapor	TO-15	0.008	0.08	0.12		16		160/1600
Ethylbenzene	100-41-4	Vapor	TO-15	0.004	0.088	0.132		460		4600/46000
Methyl tert-butyl ether	1634-04-4	Vapor	TO-15	0.011	0.37	0.555	9.6	1400	96/960	14000/140000
Methylene Chloride	75-09-2	Vapor	TO-15	0.03	0.71	1.065				
m-Xylene & p-Xylene	133-020-7	Vapor	TO-15	0.004	0.17	0.255		46		460/4600
o-Xylene	95-47-6	Vapor	TO-15	0.004	0.088	0.132		46		460/4600
Tetrachloroethene	127-18-4	Vapor	TO-15	0.007	0.14	0.21	0.42	16	4.2/42	160/1600
Toluene	108-88-3	Vapor	TO-15	0.004	0.076	0.114		2200		22000/220000
trans-1,2-Dichloroethene	156-60-5	Vapor	TO-15	0.008	0.4	0.6		32		320/3200
Trichloroethene	79-01-6	Vapor	TO-15	0.005	0.11	**0.165**	0.1	16	1/10	160/1600
Vinyl chloride	75-01-4	Vapor	TO-15	0.003	0.026	0.039	0.28	46	2.8/28	460/4600

Notes:

* Base Reporting Limit is the initial reporting limit that is capable of the AirToxics analytical system.

** Adjust Reporting Limit is based on the pressurization step performed by the laboratory at the time of receipt. The reporting limit is calculated by multiplying the base reporting limit by the pressurization dilution factor of 1.5 by the laboratory at the time of receipt dilutes the sample and results in an increase in the base reporting limit.

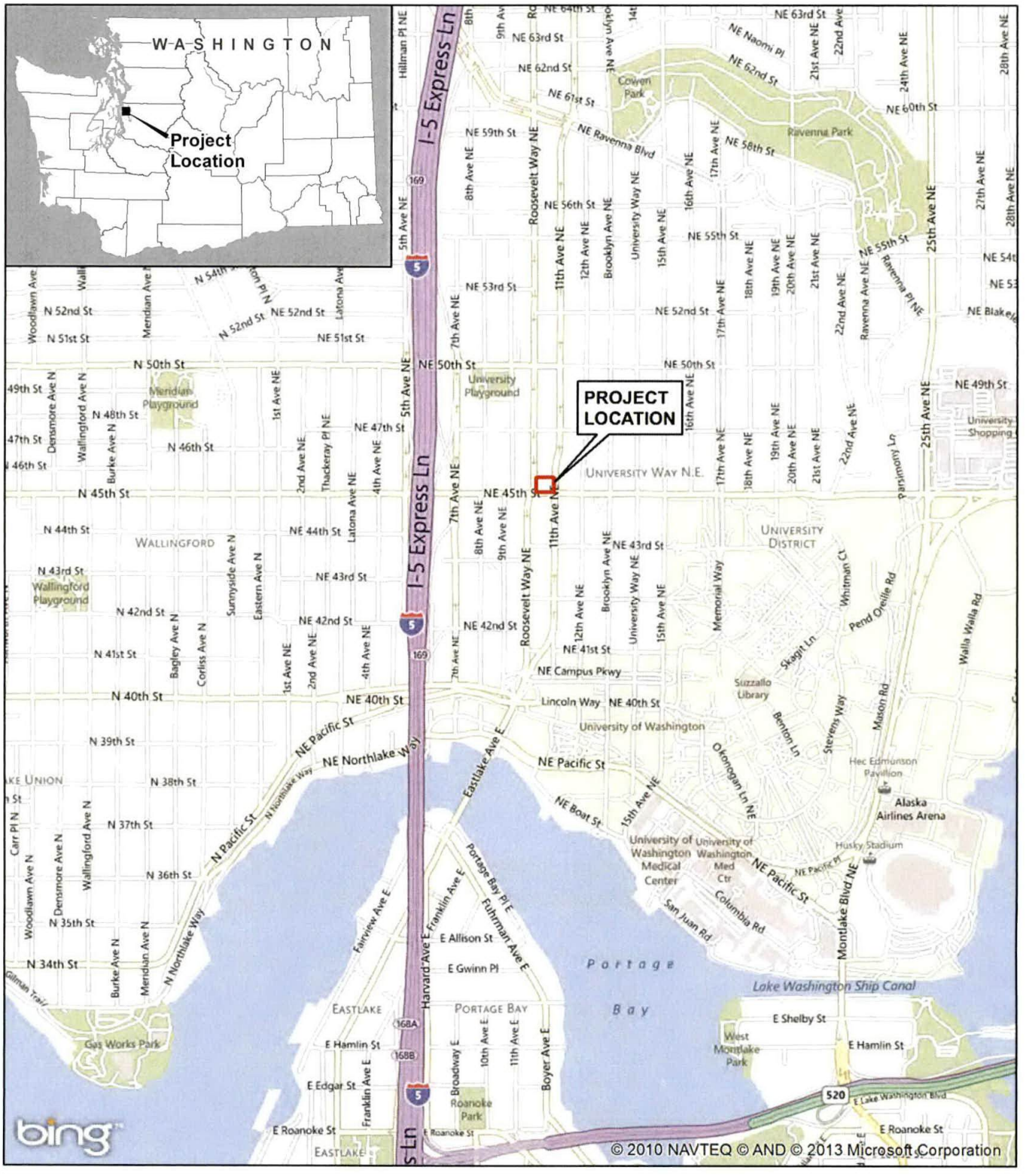
*** Soil Gas Screening Level is the concentration in the soil gas just beneath a building (first value) or at 15-foot depth or greated (second value) expected to not result in exceedance of the air cleanup level in an overlying structure under most circumstances (see Chapter 3 Draft Guidance for Evaluting Soil Vapor Intrusion in Washington State: Investigation and Remedial Action (October 2009) for more information on the appropriate use of these screening levels).

MDL = method detection limit

RL = reporting limit

ug/l = micrograms per liter

ug/m3 = micrograms per cubic liter



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N
W E
S

0 1,500 3,000
Feet

Sound Transit
1000 NE 45th Street
Seattle, Washington

VICINITY MAP

March 2013 21-1-16609-001

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 1

Filename: T:\Project\21-1\16609_Key_Bank_RI-FS\AV_mxd\RI_WorkPlan_March2013\Fig-1_VicinityMap.mxd Date: 3/6/2013 beo

Filename: T:\Project\21-1\16609_Key_Bank_RI-FS\AV_mxd\RI_WorkPlan_March2013\Fig-2_SiteExplorations.mxd Date: 3/7/2013 beo

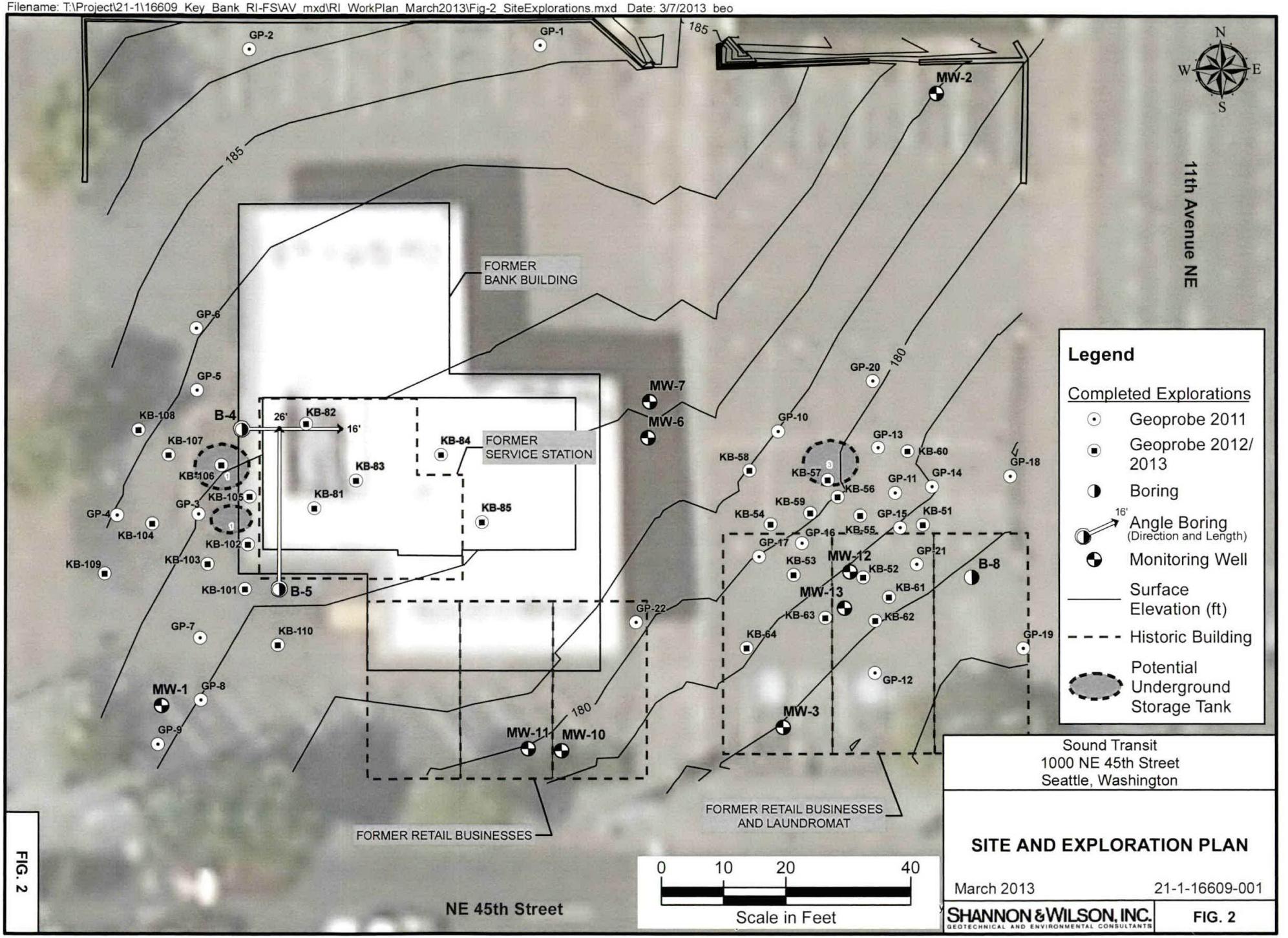

FIG. 2

Sound Transit
1000 NE 45th Street
Seattle, Washington

SITE AND EXPLORATION PLAN

March 2013 21-1-16609-001

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FIG. 2

Filename: T:\Project\21-1\16609_Key_Bank_RI-FS\AV_mxd\RI_WorkPlan_March2013\Fig-3_SitePlan_XSectionProfiles.mxd Date: 3/6/2013 beo

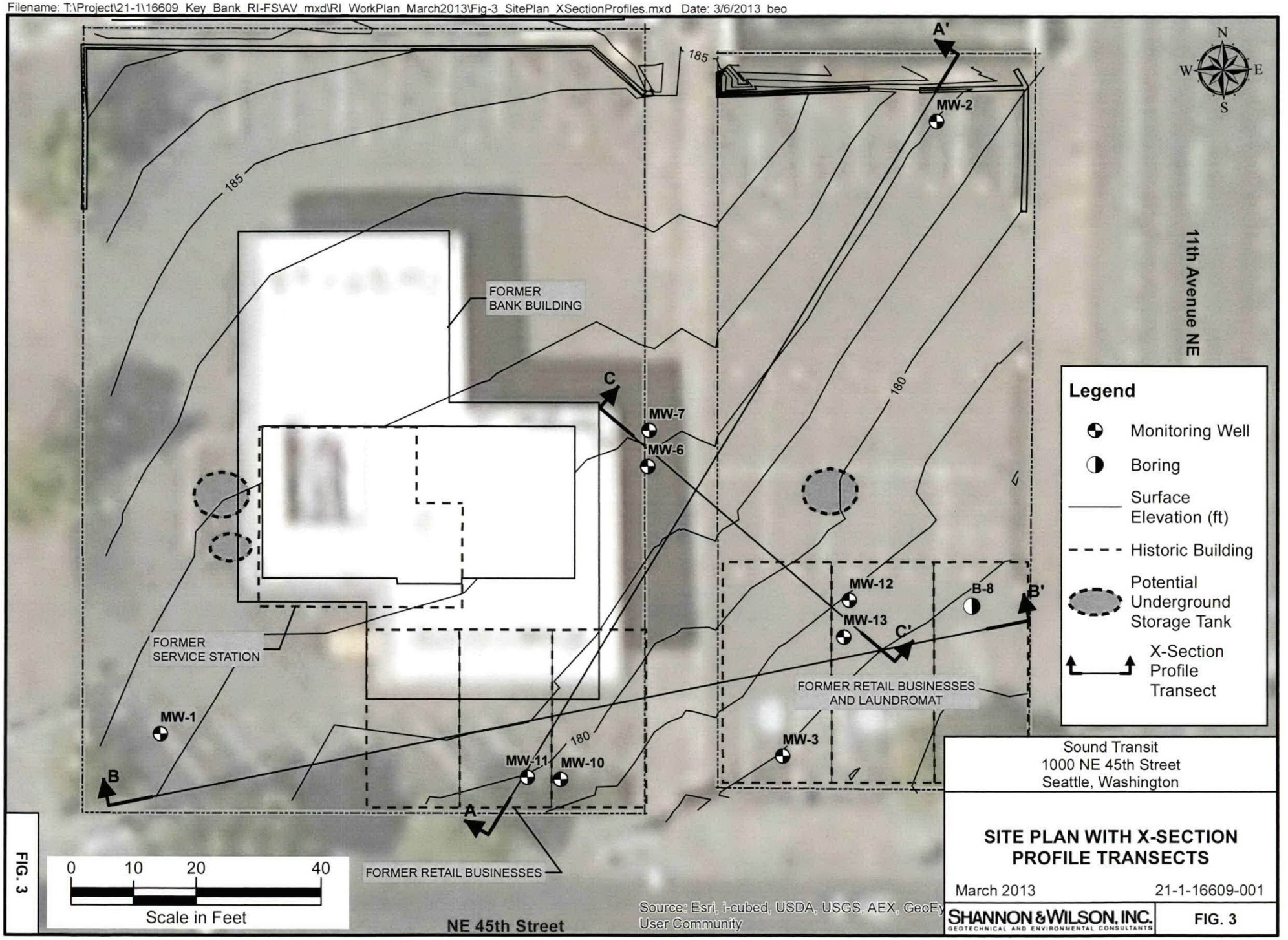

FIG. 3

Sound Transit
1000 NE 45th Street
Seattle, Washington

SITE PLAN WITH X-SECTION PROFILE TRANSECTS

March 2013 21-1-16609-001

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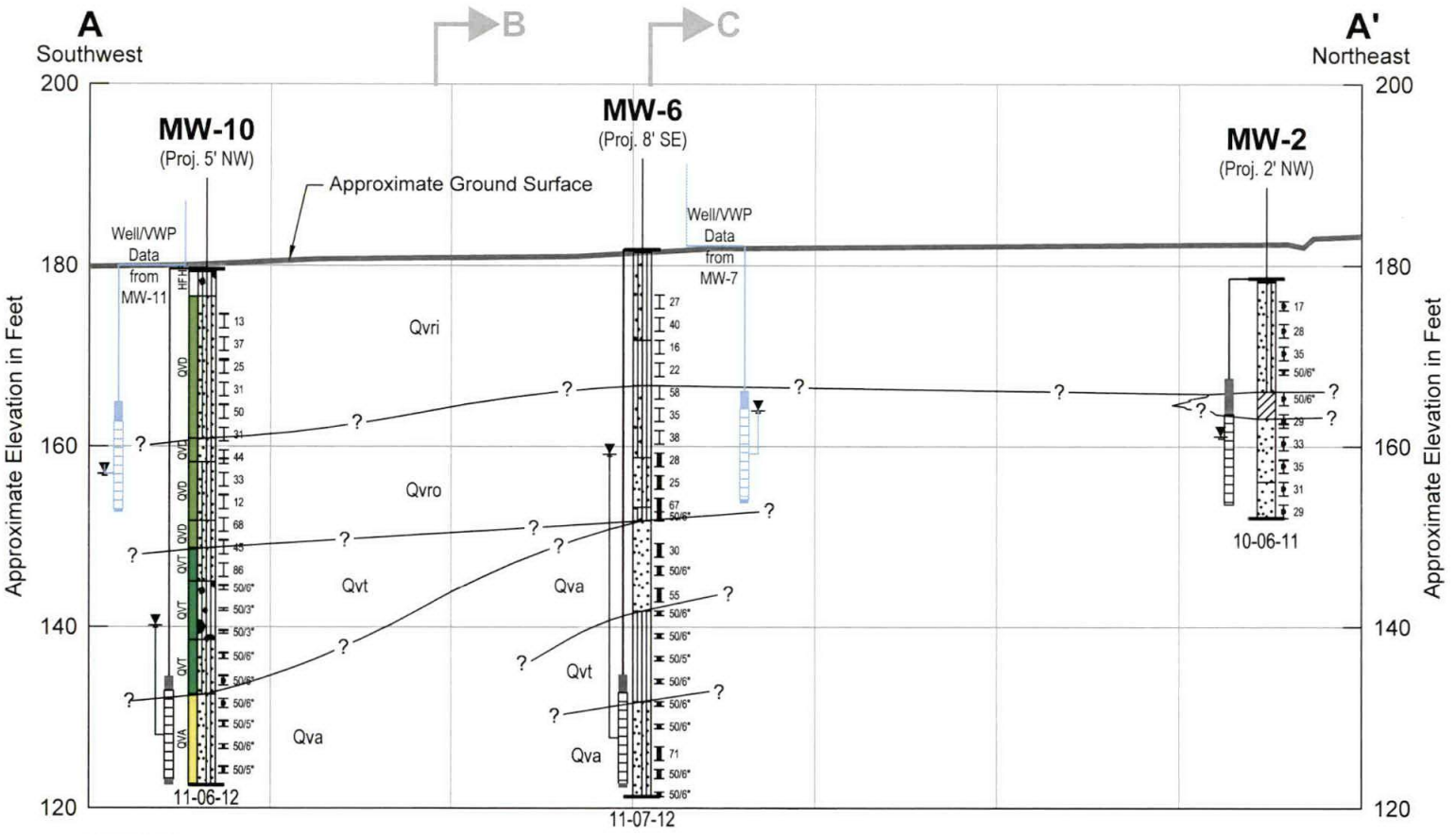
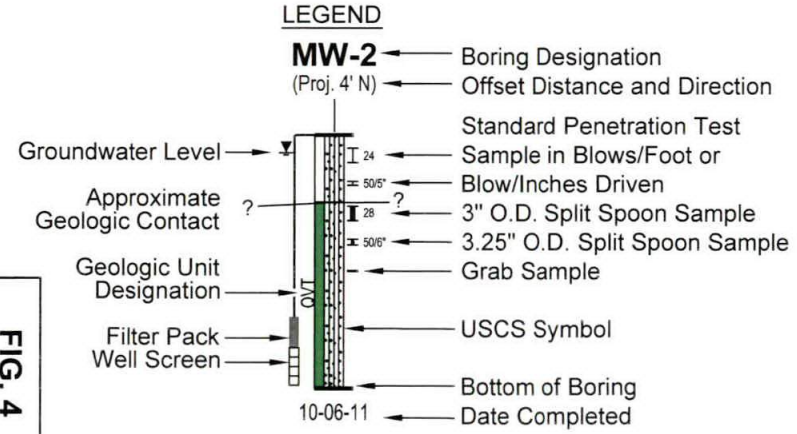
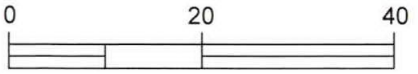
FIG. 3







NOTE

This subsurface profile is generalized from materials observed in soil borings. Variations may exist between profile and actual conditions.

FIG. 4

Sound Transit
1000 NE 45th Street
Seattle, Washington

GENERALIZED SUBSURFACE PROFILE A-A'

March 2013 21-1-16609-003

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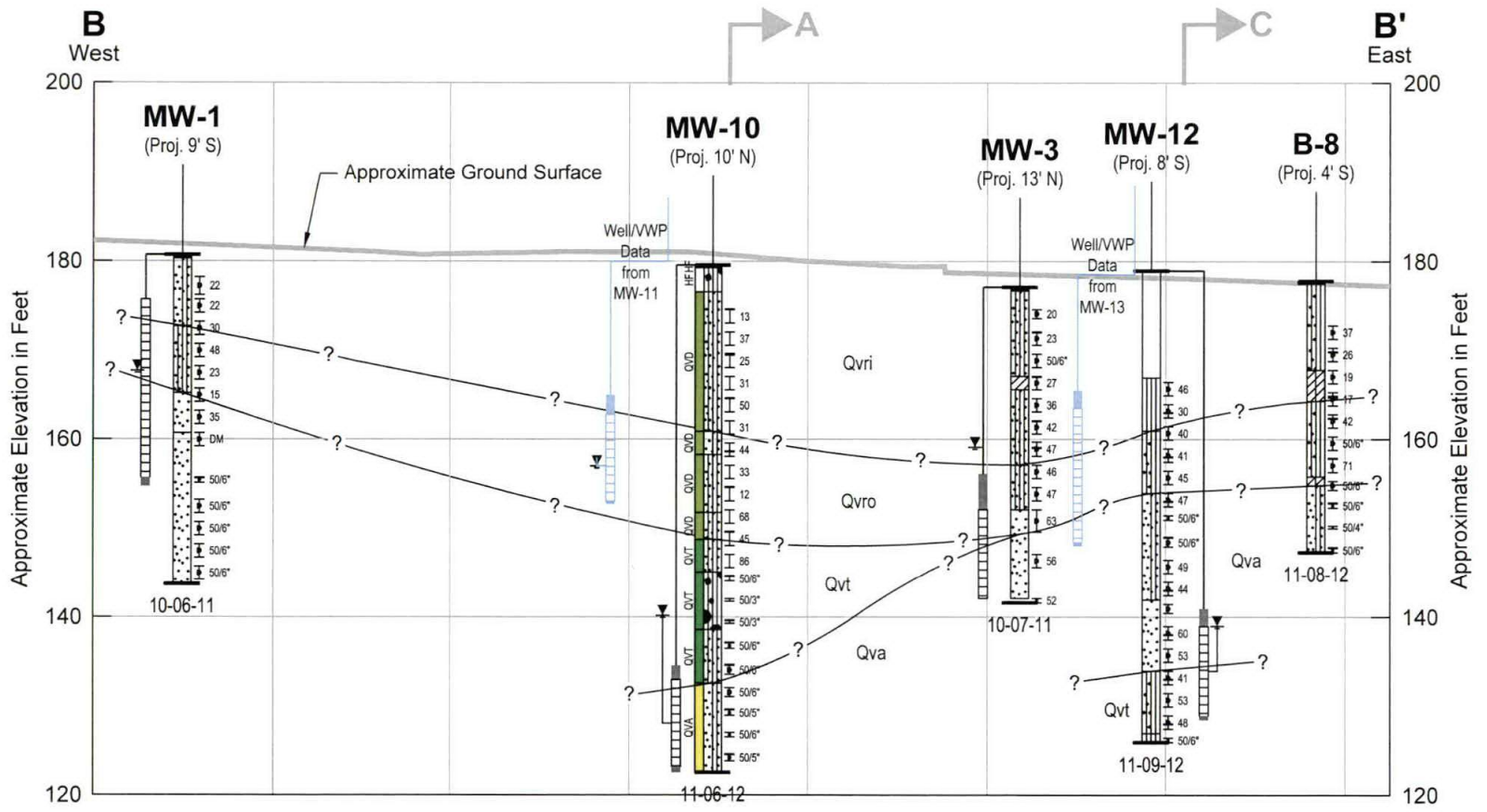
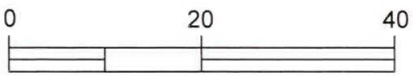
FIG. 4

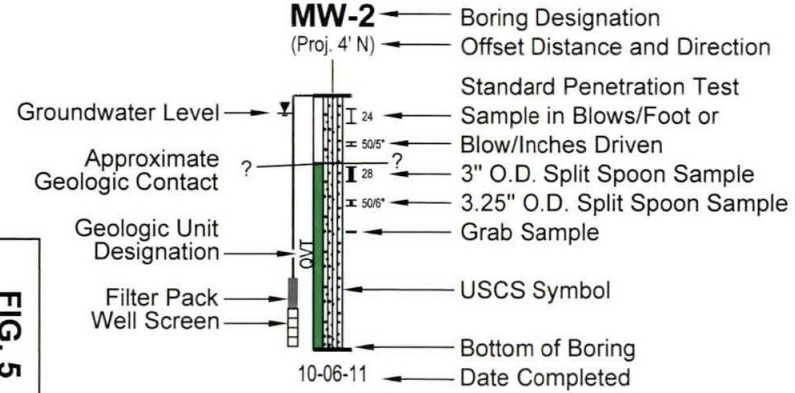
Filename: J:\211\16609-003\21-1-16609-003 Profiles.dwg Date: 03-07-2013 Login: SAC





Scale in Feet
Vertical = Horizontal

LEGEND



NOTE

This subsurface profile is generalized from materials observed in soil borings. Variations may exist between profile and actual conditions.

Sound Transit
1000 NE 45th Street
Seattle, Washington

GENERALIZED SUBSURFACE PROFILE B-B'

March 2013 21-1-16609-003

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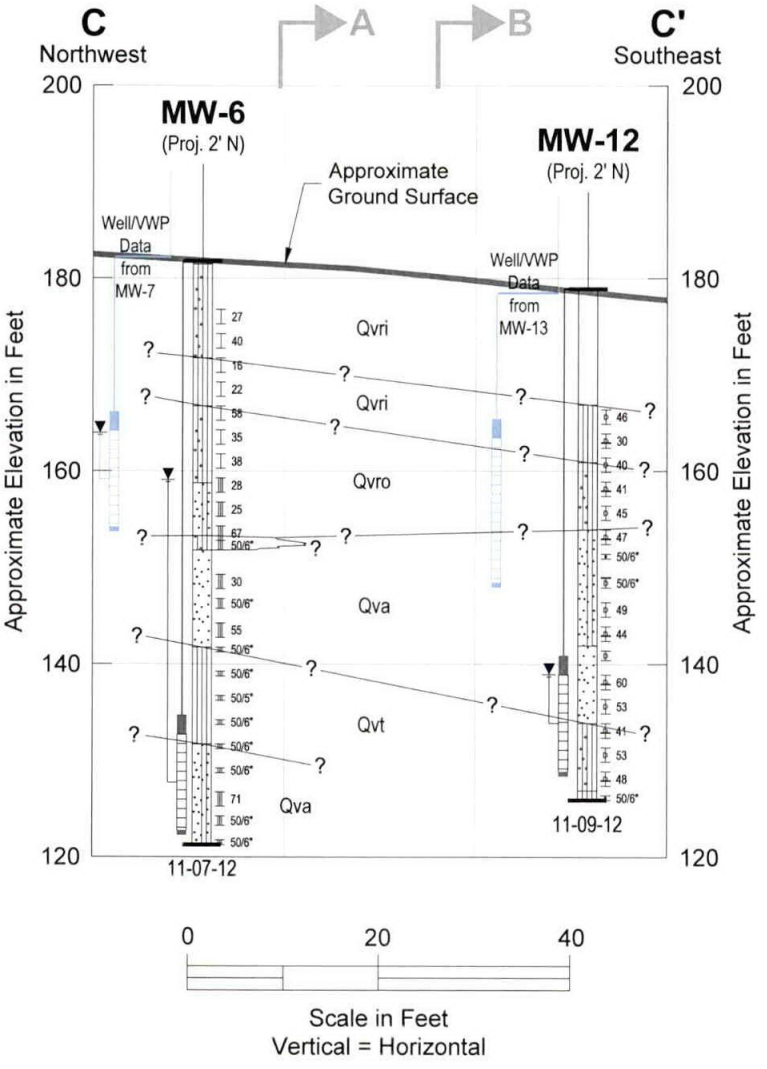
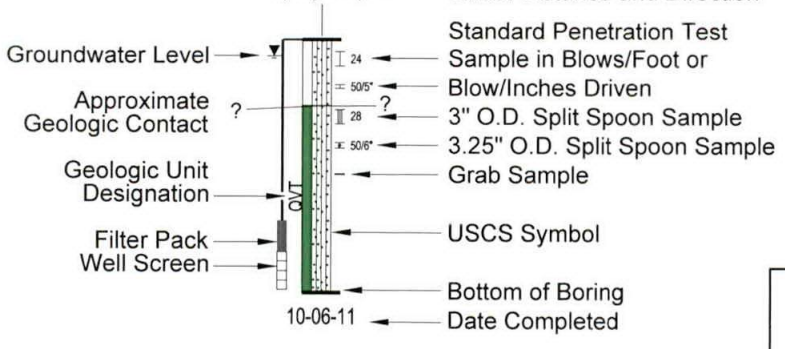
FIG. 5

FIG. 5



LEGEND



NOTE

This subsurface profile is generalized from materials observed in soil borings. Variations may exist between profile and actual conditions.

Sound Transit
1000 NE 45th Street
Seattle, Washington

GENERALIZED SUBSURFACE PROFILE C-C'

March 2013 21-1-16609-003

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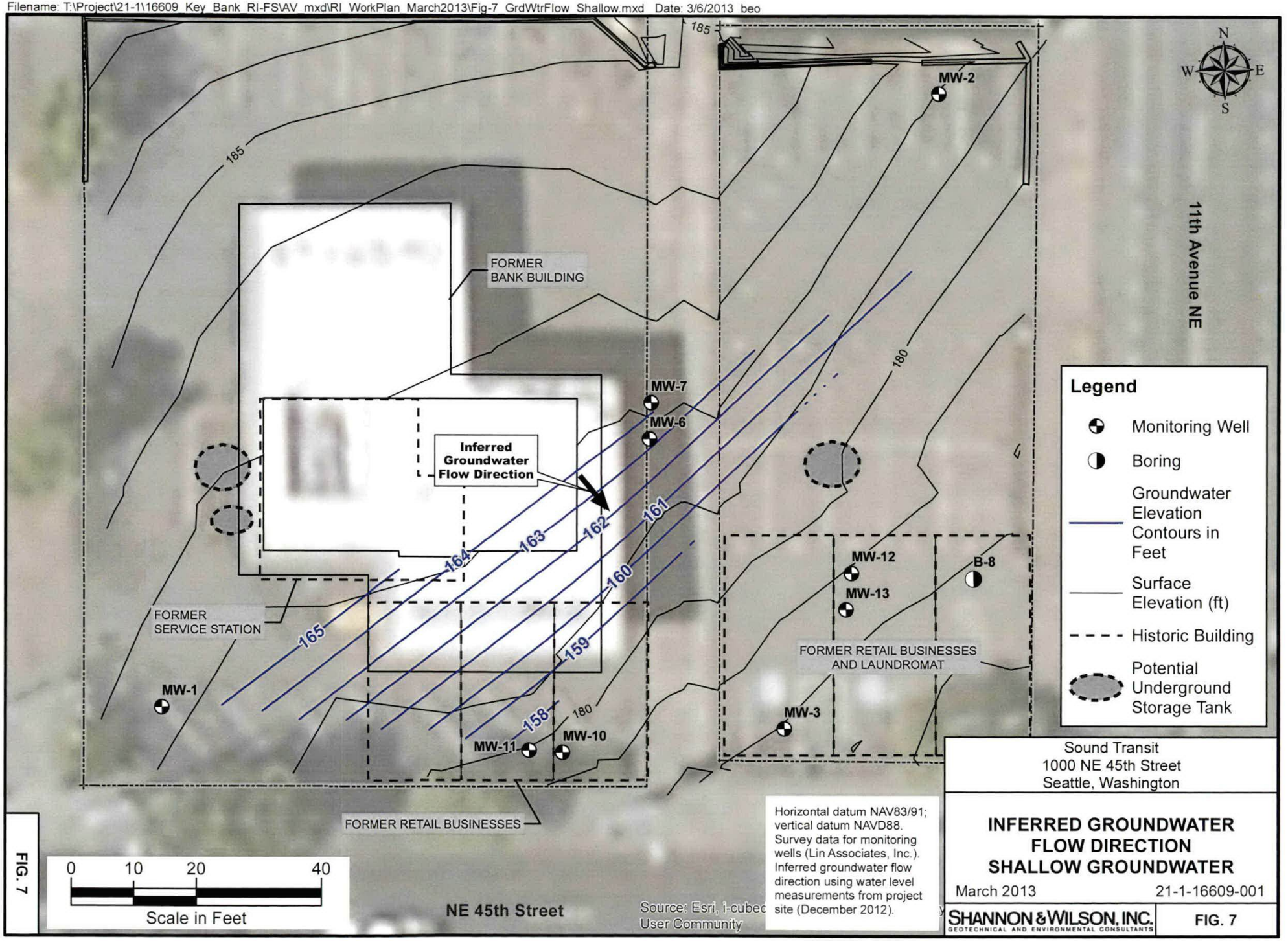
FIG. 6

Filename: J:\21\116609-003\21-1-16609-003 Profiles.dwg Date: 03-07-2013 Login: SAC

Filename: T:\Project\21-1\16609_Key_Bank_RI-FS\AV_mxd\RI_WorkPlan_March2013\Fig-7_GrdWtrFlow_Shallow.mxd Date: 3/6/2013 beo



Horizontal datum NAV83/91; vertical datum NAVD88. Survey data for monitoring wells (Lin Associates, Inc.). Inferred groundwater flow direction using water level measurements from project site (December 2012).

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Seattle, Washington

INFERRED GROUNDWATER FLOW DIRECTION SHALLOW GROUNDWATER

March 2013 21-1-16609-001

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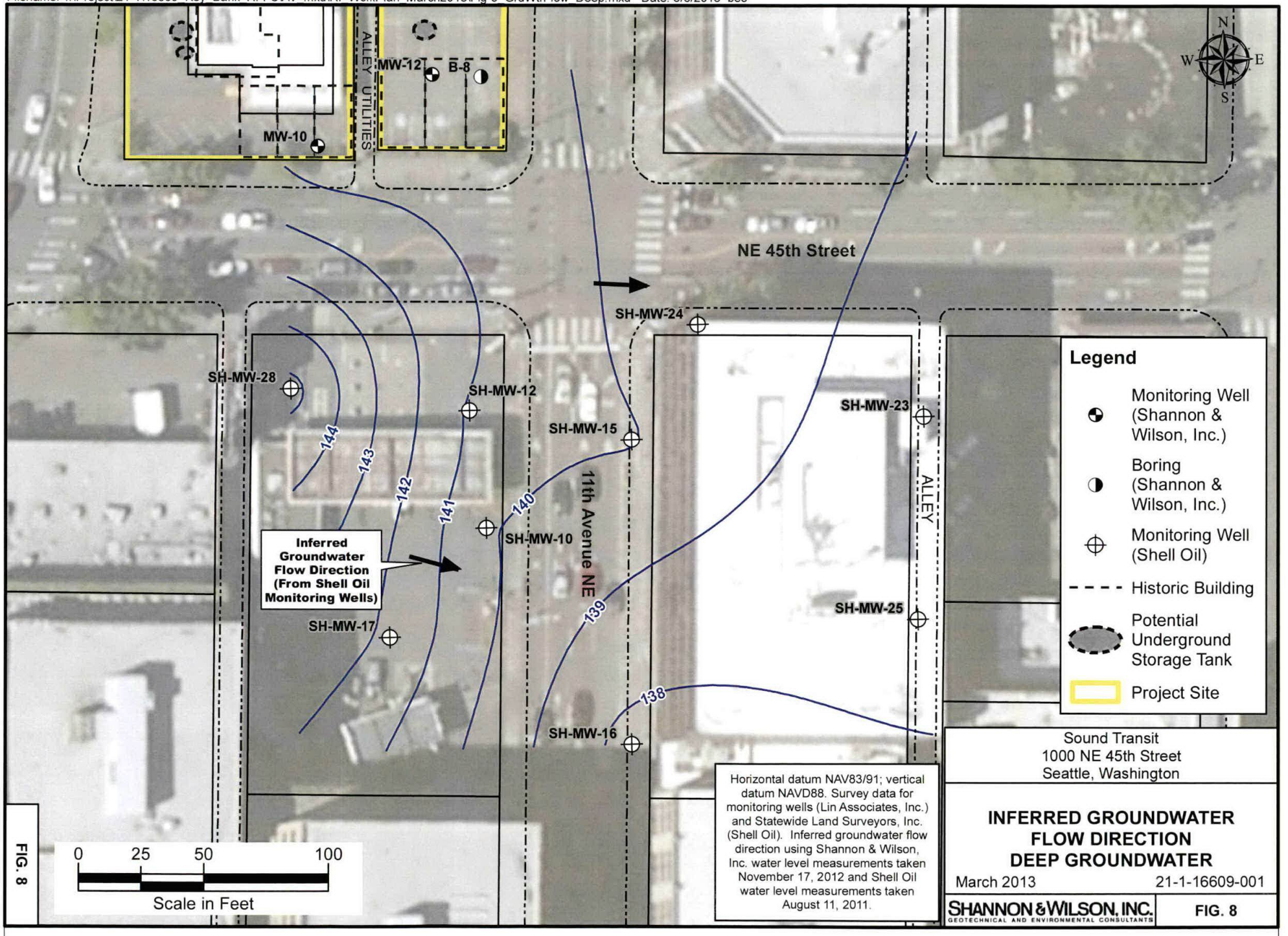
FIG. 7

FIG. 7

Filename: T:\Project\21-1\16609_Key_Bank_RI-FS\AV_mxd\RI_WorkPlan_March2013\Fig-8_GrdWtrFlow_Deep.mxd Date: 3/6/2013 beo



Horizontal datum NAV83/91; vertical datum NAVD88. Survey data for monitoring wells (Lin Associates, Inc.) and Statewide Land Surveyors, Inc. (Shell Oil). Inferred groundwater flow direction using Shannon & Wilson, Inc. water level measurements taken November 17, 2012 and Shell Oil water level measurements taken August 11, 2011.

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INFERRED GROUNDWATER FLOW DIRECTION DEEP GROUNDWATER

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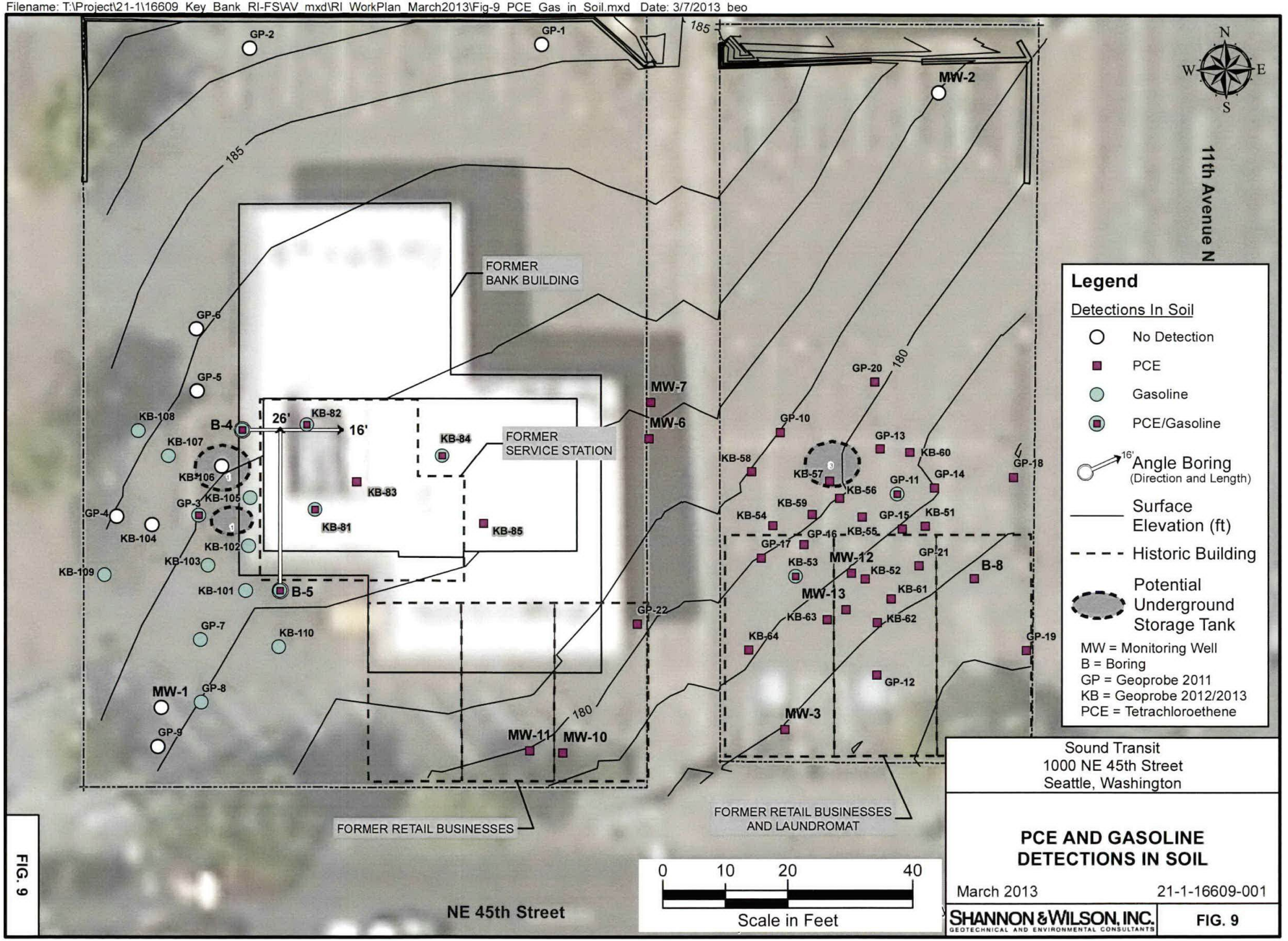
FIG. 8

FIG. 8

Filename: T:\Project\21-1\16609_Key_Bank_RI-FS\AV_mxd\RI_WorkPlan_March2013\Fig-9_PCE_Gas_in_Soil.mxd Date: 3/7/2013 beo



Sound Transit
1000 NE 45th Street
Seattle, Washington

PCE AND GASOLINE DETECTIONS IN SOIL

March 2013 21-1-16609-001

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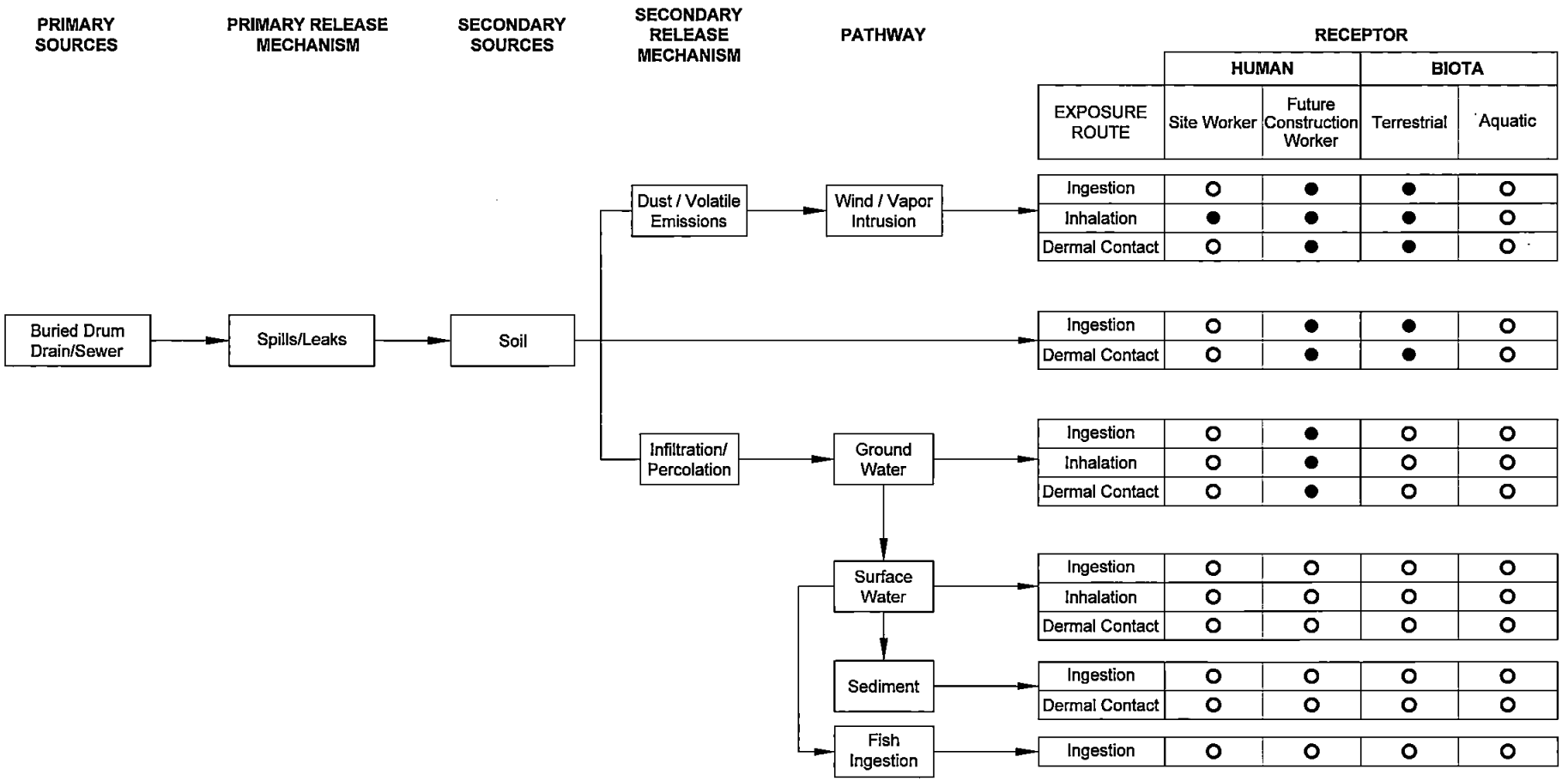
FIG. 9

FIG. 9

Filename: J:\211\16609-003\21-1-16609-003 Fig 10 Site Model.dwg Date: 03-06-2013 Login: SAC



LEGEND

O Incomplete Pathway

● Complete Pathway

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Seattle, Washington

CONCEPTUAL SITE MODEL

March 2013 21-1-16609-003

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FIG. 10

FIG. 10

Filename: T:\Project\21-1\16609_Key_Bank_RI-FS\AV_mxd\RI_WorkPlan_March2013\Fig-11_SiteExplor_AdjProperty.mxd Date: 3/6/2013 beo

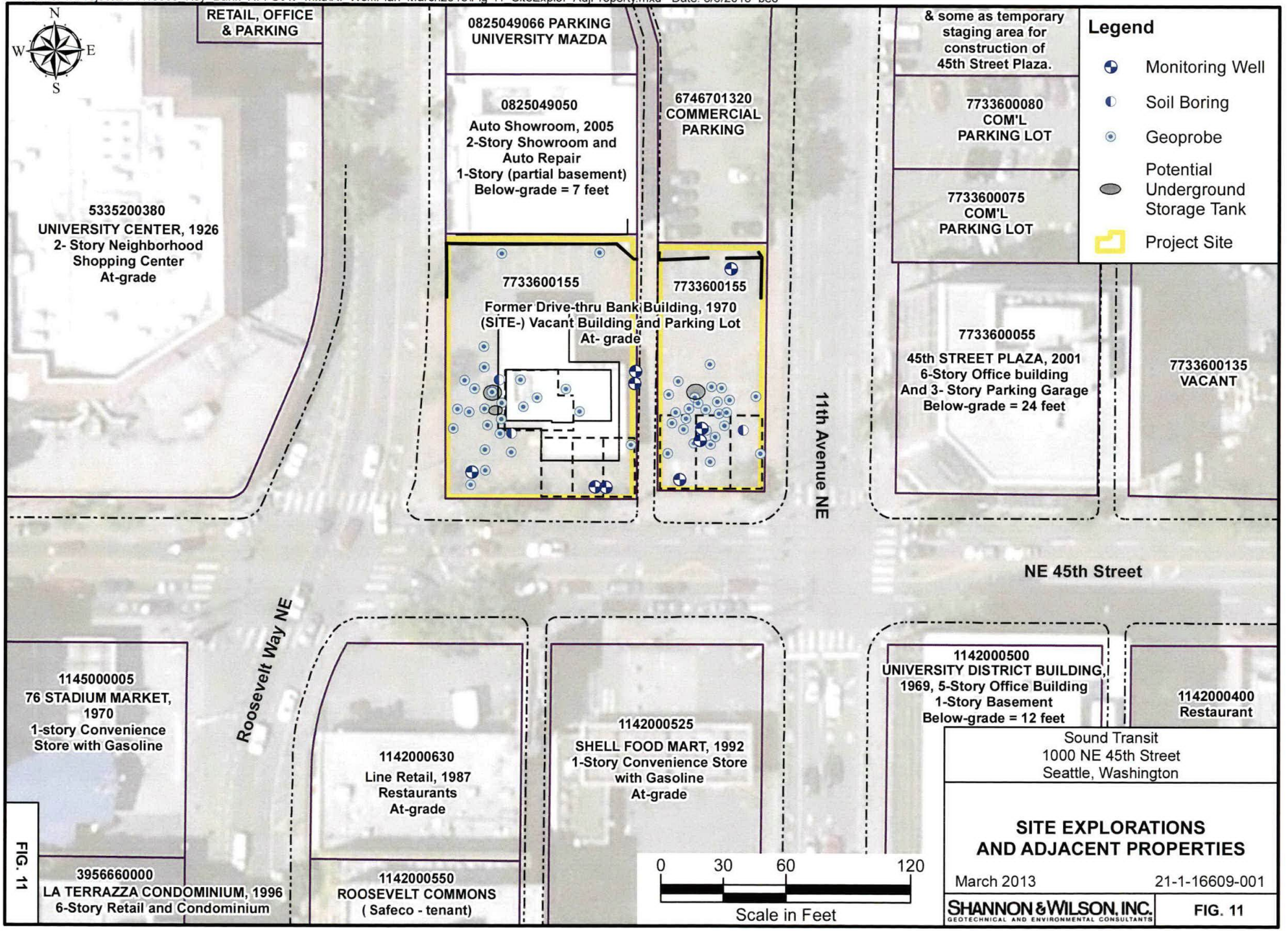

FIG. 11

Sound Transit
1000 NE 45th Street
Seattle, Washington

SITE EXPLORATIONS AND ADJACENT PROPERTIES

March 2013 21-1-16609-001

SHANNON & WILSON, INC.
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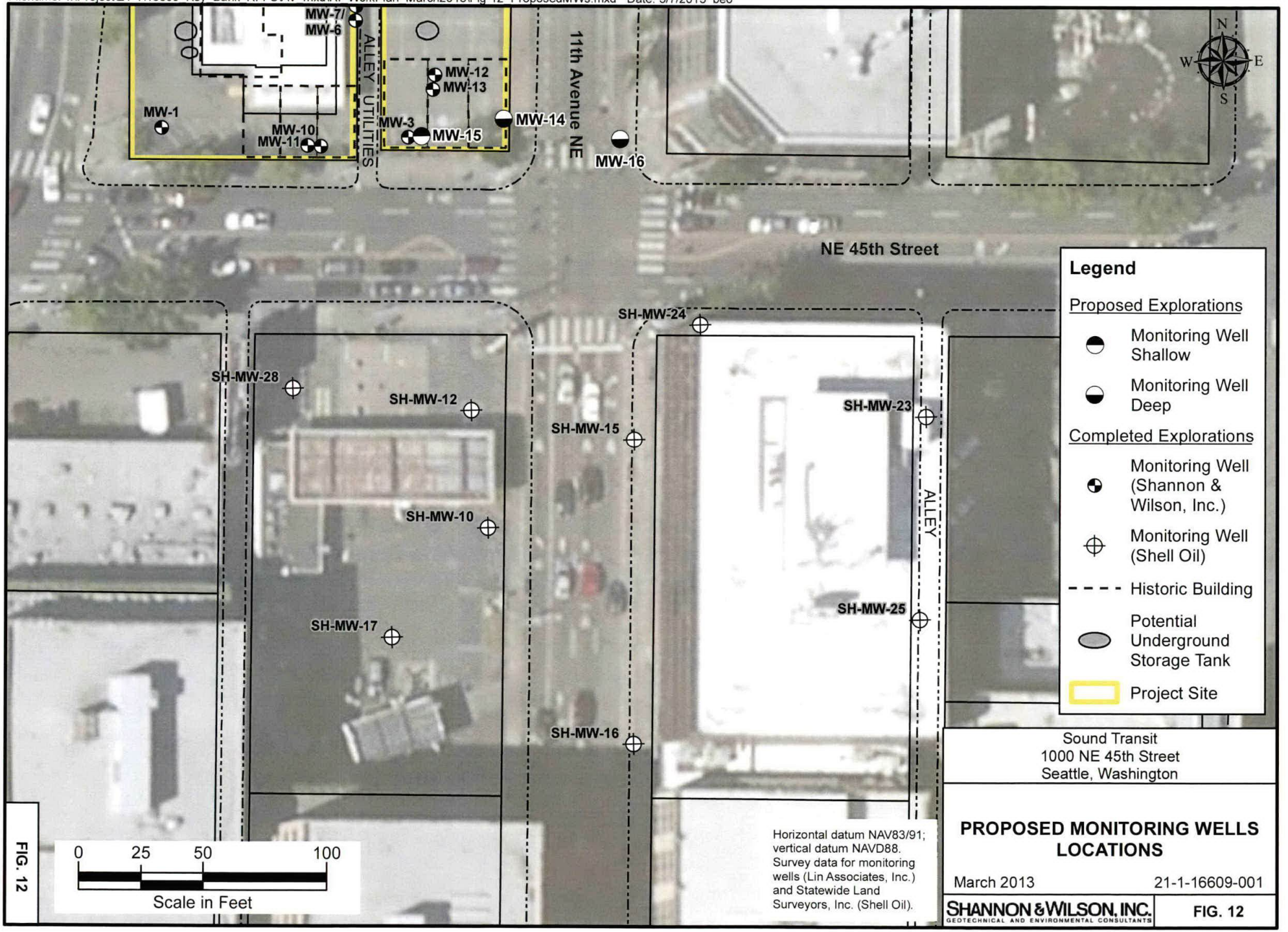
FIG. 11

Filename: T:\Project\21-1\16609_Key_Bank_RI-FS\AV_mxd\RI_WorkPlan_March2013\Fig-12_ProposedMWs.mxd Date: 3/7/2013 beo



Legend

Proposed Explorations

- Monitoring Well Shallow
- Monitoring Well Deep

Completed Explorations

- Monitoring Well (Shannon & Wilson, Inc.)
- Monitoring Well (Shell Oil)
- Historic Building
- Potential Underground Storage Tank
- Project Site

Horizontal datum NAV83/91; vertical datum NAVD88. Survey data for monitoring wells (Lin Associates, Inc.) and Statewide Land Surveyors, Inc. (Shell Oil).

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Seattle, Washington

PROPOSED MONITORING WELLS LOCATIONS

March 2013 21-1-16609-001

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FIG. 12

FIG. 12

Appendix A

APPENDIX A

BORING LOGS

APPENDIX A

BORING LOGS
NE 45th Street Site

TABLE OF CONTENTS

FIGURES

TABLE OF CONTENTS (cont.)

FIGURES (cont.)

Remedial Investigation Phase 1
Geoprobes

TABLE OF CONTENTS (cont.)

FIGURES (cont.)

Phase II ESA and RI
Borings/Monitoring Wells

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
NAD	North American Datum (year)
NAVD	North American Vertical Datum (year)
NGVD	National Geodetic Vertical Datum (year)
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
WOH	Weight of hammer
WOR	Weight of drill rods

GRAIN SIZE DEFINITION

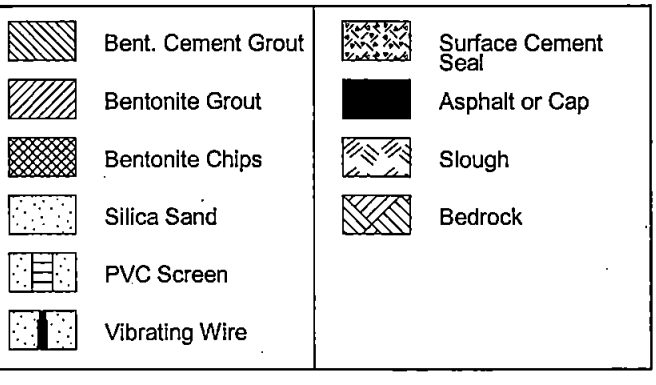
DESCRIPTION	SIEVE NUMBER AND/OR SIZE
FINES	< #200 (0.08 mm)
SAND*	
- Fine	#200 to #40 (0.08 to 0.4 mm)
- Medium	#40 to #10 (0.4 to 2 mm)
- Coarse	#10 to #4 (2 to 5 mm)
GRAVEL*	
- Fine	#4 to 3/4 inch (5 to 19 mm)
- Coarse	3/4 to 3 inches (19 to 76 mm)
COBBLES	3 to 12 inches (76 to 305 mm)
BOULDERS	> 12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



1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

SOIL CLASSIFICATION AND LOG KEY

January 2012 21-1-16604-005

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-1
Sheet 1 of 2

BORING CLASS1 21-16604.GPJ SWNEW.GDT 3/6/13

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)
(From USACE Tech Memo 3-357)

MAJOR DIVISIONS			GROUP/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 of 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)

NOTE: No. 4 size = 5 mm; No. 200 size = 0.075 mm

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.

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

SOIL CLASSIFICATION AND LOG KEY

January 2012 | 21-1-16604-005

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FIG. A-1
Sheet 2 of 2

LOG OF GEOPROBE

Date Started: 9/22/11	Location: 1000 NE 45th Street, Seattle, Washington	Ground Elevation: Approx. 183.0 feet
Date Completed: 9/22/11		Typical Run Length: 4 feet
Total Depth (ft): 13.0	Drilling Company: Cascade Drilling	Hole Diameter: 2 inches

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
	R-1	ASPHALT	0.4					
		Dark brown, slightly silty, gravelly SAND; moist; SP-SM.	1.0					
		Brown, silty, gravelly SAND; moist; iron-oxide staining throughout; SM.			0			
5	R-2	Brown to gray, silty, gravelly, medium to coarse SAND; moist; SM.	5.0		0	None Observed During Drilling		5
10	R-3	Gray, silty SAND; dry; SM.	10.0		0		GP-1-11:10	10
		REFUSAL AT 13 FEET COMPLETED 9/22/2011	13.0					
15								15

Typ: CLP
Rev: DJR
Log: DJR

NOTES

1. In some cases where recovery was low in the upper part of the run, the soil sample may have slid down in the tube prior to removal from the ground.
2. Groundwater level, if indicated above, was estimated during probing and should be considered approximate.
3. Refer to KEY for definitions and explanation of symbols.
4. CT = corrosion test sample; TR = thermal resistivity sample; EN = environmental sample; GE = geotechnical sample; AR = archeological sample.

LEGEND

3 — Run No.
2" Plastic Tube - No Soil Recovery
2" Plastic Tube with Soil Recovery
▽ Estimated Water Level

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF GEOPROBE GP-1-11

January 2012 21-1-16604-005

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FIG. A-2

GEOPROBE 21-16604.GPJ 21-16604.GPJ 3/6/13

LOG OF GEOPROBE

Date Started: 9/22/11	Location: 1000 NE 45th Street, Seattle, Washington	Ground Elevation: Approx. 184.0 feet
Date Completed: 9/22/11		Typical Run Length: 4 feet
Total Depth (ft): 12.0	Drilling Company: Cascade Drilling	Hole Diameter: 2 inches

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
	R-1	ASPHALT	0.4					
		Brown, slightly gravelly, silty, fine to medium SAND; dry; SM.			0			
5	R-2				0	None Observed During Drilling		5
		Brown to gray, silty, fine to medium SAND, iron-oxide staining; dry; SM.	8.0					
		Gray, slightly gravelly, silty SAND; dry; SM.	9.0				GP-2-11:9	
10	R-3	Gray, silty SAND; dry; SM.	10.0		0			10
		REFUSAL AT 12 FEET COMPLETED 9/22/2011	12.0					
15								15

Log: DJR Rev: DJR Typ: CLP

GEOPROBE 21-16604.GPJ 21-16604.GPJ 3/6/13

NOTES

1. In some cases where recovery was low in the upper part of the run, the soil sample may have slid down in the tube prior to removal from the ground.
2. Groundwater level, if indicated above, was estimated during probing and should be considered approximate.
3. Refer to KEY for definitions and explanation of symbols.
4. CT = corrosion test sample; TR = thermal resistivity sample; EN = environmental sample; GE = geotechnical sample; AR = archeological sample.

LEGEND

3 — Run No.

2" Plastic Tube - No Soil Recovery

2" Plastic Tube with Soil Recovery

▽ Estimated Water Level

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF GEOPROBE GP-2-11

January 2012 21-1-16604-005

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FIG. A-3

LOG OF GEOPROBE

Date Started: 9/22/11	Location: 1000 NE 45th Street, Seattle, Washington	Ground Elevation: Approx. 182.0 feet
Date Completed: 9/22/11		Typical Run Length: 4 feet
Total Depth (ft): 14.0	Drilling Company: Cascade Drilling	Hole Diameter: 2 inches

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
	R-1	ASPHALT	0.4					
		Dark brown to brown, silty, gravelly, fine to medium SAND; dry; slight hydrocarbon odor; SM.						
		Brown to gray, silty SAND; dry; SM.	2.5		5			
5	R-2	Gray to brown, silty, fine to medium SAND; moist; slight hydrocarbon odor; SM.	5.0					5
		Gray, fine to medium SAND, hydrocarbon odor; moist; SP.	7.5		23.5 114			
		Gray to brown, silty, fine SAND, trace of gravel, hydrocarbon odor; SM.	8.0		10			
10	R-3	Gray, silty, gravelly, fine to medium SAND; moist to wet; hydrocarbon odor; SM.	10.0		340			10
						▽ During Drilling	GP-3-11:13 GP-3:GW	
		BOTTOM OF GEOPROBE COMPLETED 9/22/2011	14.0					
15								15

Typ: CLP
Rev: DJR
Log: DJR

GEOPROBE 21-16604.GPJ 21-16604.GPJ 3/6/13

NOTES

1. In some cases where recovery was low in the upper part of the run, the soil sample may have slid down in the tube prior to removal from the ground.
2. Groundwater level, if indicated above, was estimated during probing and should be considered approximate.
3. Refer to KEY for definitions and explanation of symbols.
4. CT = corrosion test sample; TR = thermal resistivity sample; EN = environmental sample; GE = geotechnical sample; AR = archeological sample.

LEGEND

3 — Run No.
2" Plastic Tube - No Soil Recovery
2" Plastic Tube with Soil Recovery
▽ Estimated Water Level

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF GEOPROBE GP-3-11

January 2012 21-1-16604-005

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FIG. A-4

LOG OF GEOPROBE

Date Started: 9/22/11	Location: 1000 NE 45th Street, Seattle, Washington	Ground Elevation: Approx. 182.0 feet
Date Completed: 9/22/11		Typical Run Length: 4 feet
Total Depth (ft): 10.0	Drilling Company: Cascade Drilling	Hole Diameter: 2 inches

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
	R-1	ASPHALT	0.4					
		Dark brown, gravelly, fine to medium SAND; dry; SP.						
		Dark brown to brown, gravelly, silty, fine to medium SAND, some iron-oxide staining; moist; SM.	2.5		0			
5	R-2	Brown, silty SAND, trace of gravel, iron-oxide staining throughout; moist; SM.	5.0		0	None Observed During Drilling		5
					0		GP-4-11:9.5	
10		REFUSAL AT 10 FEET COMPLETED 9/22/2011	10.0					10
15								15

Log: DJR Rev: DJR Typ: CLP

NOTES

1. In some cases where recovery was low in the upper part of the run, the soil sample may have slid down in the tube prior to removal from the ground.
2. Groundwater level, if indicated above, was estimated during probing and should be considered approximate.
3. Refer to KEY for definitions and explanation of symbols.
4. CT = corrosion test sample; TR = thermal resistivity sample; EN = environmental sample; GE = geotechnical sample; AR = archeological sample.

LEGEND

3 — Run No.

2" Plastic Tube - No Soil Recovery

2" Plastic Tube with Soil Recovery

▽ Estimated Water Level

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF GEOPROBE GP-4-11

January 2012 21-1-16604-005

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FIG. A-5

GEOPROBE 21-16604.GPJ 21-16604.GPJ 3/6/13

LOG OF GEOPROBE

Date Started: 9/22/11	Location: 1000 NE 45th Street, Seattle, Washington	Ground Elevation: Approx. 182.5 feet
Date Completed: 9/22/11		Typical Run Length: 4 feet
Total Depth (ft): 13.0	Drilling Company: Cascade Drilling	Hole Diameter: 2 inches

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
	R-1	ASPHALT	0.4					
		Dark brown to brown, silty, gravelly SAND to gravelly, silty SAND, iron-oxide staining; SM.			0			
5	R-2				0	None Observed During Drilling		5
		Brown to gray, silty SAND; moist; slight hydrocarbon odor; SM.	9.0		13.5			
10	R-3	Gray, silty, fine to medium SAND; moist; strong hydrocarbon odor; SM.	10.0					10
		BOTTOM OF GEOPROBE COMPLETED 9/22/2011	13.0		248		GP-5-11:13	
15								15

Typ: CLP Rev: DJR Log: DJR

NOTES

1. In some cases where recovery was low in the upper part of the run, the soil sample may have slid down in the tube prior to removal from the ground.
2. Groundwater level, if indicated above, was estimated during probing and should be considered approximate.
3. Refer to KEY for definitions and explanation of symbols.
4. CT = corrosion test sample; TR = thermal resistivity sample; EN = environmental sample; GE = geotechnical sample; AR = archeological sample.

LEGEND

3 — Run No.

2" Plastic Tube - No Soil Recovery

2" Plastic Tube with Soil Recovery

▽ Estimated Water Level

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF GEOPROBE GP-5-11

January 2012 21-1-16604-005

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-6

GEOPROBE 21-16604.GPJ 21-16604.GPJ 3/6/13

LOG OF GEOPROBE

Date Started 9/22/11	Location 1000 NE 45th Street, Seattle, Washington	Ground Elevation: Approx. 182.5 feet	
Date Completed 9/22/11		Typical Run Length 4 feet	
Total Depth (ft) 14.0	Drilling Company: Cascade Drilling	Hole Diameter: 2 inches	

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
	R-1	ASPHALT	0.4					
		Brown, silty, fine to medium SAND, trace of gravel; moist; SM.			0			
		Brown, clayey SAND, iron-oxide staining; moist; SC.	4.5		0			
5	R-2	Brown to gray, clayey SAND, trace of gravel, medium dense sand lens at 7.5 feet; moist; SC.	5.0		0	None Observed During Drilling		5
		Gray, silty, fine to medium SAND; moist; hard, clayey sand layer at 14 feet.	9.0		0			
10	R-3				0		GP-6-11:13	10
		REFUSAL AT 14 FEET COMPLETED 9/22/2011	14.0					
15								15

Log: DJR Rev: DJR Typ: CLP

NOTES

1. In some cases where recovery was low in the upper part of the run, the soil sample may have slid down in the tube prior to removal from the ground.
2. Groundwater level, if indicated above, was estimated during probing and should be considered approximate.
3. Refer to KEY for definitions and explanation of symbols.
4. CT = corrosion test sample; TR = thermal resistivity sample; EN = environmental sample; GE = geotechnical sample; AR = archeological sample.

LEGEND

3 — Run No.
2" Plastic Tube - No Soil Recovery
2" Plastic Tube with Soil Recovery
▽ Estimated Water Level

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF GEOPROBE GP-6-11

January 2012 21-1-16604-005

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FIG. A-7

GEOPROBE 21-16604.GPJ 21-16604.GPJ 3/6/13

LOG OF GEOPROBE

Date Started 9/22/11	Location 1000 NE 45th Street, Seattle, Washington	Ground Elevation: Approx. 181.0 feet	
Date Completed 9/22/11		Typical Run Length 4 feet	
Total Depth (ft) 14.0	Drilling Company: Cascade Drilling	Hole Diameter: 2 inches	

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
	R-1	ASPHALT	0.4					
		Dark brown, slightly silty, gravelly, fine to medium SAND; moist; SP-SM.						
		Brown, silty, fine to medium SAND, trace of gravel and some cobbles; moist; SM.	2.5		0 0			
5	R-2							5
					56			
		Gray, silty, fine to medium SAND, trace of cobbles; moist to wet at 14 feet; strong hydrocarbon odor; SM.	9.0			None Observed During Drilling		
10	R-3							10
		REFUSAL AT 14 FEET COMPLETED 9/23/2011	14.0		396		GP-7-11:14	
15								15

Log: DJR Rev: DJR Typ: CLP

GEOPROBE 21-16604.GPJ 21-16604.GPJ 3/6/13

NOTES

1. In some cases where recovery was low in the upper part of the run, the soil sample may have slid down in the tube prior to removal from the ground.
2. Groundwater level, if indicated above, was estimated during probing and should be considered approximate.
3. Refer to KEY for definitions and explanation of symbols.
4. CT = corrosion test sample; TR = thermal resistivity sample; EN = environmental sample; GE = geotechnical sample; AR = archeological sample.

LEGEND

3 — Run No.

2" Plastic Tube - No Soil Recovery

2" Plastic Tube with Soil Recovery

▽ Estimated Water Level

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF GEOPROBE GP-7-11

January 2012 21-1-16604-005

SHANNON & WILSON, INC.
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FIG. A-8

LOG OF GEOPROBE

Date Started 9/22/11	Location 1000 NE 45th Street, Seattle, Washington	Ground Elevation: Approx. 180.5 feet	
Date Completed 9/22/11		Typical Run Length 4 feet	
Total Depth (ft) 14.0	Drilling Company: Cascade Drilling	Hole Diameter: 2 inches	

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
	R-1	ASPHALT	0.4					
		Dark brown, slightly silty, gravelly, fine to medium SAND; dry; SP-SM.						
		Brown to light gray, silty, fine to medium SAND, trace of gravel, some iron-oxide staining and mottling; SM.	2.5		0			
5	R-2				0			5
					1	None Observed During Drilling		
		Gray, silty, fine to medium SAND, trace of gravel; moist; strong hydrocarbon odor at 14 feet; SM.	8.5					
10	R-3							10
		REFUSAL AT 14 FEET	14.0		328		GP-8-11:14	
15		COMPLETED 9/22/2011						15

Log: DJR Rev: DJR Typ: CLP

NOTES

1. In some cases where recovery was low in the upper part of the run, the soil sample may have slid down in the tube prior to removal from the ground.
2. Groundwater level, if indicated above, was estimated during probing and should be considered approximate.
3. Refer to KEY for definitions and explanation of symbols.
4. CT = corrosion test sample; TR = thermal resistivity sample; EN = environmental sample; GE = geotechnical sample; AR = archeological sample.

LEGEND

3 — 2" Plastic Tube - No Soil Recovery
2" Plastic Tube with Soil Recovery — Run No.
▽ Estimated Water Level

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF GEOPROBE GP-8-11

January 2012 21-1-16604-005

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FIG. A-9

GEOPROBE 21-16604.GPJ 21-16604.GPJ 3/6/13

LOG OF GEOPROBE

Date Started: 9/22/11	Location: 1000 NE 45th Street, Seattle, Washington	Ground Elevation: Approx. 180.5 feet
Date Completed: 9/22/11		Typical Run Length: 4 feet
Total Depth (ft): 13.0	Drilling Company: Cascade Drilling	Hole Diameter: 2 inches

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
	R-1	ASPHALT	0.4					
		Dark brown to brown, silty, gravelly, fine to medium SAND; dry; SM.			0			
		Brown, silty, gravelly, fine to medium SAND; dry; SM.	3.0					
5	R-2				0	None Observed During Drilling		5
		Gray, silty, fine to medium SAND; moist; slight hydrocarbon odor at 13 feet; SM.	9.5					
10	R-3				0			10
		REFUSAL AT 13 FEET COMPLETED 9/22/2011	13.0		25		GP-9-11:13	
15								15

Typ: CLP
Rev: DJR
Log: DJR

NOTES

1. In some cases where recovery was low in the upper part of the run, the soil sample may have slid down in the tube prior to removal from the ground.
2. Groundwater level, if indicated above, was estimated during probing and should be considered approximate.
3. Refer to KEY for definitions and explanation of symbols.
4. CT = corrosion test sample; TR = thermal resistivity sample; EN = environmental sample; GE = geotechnical sample; AR = archeological sample.

LEGEND

3 — Run No.
2" Plastic Tube - No Soil Recovery
2" Plastic Tube with Soil Recovery
▽ Estimated Water Level

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF GEOPROBE GP-9-11

January 2012 21-1-16604-005

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FIG. A-10

GEOPROBE 21-16604.GPJ 21-16604.GPJ 3/6/13

LOG OF GEOPROBE

Date Started 9/22/11	Location 1000 NE 45th Street, Seattle, Washington	Ground Elevation: Approx. 178.0 feet	
Date Completed 9/22/11		Typical Run Length 4 feet	
Total Depth (ft) 10.0	Drilling Company: Cascade Drilling	Hole Diameter: 2 inches	

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
	R-1	ASPHALT	0.4					
		Dark brown to brown, silty, gravelly, fine to medium SAND; dry; SM.			0			
5	R-2	Brown, slightly silty to silty, fine to medium SAND, gray mottling; dry; SP-SM/SM.	5.0		0	None Observed During Drilling		5
10		REFUSAL AT 10 FEET COMPLETED 9/22/2011	10.0		0		GP-10-11:10	10
15								15

Log: DJR Rev: DJR Typ: CLP

NOTES

1. In some cases where recovery was low in the upper part of the run, the soil sample may have slid down in the tube prior to removal from the ground.
2. Groundwater level, if indicated above, was estimated during probing and should be considered approximate.
3. Refer to KEY for definitions and explanation of symbols.
4. CT = corrosion test sample; TR = thermal resistivity sample; EN = environmental sample; GE = geotechnical sample; AR = archeological sample.

LEGEND

3 — 2" Plastic Tube - No Soil Recovery
2" Plastic Tube with Soil Recovery — Run No.
▽ Estimated Water Level

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF GEOPROBE GP-10-11

January 2012 21-1-16604-005

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FIG. A-11

GEOPROBE 21-16604.GPJ 21-16604.GPJ 3/6/13

LOG OF GEOPROBE

Date Started: 9/22/11	Location: 1000 NE 45th Street, Seattle, Washington	Ground Elevation: Approx. 178.0 feet
Date Completed: 9/22/11		Typical Run Length: 4 feet
Total Depth (ft): 10.0	Drilling Company: Cascade Drilling	Hole Diameter: 2 inches

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
	R-1	ASPHALT	0.4					
		Dark brown to brown, silty, gravelly, fine to medium SAND; dry; SM.						
		Brown, silty, gravelly SAND; SM.	2.5		0			
5	R-2	Brown, silty, fine SAND; dry; SM.	5.0			None Observed During Drilling		5
		Gray, silty SAND; dry; SM.	6.5					
10		REFUSAL AT 10 FEET COMPLETED 9/22/2011	10.0		0		GP-11-11:10	10
15								15

Soil Description: *Refer to the report text for a proper understanding of the subsurface materials and probing methods. The stratification lines indicated below represent the approximate boundaries between soil types. Actual boundaries may be different if soil shifted inside sample tubes during extraction.*

Log: DJR Rev: DJR Typ: CLP

NOTES

1. In some cases where recovery was low in the upper part of the run, the soil sample may have slid down in the tube prior to removal from the ground.
2. Groundwater level, if indicated above, was estimated during probing and should be considered approximate.
3. Refer to KEY for definitions and explanation of symbols.
4. CT = corrosion test sample; TR = thermal resistivity sample; EN = environmental sample; GE = geotechnical sample; AR = archeological sample.

LEGEND

3 — Run No.

2" Plastic Tube - No Soil Recovery

2" Plastic Tube with Soil Recovery

▽ Estimated Water Level

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF GEOPROBE GP-11-11

January 2012 21-1-16604-005

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FIG. A-12

GEOPROBE 21-16604.GPJ 21-16604.GPJ 3/6/13

LOG OF GEOPROBE

Date Started 9/22/11	Location 1000 NE 45th Street, Seattle, Washington	Ground Elevation: Approx. 177.5 feet	
Date Completed 9/22/11		Typical Run Length 4 feet	
Total Depth (ft) 10.0	Drilling Company: Cascade Drilling	Hole Diameter: 2 inches	

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
		ASPHALT	0.4					
	R-1	Dark brown, silty SAND, trace of gravel; dry; SM.	1.0					
		Brown, slightly silty, fine to medium SAND, trace of gravel; dry; SP-SM.						
5	R-2	Brown, silty, fine to medium SAND, trace of gravel; dry; SM.	4.0			None Observed During Drilling		5
	R-3	Brown, silty SAND; dry; SM.	8.0					
10	1	REFUSAL AT 10 FEET COMPLETED 9/22/2011	10.0				GP-12:11:10	10
15								15

Typ: CLP
Rev: DJR
Log: DJR

NOTES

1. In some cases where recovery was low in the upper part of the run, the soil sample may have slid down in the tube prior to removal from the ground.
2. Groundwater level, if indicated above, was estimated during probing and should be considered approximate.
3. Refer to KEY for definitions and explanation of symbols.
4. CT = corrosion test sample; TR = thermal resistivity sample; EN = environmental sample; GE = geotechnical sample; AR = archeological sample.

LEGEND

3 — Run No.
2" Plastic Tube - No Soil Recovery
2" Plastic Tube with Soil Recovery
▽ Estimated Water Level

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF GEOPROBE GP-12-11

January 2012 21-1-16604-005

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FIG. A-13

GEOPROBE 21-16604.GPJ 21-16604.GPJ 3/6/13

LOG OF GEOPROBE

Date Started: 10/14/11	Location: 1000 NE 45th Street, Seattle, Washington	Ground Elevation: Approx. 178.0 feet
Date Completed: 10/14/11		Typical Run Length: 4 feet
Total Depth (ft): 16.0	Drilling Company: ESN Northwest	Hole Diameter: 1.25 inches

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
	R-1	ASPHALT	0.4					
		Brown, gravelly, fine sandy SILT to silty, fine SAND; moist from 8 to 14 feet; wood debris in the upper 4 feet; ML/SM.			0	None Observed During Drilling		
	R-2				0		GP-13:4.5	
5								5
	R-3							
10		- Iron-oxide staining from 10 to 14 feet.			0		GP-13:10.0	10
	R-4				0			
		Hard, gray, clayey SILT/silty CLAY; dry; thin, fine sand stringers; (Till) ML/CL.	14.0					
15								15
		BOTTOM OF GEOPROBE COMPLETED 10/14/2011	16.0					

Typ: CLP
Rev: EVP
Log: EVP

NOTES

1. In some cases where recovery was low in the upper part of the run, the soil sample may have slid down in the tube prior to removal from the ground.
2. Groundwater level, if indicated above, was estimated during probing and should be considered approximate.
3. Refer to KEY for definitions and explanation of symbols.
4. CT = corrosion test sample; TR = thermal resistivity sample; EN = environmental sample; GE = geotechnical sample; AR = archeological sample.

LEGEND

3 — Run No.
2" Plastic Tube - No Soil Recovery
2" Plastic Tube with Soil Recovery
▽ Estimated Water Level

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF GEOPROBE GP-13

January 2012 21-1-16604-005

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FIG. A-14

GEOPROBE 21-16604.GPJ 21-16604.GPJ 3/6/13

LOG OF GEOPROBE

Date Started 10/14/11	Location 1000 NE 45th Street, Seattle, Washington	Ground Elevation: Approx. 178.0 feet	
Date Completed 10/14/11		Typical Run Length 4 feet	
Total Depth (ft) 12.0	Drilling Company: ESN Northwest	Hole Diameter: 1.25 inches	

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
	R-1	ASPHALT	0.4					
		Brown/gray, gravelly, fine to medium sandy SILT to silty, fine to medium SAND; moist; interbeds of fine to medium sand and gravel; ML/SM.			0			
	R-2							
5					0.2	None Observed During Drilling	GP-14:5.5	5
	R-3							
		Red-brown, silty GRAVEL; moist; heavy iron-oxide staining; (Fill) GM.	10.0					
10		Gray, silty CLAY, trace of gravel; dry; (Till) CL.	10.5		0		GP-14:10.5	10
		BOTTOM OF GEOPROBE COMPLETED 10/14/2011	12.0					
15								15

Log: EVP Rev: EVP Typ: CLP

GEOPROBE 21-16604.GPJ 21-16604.GPJ 3/6/13

NOTES

1. In some cases where recovery was low in the upper part of the run, the soil sample may have slid down in the tube prior to removal from the ground.
2. Groundwater level, if indicated above, was estimated during probing and should be considered approximate.
3. Refer to KEY for definitions and explanation of symbols.
4. CT = corrosion test sample; TR = thermal resistivity sample; EN = environmental sample; GE = geotechnical sample; AR = archeological sample.

LEGEND

3 — 2" Plastic Tube - No Soil Recovery
2" Plastic Tube with Soil Recovery — Run No.
▽ Estimated Water Level

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF GEOPROBE GP-14

January 2012 21-1-16604-005

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-15

LOG OF GEOPROBE

Date Started: 10/14/11	Location: 1000 NE 45th Street, Seattle, Washington	Ground Elevation: Approx. 178.0 feet
Date Completed: 10/14/11		Typical Run Length: 4 feet
Total Depth (ft): 12.0	Drilling Company: ESN Northwest	Hole Diameter: 1.25 inches

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
	R-1	ASPHALT	0.4					
		Brown, gravelly, fine to medium, sandy SILT to silty, fine to medium SAND; dry; layer of gravel and red brick fragments at 1.5 feet; (Fill) ML/SM.			0			
	R-2		4.5					
5		Gray, silty CLAY to clayey SILT; dry; thin, fine sand stringers; (Till) CL/ML.			0	None Observed During Drilling	GP-15:5.0	5
	R-3							
10								10
		BOTTOM OF GEOPROBE COMPLETED 10/14/2011	12.0		0.2		GP-15:12.0	
15								15

Typ: CLP
Rev: EVP
Log: EVP

NOTES

1. In some cases where recovery was low in the upper part of the run, the soil sample may have slid down in the tube prior to removal from the ground.
2. Groundwater level, if indicated above, was estimated during probing and should be considered approximate.
3. Refer to KEY for definitions and explanation of symbols.
4. CT = corrosion test sample; TR = thermal resistivity sample; EN = environmental sample; GE = geotechnical sample; AR = archeological sample.

LEGEND

3 — Run No.
2" Plastic Tube - No Soil Recovery
2" Plastic Tube with Soil Recovery
▽ Estimated Water Level

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF GEOPROBE GP-15

January 2012 21-1-16604-005

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-16

GEOPROBE 21-16604.GPJ 21-16604.GPJ 3/6/13

LOG OF GEOPROBE

Date Started 10/14/11	Location 1000 NE 45th Street, Seattle, Washington	Ground Elevation: Approx. 178.0 feet	
Date Completed 10/14/11		Typical Run Length 4 feet	
Total Depth (ft) 12.0	Drilling Company: ESN Northwest	Hole Diameter: 1.25 inches	

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
	R-1	ASPHALT	0.4					
		Mottled brown and gray, gravelly, fine sandy SILT and silty, fine to medium SAND; moist; iron-oxide staining; ML/SM.			0			
	R-2							
5		Light gray, silty, fine sandy GRAVEL; dry; GM.	5.0					5
		Mottled brown and gray, gravelly, fine sandy SILT; moist at 6 to 8 feet; ML.	5.6		0.2			
		- Strong hydrocarbon odor from 7.5 to 8 feet.			280	None Observed During Drilling	GP-16:8.0	
	R-3							
10		Gray, trace to slightly gravelly, silty CLAY; dry; thin sand stringers at 10 feet; CL.	9.3		0.2		GP-16:11.5	10
		BOTTOM OF GEOPROBE COMPLETED 10/14/2011	12.0					
15								15

Typ: CLP
Rev: EVP
Log: EVP

NOTES

1. In some cases where recovery was low in the upper part of the run, the soil sample may have slid down in the tube prior to removal from the ground.
2. Groundwater level, if indicated above, was estimated during probing and should be considered approximate.
3. Refer to KEY for definitions and explanation of symbols.
4. CT = corrosion test sample; TR = thermal resistivity sample; EN = environmental sample; GE = geotechnical sample; AR = archeological sample.

LEGEND

3 — Run No.
2" Plastic Tube - No Soil Recovery
2" Plastic Tube with Soil Recovery
▽ Estimated Water Level

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF GEOPROBE GP-16

January 2012 21-1-16604-005

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-17

GEOPROBE 21-16604.GPJ 21-16604.GPJ 3/6/13

LOG OF GEOPROBE

Date Started: 10/14/11	Location: 1000 NE 45th Street, Seattle, Washington	Ground Elevation: Approx. 178.0 feet
Date Completed: 10/14/11		Typical Run Length: 4 feet
Total Depth (ft): 14.0	Drilling Company: ESN Northwest	Hole Diameter: 1.25 inches

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
		Refer to the report text for a proper understanding of the subsurface materials and probing methods. The stratification lines indicated below represent the approximate boundaries between soil types. Actual boundaries may be different if soil shifted inside sample tubes during extraction.						
	R-1	ASPHALT	0.4					
		Brown/gray, gravelly, fine sandy SILT to silty, fine SAND; moist; (Fill) ML/SM.			0.2			
	R-2	- Iron-oxide staining from 4 to 5 feet.						
5					0		GP-17:6:0	5
	R-3	- Brick fragments at 8.0 feet.						
					0			
10		- Iron-oxide staining from 10.0 to 11.0 feet.						10
	R-	Gray, gravelly, fine to medium sandy SILT; moist; (Fill) ML.	11.0					
		Red-brown, gravelly, fine to medium, sandy, silty CLAY; moist; (Fill) CL.	11.5					
		Gray, gravelly, silty, fine to medium SAND; wet; (Till) SM.	13.0					
		BOTTOM OF GEOPROBE	14.0		0.3		GP-17:14:0	
15		COMPLETED 10/14/2011						15

None Observed During Drilling

Log: EVP Rev: EVP Typ: CLP

NOTES

1. In some cases where recovery was low in the upper part of the run, the soil sample may have slid down in the tube prior to removal from the ground.
2. Groundwater level, if indicated above, was estimated during probing and should be considered approximate.
3. Refer to KEY for definitions and explanation of symbols.
4. CT = corrosion test sample; TR = thermal resistivity sample; EN = environmental sample; GE = geotechnical sample; AR = archeological sample.

LEGEND

3 — Run No.

2" Plastic Tube - No Soil Recovery

2" Plastic Tube with Soil Recovery

▽ Estimated Water Level

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF GEOPROBE GP-17

January 2012 21-1-16604-005

SHANNON & WILSON, INC.
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FIG. A-18

GEOPROBE 21-16604.GPJ 21-16604.GPJ 3/6/13

LOG OF GEOPROBE

Date Started: 10/14/11	Location: 1000 NE 45th Street, Seattle, Washington	Ground Elevation: Approx. 178.0 feet
Date Completed: 10/14/11		Typical Run Length: 4 feet
Total Depth (ft): 11.0	Drilling Company: ESN Northwest	Hole Diameter: 1.25 inches

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
	R-1	ASPHALT	0.4					
		Brown/dark brown, silty, fine to medium GRAVEL, gravelly, silty, fine to medium SAND and gravelly, fine to medium, sandy SILT; dry; (Fill) GM/SM/ML.			0.1			
	R-2	Gray/brown, gravelly, fine to medium sandy SILT; moist at 5 to 6 feet; thin, fine sand stringers; (Fill) ML.	4.0		0.3	None Observed During Drilling		
5	R-3	Gray/brown gravelly, silty, fine to medium SAND; wet at 8 to 9 feet, moist throughout; (Till) SM.	8.0					5
10		BOTTOM OF GEOPROBE COMPLETED 10/14/2011	11.0		0.2		GP-18:11.0	10
15								15

Log: EVP Rev: EVP Typ: CLP

NOTES

1. In some cases where recovery was low in the upper part of the run, the soil sample may have slid down in the tube prior to removal from the ground.
2. Groundwater level, if indicated above, was estimated during probing and should be considered approximate.
3. Refer to KEY for definitions and explanation of symbols.
4. CT = corrosion test sample; TR = thermal resistivity sample; EN = environmental sample; GE = geotechnical sample; AR = archeological sample.

LEGEND

3 — Run No.

2" Plastic Tube - No Soil Recovery

2" Plastic Tube with Soil Recovery

▽ Estimated Water Level

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF GEOPROBE GP-18

January 2012 21-1-16604-005

SHANNON & WILSON, INC.
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FIG. A-19

GEOPROBE 21-16604.GPJ 21-16604.GPJ 3/6/13

LOG OF GEOPROBE

Date Started: 10/14/11	Location: 1000 NE 45th Street, Seattle, Washington	Ground Elevation: Approx. 177.5 feet
Date Completed: 10/14/11		Typical Run Length: 4 feet
Total Depth (ft): 11.0	Drilling Company: ESN Northwest	Hole Diameter: 1.25 inches

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
	R-1	ASPHALT	0.4					
		Brown/gray, gravelly, fine to medium, sandy SILT; wet at 3.0 and 10.0 feet; iron-oxide staining throughout; (Till at 8.0 feet) ML.			0.2	None Observed During Drilling		
5	R-2				0			5
	R-3							
10		BOTTOM OF GEOPROBE COMPLETED 10/14/2011	11.0		0.1		GP-19:11.0	10
15								15

Log: EVP Rev: EVP Typ: CLP

GEOPROBE 21-16604.GPJ 21-16604.GPJ 3/6/13

NOTES

1. In some cases where recovery was low in the upper part of the run, the soil sample may have slid down in the tube prior to removal from the ground.
2. Groundwater level, if indicated above, was estimated during probing and should be considered approximate.
3. Refer to KEY for definitions and explanation of symbols.
4. CT = corrosion test sample; TR = thermal resistivity sample; EN = environmental sample; GE = geotechnical sample; AR = archeological sample.

LEGEND

3 — Run No.

2" Plastic Tube - No Soil Recovery

2" Plastic Tube with Soil Recovery

▽ Estimated Water Level

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF GEOPROBE GP-19

January 2012 21-1-16604-005

SHANNON & WILSON, INC.
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FIG. A-20

LOG OF GEOPROBE

Date Started: 10/14/11	Location: 1000 NE 45th Street, Seattle, Washington	Ground Elevation: Approx. 178.0 feet
Date Completed: 10/14/11		Typical Run Length: 4 feet
Total Depth (ft): 9.0	Drilling Company: ESN Northwest	Hole Diameter: 1.25 inches

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
	R-1	ASPHALT	0.4					
		Brown/gray, silty, fine to medium SAND; moist; SM.			0		GP-20:4.0	
5	R-2	- Iron-oxide staining at 2.0 feet.			0.2	None Observed During Drilling		5
	R-3	- Interbeds of clean sand at 7.0 feet.						
		BOTTOM OF GEOPROBE COMPLETED 10/14/2011	9.0		0.2		GP-20:9.0	
10								10
15								15

Typ: CLP Rev: EVP Log: EVP

NOTES

1. In some cases where recovery was low in the upper part of the run, the soil sample may have slid down in the tube prior to removal from the ground.
2. Groundwater level, if indicated above, was estimated during probing and should be considered approximate.
3. Refer to KEY for definitions and explanation of symbols.
4. CT = corrosion test sample; TR = thermal resistivity sample; EN = environmental sample; GE = geotechnical sample; AR = archeological sample.

LEGEND

3 — Run No.

2" Plastic Tube - No Soil Recovery

2" Plastic Tube with Soil Recovery

▽ Estimated Water Level

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF GEOPROBE GP-20

January 2012 21-1-16604-005

SHANNON & WILSON, INC.
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FIG. A-21

GEOPROBE 21-16604.GPJ 21-16604.GPJ 3/6/13

LOG OF GEOPROBE

Date Started: 10/14/11	Location: 1000 NE 45th Street, Seattle, Washington	Ground Elevation: Approx. 178.0 feet
Date Completed: 10/14/11		Typical Run Length: 4 feet
Total Depth (ft): 13.0	Drilling Company: ESN Northwest	Hole Diameter: 1.25 inches

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
	R-1	ASPHALT	0.4					
		Brown, silty, sandy GRAVEL; dry; brick fragments at 1.3 feet; (Fill) GM.			0			
	R-2	Brown/gray, gravelly, fine to medium, sandy SILT and silty, fine to medium SAND; ML/SM.	4.0					
5					0.2		GP-21:6.0	5
	R-3	- Iron-oxide staining from 8.0 to 12.0 feet.			0	None Observed During Drilling		
		- Dry from 9 to 9.5 feet. - Moist from 9.5 to 10. feet. - Wet from 10.0 to 12.0 feet.						
10	R-4							10
		Gray, silty CLAY to clayey SILT; dry; fine to medium sand stringers; (Till) CL/ML.	12.0		0		GP-21:12.0	
		BOTTOM OF GEOPROBE COMPLETED 10/14/2011	13.0					
15								15

Log: EVP Rev: EVP Typ: CLP

NOTES

1. In some cases where recovery was low in the upper part of the run, the soil sample may have slid down in the tube prior to removal from the ground.
2. Groundwater level, if indicated above, was estimated during probing and should be considered approximate.
3. Refer to KEY for definitions and explanation of symbols.
4. CT = corrosion test sample; TR = thermal resistivity sample; EN = environmental sample; GE = geotechnical sample; AR = archeological sample.

LEGEND

3 — Run No.

2" Plastic Tube - No Soil Recovery

2" Plastic Tube with Soil Recovery

▽ Estimated Water Level

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF GEOPROBE GP-21

January 2012 21-1-16604-005

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-22

GEOPROBE 21-16604.GPJ 21-16604.GPJ 3/6/13

LOG OF GEOPROBE

Date Started 10/14/11	Location 1000 NE 45th Street, Seattle, Washington	Ground Elevation: Approx. 177.5 feet	
Date Completed 10/14/11		Typical Run Length 4 feet	
Total Depth (ft) 13.0	Drilling Company: ESN Northwest	Hole Diameter: 1.25 inches	

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
	R-1	ASPHALT	0.4					
		Brown/gray, gravelly, silty, fine to medium SAND; SM.			0.2			
	R-2							
5		- Moist from 5.5 to 6.0 feet.			0	None Observed During Drilling	GP-22:5.5	5
		Brown, slightly gravelly, fine to medium sandy, clayey SILT and silty CLAY; dry; thin, fine sand stringers throughout; (Till) ML/CL.	7.0					
	R-3				0			
10								10
		BOTTOM OF GEOPROBE COMPLETED 10/14/2011	13.0		0.2		GP-22:13.0	
15								15

Typ: CLP
Rev: EVP
Log: EVP

NOTES

1. In some cases where recovery was low in the upper part of the run, the soil sample may have slid down in the tube prior to removal from the ground.
2. Groundwater level, if indicated above, was estimated during probing and should be considered approximate.
3. Refer to KEY for definitions and explanation of symbols.
4. CT = corrosion test sample; TR = thermal resistivity sample; EN = environmental sample; GE = geotechnical sample; AR = archeological sample.

LEGEND

3 — Run No.
2" Plastic Tube - No Soil Recovery
2" Plastic Tube with Soil Recovery
▽ Estimated Water Level

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF GEOPROBE GP-22

January 2012 21-1-16604-005

SHANNON & WILSON, INC.
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FIG. A-23

GEOPROBE 21-16604.GPJ 21-16604.GPJ 3/6/13

LOG OF GEOPROBE

Date Started *10/31/12*	Location	Ground Elevation: *Approx. NA feet*	
Date Completed *10/31/12*		Typical Run Length *5 feet*	
Total Depth (ft) *12.0*	Drilling Company: *Cascade Drilling*	Hole Diameter: *2 inches*	

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
	R-1	ASPHALT	0.3					
		Brown and gray, gravelly SILT; dry; locally fine to medium sandy; ML.			0.3		KB-51:2.5	
5	R-2						KB-51:6.5	5
		Gray, slightly clayey, gravelly SILT; moist; iron-oxide staining from 8 to 9 feet; ML.	7.0		0.3		KB-51:9.0	
10	R-3				0.5			10
		BOTTOM OF GEOPROBE COMPLETED 10/31/2012	12.0				KB-51:12.0	
15								15

Soil Description: *Refer to the report text for a proper understanding of the subsurface materials and probing methods. The stratification lines indicated below represent the approximate boundaries between soil types. Actual boundaries may be different if soil shifted inside sample tubes during extraction.*

Log: EVP Rev: EVP Typ: LKN

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

LEGEND

3 — Run No.

2" Plastic Tube - No Soil Recovery

2" Plastic Tube with Soil Recovery

▽ Estimated Water Level

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF GEOPROBE KB-51

March 2013 21-1-16609-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-24

GEOPROBE 21-16609.GPJ 21-16604.GPJ 3/7/13

LOG OF GEOPROBE

Date Started 10/31/12	Location	Ground Elevation: Approx. NA feet
Date Completed 10/31/12		Typical Run Length 5 feet
Total Depth (ft) 14.0	Drilling Company: Cascade Drilling	Hole Diameter: 2 inches

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
	R-1	ASPHALT	0.3					
		Gray and dark brown, gravelly SILT to silty GRAVEL; dry; locally sandy; dark staining at 1.5 feet; wood at 1.5 feet; ML/GM.	2.0					
		Motled brown and gray, slightly gravelly, slightly clayey SILT; dry; iron-oxide staining from 4 to 5 feet; ML.			2.1		KB-52:2.5	
5	R-2						KB-52:6.0	5
					2.1			
		Gray, slightly clayey, SILT; moist; fine sand partings; ML.	8.0				KB-52:9.0	
10	R-3	Brown, slightly gravelly SILT; dry; iron oxide staining; ML	10.0					10
		Gray, slightly clayey, SILT; moist; ML.	12.0		0.3		KB-52:12.0	
			14.0					
15		BOTTOM OF GEOPROBE COMPLETED 10/31/2012						15

Typ: LKN Rev: EVP Log: EVP

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

LEGEND

3 — Run No.

2" Plastic Tube - No Soil Recovery

2" Plastic Tube with Soil Recovery

▽ Estimated Water Level

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF GEOPROBE KB-52

March 2013 21-1-16609-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-25

GEOPROBE 21-16609.GPJ 21-16604.GPJ 3/7/13

LOG OF GEOPROBE

Date Started: 10/31/12	Location:	Ground Elevation: Approx. NA feet
Date Completed: 10/31/12		Typical Run Length: 5 feet
Total Depth (ft): 14.0	Drilling Company: Cascade Drilling	Hole Diameter: 2 inches

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
	R-1	ASPHALT	0.3					
		Gray and dark brown, gravelly SILT to silty GRAVEL; moist; (Fill) ML/GM.	1.5				KB-53:1.5	
		Brown and gray, slightly clayey, slightly gravelly SILT, trace fine sand; moist; dry from 5.5 to 6 feet; ML.			2.1			
5	R-2							5
		Brown and gray, slightly fine to medium sandy, gravelly SILT to silty GRAVEL; wet; ML/GM.	6.0				KB-53:6.0	
		Brown and gray, clayey SILT and silty CLAY; moist; iron-oxide staining; ML/CL.	7.5		2.1		KB-53:9.0	
10	R-3				0.3		KB-53:12.0	10
		BOTTOM OF GEOPROBE COMPLETED 10/31/2012	14.0				KB-53:14.0	
15								15

Typ: LKN
Rev: EVP
Log: EVP

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

LEGEND

3 — Run No.
2" Plastic Tube - No Soil Recovery
2" Plastic Tube with Soil Recovery
▽ Estimated Water Level

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF GEOPROBE KB-53

March 2013 21-1-16609-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-26

GEOPROBE 21-16609.GPJ 21-16604.GPJ 3/7/13

LOG OF GEOPROBE

Date Started *10/31/12*	Location	Ground Elevation: *Approx. NA feet*	
Date Completed *10/31/12*		Typical Run Length *5 feet*	
Total Depth (ft) *13.0*	Drilling Company: *Cascade Drilling*	Hole Diameter: *2 inches*	

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
	R-1	ASPHALT	0.3					
		Brown to dark brown, gravelly SILT and silty GRAVEL; wet; (Fill) ML/GM.	1.5					
		Brown and gray, gravelly SILT; dry to moist; locally fine sandy; iron-oxide staining; ML.			0.1		KB-54:3.0	
5	R-2						KB-54:6.0	5
					0.3		KB-54:9.0	
10	R-3							10
					0.4		KB-54:12.0	
		BOTTOM OF GEOPROBE COMPLETED 10/31/2012	13.0					
15								15

Log: EVP Rev: EVP Typ: LKN

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

LEGEND

3 — 2" Plastic Tube - No Soil Recovery
2" Plastic Tube with Soil Recovery — Run No.
▽ Estimated Water Level

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF GEOPROBE KB-54

March 2013 21-1-16609-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-27

GEOPROBE 21-16609.GPJ 21-16604.GPJ 3/7/13

LOG OF GEOPROBE

Date Started *10/31/12*	Location	Ground Elevation: *Approx. NA feet*
Date Completed *10/31/12*		Typical Run Length *5 feet*
Total Depth (ft) *13.0*	Drilling Company: *Cascade Drilling*	Hole Diameter: *2 inches*

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
	R-1	ASPHALT	0.3					
		Gray, gravelly SILT; dry; locally fine to medium sandy; ML.			0.5		KB-55:3.0	
5	R-2						KB-55:6.0	5
					3.3		KB-55:9.0	
10	R-3	Gray, slightly silty, gravelly, fine to coarse SAND; wet; SP-SM.	10.0		2.2			10
		Gray, clayey SILT to silty CLAY; dry; ML/CL.	12.0				KB-55:12.0	
15		BOTTOM OF GEOPROBE COMPLETED 10/31/2012	13.0					15

Log: EVP Rev: EVP Typ: LKN

GEOPROBE 21-16609.GPJ 21-16604.GPJ 3/7/13

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

LEGEND

3 — Run No.

2" Plastic Tube - No Soil Recovery

2" Plastic Tube with Soil Recovery

▽ Estimated Water Level

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF GEOPROBE KB-55

March 2013 21-1-16609-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-28

LOG OF GEOPROBE

Date Started: 10/31/12	Location:	Ground Elevation: Approx. NA feet
Date Completed: 10/31/12		Typical Run Length: 5 feet
Total Depth (ft): 13.0	Drilling Company: Cascade Drilling	Hole Diameter: 2 inches

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
	R-1	ASPHALT	0.3					
		Dark gray, gravelly SILT and silty GRAVEL; dry; staining; ML/GM.						
		Brown and gray, gravelly SILT; dry; locally fine sandy; brick at 4 feet; dark staining from 2 to 3 feet; ML.	2.0		56.3		KB-56:2.0	
5	R-2				2.4		KB-56:6.0	5
							KB-56:9.0	
10	R-3	Gray, fine to medium sandy, gravelly SILT to silty, gravelly, fine to medium SAND; wet; ML/SM.	9.5					10
		Mottled brown and red-brown, slightly gravelly, clayey SILT; dry; (Till) ML.	11.0		18.1		KB-56:12.5	
15		BOTTOM OF GEOPROBE COMPLETED 10/31/2012	13.0					15

Log: EVP Rev: EVP Typ: LKN

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

LEGEND

3 — Run No.

2" Plastic Tube - No Soil Recovery

2" Plastic Tube with Soil Recovery

▽ Estimated Water Level

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF GEOPROBE KB-56

March 2013 21-1-16609-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-29

GEOPROBE 21-16609.GPJ 21-16604.GPJ 3/7/13

LOG OF GEOPROBE

Date Started *10/31/12*	Location	Ground Elevation: *Approx. NA feet*	
Date Completed *10/31/12*		Typical Run Length *5 feet*	
Total Depth (ft) *1.6*	Drilling Company: *Cascade Drilling*	Hole Diameter: *2 inches*	

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
	1 G	ASPHALT	0.3		1.4			
		Dark brown, slightly gravelly SILT; dry; ML.						
		Suspected underground storage tank encountered at 1.6 feet.	1.6				KB-57:1.6	
		BOTTOM OF GEOPROBE COMPLETED 10/31/2012						
5								5
10								10
15								15

Refer to the report text for a proper understanding of the subsurface materials and probing methods. The stratification lines indicated below represent the approximate boundaries between soil types. Actual boundaries may be different if soil shifted inside sample tubes during extraction.

Log: EVP Rev: EVP Typ: LKN

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

LEGEND

3 — Run No.

2" Plastic Tube - No Soil Recovery

2" Plastic Tube with Soil Recovery

▽ Estimated Water Level

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF GEOPROBE KB-57

March 2013 21-1-16609-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-30

GEOPROBE 21-16609.GPJ 21-16604.GPJ 3/7/13

LOG OF GEOPROBE

Date Started *10/31/12*	Location	Ground Elevation: *Approx. NA feet*	
Date Completed *10/31/12*		Typical Run Length *5 feet*	
Total Depth (ft) *14.0*	Drilling Company: *Cascade Drilling*	Hole Diameter: *2 inches*	

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
	R-1	ASPHALT	0.3					
		Brown and gray, slightly sandy, gravelly SILT; dry; iron-oxide staining at 4 feet; ML.			0.4		KB-58:3.0	
5	R-2						KB-58:6.0	5
					5.4			
		Brown and gray, silty, gravelly SAND; wet; SM.	8.0				KB-58:9.0	
10	R-3	Blue-gray, clayey SILT to silty CLAY; moist; locally fine sandy; (Till) ML/CL.	10.0		3.8			10
		BOTTOM OF GEOPROBE COMPLETED 10/31/2012	14.0				KB-58:14.0	
15								15

Typ: LKN
Rev: EVP
Log: EVP

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

LEGEND

3 — 2" Plastic Tube - No Soil Recovery
2" Plastic Tube with Soil Recovery — Run No.
▽ Estimated Water Level

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF GEOPROBE KB-58

March 2013 21-1-16609-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-31

GEOPROBE 21-16609.GPJ 21-16604.GPJ 3/7/13

LOG OF GEOPROBE

Date Started 11/7/12	Location	Ground Elevation: Approx. NA feet
Date Completed 11/7/12		Typical Run Length 5 feet
Total Depth (ft) 13.0	Drilling Company: Cascade Drilling	Hole Diameter: inches

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
	R-1	ASPHALT.	0.3					
		Brown, slightly sandy, gravelly SILT; moist; wet from 1 to 2 feet below ground surface; ML.			3		KB-59:3.0	
5	R-2	Brown/gray, gravelly SILT, trace of sand; moist; ML.	5.0		0.7		KB-59:6.0	5
							KB-59:9.0	
10	R-3	Gray/brown/red, gravelly SILT; moist to wet from 12 to 12.5 feet below ground surface; iron staining from 12 to 13 feet; ML.	10.0		0		KB-59:12.5	10
		BOTTOM OF GEOPROBE COMPLETED 11/7/2012	13.0					
15								15

Soil Description: *Refer to the report text for a proper understanding of the subsurface materials and probing methods. The stratification lines indicated below represent the approximate boundaries between soil types. Actual boundaries may be different if soil shifted inside sample tubes during extraction.*

Log: EVP Rev: EVP Typ: LKN

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

LEGEND

3 — 2" Plastic Tube - No Soil Recovery
2" Plastic Tube with Soil Recovery — Run No.
▽ Estimated Water Level

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF GEOPROBE KB-59

March 2013 21-1-16609-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-32

GEOPROBE 21-16609.GPJ 21-16604.GPJ 3/7/13

LOG OF GEOPROBE

Date Started: 11/7/12	Location:	Ground Elevation: Approx. NA feet
Date Completed: 11/7/12		Typical Run Length: 5 feet
Total Depth (ft): 14.0	Drilling Company: Cascade Drilling	Hole Diameter: inches

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
	R-1	ASPHALT.	0.3					
		Dark brown, slightly fine to medium sandy, gravelly SILT; moist; ML.						
		Dark brown, gravelly SILT, trace of clay; moist; ML.	2.0		0.6		KB-60:3.0	
5	R-2							5
		Brown and gray SILT; moist; iron oxide staining; ML.	6.0		0.4		KB-60:9.0	
10	R-3	Gray-brown, slightly sandy SILT, trace of clay and gravel; wet from 12 to 13 feet; ML.	10.0		1.8		KB-60:12.0	10
		BOTTOM OF GEOPROBE COMPLETED 11/7/2012	14.0				KB-60:14.0	
15								15

Log: EVP Rev: EVP Typ: LKN

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

LEGEND

3 — 2" Plastic Tube - No Soil Recovery
2" Plastic Tube with Soil Recovery — Run No.
▽ Estimated Water Level

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF GEOPROBE KB-60

March 2013 21-1-16609-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-33

GEOPROBE 21-16609.GPJ 21-16604.GPJ 3/7/13

LOG OF GEOPROBE

Date Started 11/7/12	Location	Ground Elevation: Approx. NA feet
Date Completed 11/7/12		Typical Run Length 5 feet
Total Depth (ft) 14.0	Drilling Company: Cascade Drilling	Hole Diameter: inches

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
	R-1	ASPHALT.	0.3					
		Brown and gray, slightly sandy SILT, trace of clay and gravel; ML-SM.			0.7		KB-61:3.0	
5	R-2	Gray and red, slightly gravelly SILT; moist; iron oxide staining from 7 to 9 feet; ML.	5.0				KB-61:6.0	5
					1.1		KB-61:9.0	
10	R-3	Dark gray, slightly clayey SILT; moist; ML.	10.0					10
					0.1		KB-61:12.0	
		BOTTOM OF GEOPROBE COMPLETED 11/7/2012	14.0				KB-61:14.0	
15								15

Soil Description: *Refer to the report text for a proper understanding of the subsurface materials and probing methods. The stratification lines indicated below represent the approximate boundaries between soil types. Actual boundaries may be different if soil shifted inside sample tubes during extraction.*

Log: EVP Rev: EVP Typ: LKN

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

LEGEND

- 3 — Run No.
- 2" Plastic Tube - No Soil Recovery
- 2" Plastic Tube with Soil Recovery
- ▽ Estimated Water Level

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF GEOPROBE KB-61

March 2013 21-1-16609-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-34

GEOPROBE 21-16609.GPJ 21-16604.GPJ 3/7/13

LOG OF GEOPROBE

Date Started *11/7/12*	Location	Ground Elevation: *Approx. NA feet*	
Date Completed *11/7/12*		Typical Run Length *5 feet*	
Total Depth (ft) *13.0*	Drilling Company: *Cascade Drilling*	Hole Diameter: *inches*	

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
	R-1	ASPHALT.	0.3					
		Brown/gray, slightly gravelly, sandy SILT; dry to moist; ML/SM.			0.8		KB-62:3.0	
5	R-2	Gray/brown, slightly sandy, gravelly SILT, trace of clay; moist; ML.	5.0				KB-62:6.0	5
					0.6			
10	R-3	Gray, gravelly SILT, trace of clay; moist; (Till) ML	10.0					10
					0.4			
		BOTTOM OF GEOPROBE COMPLETED 11/7/2012	13.0				KB-62:13	
15								15

Typ: LKN
Rev: EVP
Log: EVP

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

LEGEND

3 — Run No.
2" Plastic Tube - No Soil Recovery
2" Plastic Tube with Soil Recovery
▽ Estimated Water Level

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF GEOPROBE KB-62

March 2013 21-1-16609-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-35

GEOPROBE 21-16609.GPJ 21-16604.GPJ 3/7/13

LOG OF GEOPROBE

Date Started *11/7/12*	Location	Ground Elevation: *Approx. NA feet*
Date Completed *11/7/12*		Typical Run Length *5 feet*
Total Depth (ft) *12.0*	Drilling Company: *Cascade Drilling*	Hole Diameter: *inches*

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
	R-1	ASPHALT.	0.3					
		Light brown, slightly sandy, gravelly SILT, trace of clay; moist; ML.			0.9		KB-63:3.0	
5	R-2	Brown/gray, gravelly SILT, trace of clay; moist; ML.	5.0				KB-63:6.0	5
					4.2			
		Brown, gravelly, silty SAND; moist; SM.	9.0				KB-63:9.0	
10	R-3	Gray, gravelly SILT; moist; (Till) ML	10.0		1.9			10
		BOTTOM OF GEOPROBE COMPLETED 11/7/2012	12.0				KB-63:12.0	
15								15

Typ: LKN
Rev: EVP
Log: EVP

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

LEGEND

3 — 2" Plastic Tube - No Soil Recovery
2" Plastic Tube with Soil Recovery — *Run No.*
▽ Estimated Water Level

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF GEOPROBE KB-63

March 2013 21-1-16609-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-36

GEOPROBE 21-16609.GPJ 21-16604.GPJ 3/7/13

LOG OF GEOPROBE

Date Started: 11/7/12	Location:	Ground Elevation: Approx. NA feet
Date Completed: 11/7/12		Typical Run Length: 5 feet
Total Depth (ft): 12.0	Drilling Company: Cascade Drilling	Hole Diameter: inches

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
	R-1	ASPHALT.	0.3					
		Brown, gravelly silty SAND and sandy SILT, trace of clay; moist; iron oxide staining at 2.0 feet; SM/ML			0		KB-64:3.0	
5	R-2	Light brown, gravelly SILT, trace sand, trace of clay; moist; iron staining at 10 feet; SM/ML.	5.0		0		KB-64:6.0	5
							KB-64:9.0	
10	R-3	Dark brown, gravelly SILT, trace of clay; moist; ML.	10.0		0			10
		BOTTOM OF GEOPROBE COMPLETED 11/7/2012	12.0				KB-64:12.0	
15								15

Typ: LKN Rev: EVP Log: EVP

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

LEGEND

3 — 2" Plastic Tube - No Soil Recovery
2" Plastic Tube with Soil Recovery — Run No.
▽ Estimated Water Level

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF GEOPROBE KB-64

March 2013 21-1-16609-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-37

GEOPROBE 21-16609.GPJ 21-16604.GPJ 3/7/13

LOG OF GEOPROBE

Date Started: 2/21/13	Location: 1000 NE 45th Street	Ground Elevation: Approx. NA feet
Date Completed: 2/21/13		Typical Run Length: 3 feet
Total Depth (ft): 9.0	Drilling Company: Cascade Drilling	Hole Diameter: 2 inches

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
	R-1	CONCRETE						
		Brown to gray, clayey, fine sandy SILT; moist; iron-oxide staining, strong hydrocarbon odor at 5 feet; ML.	0.6		0.1		KB-81:2	
	R-2				325			
5								5
	R-3	Gray, clayey, fine sandy SILT and silty SAND; moist; hydrocarbon odor; ML/SM.	6.0		6.8		KB-81:6	
		REFUSAL AT 9 FEET COMPLETED 2/21/2013	9.0				KB-81:9	
10								10
15								15

Typ: CLP Rev: DJR Log: DJR

GEOPROBE 21-16609.GPJ 21-16604.GPJ 3/7/13

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

LEGEND

3 — Run No.

2" Plastic Tube - No Soil Recovery

2" Plastic Tube with Soil Recovery

▽ Estimated Water Level

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF GEOPROBE KB-81

March 2013 21-1-16609-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-38

LOG OF GEOPROBE

Date Started 2/21/13	Location 1000 NE 45th Street	Ground Elevation: Approx. NA feet	
Date Completed 2/21/13		Typical Run Length 3 feet	
Total Depth (ft) 9.0	Drilling Company: Cascade Drilling	Hole Diameter: inches	

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
	R-1	CONCRETE	0.6					
		Brown to gray, fine to medium, sandy SILT, trace of gravel and silty, medium SAND; moist; iron-oxide staining, strong hydrocarbon odor at 6 feet; ML/SM.			0.1		KB-82:2	
	R-2				540			
5								5
	R-3	Gray, sandy SILT; moist; strong hydrocarbon odor; SM.	6.0		321		KB-82:6	
		REFUSAL AT 9 FEET COMPLETED 2/21/2013	9.0				KB-82:9	
10								10
15								15

Log: DJR Rev: DRJ Typ: CLP

GEOPROBE 21-16609.GPJ 21-16604.GPJ 3/7/13

Soil Description

Refer to the report text for a proper understanding of the subsurface materials and probing methods. The stratification lines indicated below represent the approximate boundaries between soil types. Actual boundaries may be different if soil shifted inside sample tubes during extraction.

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

LEGEND

3 — Run No.

2" Plastic Tube - No Soil Recovery

2" Plastic Tube with Soil Recovery

▽ Estimated Water Level

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF GEOPROBE KB-82

March 2013 21-1-16609-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-39

LOG OF GEOPROBE

Date Started: 2/21/13	Location: 1000 NE 45th Street	Ground Elevation: Approx. NA feet
Date Completed: 2/21/13		Typical Run Length: 3 feet
Total Depth (ft): 6.0	Drilling Company: Cascade Drilling	Hole Diameter: inches

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
	R-1	CONCRETE						
		Brown, slightly clayey, fine sandy SILT; moist; ML.	0.6		0		KB-83:2	
	R-2	Brown, slightly clayey, fine sandy SILT and silty, fine to medium SAND; moist; ML/SM.	3.0		0			
5		REFUSAL AT 6 FEET COMPLETED 2/21/2013	6.0				KB-83:6	5
10								10
15								15

Typ: CLP
Rev: DJR
Log: DJR

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

LEGEND

3 — Run No.

2" Plastic Tube - No Soil Recovery

2" Plastic Tube with Soil Recovery

▽ Estimated Water Level

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF GEOPROBE KB-83

March 2013 21-1-16609-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-40

GEOPROBE 21-16609.GPJ 21-16604.GPJ 3/7/13

LOG OF GEOPROBE

Date Started: 2/21/13	Location: 1000 NE 45th Street	Ground Elevation: Approx. NA feet
Date Completed: 2/21/13		Typical Run Length: 3 feet
Total Depth (ft): 5.0	Drilling Company: Cascade Drilling	Hole Diameter: inches

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
	R-1	CONCRETE	0.6					
		Brown to gray, fine to medium, sandy SILT and fine to medium, silty SAND, trace of gravel; moist; strong hydrocarbon odor; ML/SM.			65		KB-84:2	
	R-2	Gray, fine to medium, silty SAND, trace of gravel, strong hydrocarbon odor; moist; SM.	2.5		120			
5		REFUSAL AT 5 FEET COMPLETED 2/21/2013	5.0				KB-85:5:1 KB-85:5:2 (Duplicate) Sample	5
10								10
15								15

Typ: CLP Rev: DJR Log: DJR

GEOPROBE 21-16609.GPJ 21-16604.GPJ 3/7/13

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

LEGEND

3 — Run No.

2" Plastic Tube - No Soil Recovery

2" Plastic Tube with Soil Recovery

▽ Estimated Water Level

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF GEOPROBE KB-84

March 2013 21-1-16609-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-41

LOG OF GEOPROBE

Date Started: 2/21/13	Location: 1000 NE 45th Street	Ground Elevation: Approx. NA feet
Date Completed: 2/21/13		Typical Run Length: 3 feet
Total Depth (ft): 5.0	Drilling Company: Cascade Drilling	Hole Diameter: inches

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
	R-1	CONCRETE	0.6					
		Brown, fine to medium, sandy SILT and fine to medium, silty SAND, trace of gravel; moist; iron-oxide staining throughout; ML/SM.	2.0		0		KB-85:2	
	R-2	Brown, fine to medium, silty SAND, trace of gravel; moist; SM.			0			
5		REFUSAL AT 5 FEET COMPLETED 2/21/2013	5.0				KB-85:5	5
10								10
15								15

Log: DJR Rev: DJR Typ: CLP

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

LEGEND

3 — Run No.

2" Plastic Tube - No Soil Recovery

2" Plastic Tube with Soil Recovery

▽ Estimated Water Level

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF GEOPROBE KB-85

March 2013 21-1-16609-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-42

GEOPROBE 21-16609.GPJ 21-16604.GPJ 3/7/13

LOG OF GEOPROBE

Date Started 11/1/12	Location	Ground Elevation: Approx. NA feet
Date Completed 11/1/12		Typical Run Length 5 feet
Total Depth (ft) 15.0	Drilling Company: Cascade Drilling	Hole Diameter: 2 inches

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
	R-1	ASPHALT	0.3					
		Dark gray, silty, sandy GRAVEL; moist; GM.	1.0					
		Gray/brown, gravelly, silty, fine to medium SAND; moist; SM.			4.3		KB-101:4.0	
5	R-2	Gray, clayey SILT, trace fine sand; moist; slightly gravelly and sandy from 9 to 9.5 feet, hydrocarbon odors from 9 to 9.5 feet; ML.	5.0		363.2		KB-101:9.5	5
10	R-3	Gray, slightly gravelly, silty, fine to medium SAND; moist; wet from 14 to 15 feet; strong hydrocarbon odors, pockets of gravelly, sandy silt; SM.	10.0		1233 933 2003		KB-101:14.5	10
15		BOTTOM OF GEOPROBE COMPLETED 11/1/2012	15.0					15

Typ: LKN
Rev: EVP
Log: EVP

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

LEGEND

3 — Run No.
2" Plastic Tube - No Soil Recovery
2" Plastic Tube with Soil Recovery
▽ Estimated Water Level

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF GEOPROBE KB-101

March 2013 21-1-16609-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-43

GEOPROBE 21-16609.GPJ 21-16604.GPJ 3/7/13

LOG OF GEOPROBE

Date Started 11/1/12	Location	Ground Elevation: Approx. NA feet
Date Completed 11/1/12		Typical Run Length 5 feet
Total Depth (ft) 17.0	Drilling Company: Cascade Drilling	Hole Diameter: 2 inches

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
	R-1	ASPHALT	0.3					
		Dark brown, silty, sandy GRAVEL; moist; GM.	1.0					
		Gray/brown, gravelly, silty, fine to medium SAND; moist; pockets of crushed gravel; SM.			3.2			
		Gray and brown, slightly gravelly, fine sandy SILT; moist; iron-oxide staining; hydrocarbon odors from 4 to 5 feet; ML.	3.0		4.4		KB-102:4.5	
5	R-2	Brown and gray, clayey SILT, trace gravel; moist; hydrocarbon odors at 9 feet; ML.	5.0		271			5
					7.8			
					18.7			
							KB-102:9.5	
10	R-3				303			10
		Gray, gravelly, silty, fine to medium SAND; moist; wet at 15 feet, strong hydrocarbon odors; SM.	11.0		25			
					205			
					1420		KB-102:14.0	
15	R-4				821			15
		Brown, clayey, SILT; moist; ML	16.0		80			
		Gray, slightly gravelly, silty, fine to medium SAND; wet; iron oxide staining; hydrocarbon odors; SM	16.5 17.0		1352		KB-102:17.0	
		BOTTOM OF GEOPROBE COMPLETED 11/1/2012						

Typ: LKN
Rev: EVP
Log: EVP

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

LEGEND

3 — Run No.
2" Plastic Tube - No Soil Recovery
2" Plastic Tube with Soil Recovery
▽ Estimated Water Level

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF GEOPROBE KB-102

March 2013 21-1-16609-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-44

GEOPROBE 21-16609.GPJ 21-16604.GPJ 3/7/13

LOG OF GEOPROBE

Date Started *11/1/12*	Location	Ground Elevation: *Approx. NA feet*
Date Completed *11/1/12*		Typical Run Length *5 feet*
Total Depth (ft) *15.0*	Drilling Company: *Cascade Drilling*	Hole Diameter: *2 inches*

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
	R-1	*Refer to the report text for a proper understanding of the subsurface materials and probing methods. The stratification lines indicated below represent the approximate boundaries between soil types. Actual boundaries may be different if soil shifted inside sample tubes during extraction.*						
		ASPHALT	0.3					
		Dark gray GRAVEL; dry; GM.	0.6					
		Brown, slightly gravelly, slightly silty, fine to medium SAND; moist; SP-SM.	2.5		3.2			
		Gray and brown, clayey SILT; moist; iron-oxide staining from 4 to 5 feet; ML.			3.2			
					4.7		KB-103:3.0	
5	R-2				5.2			5
					3.4			
					7.6		KB-103:9.0	
10	R-3				7.4			10
		Dark brown, sandy GRAVEL; dry; GM.	12.0		8.9			
					3.4			
		Gray, slightly silty, gravelly, fine to medium SAND; wet; hydrocarbon odor; SP-SM.	13.0					
					2782		KB-103:14.0	
15		BOTTOM OF GEOPROBE COMPLETED 11/1/2012	15.0					15

Log: EVP Rev: EVP Typ: LKN

GEOPROBE 21-16609.GPJ 21-16604.GPJ 3/7/13

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

LEGEND

3 — Run No.

2" Plastic Tube - No Soil Recovery

2" Plastic Tube with Soil Recovery

▽ Estimated Water Level

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF GEOPROBE KB-103

March 2013 21-1-16609-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-45

LOG OF GEOPROBE

Date Started *11/1/12*	Location	Ground Elevation: *Approx. NA feet*	
Date Completed *11/1/12*		Typical Run Length *5 feet*	
Total Depth (ft) *14.0*	Drilling Company: *Cascade Drilling*	Hole Diameter: *2 inches*	

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
	R-1	ASPHALT	0.3					
		Dark gray, silty GRAVEL and gravelly SILT; dry; GM/ML.	1.0					
		Brown and gray, slightly silty, gravelly, fine to medium SAND; moist; iron-oxide staining; SP-SM.			4.2			
			3.0		4.2		KB-104:3.0	
5	R-2	Brown, clayey SILT to silty CLAY; moist; sand and gravel interbeds at 7 feet; ML/CL.			3.1			5
					3.2			
					3.2			
					3.8		KB-104:9.0	
10	R-3							10
					2.1			
					2.1			
		Gray, slightly silty, gravelly, fine to medium SAND; moist; hydrocarbon odorS; SP-SM.	13.0		284		KB-104:13.5	
15		BOTTOM OF GEOPROBE COMPLETED 11/1/2012	15.0		25			15

Log: EVP Rev: EVP Typ: LKN

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

LEGEND

3 — 2" Plastic Tube - No Soil Recovery
2" Plastic Tube with Soil Recovery — Run No.
▽ Estimated Water Level

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF GEOPROBE KB-104

March 2013 21-1-16609-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-46

GEOPROBE 21-16609.GPJ 21-16604.GPJ 3/7/13

LOG OF GEOPROBE

Date Started *11/1/12*	Location	Ground Elevation: *Approx. NA feet*	
Date Completed *11/1/12*		Typical Run Length *5 feet*	
Total Depth (ft) *13.0*	Drilling Company: *Cascade Drilling*	Hole Diameter: *2 inches*	

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
	R-1	ASPHALT	0.3					
		Dark brown, silty GRAVEL to gravelly SILT; dry; GM/ML.	1.5		5.3			
		Brown, silty, gravelly, fine to medium SAND; moist; SM.	2.5		5.3			
		Gray, clayey SILT; moist; hydrocarbon odor from 2.5 to 10.5 feet; ML.			386		KB-105:4.5	
5	R-2				3.4			5
					3.4			
							KB-105:9.0	
10	R-3							10
		Gray, silty, gravelly, fine to medium SAND; moist to wet; hydrocarbon odors; SM.	11.0		82			
					82			
					652			
					2742			
		BOTTOM OF GEOPROBE COMPLETED 11/1/2012	13.0				KB-105:13.0	
15								15

Log: EVP Rev: EVP Typ: LKN

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

LEGEND

3 — 2" Plastic Tube - No Soil Recovery
2" Plastic Tube with Soil Recovery — Run No.
▽ Estimated Water Level

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF GEOPROBE KB-105

March 2013 21-1-16609-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-47

GEOPROBE 21-16609.GPJ 21-16604.GPJ 3/7/13

LOG OF GEOPROBE

Date Started 11/1/12	Location	Ground Elevation: Approx. NA feet
Date Completed 11/1/12		Typical Run Length 5 feet
Total Depth (ft) 1.6	Drilling Company: Cascade Drilling	Hole Diameter: 2 inches

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
	1	ASPHALT	0.3					
		Brown and gray, silty, gravelly, fine to medium SAND to silty, fine to medium sandy GRAVEL; dry; SM/GM.			5.2			
		Suspected underground storage tank encountered at 1.6 feet.	1.6				KB-106:1.6	
		BOTTOM OF GEOPROBE COMPLETED 11/1/2012						
5								5
10								10
15								15

Log: EVP Rev: EVP Typ: LKN

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

LEGEND

3 — 2" Plastic Tube - No Soil Recovery
2" Plastic Tube with Soil Recovery — Run No.
▽ Estimated Water Level

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF GEOPROBE KB-106

March 2013 21-1-16609-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-48

GEOPROBE 21-16609.GPJ 21-16604.GPJ 3/7/13

LOG OF GEOPROBE

Date Started: 11/1/12	Location:	Ground Elevation: Approx. NA feet
Date Completed: 11/1/12		Typical Run Length: 5 feet
Total Depth (ft): 15.0	Drilling Company: Cascade Drilling	Hole Diameter: 2 inches

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
	R-1	ASPHALT	0.3					
		Dark gray, silty GRAVEL and gravelly SILT; dry; GM/ML.	0.6					
		Brown, slightly silty, gravelly, fine to medium SAND; moist; SP-SM.	2.0					
		Brown and gray, clayey SILT, trace gravel; moist; hydrocarbon odors from 9 to 10 feet; ML.			3.2		KB-107:3.0	
5	R-2				2.3			5
					24			
					472		KB-107:9.0	
10	R-3				7.9			10
		Gray, slightly gravelly, silty, fine to medium SAND; wet; hydrocarbon odors; SM.	12.0		864			
					2653		KB-107:14.5	
15		BOTTOM OF GEOPROBE COMPLETED 11/1/2012	15.0					15

Soil Description: *Refer to the report text for a proper understanding of the subsurface materials and probing methods. The stratification lines indicated below represent the approximate boundaries between soil types. Actual boundaries may be different if soil shifted inside sample tubes during extraction.*

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

LEGEND

3 — Run No.
2" Plastic Tube - No Soil Recovery
2" Plastic Tube with Soil Recovery
▽ Estimated Water Level

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF GEOPROBE KB-107

March 2013 21-1-16609-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-49

Log: EVP Rev: EVP Typ: LKW

GEOPROBE 21-16609.GPJ 21-16604.GPJ 3/7/13

LOG OF GEOPROBE

Date Started 11/1/12	Location	Ground Elevation: Approx. NA feet	
Date Completed 11/1/12		Typical Run Length 5 feet	
Total Depth (ft) 14.0	Drilling Company: Cascade Drilling	Hole Diameter: 2 inches	

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
	R-1	ASPHALT	0.3					
		Dark gray, silty, sandy GRAVEL; dry; GM.	0.6					
		Gray and brown, gravelly, silty, fine to medium SAND; dry; iron-oxide staining; SM.						
		Brown and gray, slightly clayey SILT; moist; iron-oxide staining from 5 to 10 feet; ML.	2.5		0.1		KB-108:3.0	
5	R-2				3.8		KB-108:9.0	5
10	R-3	Gray, slightly silty, gravelly, fine to medium SAND; moist; hydrocarbon odor from 12 to 14 feet; SP-SM.	10.0		84 7.5			10
		BOTTOM OF GEOPROBE COMPLETED 11/1/2012	14.0		2142		KB-108:14.0	
15								15

Log: EVP Rev: EVP Typ: LKN

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

LEGEND

3 — Run No.

2" Plastic Tube - No Soil Recovery

2" Plastic Tube with Soil Recovery

▽ Estimated Water Level

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF GEOPROBE KB-108

March 2013 21-1-16609-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-50

GEOPROBE 21-16609.GPJ 21-16604.GPJ 3/7/13

LOG OF GEOPROBE

Date Started: 11/7/12	Location:	Ground Elevation: Approx. NA feet
Date Completed: 11/7/12		Typical Run Length: 5 feet
Total Depth (ft): 12.0	Drilling Company: Cascade Drilling	Hole Diameter: inches

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
	R-1	ASPHALT.	0.3					
		Brown, slightly silty, slightly gravelly SAND; moist; SM-SP.			8.7		KB-109:3.0	
5	R-2	Brown, slightly sandy, gravelly SILT; moist; ML.	5.0		0.2		KB-109:6.0	5
							KB-109:9.0	
10	R-3	Gray, slightly sandy, gravelly SILT, trace of clay; moist; strong hydrocarbon odor @ 12 ft; (Till) ML.	10.0		85.6			10
		BOTTOM OF GEOPROBE COMPLETED 11/7/2012	12.0				KB-109:12.0	
15								15

Typ: LKN Rev: EVP Log: EVP

Soil Description

Refer to the report text for a proper understanding of the subsurface materials and probing methods. The stratification lines indicated below represent the approximate boundaries between soil types. Actual boundaries may be different if soil shifted inside sample tubes during extraction.

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

LEGEND

3 — 2" Plastic Tube - No Soil Recovery
2" Plastic Tube with Soil Recovery — Run No.
▽ Estimated Water Level

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF GEOPROBE KB-109

March 2013 21-1-16609-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-51

GEOPROBE 21-16609.GPJ 21-16604.GPJ 3/7/13

LOG OF GEOPROBE

Date Started 11/7/12	Location	Ground Elevation: Approx. NA feet
Date Completed 11/7/12		Typical Run Length 5 feet
Total Depth (ft) 14.0	Drilling Company: Cascade Drilling	Hole Diameter: inches

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
	R-1	ASPHALT.	0.3					
		Dark gray to light brown, silty SAND to medium, sandy SILT, trace of clay and gravel; moist; SM/ML.			11		KB-110:3.0	
5	R-2	Gray, slightly sandy, gravelly SILT, trace of clay; moist; hydrocarbon odor increasing with depth; ML/SM.	5.0		143		KB-110:6.0 KB-110:9.0	5
10	R-3	Gray, slightly sandy, slightly gravelly SILT, trace of clay; moist; strong hydrocarbon odor; ML/SM.	10.0		1200		KB-110:12.0	10
		BOTTOM OF GEOPROBE COMPLETED 11/7/2012	14.0				KB-110:14.0	
15								15

Typ: LKN
Rev: EVP
Log: EVP

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

LEGEND

3 — Run No.
2" Plastic Tube - No Soil Recovery
2" Plastic Tube with Soil Recovery
▽ Estimated Water Level

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF GEOPROBE KB-110

March 2013 21-1-16609-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-52

GEOPROBE 21-16609.GPJ 21-16604.GPJ 3/7/13

Total Depth:	37 ft.	Northing:		Drilling Method:	Hollow Stem Auger	Hole Diam.:	8 in.
Top Elevation:	~ 180.7 ft.	Easting:		Drilling Company:	Cascade Drilling	Rod Diam.:	3"/2.5 I.D.
Vert. Datum:		Station:		Drill Rig Equipment:		Hammer Type:	
Horiz. Datum:		Offset:		Other Comments:			

SOIL DESCRIPTION

Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines represent the approximate boundaries between material types, and the transition may be gradual.

PENETRATION RESISTANCE (blows/foot)

▲ Hammer Wt. & Drop: 140 lbs / 30 inches

Depth, ft. | Symbol | PID, ppm | Samples | Ground Water | Depth, ft.

ASPHALT — 0.4

Medium dense, brown to gray, slightly silty, gravelly, fine to medium SAND, iron-oxide stains; moist; SP-SM.

8.0

Dense to very dense, dark gray, silty, fine to medium SAND, trace of cobbles and gravel; moist to wet; hydrocarbon odor starting at 11.5 feet; SM.

- Collected environmental sample: SW-MW1-11:13.

15.5

Medium dense, brown, fine to medium SAND, trace of silt; wet; some iron-oxide staining; SP.

CONTINUED NEXT SHEET

Sample	PID, ppm
1	
2	
3	20
4	250
5	80
6	158
7	

During Drilling ▽

Penetration resistance (blows/foot): 0, 20, 40, 60

Depth, ft.: 2, 4, 6, 8, 10, 12, 14, 16, 18

◇ % Fines (<0.075mm)

● % Water Content

LEGEND

- * Sample Not Recovered
- E Environmental Sample Obtained
- 3.25" O.D. Split Spoon Sample
- Piezometer Screen and Sand Filter
- Bentonite-Cement Grout
- Bentonite Chips/Pellets
- Bentonite Grout
- ▽ Ground Water Level ATD

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF BORING MW-1

January 2012 | 21-1-16604-005

SHANNON & WILSON, INC.
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FIG. A-53
Sheet 1 of 2

Log: DJR Rev: DJR Typ: CLP

MASTER LOG E 21-16604.GPJ SHAN WIL.GDT 3/6/13

Total Depth:	37 ft.	Northing:		Drilling Method:	Hollow Stem Auger	Hole Diam.:	8 in.
Top Elevation:	~ 180.7 ft.	Easting:		Drilling Company:	Cascade Drilling	Rod Diam.:	3"/2.5 I.D.
Vert. Datum:		Station:		Drill Rig Equipment:		Hammer Type:	
Horiz. Datum:		Offset:		Other Comments:			

SOIL DESCRIPTION

Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines represent the approximate boundaries between material types, and the transition may be gradual.

Very dense, brown, gravelly, coarse SAND to coarse SAND, trace of gravel; wet; SP.

– Gray, silty, fine to medium SAND lens at 20 feet; moist.

- Collected environmental sample: SW-MW1-11:25.

BOTTOM OF BORING
COMPLETED 10/6/2011

Depth, ft. | Symbol | PID, ppm | Samples | Ground Water | Depth, ft.

20.0 — 37.0

PID, ppm: 83

Samples: 8, 9 (E), 10, 11, 12, 13

Depth, ft.: 22, 24, 26, 28, 30, 32, 34, 36, 38

PENETRATION RESISTANCE (blows/foot)

▲ Hammer Wt. & Drop: 140 lbs / 30 inches

0 20 40 60

50/6" 50/6" 50/6" 50/6"

0 20 40 60

◇ % Fines (<0.075mm)
● % Water Content

LEGEND

* Sample Not Recovered
E Environmental Sample Obtained
3.25" O.D. Split Spoon Sample
Piezometer Screen and Sand Filter
Bentonite-Cement Grout
Bentonite Chips/Pellets
Bentonite Grout
Ground Water Level ATD

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF BORING MW-1

January 2012 21-1-16604-005

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-53
Sheet 2 of 2

Log: DJR Rev: DJR Typ: CLP

MASTER LOG E 21-16604.GPJ SHAN_WIL.GDT 3/6/13

Total Depth:	26.5 ft.	Northing:		Drilling Method:	Hollow Stem Auger	Hole Diam.:	8 in.
Top Elevation:	~ 178.6 ft.	Easting:		Drilling Company:	Cascade Drilling	Rod Diam.:	3"/2.5'
Vert. Datum:		Station:		Drill Rig Equipment:		Hammer Type:	
Horiz. Datum:		Offset:		Other Comments:			

SOIL DESCRIPTION

Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.

PENETRATION RESISTANCE (blows/foot)

▲ Hammer Wt. & Drop: 140 lbs / 30 inches

ASPHALT 0.4

Medium dense to dense, brown to gray, slightly silty, gravelly, fine to medium SAND to silty, gravelly, fine to medium SAND, trace of cobbles; moist; SP-SM/SM.

- Collected environmental sample: SW-MW2-11:5.

- Collected environmental sample: SW-MW2-11:10.

12.5

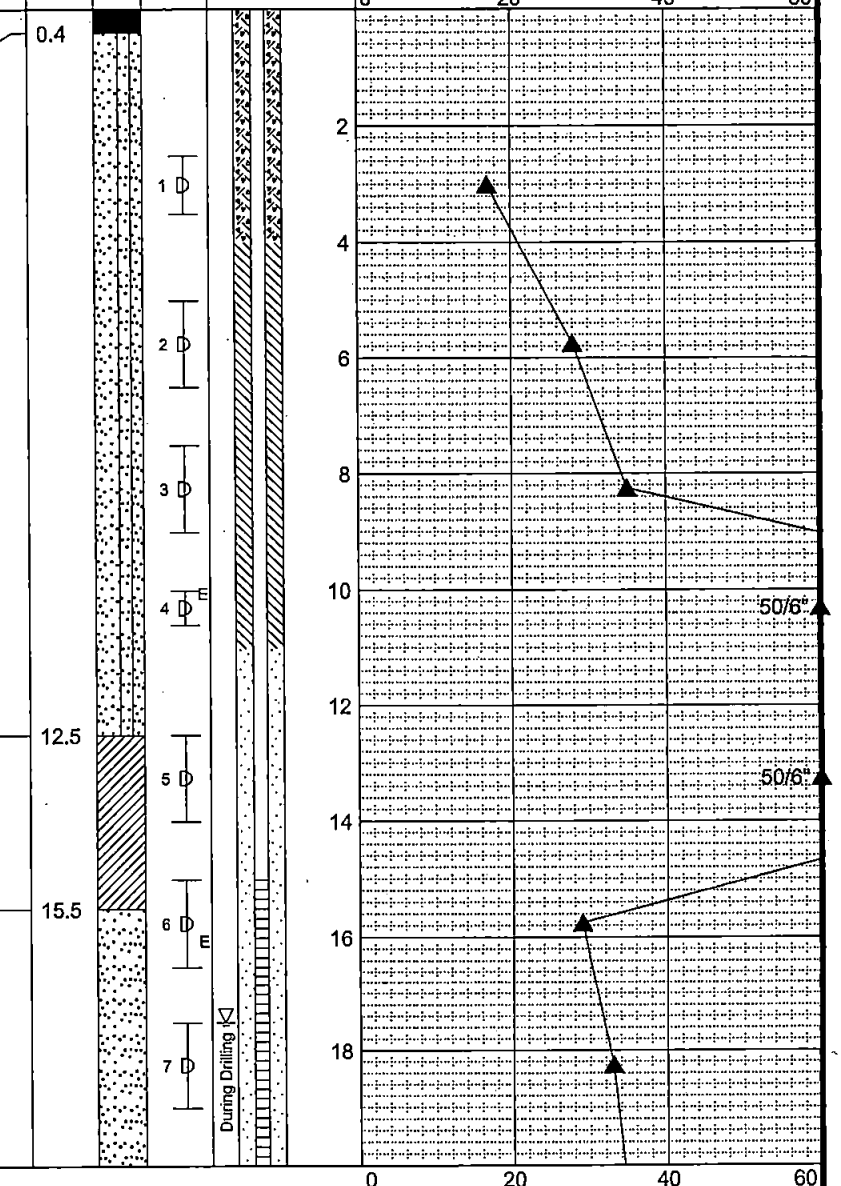
Very stiff, gray, slightly sandy CLAY (till), trace of cobbles; moist; CL.

15.5

Dense, gray, fine to medium SAND, trace of silt and gravel; moist to wet; SP.

- Collected environmental sample: SW-MW2-11:16.

CONTINUED NEXT SHEET



LEGEND

- * Sample Not Recovered
- E Environmental Sample Obtained
- 3.25" O.D. Split Spoon Sample
- Piezometer Screen and Sand Filter
- Bentonite-Cement Grout
- Bentonite Chips/Pellets
- Bentonite Grout
- Ground Water Level ATD
- ◇ % Fines (<0.075mm)
- ● % Water Content

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF BORING MW-2

January 2012 | 21-1-16604-005

SHANNON & WILSON, INC.
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FIG. A-54
Sheet 1 of 2

Log: DJR Rev: DJR Typ: CLP

MASTER LOG E 21-16604.GPJ SHAN WIL.GDT 3/6/13

Total Depth: 26.5 ft.	Northing:	Drilling Method: Hollow Stem Auger	Hole Diam.: 8 in.
Top Elevation: ~ 178.6 ft.	Easting:	Drilling Company: Cascade Drilling	Rod Diam.: 3"/2.5'
Vert. Datum:	Station:	Drill Rig Equipment:	Hammer Type:
Horiz. Datum:	Offset:	Other Comments:	

SOIL DESCRIPTION	Depth, ft.	Symbol	Samples	Ground Water	Depth, ft.
Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.					
- Collected environmental sample: SW-MW2-11:20.			E 8		22
Dense, gray to brown, medium to coarse SAND, trace of gravel; wet; SP.	22.5		9		24
- Collected environmental sample: SW-MW2-11:25.			10 E		26
BOTTOM OF BORING COMPLETED 10/6/2011	26.5				28
					30
					32
					34
					36
					38

PENETRATION RESISTANCE (blows/foot)
▲ Hammer Wt. & Drop: 140 lbs / 30 inches

0 20 40 60

0 20 40 60

◇ % Fines (<0.075mm)
● % Water Content

LEGEND

* Sample Not Recovered	Piezometer Screen and Sand Filter
E Environmental Sample Obtained	Bentonite-Cement Grout
3.25" O.D. Split Spoon Sample	Bentonite Chips/Pellets
	Bentonite Grout
	Ground Water Level ATD

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF BORING MW-2

January 2012 21-1-16604-005

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-54
Sheet 2 of 2

Log: DJR Rev: DJR Typ: CLP

MASTER_LOG_E 21-16604.GPJ SHAN_WIL.GDT 3/6/13

Total Depth: 35.5 ft.	Northing:	Drilling Method: Hollow Stem Auger	Hole Diam.: 8 in.
Top Elevation: ~ 177.1 ft.	Easting:	Drilling Company: Cascade Drilling	Rod Diam.: 3"/2.5 I.D.
Vert. Datum:	Station:	Drill Rig Equipment:	Hammer Type:
Horiz. Datum:	Offset:	Other Comments:	

SOIL DESCRIPTION

Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.

ASPHALT — 0.4

Medium dense to dense, brown, slightly silty to silty, fine to medium SAND, trace of gravel, interbedded with gray SAND starting at 5 feet; moist; iron-oxide staining throughout; SM.

- Collected environmental sample: SW-MW3-11:5.

Very stiff, gray, sandy CLAY (till), trace of gravel; moist; CL. — 10.0 to 11.5

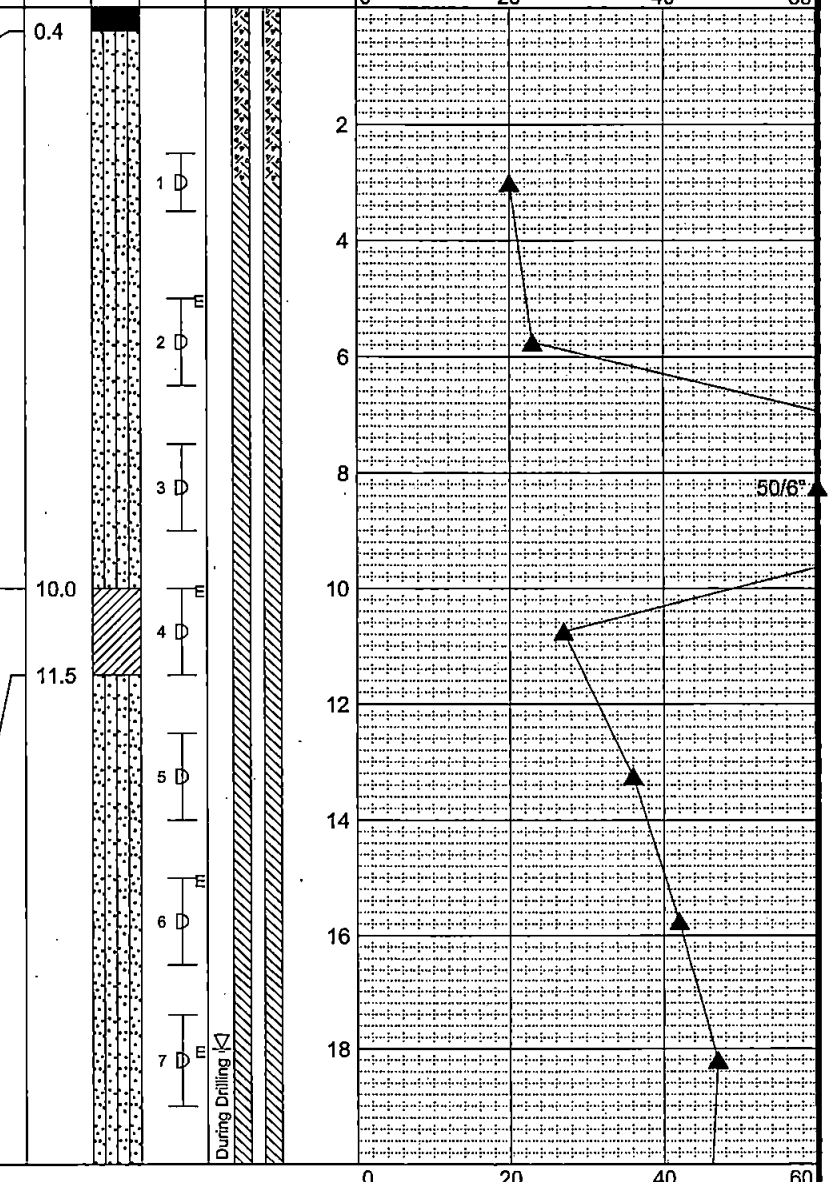
- Collected environmental sample: SW-MW3-11:10.

Dense, brown, silty, fine to medium SAND, trace of gravel to slightly silty, medium to coarse SAND, trace of cobbles; moist to wet, wet at 18 feet; SM.

- Collected environmental sample: SW-MW3-11:15.

- Collected environmental sample: SW-MW3-11:18.

CONTINUED NEXT SHEET



◇ % Fines (<0.075mm)
● % Water Content

LEGEND

* Sample Not Recovered
E Environmental Sample Obtained
3.25" O.D. Split Spoon Sample
Piezometer Screen and Sand Filter
Bentonite-Cement Grout
Bentonite Chips/Pellets
Bentonite Grout
Ground Water Level ATD

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF BORING MW-3

January 2012 — 21-1-16604-005

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-55
Sheet 1 of 2

Log: DJR Rev: DJR Typ: CLP

MASTER LOG E 21-16604.GPJ SHAN WIL.GDT 3/6/13

Total Depth:	35.5 ft.	Northing:		Drilling Method:	Hollow Stem Auger	Hole Diam.:	8 in.
Top Elevation:	~ 177.1 ft.	Easting:		Drilling Company:	Cascade Drilling	Rod Diam.:	3"/2.5 I.D.
Vert. Datum:		Station:		Drill Rig Equipment:		Hammer Type:	
Horiz. Datum:		Offset:		Other Comments:			

SOIL DESCRIPTION

Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.

Depth, ft. | Symbol | Samples | Ground Water | Depth, ft.

PENETRATION RESISTANCE (blows/foot)

▲ Hammer Wt. & Drop: 140 lbs / 30 inches

0 20 40 60

20.0

Dense, brown, silty, fine to medium SAND to sandy SILT, trace of gravel; moist to dry; SM/ML.

- Collected environmental sample: SW-MW3-11:20.

8 E

9

22

24

25.0

Dense, brown, fine to medium SAND; moist to wet, wet at 30 feet; SP.

- Collected environmental sample: SW-MW3-11:25.

10 E

26

63

28

- Collected environmental sample: SW-MW3-11:30.

11 E

30

32

34

35.0

BOTTOM OF BORING COMPLETED 10/7/2011

- Collected environmental sample: SW-MW3-11:35.

12 E

36

38

0 20 40 60

◇ % Fines (<0.075mm)

● % Water Content

LEGEND

* Sample Not Recovered	Piezometer Screen and Sand Filter
E Environmental Sample Obtained	Bentonite-Cement Grout
3.25" O.D. Split Spoon Sample	Bentonite Chips/Pellets
	Bentonite Grout
	Ground Water Level ATD

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF BORING MW-3

January 2012 21-1-16604-005

SHANNON & WILSON, INC.
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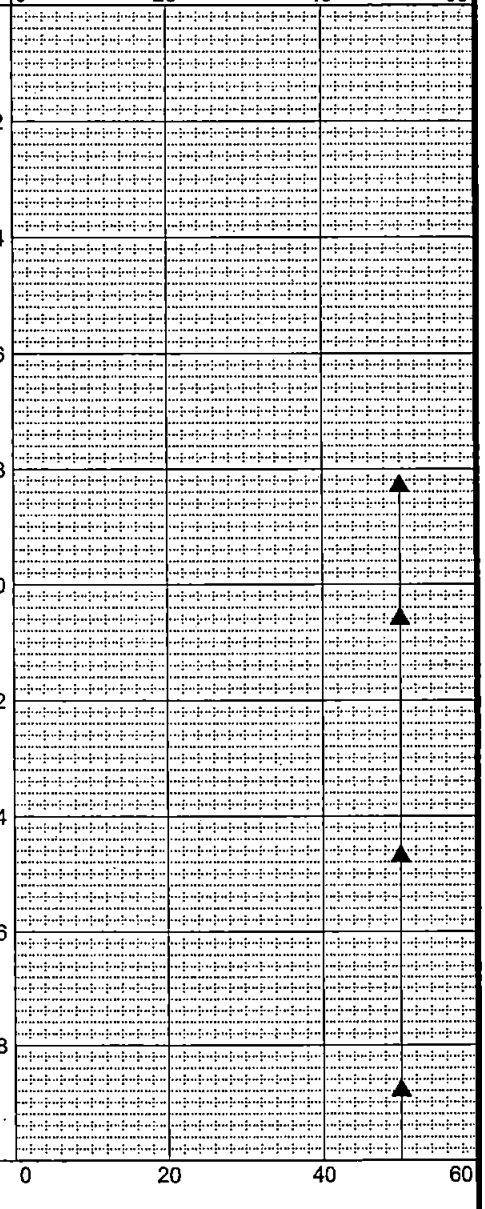
FIG. A-55
Sheet 2 of 2

MASTER LOG E 21-16604.GPJ SHAN WIL.GDT 3/6/13 Log: DJR Rev: DJR Typ: CLP

Total Depth:	22.9 ft.	Northing:		Drilling Method:	Hollow Stem Auger	Hole Diam.:	9 in.
Top Elevation:	~	Easting:		Drilling Company:	Cascade Drilling	Rod Diam.:	
Vert. Datum:		Station:		Drill Rig Equipment:	CME 75 Truck	Hammer Type:	Downhole
Horiz. Datum:		Offset:		Other Comments:			

SOIL DESCRIPTION	Depth, ft.	PID, ppm	Samples	Ground Water Depth, ft.
Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines represent the approximate boundaries between material types, and the transition may be gradual.				
ASPHALT	0.3			
Interbedded, gray, fine to medium, sandy SILT and silty, fine to medium SAND, trace of gravel; moist; ML/SM.		1250	1	
		1100	2 E	
Red-brown, slightly fine sandy SILT; dry; iron-oxide staining; ML.	14.3	16	5 E	
Interbedded, gray, slightly gravelly, slightly fine sandy SILT and silty, fine SAND;	18.4	130	3 E	
CONTINUED NEXT SHEET				

PENETRATION RESISTANCE (blows/foot)
▲ Hammer Wt. & Drop: 140 lbs / 30 inches



LEGEND

* Sample Not Recovered
E Environmental Sample Obtained
3" O.D. Split Spoon Sample
▽ Ground Water Level ATD

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF BORING B-4

March 2013 21-1-16609-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-56
Sheet 1 of 2

Log: EVP Rev: EVP Typ: LKN

MASTER_LOG_E 21-16609.GPJ SHAN WIL.GDT 3/7/13

Total Depth:	22.9 ft.	Northing:		Drilling Method:	Hollow Stem Auger	Hole Diam.:	9 in.
Top Elevation:	~	Easting:		Drilling Company:	Cascade Drilling	Rod Diam.:	
Vert. Datum:		Station:		Drill Rig Equipment:	CME 75 Truck	Hammer Type:	Downhole
Horiz. Datum:		Offset:		Other Comments:			

SOIL DESCRIPTION *Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines represent the approximate boundaries between material types, and the transition may be gradual.*	Depth, ft.	Symbol	PID, ppm	Samples	Ground Water	PENETRATION RESISTANCE (blows/foot) ▲ Hammer Wt. & Drop: 140 lbs / 30 inches
moist; wet at 22.5 feet; ML/SM. Blow counts are not accurate due to drilling inclination. A standard 50 blows was used to maximize sample recovery.	22.9		140	4	During Drilling ▽	0 20 40 60
BOTTOM OF BORING COMPLETED 11/1/2012						22 24 26 28 30 32 34 36 38

LEGEND

* Sample Not Recovered
E Environmental Sample Obtained
3" O.D. Split Spoon Sample
▽ Ground Water Level ATD

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF BORING B-4

March 2013 21-1-16609-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-56
Sheet 2 of 2

Log: EVP Rev: EVP Typ: LKN

MASTER LOG E 21-16609.GPJ SHAN_WIL.GDT 3/7/13

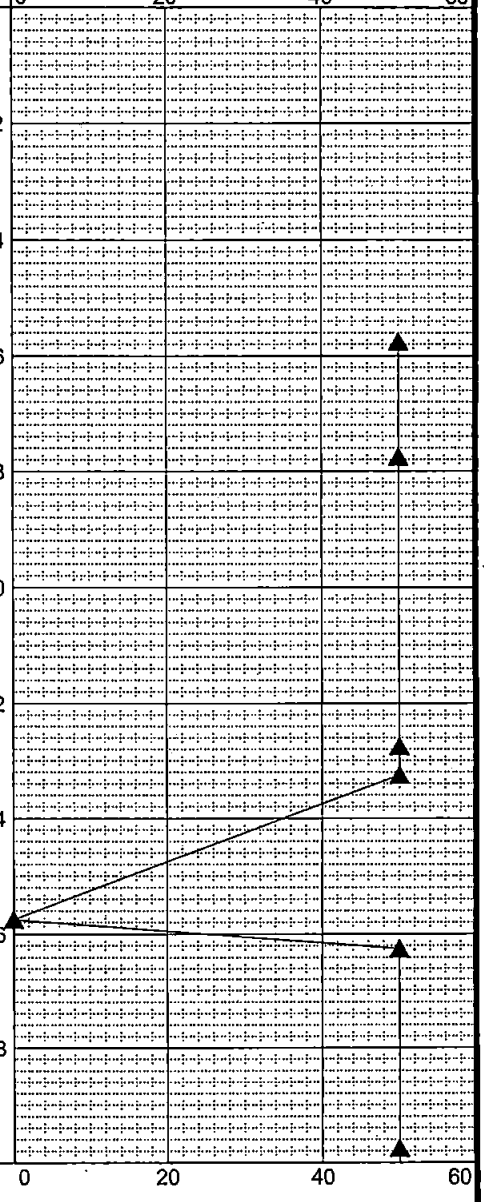
Total Depth: 39 ft.	Northing:	Drilling Method: Hollow Stem Auger	Hole Diam.: 9 in.
Top Elevation: ~	Easting:	Drilling Company: Cascade Drilling	Rod Diam.:
Vert. Datum:	Station:	Drill Rig Equipment: CME 75 Truck	Hammer Type: Downhole
Horiz. Datum:	Offset:	Other Comments:	

SOIL DESCRIPTION	Depth, ft.	PID, ppm	Samples
Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines represent the approximate boundaries between material types, and the transition may be gradual.			
ASPHALT	0.3		
Mottled brown and gray, slightly clayey, fine sandy SILT; moist; hydrocarbon odors; ML.		476 323	1 2 E
Interbedded, brown and gray, slightly clayey, fine sandy SILT and silty, fine SAND; moist; iron-oxide staining, hydrocarbon odors, thin fine sand stringers; ML/SM.	8.8	46 1990 0 310 181	5 E 3 4 6 E 7 E
CONTINUED NEXT SHEET			

Ground Water Depth, ft.

PENETRATION RESISTANCE (blows/foot)

▲ Hammer Wt. & Drop: 140 lbs / 30 inches



LEGEND

* Sample Not Recovered

E Environmental Sample Obtained

3" O.D. Split Spoon Sample

▽ Ground Water Level ATD

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF BORING B-5

March 2013 21-1-16609-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-57
Sheet 1 of 2

Log: EVP Rev: EVP Typ: LKN

MASTER LOG E 21-16609.GPJ SHAN WIL.GDT 3/6/13

Total Depth:	39 ft.	Northing:		Drilling Method:	Hollow Stem Auger	Hole Diam.:	9 in.
Top Elevation:	~	Easting:		Drilling Company:	Cascade Drilling	Rod Diam.:	
Vert. Datum:		Station:		Drill Rig Equipment:	CME 75 Truck	Hammer Type:	Downhole
Horiz. Datum:		Offset:		Other Comments:			

SOIL DESCRIPTION	Depth, ft.	Symbol	PID, ppm	Samples	Ground Water	Depth, ft.
Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines represent the approximate boundaries between material types, and the transition may be gradual.						
Brown, silty, fine to medium SAND; moist; wet at 26.5 feet; iron-oxide staining; SM.	21.2		14	8 E		22
Blow counts are not accurate due to drilling inclination. A standard 50 blows was used to maximize sample recovery.			0	9 E		24
BOTTOM OF BORING COMPLETED 11/12/2012	27.5				During Drilling ▽	26
						28
						30
						32
						34
						36
						38

PENETRATION RESISTANCE (blows/foot)
▲ Hammer Wt. & Drop: 140 lbs / 30 inches
0 20 40 60

LEGEND

* Sample Not Recovered
E Environmental Sample Obtained
3" O.D. Split Spoon Sample
▽ Ground Water Level ATD

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions..
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF BORING B-5

March 2013 21-1-16609-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-57
Sheet 2 of 2

Log: EVP Rev: EVP Typ: LKN
MASTER LOG E 21-16609.GPJ SHAN WIL.GDT 3/6/13

Total Depth:	60.5 ft.	Northing:		Drilling Method:	Hollow Stem Auger	Hole Diam.:	9 in.
Top Elevation:	~ 181.76 ft.	Easting:		Drilling Company:	Cascade Drilling	Rod Diam.:	AWJ 2-5/8-O.D.
Vert. Datum:		Station:		Drill Rig Equipment:	CME 75 Truck	Hammer Type:	Automatic
Horiz. Datum:		Offset:		Other Comments:			

SOIL DESCRIPTION

Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.

Depth, ft. | Symbol | Samples | Ground Water | Depth, ft.

PENETRATION RESISTANCE (blows/foot)

▲ Hammer Wt. & Drop: 140 lbs / 30 inches

0 20 40 60

ASPHALT

0.3

Medium dense to dense, brown, slightly gravelly, fine to medium sandy SILT to silty, fine to medium SAND; moist; ML/SM.

10.0

Medium dense, brown/gray, slightly clayey SILT; moist; thin fine sand partings, iron-oxide staining at 10.5 feet; ML.

15.0

Dense to very dense, gray, interbedded fine sandy SILT and silty, fine SAND; moist, wet in sand interbeds at 18 to 20 feet; ML/SM.

CONTINUED NEXT SHEET

2 4 6 8 10 12 14 16 18

0 20 40 60

LEGEND

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

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF BORING MW-6

March 2013 21-1-16609-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-58
Sheet 1 of 4

Log: EVP Rev: EVP Typ: CLP

MASTER LOG E 21-16609.GPJ SHAN WIL.GDT 3/6/13

Total Depth: 60.5 ft.	Northing:	Drilling Method: Hollow Stem Auger	Hole Diam.: 9 in.
Top Elevation: ~ 181.76 ft.	Easting:	Drilling Company: Cascade Drilling	Rod Diam.: AWJ 2-5/8-O.D.
Vert. Datum:	Station:	Drill Rig Equipment: CME 75 Truck	Hammer Type: Automatic
Horiz. Datum:	Offset:	Other Comments:	

SOIL DESCRIPTION

Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.

Depth, ft. | Symbol | Samples | Ground Water | Depth, ft.

PENETRATION RESISTANCE (blows/foot)

▲ Hammer Wt. & Drop: 140 lbs / 30 inches

0 20 40 60

Medium dense, gray, slightly silty, fine to medium SAND; moist to wet; thin silt seams; SP-SM.

23.0

Very dense, brown, interbedded slightly gravelly, fine to medium sandy SILT and silty, fine to medium SAND; dry to moist; iron-oxide staining at 30.0 feet; ML/SM.

28.5

30.0

Medium dense to very dense, brown, gravelly, fine to coarse SAND, trace of silt; wet; iron-oxide staining at 38.5 feet; SP.

CONTINUED NEXT SHEET

7 8 9 10 11 12 13 14

11/14/2012

22 24 26 28 30 32 34 36 38

67 50/6" 50/6"

0 20 40 60

LEGEND

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

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF BORING MW-6

March 2013 21-1-16609-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-58
Sheet 2 of 4

Log: EVP Rev: EVP Typ: CLP

MASTER LOG E 21-16609.GPJ SHAN WIL.GDT 3/6/13

Total Depth: 60.5 ft.	Northing:	Drilling Method: Hollow Stem Auger	Hole Diam.: 9 in.
Top Elevation: ~ 181.76 ft.	Easting:	Drilling Company: Cascade Drilling	Rod Diam.: AWJ 2-5/8-O.D.
Vert. Datum:	Station:	Drill Rig Equipment: CME 75 Truck	Hammer Type: Automatic
Horiz. Datum:	Offset:	Other Comments:	

SOIL DESCRIPTION

Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.

Depth, ft. | Symbol | Samples | Ground Water | Depth, ft.

PENETRATION RESISTANCE (blows/foot)

▲ Hammer Wt. & Drop: 140 lbs / 30 inches

0 20 40 60

40.0

Very dense, brown, slightly fine to medium sandy, gravelly SILT; moist; fine sand seams; iron-oxide staining at 40 feet; ML.

50.0

Very dense, brown, slightly silty, gravelly, fine to medium SAND; wet; iron-oxide staining at 53.0 feet; gravelly at 57 to 58 feet; SP-SM.

CONTINUED NEXT SHEET

Depth, ft.	Sample	Penetration Resistance (blows/foot)
42	15	50/6"
44	16	50/6"
46	17	50/5"
48	18	50/6"
50	19	50/6"
52	20	50/6"
54	21	71
56	22	50/6"
58		

0 20 40 60

LEGEND

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

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF BORING MW-6

March 2013 21-1-16609-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-58
Sheet 3 of 4

MASTER LOG E 21-16609.GPJ SHAN WIL.GDT 3/6/13 Log: EVP Rev: EVP Typ: CLP

Total Depth: 60.5 ft.	Northing:	Drilling Method: Hollow Stem Auger	Hole Diam.: 9 in.
Top Elevation: ~ 181.76 ft.	Easting:	Drilling Company: Cascade Drilling	Rod Diam.: AWJ 2-5/8-O.D.
Vert. Datum:	Station:	Drill Rig Equipment: CME 75 Truck	Hammer Type: Automatic
Horiz. Datum:	Offset:	Other Comments:	

SOIL DESCRIPTION	Depth, ft.	Symbol	Samples	Ground Water	Depth, ft.	PENETRATION RESISTANCE (blows/foot) ▲ Hammer Wt. & Drop: 140 lbs / 30 inches
Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.						0 20 40 60
	60.5		23			50/6" ▲
BOTTOM OF BORING COMPLETED 11/7/2012					62	
					64	
					66	
					68	
					70	
					72	
					74	
					76	
					78	
						0 20 40 60

LEGEND

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

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF BORING MW-6

March 2013 21-1-16609-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-58
Sheet 4 of 4

Log: EVP Rev: EVP Typ: CLP

MASTER_LOG_E 21-16609.GPJ SHAN_WIL.GDT 3/6/13

Total Depth: 28 ft.	Northing:	Drilling Method: Hollow Stem Auger	Hole Diam.: 9 in.
Top Elevation: ~ 182.18 ft.	Easting:	Drilling Company: Cascade Drilling	Rod Diam.:
Vert. Datum:	Station:	Drill Rig Equipment: CME 75 Truck	Hammer Type:
Horiz. Datum:	Offset:	Other Comments:	

SOIL DESCRIPTION	Depth, ft.	Symbol	Samples	Ground Water	Depth, ft.
Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.					
- See log of boring MW-6, located 6 feet north, for soil descriptions.				11/14/2012	0 20 40 60 2 4 6 8 10 12 14 16 18

CONTINUED NEXT SHEET

LEGEND

* Sample Not Recovered

- Piezometer Screen and Sand Filter
- Bentonite-Cement Grout
- Bentonite Chips/Pellets
- Bentonite Grout
- Ground Water Level in Well

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF BORING MW-7

March 2013 21-1-16609-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-59
Sheet 1 of 2

Log: EVP Rev: EVP Typ: CLP

MASTER LOG E 21-16609.GPJ SHAN WIL.GDT 3/6/13

Total Depth: 28 ft.	Northing:	Drilling Method: Hollow Stem Auger	Hole Diam.: 9 in.
Top Elevation: ~ 182.18 ft.	Easting:	Drilling Company: Cascade Drilling	Rod Diam.:
Vert. Datum:	Station:	Drill Rig Equipment: CME 75 Truck	Hammer Type:
Horiz. Datum:	Offset:	Other Comments:	

SOIL DESCRIPTION	Depth, ft.	Symbol	Samples	Ground Water	Depth, ft.
Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.					0 20 40 60
BOTTOM OF BORING COMPLETED 11/7/2012	27.9 28.0				22 24 26 28 30 32 34 36 38

LEGEND

* Sample Not Recovered

- Piezometer Screen and Sand Filter
- Bentonite-Cement Grout
- Bentonite Chips/Pellets
- Bentonite Grout
- Ground Water Level in Well

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF BORING MW-7

March 2013 21-1-16609-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-59
Sheet 2 of 2

Log: EVP Rev: EVP Typ: CLP

MASTER LOG E 21-16609.GPJ SHAN WIL.GDT 3/6/13

Total Depth:	30.5 ft.	Northing:		Drilling Method:	Hollow Stem Auger	Hole Diam.:	9 in.
Top Elevation:	~	Easting:		Drilling Company:	Cascade Drilling	Rod Diam.:	
Vert. Datum:		Station:		Drill Rig Equipment:	CME 75 Truck	Hammer Type:	
Horiz. Datum:		Offset:		Other Comments:			

SOIL DESCRIPTION

Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines represent the approximate boundaries between material types, and the transition may be gradual.

Depth, ft. | Symbol | PID, ppm | Samples | Ground Water | Depth, ft.

PENETRATION RESISTANCE (blows/foot)

▲ Hammer Wt. & Drop: *140 lbs / 30 inches*

0 20 40 60

ASPHALT 0.3

Medium dense to dense, brown and gray, slightly gravelly, fine sandy SILT to slightly gravelly, silty, fine SAND; dry; iron-oxide staining; ML/SM.

PID: 0 | Sample 1

PID: 0 0 | Sample 2

10.0

Medium dense, gray, slightly gravelly, clayey SILT to silty CLAY; moist; thin, fine sand stringers, iron-oxide staining at 10.0 to 11.0 feet; ML/CL.

PID: 0 | Sample 3

PID: 0 | Sample 4

13.5

Dense to very dense, slightly clayey, fine sandy SILT and silty, fine SAND; moist, sandy and wet at 15.5 feet; ML/SM.

PID: 0 | Sample 5

PID: 0.5 | Sample 6

50/6"

CONTINUED NEXT SHEET

0 20 40 60

LEGEND

* Sample Not Recovered

E Environmental Sample Obtained

3.25" O.D. Split Spoon Sample

Grab Sample

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF BORING B-8

March 2013 21-1-16609-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-60
Sheet 1 of 2

Log: EVP Rev: EVP Typ: CLP

MASTER LOG E 21-16609.GPJ SHAN WIL.GDT 3/6/13

Total Depth:	30.5 ft.	Northing:		Drilling Method:	Hollow Stem Auger	Hole Diam.:	9 in.
Top Elevation:	~	Easting:		Drilling Company:	Cascade Drilling	Rod Diam.:	
Vert. Datum:		Station:		Drill Rig Equipment:	CME 75 Truck	Hammer Type:	
Horiz. Datum:		Offset:		Other Comments:			

SOIL DESCRIPTION	Depth, ft.	Symbol	PID, ppm	Samples	Ground Water	Depth, ft.	PENETRATION RESISTANCE (blows/foot)
Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines represent the approximate boundaries between material types, and the transition may be gradual.							▲ Hammer Wt. & Drop: 140 lbs / 30 inches
			0	7 E			71
	22.0					22	
Very dense, gray, clayey SILT to silty CLAY and trace of gravel; moist; thin sand stringers; ML/CL.	23.0		0	8			50/6"
Very dense, gray, slightly silty, fine to medium SAND; dry to moist; iron-oxide staining at 30.0 feet; clayey silt seams at 25.7 feet; SP-SM.			0	9 E		24	50/6"
						26	
			0	10		28	50/4"
						30	
	30.5		0	11 E			50/6"
BOTTOM OF BORING COMPLETED 11/8/2012						32	
						34	
						36	
						38	

0 20 40 60

LEGEND

* Sample Not Recovered
E Environmental Sample Obtained
3.25" O.D. Split Spoon Sample
Grab Sample

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF BORING B-8

March 2013 21-1-16609-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-60
Sheet 2 of 2

Log: EVP Rev: EVP Typ: CLP

MASTER LOG E 21-16609.GPJ SHAN_WIL.GDT 3/6/13

Total Depth:	57 ft.	Northing:		Drilling Method:	Hollow Stem Auger	Hole Diam.:	9 in.
Top Elevation:	~ 179.54 ft.	Easting:		Drilling Company:	Cascade Drilling	Rod Diam.:	NWJ
Vert. Datum:		Station:		Drill Rig Equipment:	CME 75 Truck	Hammer Type:	Automatic
Horiz. Datum:		Offset:		Other Comments:	Downhole 300# hammer used below 40 ft. 15-in. borehole to 34		

SOIL DESCRIPTION

Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines represent the approximate boundaries between material types, and the transition may be gradual.

Depth, ft. | Symbol | PID, ppm | Samples | Ground Water | Depth, ft.

PENETRATION RESISTANCE (blows/foot)

▲ Hammer Wt. & Drop: 140 lbs / 30 inches

▼ Hammer Wt. & Drop: 300 lbs / 30 inches

0 | 20 | 40 | 60

Depth, ft.	Soil Description	PID, ppm	Samples
0.3	ASPHALT.		
	Brown, silty, sandy, fine GRAVEL; moist; subangular; GM.		
3.0	Medium dense to dense, mottled gray and brown, slightly gravelly to gravelly, silty, fine and fine to medium SAND, trace of clay; moist; iron oxide-stained; SM.	0	1
		0	2
	- Moist to wet from approximately 12 to 13.5 feet.	0	3
	- Scattered layers of sandy silt, trace of clay, from 13.5 to 14.5 feet, with heavier oxidation.	0	4
		0	5
18.7	Dense, brown-gray, slightly silty to silty, fine to medium SAND; moist; iron	0	6

CONTINUED NEXT SHEET

Ground Water Depth, ft.: 2, 4, 6, 8, 10, 12, 14, 16, 18

0 | 20 | 40 | 60

LEGEND

* Sample Not Recovered	Piezometer Screen and Sand Filter
E Environmental Sample Obtained	Bentonite-Cement Grout
Grab Sample	Bentonite Chips/Pellets
2.0" O.D. Split Spoon Sample	Bentonite Grout
3.25" O.D. Split Spoon Sample	Ground Water Level ATD
	Ground Water Level in Well

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF BORING MW-10

March 2013 | 21-1-16609-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-61
Sheet 1 of 3

REV 0

Log: PVH Rev: PVH Typ: LKN

MASTER_LOG_E_21-16609.GPJ SHAN_WIL.GDT 3/6/13

Total Depth:	57 ft.	Northing:		Drilling Method:	Hollow Stem Auger	Hole Diam.:	9 in.
Top Elevation:	~ 179.54 ft.	Easting:		Drilling Company:	Cascade Drilling	Rod Diam.:	NWJ
Vert. Datum:		Station:		Drill Rig Equipment:	CME 75 Truck	Hammer Type:	Automatic
Horiz. Datum:		Offset:		Other Comments:	Downhole 300# hammer used below 40 ft. 15-in. borehole to 34 ft.		

SOIL DESCRIPTION

Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines represent the approximate boundaries between material types, and the transition may be gradual.

oxide-stained; SP-SM/SM.

21.3

Medium dense to dense, gray and brown-gray, trace to slightly gravelly, silty, fine SAND and trace of silt to silty, fine to medium SAND; wet; no heave; SM/SP-SM/SP.

- Iron oxide-stained and with sandy silt seams from 22.8 to 23.1 feet.

27.8

Dense to very dense, gray, gravelly, silty, fine SAND to slightly silty to silty, fine to medium SAND; wet; scattered fine sandy silt seams; SM/SP-SM.

30.8

Dense to very dense, gray-brown, gravelly, silty, fine SAND; moist; iron oxide-stained, diamict;SM.

-After driving S-12, removed 9-inch O.D. auger and drilled to 34 feet with 15-inch O.D. auger. Placed bentonite seal at 32 to 34 feet. Advanced from 34 feet using 9-inch O.D. auger.

34.5

Very dense, gray-brown, silty, gravelly, fine to medium SAND to slightly silty to silty, sandy GRAVEL; moist; iron oxide-stained, possible diamict; GM/SM.

CONTINUED NEXT SHEET

Depth, ft.	PID, ppm	Samples
	0	7
	0	8
	0.1	9
	0	10
	0.1	11
	0	12
	0	13
	0	14

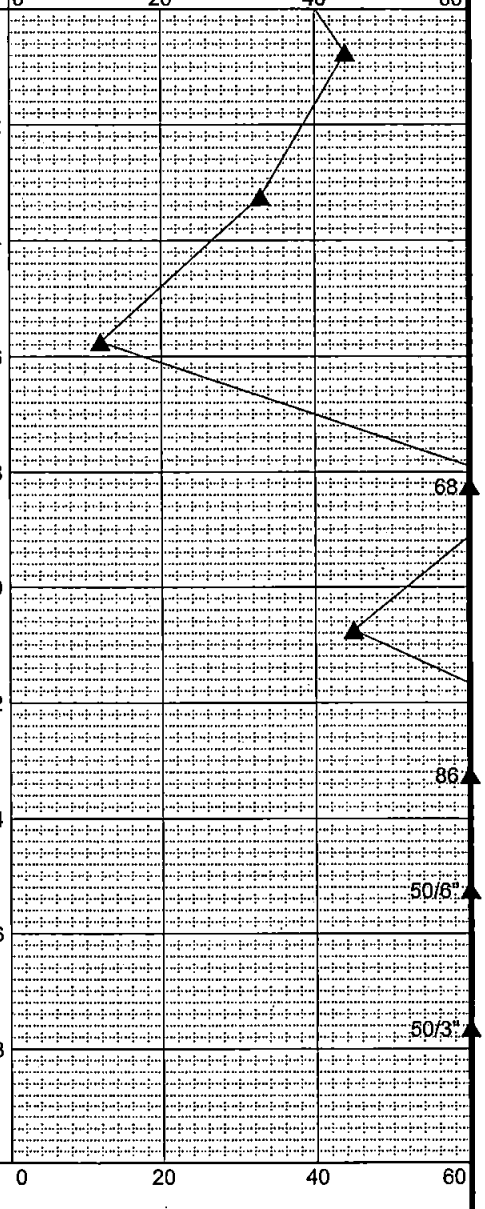
Ground Water: During Drilling ▽

11/7/2012

PENETRATION RESISTANCE (blows/foot)

▲ Hammer Wt. & Drop: 140 lbs / 30 inches

▼ Hammer Wt. & Drop: 300 lbs / 30 inches



LEGEND

* Sample Not Recovered	Piezometer Screen and Sand Filter
E Environmental Sample Obtained	Bentonite-Cement Grout
Grab Sample	Bentonite Chips/Pellets
2.0" O.D. Split Spoon Sample	Bentonite Grout
3.25" O.D. Split Spoon Sample	Ground Water Level ATD
	Ground Water Level in Well

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF BORING MW-10

March 2013 | 21-1-16609-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-61
Sheet 2 of 3

REV 0

Log: PVH Rev: PVH Typ: LKN

MASTER LOG E 21-16609.GPJ SHAN WIL.GDT 3/6/13

Total Depth:	57 ft.	Northing:		Drilling Method:	Hollow Stem Auger	Hole Diam.:	9 in.
Top Elevation:	~ 179.54 ft.	Easting:		Drilling Company:	Cascade Drilling	Rod Diam.:	NWJ
Vert. Datum:		Station:		Drill Rig Equipment:	CME 75 Truck	Hammer Type:	Automatic
Horiz. Datum:		Offset:		Other Comments:	Downhole 300# hammer used below 40 ft. 15-in. borehole to 34		

SOIL DESCRIPTION

Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines represent the approximate boundaries between material types, and the transition may be gradual.

Depth, ft. | Symbol | PID, ppm | Samples | Ground Water | Depth, ft.

PENETRATION RESISTANCE (blows/foot)

▲ Hammer Wt. & Drop: 140 lbs / 30 inches

▼ Hammer Wt. & Drop: 300 lbs / 30 inches

0 20 40 60

- After no recovery of S-15 at 40 feet with SPT, redrove using 3.25-inch O.D. sampler and 300# downhole hammer; retrieved sample was mostly sluf. Used this sampler/hammer combination for remainder of boring.

41.0

Very dense, gray-brown, silty, gravelly, fine and fine to medium SAND to gravelly, silty, fine and fine to medium SAND; moist; scattered iron oxide staining, diamict to weak diamict; SM.

47.0

Very dense, brown-gray, silty, fine to medium SAND, trace of gravel, and slightly silty, slightly gravelly to gravelly, fine to medium SAND; moist to wet; trace iron oxide staining; SP-SM/SM.

- Trace of silt below 55.4 feet.

57.0

BOTTOM OF BORING
COMPLETED 11/5/2012

Depth, ft.	PID, ppm	Sample	Penetration Resistance (blows/foot)
41.0	0	15 E	50/3"
	0	16 E	50/6"
	0	17 E	50/6"
47.0	0	18 E	50/6"
	0	19 E	50/5"
	0	20 E	50/6"
	0	21 E	50/5"

42 44 46 48 50 52 54 56 58

0 20 40 60

LEGEND

- * Sample Not Recovered
- E Environmental Sample Obtained
- Grab Sample
- 2.0" O.D. Split Spoon Sample
- 3.25" 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

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF BORING MW-10

March 2013 21-1-16609-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-61
Sheet 3 of 3

REV 0

Log: PVH Rev: PVH Typ: LKW

MASTER LOG E 21-16609.GPJ SHAN WIL.GDT 3/6/13

Total Depth:	27.29 ft.	Northing:		Drilling Method:	Hollow Stem Auger	Hole Diam.:	9 in.
Top Elevation:	~ 179.94 ft.	Easting:		Drilling Company:	Cascade Drilling	Rod Diam.:	
Vert. Datum:		Station:		Drill Rig Equipment:	CME 75 Truck	Hammer Type:	
Horiz. Datum:		Offset:		Other Comments:			

SOIL DESCRIPTION

Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.

Depth, ft. | Symbol | Samples | Ground Water | Depth, ft.

0 20 40 60

- See log of boring MW-10, located 5.5 feet east, for soil descriptions.

2 4 6 8 10 12 14 16 18

CONTINUED NEXT SHEET

0 20 40 60

LEGEND

* Sample Not Recovered

- Piezometer Screen and Sand Filter
- Bentonite-Cement Grout
- Bentonite Chips/Pellets
- Bentonite Grout
- Ground Water Level in Well

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF BORING MW-11

March 2013 | 21-1-16609-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-62
Sheet 1 of 2

REV 0

Log: PVH Rev: PVH Typ: PVH

MASTER LOG E 21-16609.GPJ SHAN WIL.GDT 3/6/13

Total Depth:	27.29 ft.	Northing:		Drilling Method:	Hollow Stem Auger	Hole Diam.:	9 in.
Top Elevation:	~ 179.94 ft.	Easting:		Drilling Company:	Cascade Drilling	Rod Diam.:	
Vert. Datum:		Station:		Drill Rig Equipment:	CME 75 Truck	Hammer Type:	
Horiz. Datum:		Offset:		Other Comments:			

SOIL DESCRIPTION	Depth, ft.	Symbol	Samples	Ground Water	Depth, ft.
Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.					0 20 40 60
				11/7/2012 ▼	22 24 26
BOTTOM OF BORING COMPLETED 11/6/2012	27.3				28 30 32 34 36 38
					0 20 40 60

LEGEND

* Sample Not Recovered

- Piezometer Screen and Sand Filter
- Bentonite-Cement Grout
- Bentonite Chips/Pellets
- Bentonite Grout
- ▼ Ground Water Level in Well

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF BORING MW-11

March 2013 | 21-1-16609-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-62
Sheet 2 of 2

REV 0

MASTER LOG E 21-16609.GPJ SHAN WIL.GDT 3/6/13 Log: PVH Rev: PVH Typ: PVH

Total Depth:	53 ft.	Northing:		Drilling Method:	Hollow Stem Auger	Hole Diam.:	9 in.
Top Elevation:	~ 178.91 ft.	Easting:		Drilling Company:	Cascade Drilling	Rod Diam.:	
Vert. Datum:		Station:		Drill Rig Equipment:	CME 75 Truck	Hammer Type:	
Horiz. Datum:		Offset:		Other Comments:			

SOIL DESCRIPTION	Depth, ft.	Symbol	PID, ppm	Samples	Ground Water	Depth, ft.	PENETRATION RESISTANCE (blows/foot)
Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines represent the approximate boundaries between material types, and the transition may be gradual.							▲ Hammer Wt. & Drop: *140 lbs / 30 inches*
							0 20 40 60
ASPHALT	0.3						
Gray and dark brown, gravelly SILT to silty GRAVEL; dry; locally sandy; dark staining at 1.5 feet; wood at 1.5 feet; ML/GM.	2.0					2	
Motled brown and gray, slightly gravelly, slightly clayey SILT; dry; iron-oxide staining from 4 to 5 feet; ML.						4	
						6	
						8	
						10	
Medium dense to dense, gray and brown, slightly gravelly, slightly fine to medium sandy SILT; moist; thin, fine to medium sand stringers; wet at 17 to 17.5 feet; ML.	12.0		0	1		12	
			0	2 E		14	
						16	
Dense, interbedded fine to medium sandy SILT and silty, fine to medium SAND; moist; iron-oxide staining at 20.0 to 20.5	18.0		0	3		18	
CONTINUED NEXT SHEET							0 20 40 60

LEGEND

- • Sample Not Recovered
- E Environmental Sample Obtained
- 3.25" O.D. Split Spoon Sample
- Grab Sample
- Piezometer Screen and Sand Filter
- Bentonite-Cement Grout
- Bentonite Chips/Pellets
- Bentonite Grout
- Ground Water Level in Well

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF BORING MW-12

March 2013 | 21-1-16609-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-63
Sheet 1 of 3

Log: EVP Rev: EVP Typ: CLP

MASTER LOG E 21-16609.GPJ SHAN WIL.GDT 3/6/13

Total Depth: 53 ft.	Northing:	Drilling Method: Hollow Stem Auger	Hole Diam.: 9 in.
Top Elevation: ~ 178.91 ft.	Easting:	Drilling Company: Cascade Drilling	Rod Diam.:
Vert. Datum:	Station:	Drill Rig Equipment: CME 75 Truck	Hammer Type:
Horiz. Datum:	Offset:	Other Comments:	

SOIL DESCRIPTION

Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines represent the approximate boundaries between material types, and the transition may be gradual.

feet; ML/SM.

25.0

Dense to very dense, brown, slightly silty, fine to medium SAND; moist; iron-oxide staining at 26 and 28 feet; thin, light gray clayey silt seams at 25.5 and 26.0 feet; SP-SM.

37.0

Very dense, brown, slightly gravelly, fine to coarse SAND, trace of silt; wet; SP.

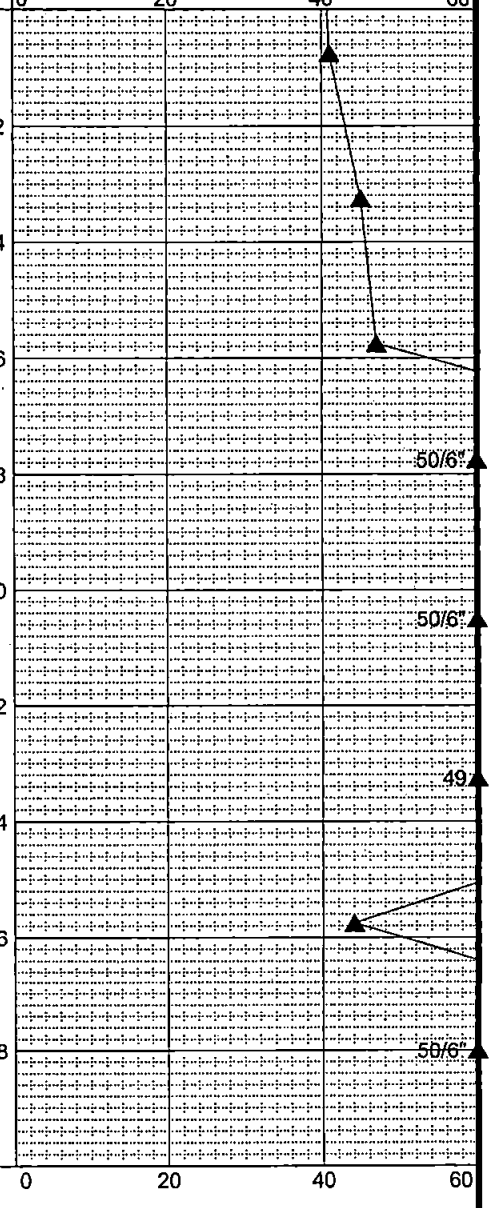
CONTINUED NEXT SHEET

Depth, ft. | Symbol | PID, ppm | Samples | Ground Water | Depth, ft.

Sample	PID, ppm	Depth, ft.
4 E	0	22
5	0.5	24
6 E	0.2	26
7	0.3	28
8 E	0.2	30
9	0.2	32
10 E	0.2	36
11	0.3	38

PENETRATION RESISTANCE (blows/foot)

▲ Hammer Wt. & Drop: 140 lbs / 30 inches



LEGEND

- * Sample Not Recovered
- E Environmental Sample Obtained
- 3.25" O.D. Split Spoon Sample
- Grab Sample
- Piezometer Screen and Sand Filter
- Bentonite-Cement Grout
- Bentonite Chips/Pellets
- Bentonite Grout
- Ground Water Level in Well

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF BORING MW-12

March 2013 | 21-1-16609-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-63
Sheet 2 of 3

MASTER_LOG E 21-16609.GPJ SHAN_WIL.GDT 3/6/13 Log: EVP Rev: EVP Typ: CLP

Total Depth: 53 ft.	Northing:	Drilling Method: Hollow Stem Auger	Hole Diam.: 9 in.
Top Elevation: ~ 178.91 ft.	Easting:	Drilling Company: Cascade Drilling	Rod Diam.:
Vert. Datum:	Station:	Drill Rig Equipment: CME 75 Truck	Hammer Type:
Horiz. Datum:	Offset:	Other Comments:	

SOIL DESCRIPTION	Depth, ft.	Symbol	PID, ppm	Samples	Ground Water	Depth, ft.
Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines represent the approximate boundaries between material types, and the transition may be gradual.						
			0.2	12	11/14/2012	42
			0	13		44
Dense to very dense, brown, interbedded fine to medium sandy, gravelly SILT and silty, gravelly, fine to medium SAND; moist; iron-oxide staining at 50.0 feet; ML/SM.	45.0		0	14		46
			0	15		48
			0	16		50
Very dense, brown, slightly gravelly, slightly fine to medium sandy SILT; moist; iron-oxide staining at 53.0 feet; thin, fine sand seams; ML.	52.0		0	17		52
	53.0					54
BOTTOM OF BORING COMPLETED 11/9/2012						56
						58

PENETRATION RESISTANCE (blows/foot)

▲ Hammer Wt. & Drop: *140 lbs / 30 inches*

0 20 40 60

60

50/6"

0 20 40 60

LEGEND

- * Sample Not Recovered
- E Environmental Sample Obtained
- 3.25" O.D. Split Spoon Sample
- Grab Sample
- Piezometer Screen and Sand Filter
- Bentonite-Cement Grout
- Bentonite Chips/Pellets
- Bentonite Grout
- Ground Water Level in Well

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF BORING MW-12

March 2013 21-1-16609-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

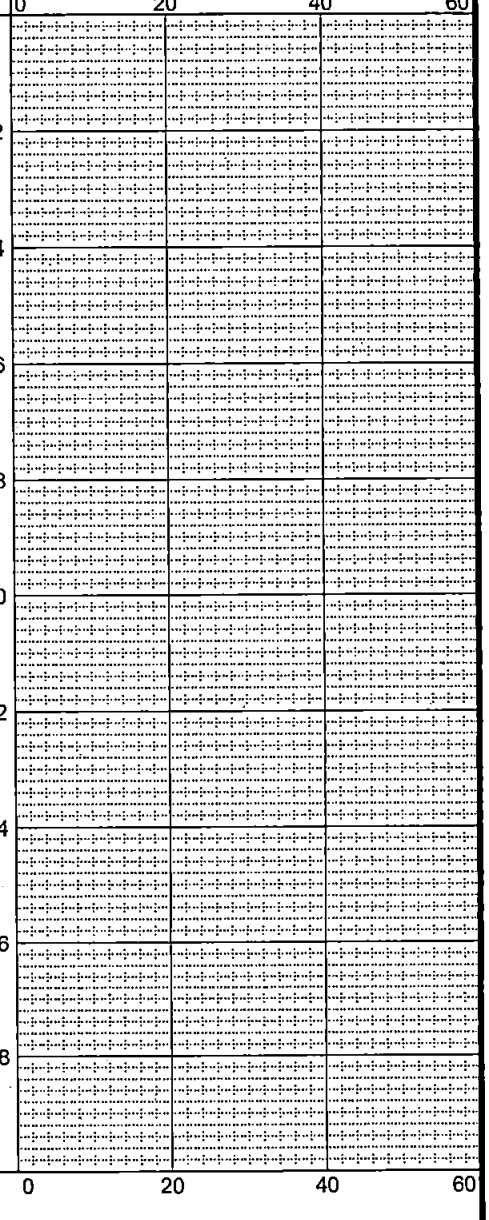
FIG. A-63
Sheet 3 of 3

Log: EVP Rev: EVP Typ: CLP

MASTER LOG E 21-16609.GPJ SHAN WIL.GDT 3/6/13

Total Depth:	30 ft.	Northing:		Drilling Method:	Hollow Stem Auger	Hole Diam.:	9 in.
Top Elevation:	~ 178.45 ft.	Easting:		Drilling Company:	Cascade Drilling	Rod Diam.:	
Vert. Datum:		Station:		Drill Rig Equipment:	CME 75 Truck	Hammer Type:	
Horiz. Datum:		Offset:		Other Comments:			

SOIL DESCRIPTION	Depth, ft.	Symbol	Samples	Ground Water	Depth, ft.
Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.					
- See log of boring MW-12, located 5.7 feet north, for soil descriptions.					



CONTINUED NEXT SHEET

LEGEND

* Sample Not Recovered

- Piezometer Screen and Sand Filter
- Bentonite-Cement Grout
- Bentonite Chips/Pellets
- Bentonite Grout
- Ground Water Level in Well

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF BORING MW-13

March 2013 | 21-1-16609-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-64
Sheet 1 of 2

Log: EVP Rev: EVP Typ: CLP

MASTER_LOG_E_21-16609.GPJ SHAN_WIL.GDT 3/6/13

Total Depth:	30 ft.	Northing:		Drilling Method:	Hollow Stem Auger	Hole Diam.:	9 in.
Top Elevation:	~ 178.45 ft.	Easting:		Drilling Company:	Cascade Drilling	Rod Diam.:	
Vert. Datum:		Station:		Drill Rig Equipment:	CME 75 Truck	Hammer Type:	
Horiz. Datum:		Offset:		Other Comments:			

SOIL DESCRIPTION	Depth, ft.	Symbol	Samples	Ground Water	Depth, ft.
Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.					0 20 40 60
					22
					24
					26
					28
					30
BOTTOM OF BORING COMPLETED 11/9/2012	29.9				32
					34
					36
					38
					0 20 40 60

Log: EVP Rev: EVP Typ: CLP

LEGEND

* Sample Not Recovered

- Piezometer Screen and Sand Filter
- Bentonite-Cement Grout
- Bentonite Chips/Pellets
- Bentonite Grout
- Ground Water Level in Well

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

1000 NE 45th St Site
1000 NE 45th St
Seattle, Washington

LOG OF BORING MW-13

March 2013 21-1-16609-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-64
Sheet 2 of 2

MASTER LOG E 21-16609.GPJ SHAN WIL.GDT 3/6/13

APPENDIX B

SAMPLING AND ANALYSIS PLAN

TABLE OF CONTENTS

APPENDIX B
SAMPLING AND ANALYSIS PLAN FOR 1000 NE 45TH STREET SITE SEATTLE, WASHINGTON

1.0 INTRODUCTION

This Sampling and Analysis Plan (SAP) has been prepared to describe Remedial Investigation soil and groundwater sampling activities for the property at 1000 NE 45th Street Seattle, Washington. The SAP serves as a guide for field activities, including geoprobe explorations, field testing, soil, groundwater, and air sampling, and the handling of investigation-derived waste (IDW). It also incorporates field and laboratory quality assurance/quality control requirements. This SAP describes the procedures that will be followed in conducting field sampling. The overall objective of this investigation is to collect sufficient data of known and acceptable quality to:

- Evaluate the nature and extent of Chemicals of Potential Concern (COPC) identified on the site.
- Collect data necessary to select a preferred remedial alternative.
- Evaluate water-bearing zones.
- Evaluate groundwater flow direction.
- Evaluate indoor air quality.

To perform this assessment, samples of soil, groundwater, and air will be collected from the Project area. Each soil, groundwater, and indoor air sample will be analyzed for the COPC identified based on the findings of the Phase II Environmental Site Assessment. The COPCs are:

West Side of the Site

- Petroleum hydrocarbons (primarily gasoline, but also diesel- and oil-range hydrocarbons)
- Aromatic hydrocarbons (benzene, toluene, ethylbenzene, and xylenes [BTEX])
- Halogenated volatile organic compounds (HVOCs) beneath the building

East Side of Site

- HVOCs (tetrachloroethene [PCE], trichloroethene, and cis-1,2-dichloroethene)
- Petroleum hydrocarbons (diesel and oil near source area, gasoline at southern property boundary)

- Aromatic hydrocarbons (BTEX at southern property boundary, possibly associated with the plume of gasoline contaminated groundwater).

2.0 PRE-SAMPLING ACTIVITIES

2.1 Coordination

Shannon & Wilson will assign an engineer or a geologist to coordinate the fieldwork before and during the exploration effort. Prior to field activities, the field coordinator will perform the following:

- Mark proposed probing and boring locations.
- Contract with APS to conduct a private utility check to mark subsurface utilities.
  - Within one week of the start of the field effort, mark and contact Call-Before-You-Dig for each geoprobe or boring/monitoring well location. Based on the results of both utility locate surveys, some of the boring locations may have to be shifted. If this occurs and the new location is outside the area marked by Call-Before-You-Dig, a new located request will be submitted and the process repeated.
  - Coordinate access with Mr. Steve Sawyer (Sound Transit).

Procedures for field activities are described in the following sections.

2.2 Health and Safety

Shannon & Wilson has prepared a site-specific Job Safety Analysis for the project that all field personnel will read and initial to acknowledge the potential job hazards and associated safe job practices prior to their involvement in the field exploration program. The geoprobe and drill rig contractors have their own health and safety standard operating procedures that will govern their work. Prior to the start of drilling each day, a tailgate safety meeting will be held to identify potential job hazards and to remind personnel to be aware of their surroundings. The Health and Safety Plan is presented in Appendix C.

3.0 PRE-SAMPLING ACTIVITIES

Remedial investigation sampling will consist of the following tasks:

- Subsurface soil sampling from Geoprobe™ boreholes, and boreholes advanced using a hollow-stem auger rig to evaluate the nature and extent of contamination.
- Installation and sampling of monitoring wells to evaluate the nature and extent of groundwater contamination.

- Indoor air sampling of building to evaluate air quality within the building.

The scope, methodologies, and procedures for conducting each of these tasks are described in the following subsections. Table 6 in the Work Plan summarizes the Data Quality Objectives and the explorations that will be performed to address the objective.

3.1 Geoprobes

Sampling with a geoprobe is performed by pushing the sampler into the ground without the use of drilling to remove soil or to make a path for the tool. The geoprobe equipment relies on static weight combined with percussion as the energy for advancement of a tool string (series of hollow rods).

A geoprobe is a direct push boring rig that advances a 2-inch-diameter, 4-foot-long probe sampler using percussive force. Soil samples will be collected continuously from ground surface to the total depth of the boring. This type of rig should be capable of advancing in shallow soil until dense hard, subsurface conditions are encountered, anticipated to be between 10 to 15 feet below ground surface (bgs). Soil samples will be collected by driving the geoprobe sampler into undisturbed soil. The probe sampler will be fitted with removable plastic sampling (sleeve) tubes that are advanced into the subsurface and retrieved. Upon retrieval of the soil sample, the plastic tube will be sliced open and the soil will be field-screened for contaminants. Soil samples will be collected as described below. Probe boreholes will be filled with bentonite after all of the probe equipment has been removed from the boreholes. Probing within the building will require the use of portable probing tool. A 4-inch core will be removed from the concrete floor. The probe will be advanced through this hole. Upon completion the concrete core will be replaced and sealed with additional concrete. The finished location will be level with the adjacent concrete floor.

3.2 Hollow-Stem Auger Drilling

Shallow borings will be accomplished using a hollow-stem auger machine driven drill rig equipped with either 4¼- or 6-inch inside diameter (I.D.) augers. Sampling of the deeper water bearing zone will be accomplished by advancing 6-inch I.D. augers (outside diameter [O.D.] of 15 inches) to a depth of approximately 30 feet bgs, into dense soil. As the augers are pulled back 5 feet, bentonite chips are poured into the annular space and hydrated. After approximately 1 hour, 4¼-inch I.D. augers are advanced through the center of the large augers, and the 5-foot bentonite seal, effectively isolating the perched water zone. Drilling with the larger auger is not necessary when shallow groundwater is not encountered.

Soil samples will be collected using Standard Penetration Test procedures (ASTM International D 1586-84), modified by using a 2- or 3-inch O.D., split-spoon sampler and a 140-pound or larger drop hammer. Pertinent information, such as the number of blow counts and drilling action, will be recorded on the boring logs. Soil samples will be collected at 2.5-foot intervals for lithologic description and field screening. Drill cuttings and other IDW will be collected in drums during drilling. The drums will be labeled, with the boring number, date, and contents.

In each borehole, soil samples will be collected using a 2- or 3-inch-diameter, stainless steel, split-spoon sampler equipped with a sample catcher, if necessary.

Borings will be completed as monitoring wells. The wells will be installed, under the direct supervision of field personnel, to comply with the Washington State standards for resource protection wells (Washington Administrative Code [WAC] 173-162).

3.3 Well Construction

Monitoring wells will be installed in accordance with the construction diagrams shown in Figures A-1 and A-2, WAC Chapter 173-160, Part Three – Resource Protection Wells. Wells will be completed in the shallow and deeper water-bearing zones. Where a well is completed in the deeper aquifer and shallow groundwater is present, the annular space above the screen will be sealed with bentonite to prevent any exchange between the shallow and deep aquifers. The number of monitoring wells to be installed will be dependent upon the information collected from the initial hydrogeologic assessment and monitoring phase of the remedial investigation. Wells will be installed to refine the hydrogeologic conceptual model for the site, to assess the connection between the perched groundwater and the underlying aquifer, to evaluate groundwater flow direction across the site.

Proposed locations for monitoring wells are presented in Figure 7 of the Work Plan. The actual locations and number of monitoring wells to be installed during future remedial investigations may be revised based on site conditions.

Each well will be constructed with 2-inch, Schedule 40, polyvinyl chloride, thread-coupled, flush-joint riser pipe, and a 10-foot-long section of 0.020-inch slotted screen, Schedule 40. The annulus between the boring wall and the well screen will be backfilled with clean filter sand (U.S. No.10-20 or 20-40) to a level of 3 feet above the top of the screen. Approximately 2 feet of bentonite chips will be placed above the filter sand, and the remaining annular space will be backfilled with bentonite or bentonite-cement slurry and capped by a 2-foot-thick plug of cement at the ground surface. Each well will be completed with a monument box flush with the ground surface.

3.4 Monitoring Well Development

To collect representative groundwater samples, the monitoring wells will first be developed by field personnel using a pump and surge method, using a surge block and submersible pump. Before development, the well will be inspected for the presence of a floating free-product layer. Floating product is not anticipated based on previous sampling results. If floating product is present, this layer will be sampled, and no additional activities will be performed at the well during this investigation.

If no free-product layer is present, the well will be developed. Groundwater quality parameters, including conductivity, pH, turbidity, and temperature, will be measured periodically during development. Development will be considered complete when the groundwater removed from the well becomes clear and/or when the groundwater quality parameters stabilize, or at a maximum of 4 hours.

3.5 Decontamination Procedures

The decontamination procedures that will be followed are in accordance with approved procedures. Decontamination of sampling equipment must be conducted consistently, so as to assure the quality of samples collected. All equipment that comes into contact with potentially contaminated soil or water will be decontaminated. Disposable equipment intended for one-time use will not be decontaminated, but will be packaged for appropriate disposal. Decontamination will occur prior to and after each use of a piece of equipment. All non-disposable sampling equipment will be pre-cleaned prior to field activities. Items such as hand tools and other reusable equipment will be decontaminated prior to arrival in the field and between uses at different sampling locations.

Any drilling equipment that may have come in contact with subsurface soil will be cleaned using a high-pressure steam cleaner, between boreholes and before leaving the property. All water will be contained in drums.

The decontamination procedures for re-usable sampling equipment are as follows:

- Scrape off the gross material from sampler, if necessary.
- Wash and scrub in diluted laboratory grade detergent such as Alconox.
- Rinse with tap water.
- Rinse with distilled water.
- Change gloves.

The wash and rinse water will be collected in five-gallon buckets and transferred to a drum for storage pending disposal.

4.0 SAMPLE COLLECTION

4.1 Soil

Soil samples will be collected from each exploration for purposes of geologic evaluation, soil characterization, and chemical analytical testing. Sampling methods differed, based on the drilling method used (see Section 2.2).

Field personnel will field screen soil samples for potential contamination. Typical field screening includes photoionization detector screening for volatile organic compounds, sheen testing, and visual and olfactory inspection for evidence of contamination. Soil samples for analysis will be collected at pre-prescribed depths and at the groundwater interface, if encountered. Additional samples may be collected where field screening indicates the presence of potential contamination.

Field personnel will collect soil samples by first donning a pair of disposable nitrile gloves. At least one, laboratory-supplied, 4-ounce sample jars will be filled using disposable stainless steel spoons and three clean, laboratory-supplied, 40-milliliter vials will be filled per U.S. Environmental Protection Agency (EPA) Method 5035. Two vials, that contain stir bars, will be used to analyze for low levels of volatile organic compounds (VOCs), and one vial that is pre-preserved with methanol will be used to analyze for high levels of VOCs. The samples for VOC analysis must be frozen within 48 hours of sample collection. Sample collection procedures for analysis of gasoline are similar to VOCs sample protocol. Samples for visual soil classification will be placed in plastic jars and labeled as potentially contaminated.

The glass jars will be filled in lifts and compacted to reduce pore and headspace for volatile losses. Once filled, the sample containers will be placed in a cooler with ice and maintained at approximately 4 degrees Celsius (°C) for transport to the analytical laboratory. A courier service will transport the coolers to the analytical laboratory under chain-of-custody procedures.

4.2 Groundwater

Groundwater samples will be collected from monitoring wells using a low-flow bladder pump at least 24 hours after the wells have been developed. Field personnel will purge each well using a low flow (less than 500 milliliters per minute) pumping rate prior to sampling. Purge water will be monitored using a water quality meter until measured groundwater quality parameters (pH,

conductivity, temperature, etc.) have stabilized to ± 5 percent for three consecutive readings taken at three- to five-minute intervals. The purge water will be collected in a bucket and later transferred to a drum for storage pending disposal.

Following purging, groundwater samples will be collected by filling four clean, laboratory-supplied, 40-milliliter vials pre-preserved with hydrochloric acid; one clean, laboratory-supplied, 1-liter amber glass bottle. Groundwater samples for testing dissolved metals will be filtered in the field using a disposable 40-micron filter. The water will be placed in a clean, laboratory-supplied, 0.5-liter polyethylene bottle pre-preserved with nitric acid. Following sampling, the samples will be placed in a cooler and maintained at approximately 4°C for transport to the laboratory.

4.3 Indoor Air

Two air samples will be collected within the existing building. Air samples will be collected as follows:

- Confirm valve on canister is closed.
- Connect the flow controller/regulator with attached in-line filter and vacuum gauge to Summa canister.
- Place canister in predetermined location and begin sampling.
- Note vacuum on Summa canister and flow controller/regulator and open valve one-half turn on Summa canister. Note start time for sample collection in field log, chain-of-custody (COC), and field sampling purging form. The vacuum on the flow controller/regulator is preset by the laboratory to 25 inches of Hg.
- Fill rate should not exceed 100 to 200 milliliters per minute (approximately 30 to 60 minutes for a 6-liter canister).
- When the Summa canister is "full," turn valve on Summa canister off and record the time and vacuum reading in the field log. Sampling is completed when the vacuum gauge on the flow controller/regulator reads 5 inches of Hg.
- Label the Summa canister sample and place in appropriate shipping container.

5.0 INVESTIGATION-DERIVED WASTE (IDW)

IDW generated by this work will consist of boring cuttings, purged groundwater, decontamination water, and disposable sampling equipment. All soil cuttings and water generated in the course of this investigation will be evaluated for HVOC detections. If HVOCs are detected the IDW will be disposed of as dangerous waste F002 because of the potential to encounter HVOCs from a former dry-cleaning operation. Minimal soil will be generated from

the probes and borings drilled near the west-side source area. Drums that contain soil with levels of tetrachloroethene above 3 milligrams per kilogram (mg/kg) will be designated dangerous waste. A contained-out designation from the Washington State Department of Ecology will be requested for soil with concentrations of PCE less than 3 mg/kg. This soil then can be directly hauled to a Resource Conservation and Recovery Act (RCRA) D landfill. Soil with no detectable levels of PCE will be disposed as non-regulated waste. Since the soil could also contain petroleum products, the remaining drums of soil will also be disposed at a RCRA Subtitle D landfill. Consequently, all IDW will be generated and disposed under a single RCRA Site ID. Purge and decontamination waters will be containerized in drums provided by the driller. Shannon & Wilson will coordinate disposal of the IDW following receipt and review of analytical test results in accordance with applicable local, state, and federal regulations and permits. Drums containing soil designated as dangerous waste will be transported by Uniform Hazardous Waste Manifest for disposal at a RCRA Subtitle C landfill. Thermal treatment may be necessary for some drums, with PCE concentrations greater than 60 parts per million. Disposable sampling equipment will be disposed as solid waste.

6.0 ANALYTICAL METHODS

The COPCs identified for the site include gasoline-, diesel-, and oil-range petroleum hydrocarbons and VOCs. Soil and groundwater samples from the four geoprobes will be analyzed to determine the concentrations of these COPCs using the following methods:

- Northwest Total Petroleum Hydrocarbon-Gasoline for gasoline-range hydrocarbons
- Northwest Total Petroleum Hydrocarbon-Diesel Extended for diesel- and oil-range hydrocarbons
- EPA Method 8260 for VOCs

Air samples will be analyzed using EPA Method TO-15 SIM. The samples will be collected in summa canisters that will be provided by the laboratory.

Select soil samples, with elevated concentrations will be analyzed for Toxicity Characteristic Leaching Potential 1311/EPA Method 8260 for PCE for disposal characterization.

7.0 DOCUMENTATION

All information pertinent to field activities will be recorded in various forms: logbooks, sample labels, photographs, etc. The documentation procedures to be used are described in the following subsections.

7.1 Field Log

A bound field logbook will be maintained in which all information pertinent to the field activity will be entered. The names of all team members will be noted. The notebook will have consecutively numbered pages, and each page will be signed and dated on the day that entries are made. Because sampling situations vary widely, notes should be as descriptive and inclusive as possible. Someone reading the entries should be able to reconstruct the sampling situation from the recorded information. Language will be objective, factual, and free of personal feelings or any other inappropriate terminology. Entries in the logbooks will be written in indelible ink and include at least the following:

- Project name and location.
- Names of sampling team and signature of recorder.
- Climatic conditions for each day.
- Date and time of site entry.
- Description of sample, date and time of collection, and identification number.
- Field observations.
- Register of all visitors to the sites while sampling personnel are present.
- Photograph information including location, date, time, direction faced, subject description, and sequential number.
- Unusual circumstances and or difficulties.
- Deviations from SAP (to be transferred later to corrective action forms, where appropriate).

Entry errors or changes will be crossed out with a single line, dated and initialized by the person making the correction. The bottom of each page will be signed and dated by the individual to whom the logbook is assigned. Entries made by other individuals will also be dated and initialed by the individual making the entry. Upon completion of the field activity, the logbooks will be transferred to the office for use as reference for data interpretation and reporting, and ultimately will be archived in the project files.

7.2 Photographs

Digital photographs of the site investigation activities will be taken periodically to provide visual documentation of specific field activities and situations. All photographs will be logged in the field logbook, including location, time, date, general direction faced and description of subject, and sequential number of photograph.

7.3 Sample Identification System

A sample identification system will be used to track all environmental samples and their analytical results. This identification system is designed to maintain unique sample designations in the electronic data transfers anticipated for this project. All samples will be designated with a unique alpha-numeric identification, which will be used on sample labels and all other applicable documentation. The sample identification system is as follows:

where: MW-##: ** (MW-3: 45) or MW-3:GW1

MW/GP/STKP/DR = Sample origin designation (GP = geoprobe (also KB), MW = monitoring well, stkp = stockpile, DR = drum

= Designation number

** = Samples depth in feet below ground surface (bgs) for soil samples (or GW = groundwater sample number)

For example, sample designation MW-5:10 would represent a soil sample obtained from monitoring well 5, at a depth of 10 feet bgs or MW-5:GW1 = would represent a groundwater sample obtained from the from monitoring well 5, first groundwater sample collected from the monitoring well.

7.4 Sample Documentation

This section describes how each sample is to be documented. A field logbook will be maintained at all times, as specified in Section 6.1. Samples will be obtained and labeled as described in the following subsections.

7.4.1 Sample Labels

Each sample must be sealed immediately after it is collected, then labeled using a non-volatile indelible ink. The labels used will be waterproof, pressure-sensitive labels, or adhesive paper labels that are resistant to moisture. Labels may be filled out and firmly affixed to the container to minimize handling of the sample containers.

7.4.2 Sample Chain-of-Custody (COC) Forms and Custody Seals

COC forms are used to document sample possession from the point of collection to the time of receipt by the laboratory sample control center. A COC form will be completed at the end of each sampling day for each sample cooler to be sent to the laboratory. The COC form will identify the contents of each shipment and maintain the custodial integrity of the samples.

Generally, a sample is considered to be in someone's custody if it is either in someone's physical possession, in someone's view, locked up, or kept in a secured area that is restricted to authorized personnel. Until the samples are shipped, the custody of the samples will be the responsibility of Shannon & Wilson. The sampling team leader or designee will sign the COC form in the "relinquished by" box and note the date and time.

The COC form will include information for all samples shipped in the same container. The information on this form will be checked against the sample labels and field documentation to verify sample identification, type of analysis, and number of containers. Additional information will be included such as date, time of collection, sampler's initials, and matrix code. The completed COC form will be sealed in a plastic bag and taped to the inside of the cooler lid.

The shipping containers in which samples are stored (usually a sturdy picnic cooler or ice chest) will be sealed with self-adhesive custody seals any time they are not in someone's possession or view before shipping. All custody seals will be signed and dated.

7.4.3 Packaging and Shipment

All sample containers will be placed in a strong-outside shipping container (a plastic cooler). The samples will be transported by courier to the laboratory. The following outlines the packaging procedures that will be followed for low concentration samples.

- The bottom of the cooler should be lined with bubble wrap to prevent breakage during shipment.
- All glass sample containers will be wrapped in bubble wrap to prevent breakage.
- The appropriate COC forms will be enclosed in a zip-lock plastic bag affixed to the underside of the cooler lid.
- Empty space in the cooler will be filled with bubble wrap to prevent movement and breakage during shipment.
- If ice is used to cool samples, it will be double sealed in two zip-lock plastic bags and placed on top of and around the samples to chill them to the correct temperature.
- Each ice chest will be securely taped shut with fiberglass strapping tape and custody seals will be affixed to the front, right, and back of each cooler.

8.0 QUALITY CONTROL (QC)

This section discusses the QC samples that will be collected to support the sampling activity. This includes field QC, confirmation, background, and laboratory QC samples.

8.1 Field Quality Control (QC) Samples

Field QC samples are intended to help evaluate conditions resulting from field activities and accomplish two primary goals: (a) assessment of contamination during transport, and (b) assessment of sampling variability. Variability due to sampling technique and instrument performance as well as variability possibly caused by the heterogeneity of the matrix being sampled are assessed by replicate sample collection.

8.1.1 Trip Blanks

Trip blanks will accompany all groundwater samples to identify if volatile contaminants may have been introduced during sample shipment. Deionized water will be placed in glassware by the laboratory. Care will be taken to prevent bubbles in the sealed vial. The trip blank will accompany the water samples from the field to the laboratory, and are analyzed as part of the testing process. The trip blanks that are collected will be analyzed for gasoline-range petroleum hydrocarbons and VOCs.

8.1.2 Field Duplicates

Duplicate samples are collected simultaneously with a standard sample from the same source under identical conditions and placed into separate sample containers. Field duplicates will consist of a homogenized sample divided in two or else a co-located sample. Each duplicate portion should be assigned its own sample number so that it will be blind to the laboratory. A duplicate sample is treated independently of its counterpart in order to assess laboratory performance through comparison of the results. Approximately 2 percent of samples collected per event will be field duplicates. At least one duplicate will be collected for each sample matrix. Every group of analytes for which a standard sample is analyzed will also be tested for in one or more duplicate samples. Duplicate samples will be collected from areas of known or suspected contamination. Since the objective is to assess variability due to sampling technique and possible sample heterogeneity, source variability is a good reason to collect co-located samples, not to avoid their collection.

Soil samples will be homogenized with a stainless steel spoon in a sample-dedicated stainless steel mixing bowl. Homogenized material from the bucket will then be transferred to the appropriate containers for both the regular and duplicate samples. Because soil samples for volatile analysis cannot be mixed, the samples will be collected immediately adjacent to each other.

Duplicate water samples will be collected first by filling the bottles for the regular sample and then the duplicate sample bottles. The water will not be homogenized prior to sampling to avoid potential volatile losses.

Duplicate samples will be preserved, packaged, and sealed in the same manner as other samples of the same matrix. A separate sample number and station number will be assigned to each duplicate, and it will be submitted blind to the laboratory.

8.2 Laboratory Quality Control (QC) Samples

Laboratory quality control (QC) samples are analyzed as part of standard laboratory practice. The laboratory monitors the precision and accuracy of the results of its analytical procedures through analysis of QC samples. Laboratory QC will include the analysis of a method blank, laboratory control sample, laboratory duplicate, and matrix spike with each QC batch (maximum of 20 samples per batch), and a surrogate analysis with each organics sample. The term "matrix" refers to use of the actual media collected in the field (e.g., routine soil and water samples). Laboratory QC samples are an aliquot (subset) of the field sample. They are not a separate sample, but a special designation of an existing sample. A description of each type of QC sample is provided below:

- Method Blanks
  - A sample of clean matrix (i.e., soil, water, etc.) is run to determine if the analytical equipment is contaminated.
- Surrogates
  - Surrogate compounds are compounds similar to the organic analytes of interest that are added to every sample at known concentrations in order to track the accuracy of the sample extraction and analysis. "Surrogate Recovery" is the measure of the effectiveness of this process on a sample-specific basis.
- Matrix Spike/Matrix Spike Duplicates
  - A sample of the matrix is taken and "spiked" with a known mass of a contaminant of interest and analyzed, as is a duplicate.
  - Matrix spike samples are used to make sure the analytes of interest can be accurately recovered from the sample matrix. The matrix spike duplicate is also used to make sure the analytes can be repeatedly recovered in an accurate and precise manner.
- Laboratory Control Sample

  - A sample of clean matrix to which known concentrations of analytes have been added. This sample assesses method accuracy.
- Laboratory Duplicates
  - A second aliquot from a sample is analyzed to examine the reproducibility of the sample result.

9.0 FIELD VARIANCES

It is not uncommon to find that, on the actual sampling date, conditions are different from expectations such that changes must be made to the SAP once the samplers are in the field. The following paragraph provides a means for documenting those deviations, or variances.

As conditions in the field may vary, it may become necessary to implement minor modifications to sampling as presented in this plan. When appropriate, the project manager will be notified and a verbal approval will be obtained before implementing the changes. Modifications to the approved plan will be documented in the sampling project report.

Appendix C

APPENDIX C

HEALTH AND SAFETY PLAN

SITE-SPECIFIC HEALTH AND SAFETY PLAN
NE 45th Street Site
Seattle

This Health and Safety Plan is to be used in conjunction with Shannon & Wilson's Corporate Health and Safety Program

INTRODUCTION

This Site-specific Health & Safety Plan (SSHSP) has been prepared for Shannon & Wilson personnel performing project-specific activities for the NE 45th Street Site in Seattle. This plan provides a Job Safety Analysis (JSA) specific to the site and the work to be performed during the project. All field personnel must understand the JSA before going to the site. Acknowledgement that personnel are aware of this SSHSP and the JSA will be documented by signing the Acknowledgement Form included at the back of this document.

Field activities to be performed under this SSHSP include the following: geoprobe study, monitoring well installation and indoor air sampling. If field activities other than those noted are performed, this document should be revised. The field activities are anticipated to extend from September 1, 2011 to December 30, 2013.

ORGANIZATION

Shannon & Wilson expects its employees to follow the policies and procedures set forth in the Corporate Health and Safety program and the specific guidelines included in this SSHSP. Employees at all level of organization are covered by this requirement. In certain cases, deviations to a policy or procedure may be appropriate, but any changes must by justifiable and documented. Changes in this program will only be made with the prior approval of the Site Safety Officer (SSO).

The goal on this project, as on all Shannon & Wilson projects, is to experience zero injuries and to remain in compliance with applicable federal, state, and local health and safety requirements. Personnel accountable for employee's safety and health on this project include the Project Manager (PM), the SSO, and the Health and Safety Officer (HSO). The names and contact numbers for these key personnel for this project are listed below.

Project Manager	Dawn Wulf	206-695-6839
Site Safety Officer	TBD	TBD
Health & Safety Officer	Joe Laprade	206-695-6713

JOB HAZARD ANALYSIS

Physical hazards associated with this project are summarized on a JSA worksheet, presented on the following pages. The JSA lists the physical hazards by activity and the safe job practices (engineering, administrative, and personal controls) that should be undertaken to minimize these hazards. Chemical hazardous analysis information is included in Table 2 and 3.

SHANNON & WILSON, INC. GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS		JOB SAFETY ANALYSIS WORKSHEET	
Project Number:	21-1-16609-002	Update:	3-Mar-13
Project Title: NE 45th Street Site		Prepared By:	Dawn Wulf
		Reviewed By:	Agnes Tirao
Project Location:	Seattle	Project Mngr:	Agnes Tirao
Brief Description of Field Activities: geoprobe study, monitoring well installation and indoor air sampling		Site Safety:	TBD
		Field Staff:	TBD
		Field Start Date:	1-Sep-11
		Field End Date:	30-Dec-13

Table 1.

Required PPE:	safety glasses, hard hat, high visibility vest, safety toe boots, ear plugs, work gloves
Required Training:	first aid/CPR, 40-hour HAZWOPR, certified drilling license
Safety Equipment:	First aid kit, Cell phone, Fire extinguisher, traffic cones
Req'd Plans/Permits:	Site-specific health and safety plan, Traffic control plan

Tasks *Identify the work activities and steps*	**Potential Hazards** *Analyze each work activity for potential hazards*	**Safe Job Practices** *Develop specific engineering, administrative, and personal controls for potential hazards for each work activity.*
Travel to and from site.	1. Vehicle breakdown	1. • Confirm that vehicle is in good condition before operating.
	2. Improper operation of vehicle	2. • Only S&W employees with a valid drivers license shall operate S&W vehicles.
	3. Injury due to vehicular accident	3. • Confirm that vehicle is in good condition before operating. • Check that mirrors, seat belts, and controls are adjusted correctly. • All vehicle occupants shall wear seat belts. • Do not use cell phone while driving. • Use defensive driving techniques. • Obey traffic rules and speed limits.
General work on site.	1. Eye or head injury, hearing loss, cuts and abrasians	1. • Wear appropriate clothing and required Personal Protective Equipment (see top of form for required PPE).
	2. Injury from distraction or collision	2. • Confirm that you can be seen by traffic, pedestrians, and/or onlookers.
	3. Dehydration, fatigue, disorientation	3. • Stay hydrated and keep your body fueled (eat regularly).
	4. Fatigue, overexertion	4. • Take breaks, as necessary.
Walking around site	1. Sprains, strains, broken bones	1. • Wear appropriate foot protection.
	2. Slips, trips, falls	2. • Use caution when working on uneven and wet ground surfaces. • Keep work area clear of debris, tools, and other materials that are not in use.
Working on a street (blocking traffic)	1. Injury due to vehicle impact	1. • Follow approved traffic control plan (copy on site). • Confirm that traffic control is in place prior to walking/working on street. • Wear appropriate PPE (see top of form) and high visibility clothing as required by traffic control plan and permit. • Do not move outside traffic control zone or stand in areas where you could be hit by vehicles. • Finish work promptly to minimize your potential exposure to traffic.
	2. Vehicular accidents, slips, trips and falls	2. • Keep street pavement clear of mud, debris, or other materials. • Make sure site is clean and free of obstructions before you leave.
Working on a street (shoulder/sidewalk)	1. Injury due to vehicle impact	1. • Make sure traffic control equipment is in place (typically signs and cones). • Follow approved traffic control plan and street use permit, if applicable. • Wear appropriate PPE (see top of form) and high visibility clothing.

Tasks *Identify the work activities and steps*	**Potential Hazards** *Analyze each work activity for potential hazards*	**Safe Job Practices** *Develop specific engineering, administrative, and personal controls for potential hazards for each work activity.*
	2. Vehicular accidents, slips, trips and falls	2. • Keep pavement clear of mud, debris, or other materials. • Make sure site is clean and free of obstructions before you leave.
Drill rig setup	1. Utility damage, explosion, electrocution due to contact with a utility	1. • Make sure utilities have been located/marked prior to drilling. • Provide general boring location information to driller. Allow driller to select exact location, when possible. • Check overhead utilities in work area. Must be at least 10 feet from power lines. • Do not excavate closer than 10 feet to marked utility lines without hand digging to confirm utility location. • Check alignment of nearby manhole covers to confirm that they do not line up with exploration location.
	2. Injury due to shifting or overturning equipment	2. • Check to make sure ground is stable in area of equipment.
	3. Injury due to vehicle impact	3. • Check to make sure drill rig is clear of traffic or other adjacent activities.
	4. Injury due to equipment impact	4. • Stay clear of drill rig as it is setting up.
Working around a drill rig	1. Injury due to equipment impact	1. • Stay clear of drill rig operating area • Agree with driller as to a safe location for soil/core sample inspection. • Stay clear of drilling equipment when rods/casing is being added/removed.
	2. Hearing loss	2. • Wear appropriate PPE (see top of form), including ear protection.
	3. Eye injury due to mud/water spray	3. • Wear appropriate PPE (see top of form), including eye protection. • Stay away from back of rig during drill rod breaks.
	4. Head injury due to falling or shifting loads	4. • Observe caution with overhead hazards
	5. Injury due to uncontrolled drill rig operation	5. • Know where the "kill" switch is located on the drill rig.
Lifiting of samples or other heavy items	1. Back injury due to lifting of heavy objects	1. • Stretch muscles before lifting. • Lift with the knees. • When lifting, maintain an upright position and avoid bending and twisting. • Keep the body as close to the load as possible. • Keep the travel distance for the lift to less than 10 feet. • Provide good handles or handholds for grasping loads. • Get assistance from others when possible • Wear back protection, if necessary
Using hand-operated power tools	1. Eye injury	1. • Wear protective goggles or face mask when using tools
	2. Cuts and abrasions, hearing loss	2. • Wear appropriate PPE (see top of form) including earplugs and gloves • Do not wear loose clothing when operating tools.
	3. Injury due to kickback or loss of control	3. • Use two hands when operating tool and maintain stable stance. Do not operate tool while moving • Make sure material being operated on is secured.
	4. Slips, trips, falls during operation	4. • Clear away brush, vegetation, or other materials that might interfere with safe operation of tool.
	5. Injury from improper operation of tool	5. • Obtain training in use of tool. Follow manufacters recommendations for use.
	6. Injury from equipment malfunction	6. • Make sure tool is in good condition before using. Report broken or malfunctioning equipment.
	7. Electrocution	7. • Make sure electrical chords are in good condition with no exposed wires. • Confirm that electrical chords and plugs are not wet or submerged in
	8. Electrocution, loss of control	8. • Make sure tool is off when plugging and unplugging electrical chords

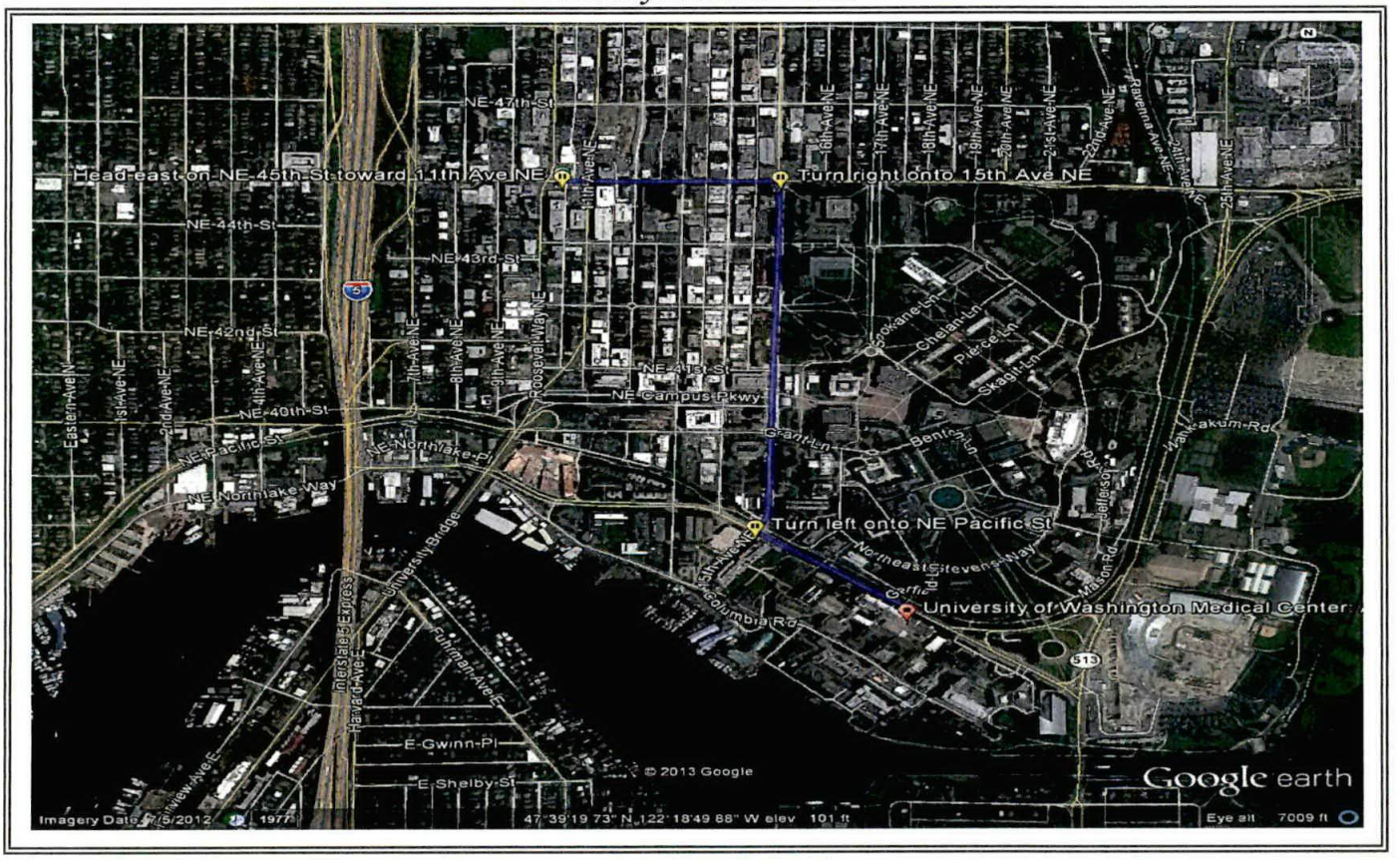
Tasks *Identify the work activities and steps*	**Potential Hazards** *Analyze each work activity for potential hazards*	**Safe Job Practices** *Develop specific engineering, administrative, and personal controls for potential hazards for each work activity.*
	9. Loss of control, slips, trips, falls	9. • Make sure electrical chords are secured or routed so that equipment and personell do not snag chords.
Indoor Air Sampling	1. Trips, slips, and falls	1. Step carefully

FIELD EQUIPMENT

Equipment to be Used *List equipment to be used in*	**Inspection Requirements** *List inspection requirements for the*	**Training Requirements** *List training requirements for the equipment*
First aid kit	*Check to make sure kit is complete prior to use at site. Replace used or outdated items.*	*Current First Aid certification is required for all S&W employees but use of first aid kit is permitted for anyone.*
Fire extinguisher	*Monthly inspection by S&W and yearly professional inspection. Check to make sure the inspection tag is not expired.*	*Fire extinguisher use training preferred, but use of fire extinguisher is permitted for anyone in an emergency.*
Vehicles	*Routine inspection by S&W so that vehicles meet the requirements for safe operation on roads. Seat belts shall be in good working order with no visible damage or alterations.*	*Valid driver's license*
Personal Protective Equipment (PPE) - See top of form	*PPE shall be in good working order with no visible damage or alterations.*	*Not applicable*
PID	*PID inspection before each use*	*In-house training on calibration method and use*

MAP TO HOSPITAL

University Medical Center



IN CASE OF EMERGENCY - CALL 911

(see next page for 911 call procedures)

911 CALL PROCEDURES

In an EMERGENCY, call 911 as soon as possible. Give the following information to the 911 dispatcher:

- WHERE the emergency is - use addresses, cross streets, or landmarks.
- TELEPHONE NUMBER you are calling from.
- WHAT HAPPENED - type of emergency.
- HOW MANY people need help?
- HOW MUCH was spilled (if applicable)?
- WHAT is being done?

YOU HANG UP LAST - Let the person you called hang up first. In the event of a MEDICAL EMERGENCY, do the following:

1. Call for help as soon as possible. Assess whether the scene is safet. If it is, help; if it is not, **DO NOT BECOME ANOTHER VICTIM.**
2. Administer CPR and emergency first aid if necessary.
3. If the victim can be moved, transport to the hospital while one person calls the hospital to notify them. If the injury or exposure is not life threatening, decontaminate the individual first. If decontamination is not feasible, wrap the individual in a blanket or sheet of plastic prior to transport; transport to the hospital via rescue squad vehicle.
4. Notify the PM and the HSO. If Shannon & Wilson staff are involved in the incident, the HSO will notify the Corporate Health and Safety Officer within 24 hours.
5. Complete appropriate form(s); see Appendix A of the Corporate Health and Safety Program.

ACKNOWLEDGEMENT AND SIGNATURE

I acknowledge that I have read the SSHSP for the NE 45th Street Site and that I understand the job hazards and safe job practices summarized on the JSA. I have met with the PM to discuss the project details and any questions I have related to my personal safety. I also acknowledge that I have read the Corporate Health and Safety Program documents for other Health and Safety information.

Printed Name: _____

Signature: _____

Date: _____

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

TABLE 3. ACTION LEVELS

(for PPE purposes)

Level of PPE	Respirator type	Action Level (AL) Criteria Concentrations (Total VOC Concentration measured by a PID)
Modified Level D	None	If benzene is present, less than 2.0 ppm (above upwind background concentrations) sustained for 1 minute in employee breathing zone. Coninue operations.
		If not equipped to upgrade to a respirator, stop work until readings fall below background. Notify the SSO and HSO. Reassess the work plan.
Modified Level C	Half- or full-face air purifying respirator with combination organic vapor-HEPA cartridges	Greater than 2.0 ppm (above upwind background concentrations) sustained for 1 minute in employee breathing zone. If no benzene is present, up to 5 times the AL of 2 ppm.
Level B	Stop work and move upwind until safe levels return	Greater than 5.0 ppm (above upwind background concentrations) sustained for 1 minute (if benzene is present). Greater than 100 ppm (above upwind background concentrations) sustained for 1 minute (if benzene is not present).
Level of PPE	**Respirator type**	**Combustible Gas Concentration (measured by a CGI)**
Modified Level D	None	Methane = 5-14% explosive range H_2S = 4-40%- explosive range Gasoline = 1400 ppm LEL

Notes

Total VOC action level based on levels measure with a PID meter.

Level B respiratory protection will signify a stop-work action until levels return to normal

PPE = Personal Protective Equipment

SSO = Site Safety Officer

HSO = Health and Safety Officer

CGI = Cumbustible gas indicator

LEL= Lower Explosive Limit

AL = Action Level

HEPA = high efficiency particulate air

PID = photoionization detector

ppm = parts per million

VOC = volatile organic compound

Control of the explosion hazard is usually achieved by sufficient natural or mechanical ventilation, to limit the concentration of flammable gases or vapors to a maximum level of 25% of their Lower Explosive or Flammable Limit.

Concentrations compared with the Action Level are meausured in the employees breathing zone and are sustained for 1 minute.

All action levels are above background, which is measured upwind, and is a sustained reading.

SHANNON & WILSON, INC. GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS		TABLE 2. CHEMICAL HAZARD ANALYSIS	
Project Number	21-1-16609-002	Up-Date:	3-Mar-13
Project Title: NE 45th Street		Prepared By:	Dawn Wulf
		Reviewed By:	Agnes Tiaro
Project Location:	Seattle, WA	Project Mngr:	Dawn Wulf
Brief Description of Field Activities: Site reconnaissance, geophysical survey, geoprobe study, hollow stem auger drilling, monitoring well installation, indoor air sampling and geoprobe study.		Field Staff:	TBD
		Field Start Date:	1-Sep-11
		Field End Date:	30-Dec-13
Required PPE:	safety glasses, hard hat, high visibility vest, safety toe boots, ear plugs, work gloves, nitrile gloves **(Modified Level D)**		
Required Training:	Worker Protection 40-hour HAZWOPR		
Safety Equipment:	PID		
Req'd Plans/Permits:	Site-specific health and safety plan		

Chemical Hazard	TLV/PEL	ROUTE OF EXPOSURE	SIGNS AND SYPMTOMS
Petroleum Hydrocarbons (based on gasoline)	TLV/PEL = 300 ppm STEL = 500 ppm	Eye, Skin, Inhalation, Ingestion	Irritant to eyes, skin, mucous membranes, dermatitis, headache, fainting, blurred vision, dizziness, slurred speech, confusion, convulsions, chemical pneumonia, possibly liver, kidney damage, and carcinogen.
Petroleum Hydrocarbons (based on diesel)	TLV/PEL= 100 mg/m3	Eye, Skin, Inhalation, Ingestion	Irritant to eyes, skin, mucous membranes, dermatitis, headache, fainting, blurred vision, dizziness, slurred speech, confusion, convulsions, chemical pneumonia, possibly liver, kidney damage, and carcinogen.
VOCs	TLV = varies depending on the VOC present	Inhalation, Absorption, Skin and Eye contact	Irritant to eyes, skin, nose, respiratory system, giddiness, headache, nausea, staggered gait, fatigue, anorexia, lassitude, dermatitis, bone marrow depression, and possible carcinogen (see specific analyte).
Acetone	750 ppm (TWA)	Inhalation, Absorption, Skin and Eye contact, Ingestion	Irritant to eyes, skin, nose, respiratory system, headache, dizziness.
Benzene	1 ppm (TWA) 5 ppm (STEL)	Inhalation, Skin	Irritant to eyes, skin, nose, respiratory system, giddiness, headache, nausea, staggered gait, fatigue, anorexia, lassitude, dermatitis, bone marrow depression, and carcinogen.
Toluene	200 ppm (TWA)	Inhalation, skin, ingestion	Dizziness, weakness, fatigue, weakness.
Ethylbenzene	100 ppm (TWA)	Inhalation, skin, ingestion	Irritant to eyes, skin, nose, respiratory system.
Xylenes	100 ppm (TWA)	Inhalation, skin, ingestion	Irritant to eyes, skin, nose, respiratory system, giddiness, headache, nausea, staggered gait, fatigue, lassitude, dermatitis.

Chemical Hazard	TLV/PEL	ROUTE OF EXPOSURE	SIGNS AND SYPMTOMS
Trichloroethylene (TCE)	OSHA TWA = 100 ppm; C 200 ppm; 300 ppm (5-min. max peak in any 2 hrs)	Inhalation, Absorption, Skin and Eye contact, Ingestion	Irritant to eyes, skin, nose, respiratory system depression, giddiness, headache, nausea, staggered gait, fatigue, and carcinogen.
Tetrachloroethylene (PCE)	102 ppm (STEL) 25 ppm (TLV)	Inhalation, Absorption, Skin and Eye contact, Ingestion	Accute: Irritant to eyes, skin, nose, respiratory system, impaired coordination, headache; Chronic: liver and kidney damage; and carcinogen

Notes:

mg/m^3 = milligrams per cubic meter
PEL = permissible exposure limit
ppm = parts per million
STEL = 15-minute short term exposure limit
TLV = threshold limit value
TWA = time-weighted average (always 8- hour)
VOC = volatile organic compound

Petroleum hydrocarbons and its lighter-weight constituents are flammable. Smoking is not permitted on site except in designated areas.
For sites that may be contaminated with gasoline from an old release, it is not likely benzene will be encountered in significant quantities.

APPENDIX D

PHASE II ENVIRONMENTAL SITE ASSESSMENT (ESA)

TABLE 1
SAMPLE SUMMARY
KEY BANK PROPERTY

Boring/ Well Designation	DOE Well Tag ID #	Sample ID	Sample Depth	Well Screen Interval	Media	Date Sampled	Purpose of Sampling	Metals/ EPA 200.8	PCBs/ SW8082	Diesel/Oil/ NWTPH-Dx	Gasoline/ NWTPH-Gx	VOCs-HVOCS/ SW8260B	TCLP-VOCs
West Side/Building and Parking Lot - Vicinity of former service station (Building B)													
GP-1		GP-1-11:10	10.0	--	Soil	09/22/11	Evaluate potential releases to soil from adjacent/upgradient property (existing/historic dealership autobody and paintshop)	X	X	X	X	X	
GP-2		GP-2-11:9	9.0	--	Soil	09/22/11	Evaluate potential releases to soil from subsurface anomalies and upgradient properties	X		X	X	X	
GP-3		GP-3-11:13	13.0	--	Soil	09/22/11	Evaluate potential releases to soil from subsurface anomalies (USTs)	X		X	X	X	
		GP-3-11:GW			Water	09/22/11	Evaluate potential releases to water from subsurface anomalies (USTs)				X	X	
GP-4		GP-4-11:9.5	9.5	--	Soil	09/22/11	Evaluate potential releases to soil from subsurface anomalies (USTs)	X		X	X	X	
GP-5		GP-5-11:13	13.0	--	Soil	09/22/11	Evaluate potential releases to soil from subsurface anomalies (USTs)	X	X	X	X	X	
GP-6		GP-6-11:13	13.0	--	Soil	09/22/11	Evaluate potential releases to soil from subsurface anomalies (USTs)	X	X	X	X	X	
GP-7		GP-7-11:14	14.0	--	Soil	09/22/11	Evaluate potential releases to soil from subsurface anomalies (USTs)	X		X	X	X	
GP-8		GP-8-11:14	14.0	--	Soil	09/22/11	Evaluate potential releases to soil from subsurface anomalies (USTs)	X		X	X	X	
GP-9		GP-9-11:13	13.0	--	Soil	09/22/11	Evaluate potential releases to soil from subsurface anomalies (USTs)	X		X	X	X	
MW-1	BHJ-554	SW-MW1-11:13	13.0	--	Soil	10/06/11	Evaluate potential releases to soil from subsurface anomalies (USTs) and confirmed onsite soil petroleum contamination	X		X	X	X	
		SW-MW1-11:25	25.0	--	Soil	10/06/11	Evaluate potential releases to soil and/or groundwater from subsurface anomalies (USTs) and confirmed onsite soil petroleum contamination	X		X	X	X	
		MW-1		5'-25'	Water	10/13/11	Evaluate potential releases to groundwater from subsurface anomalies (USTs) and confirmed onsite soil petroleum contamination	X		X	X	X	
East Side/Parking Lot - North of former Building A													
GP-10		GP-10-11:10	10.0	--	Soil	09/22/11	Evaluate potential releases to soil from subsurface anomaly	X		X	X	X	
GP-11		GP-11-11:10	10.0	--	Soil	09/22/11	Evaluate potential releases to soil from subsurface anomaly	X		X	X	X	
GP-12		GP-12-11:10	10.0	--	Soil	09/22/11	Evaluate potential releases to soil from subsurface anomaly	X	X	X	X	X	
GP-13		GP-13:4.5	4.5	--	Soil	10/14/11	Evaluate potential releases to soil from subsurface anomaly and evaluate extent of HVOC contamination discovered in adjacent geoprobes					X	
		GP-13:10.0	10.0	--	Soil	10/14/11	Evaluate potential releases to soil from subsurface anomaly and evaluate extent of HVOC contamination discovered in adjacent geoprobes					X	
GP-14		GP-14:5.5	5.5	--	Soil	10/14/11	Evaluate potential releases to soil from subsurface anomaly and evaluate extent of HVOC contamination discovered in adjacent geoprobes					X	
		GP-14:10.5	10.5	--	Soil	10/14/11	Evaluate potential releases to soil from subsurface anomaly and evaluate extent of HVOC contamination discovered in adjacent geoprobes					X	
GP-15		GP-15:5.0	5.0	--	Soil	10/14/11	Evaluate potential releases to soil from subsurface anomaly and evaluate extent of HVOC contamination discovered in adjacent geoprobes					X	
		GP-15:12.0	12.0	--	Soil	10/14/11	Evaluate potential releases to soil from subsurface anomaly and evaluate extent of HVOC contamination discovered in adjacent geoprobes					X	
GP-16		GP-16:8.0	8.0	--	Soil	10/14/11	Evaluate potential releases to soil from subsurface anomaly and evaluate extent of HVOC contamination discovered in adjacent geoprobes					X	X
		GP-16:11.5	11.5	--	Soil	10/14/11	Evaluate potential releases to soil from subsurface anomaly and evaluate extent of HVOC contamination discovered in adjacent geoprobes					X	
GP-17		GP-17:6.0	6.0	--	Soil	10/14/11	Evaluate potential releases to soil from subsurface anomaly and evaluate the western extent of HVOC contamination discovered in adjacent geoprobes					X	
		GP-17:14.0	14.0	--	Soil	10/14/11	Evaluate potential releases to soil from subsurface anomaly and evaluate extent of HVOC contamination discovered in adjacent geoprobes					X	
GP-18		GP-18:11.0	11.0	--	Soil	10/14/11	Evaluate potential releases to soil from subsurface anomaly and evaluate the eastern extent of HVOC contamination discovered in adjacent geoprobes (east side of alley)					X	
GP-19		GP-19:11.0	11.0	--	Soil	10/14/11	Evaluate potential releases to soil from subsurface anomaly and evaluate the eastern extent of HVOC contamination discovered in adjacent geoprobes					X	

TABLE 1
SAMPLE SUMMARY
KEY BANK PROPERTY

Boring/ Well Designation	DOE Well Tag ID #	Sample ID	Sample Depth	Well Screen Interval	Media	Date Sampled	Purpose of Sampling	Metals/ EPA 200.8	PCBs/ SW8082	Diesel/Oil/ NWTPH-Dx	Gasoline/ NWTPH-Gx	VOCs-HVOCS/ SW8260B	TCLP-VOCs
GP-20		GP-20:4.0	4.0	--	Soil	10/14/11	Evaluate potential releases to soil from subsurface anomaly and evaluate extent of HVOC contamination discovered in adjacent geoprobes					X	
		GP-20:9.0	9.0	--	Soil	10/14/11	Evaluate potential releases to soil from subsurface anomaly and evaluate extent of HVOC contamination discovered in adjacent geoprobes					X	
GP-21		GP-21:6.0	6.0	--	Soil	10/14/11	Evaluate potential releases to soil from subsurface anomaly and evaluate extent of HVOC contamination discovered in adjacent geoprobes					X	
		GP-21:12.0	12.0	--	Soil	10/14/11	Evaluate potential releases to soil from subsurface anomaly and evaluate extent of HVOC contamination discovered in adjacent geoprobes					X	
GP-22		GP-22:5.5	5.5	--	Soil	10/14/11	Evaluate potential releases to soil from subsurface anomaly and evaluate the western extent of HVOC contamination discovered in adjacent geoprobes (west side of alley)					X	
		GP-22:13.0	13.0	--	Soil	10/14/11	Evaluate potential releases to soil from subsurface anomaly and evaluate extent of HVOC contamination discovered in adjacent geoprobes					X	
STKP		STKP:1	1.0	--	Soil	10/21/11	Determine if soil in drum of spoils from the geoprobes was a characteristic Dangerous Waste based on the results of the TCLP					X	X
MW-2	BHJ-555	SW-MW2-11:5	5.0	--	Soil	10/06/11	Evaluate potential releases to soil from adjacent/upgradient properties (autobody shops and used car dealerships)					X	
		SW-MW2-11:10	10.0	--	Soil	10/06/11	Evaluate potential releases to soil from adjacent/upgradient properties (autobody shops and used car dealerships)					X	
		SW-MW2-11:16.5	16.5	--	Soil	10/06/11	Evaluate potential releases to soil from adjacent/upgradient properties (autobody shops and used car dealerships)	X		X	X	X	
		SW-MW2-11:20	20.0	--	Soil	10/06/11	Evaluate potential releases to soil and/or groundwater from adjacent/upgradient properties (autobody shops and used car dealerships)					X	
		SW-MW2-11:25	25.0	--	Soil	10/06/11	Evaluate potential releases to soil and/or groundwater from adjacent/upgradient properties (autobody shops and used car dealerships)	X		X	X	X	
		MW-2		15'-25'	Water	10/13/11	Evaluate potential releases to groundwater from adjacent/upgradient properties	X		X	X	X	
MW-3	BHJ-556	SW-MW3-11:5	5.0	--	Soil	10/07/11	Evaluate potential releases to soil from subsurface anomaly / upgradient properties and evaluate extent of HVOC contamination discovered in adjacent geoprobes					X	
		SW-MW3-11:10	10.0	--	Soil	10/07/11	Evaluate potential releases to soil from subsurface anomaly / upgradient properties and evaluate extent of HVOC contamination discovered in adjacent geoprobes	X		X	X	X	
		SW-MW3-11:18	18.0	--	Soil	10/07/11	Evaluate potential releases to soil from subsurface anomaly / upgradient properties and evaluate extent of HVOC contamination discovered in adjacent geoprobes	X		X	X	X	
		SW-MW3-11:25	25.0	--	Soil	10/07/11	Evaluate potential releases to soil from subsurface anomaly / upgradient properties and evaluate extent of HVOC contamination discovered in adjacent geoprobes					X	
		SW-MW3-11:30	30.0	--	Soil	10/07/11	Evaluate potential releases to soil from subsurface anomaly / upgradient properties and evaluate extent of HVOC contamination discovered in adjacent geoprobes					X	
		SW-MW3-11:35	35.0	--	Soil	10/07/11	Evaluate potential releases to soil from subsurface anomaly / upgradient properties and evaluate extent of HVOC contamination discovered in adjacent geoprobes					X	
		MW-3		25'-35'	Water	10/13/11	Evaluate potential releases to groundwater from subsurface anomaly / upgradient properties and evaluate extent of HVOC contamination discovered in adjacent geoprobes				X	X	
Trip Blank		Trip Blank				10/13/11					X	X	

Notes:
DOE = Department of Ecology
EPA = Environmental Protection Agency
ID = identification
HVOCs = halogenated volatile organic compounds
NWTPH-Dx = Northwest Total Petroleum hydrocarbons - diesel extended
NWTPH-Gx = Northwest Total Petroleum Hydrocarbons - gasoline
PCBs = polychlorinated biphenyls
TCLP = Toxicity Characteristic Leaching Procedure
UST = underground storage tank
VOCs = volatile organic compounds

TABLE 2
DETECTED ANALYTES IN SOIL

Area		West Side								
Exploration Designation:	**MTCA**	**GP-1**	**GP-2**	**GP-3**	**GP-4**	**GP-5**	**GP-6**	**GP-7**	**GP-8**	**GP-9**
Sample Number	**Method A**	**GP-1-11:10**	**GP-2-11:9**	**GP-3-11:13**	**GP-4-11:9.5**	**GP-5-11:13**	**GP-6-11:13**	**GP-7-11:14**	**GP-8-11:14**	**GP-9-11:13**
Sample Depth (feet)	**Cleanup**	**10**	**9**	**13**	**9.5**	**13**	**13**	**14**	**14**	**13**
ANALYTE	**Level**									
Petroleum Hydrocarbons (mg/kg)										
Gasoline Range Organics	100	6.3 U	6.4 U	**830**	7.6 U	**410**	6.2 U	60	50	6.2 U
Lube Oil	2000	660	57 U	58 U	61 U	77	330	58 U	57 U	55 U
VOCs (mg/kg)										
Acetone		0.0068 U	0.0067 U	0.0067 U	0.007 U	0.36 U	0.0061 U	0.32 U	0.0066 U	0.0087 U
Carbon Disulfide		0.0014 U	0.0013 U	0.0013 U	0.0014 U	0.072 U	0.0012 U	0.064 U	0.0013 U	0.0017 U
Ethylbenzene	6	0.0014 U	0.0013 U	0.022	0.0014 U	0.072 U	0.0012 U	0.092	0.2	0.0017 U
m, p-Xylene	9	0.0027 U	0.0027 U	0.061	0.0028 U	0.14 U	0.0024 U	0.13 U	0.21	0.0035 U
o-Xylene	9	0.0014 U	0.0013 U	0.021	0.0014 U	0.072 U	0.0012 U	0.064 U	0.0042	0.0017 U
Isopropylbenzene		0.0014 U	0.0013 U	0.0032	0.0014 U	0.076	0.0012 U	0.075	0.23	0.0017 U
n-Propylbenzene		0.0014 U	0.0013 U	0.0051	0.0014 U	0.12	0.0012 U	0.098	0.17	0.0017 U
1,3,5-Trimethylbenzene		0.0014 U	0.0013 U	0.011	0.0014 U	0.17	0.0012 U	0.16	0.25	0.0017 U
1,2,4-Trimethylbenzene		0.0014 U	0.0013 U	0.033	0.0014 U	0.25	0.0012 U	0.34	0.14	0.0017 U
Sec-Butylbenzene		0.0014 U	0.0013 U	0.0017	0.0014 U	0.12	0.0012 U	0.064 U	0.095	0.0017 U
p-Isopropyltoluene		0.0014 U	0.0013 U	0.0018	0.0014 U	0.12	0.0012 U	0.064 U	0.12	0.0017 U
Naphthalene	5	0.0014 U	0.0013 U	0.015	0.0014 U	0.072 U	0.0012 U	0.064 U	0.083	0.0017 U
Tetrachloroethene	0.05	0.0014 U	0.0013 U	0.0013 U	0.0014 U	0.072 U	0.0012 U	0.064 U	0.0013 U	0.0017 U
Trichloroethene	0.03	0.0014 U	0.0013 U	0.0013 U	0.0014 U	0.072 U	0.0012 U	0.064 U	0.0013 U	0.0017 U
Vinyl Chloride		0.0014 U	0.0013 U	0.0013 U	0.0014 U	0.072 U	0.0012 U	0.064 U	0.0013 U	0.0017 U
1,1-Dichloroethene		0.0014 U	0.0013 U	0.0013 U	0.0014 U	0.072 U	0.0012 U	0.064 U	0.0013 U	0.0017 U
cis-1,2-Dichloroethene		0.0014 U	0.0013 U	0.0013	0.0014 U	0.072 U	0.0012 U	0.064 U	0.0013 U	0.0017 U
Metals (mg/kg)										
Chromium	2,000	47	37	30	54	53	45	38	45	38

TABLE 2
DETECTED ANALYTES IN SOIL

Area		East Side						
Exploration Designation:	**MTCA**	**GP-10**	**GP-11**	**GP-12**	**GP-13**		**GP-14**	
Sample Number	**Method A**	**GP-10-11:10**	**GP-11-11:10**	**GP-12-11:10**	**GP-13:4.5**	**GP-13:10.0**	**GP-14:5.5**	**GP-14:10.5**
Sample Depth (feet)	**Cleanup**	**10**	**10**	**10**	**4.5**	**10**	**5.5**	**10.5**
ANALYTE	**Level**							
Petroleum Hydrocarbons (mg/kg)								
Gasoline Range Organics	100	7.2 U	15	7.8 U	NA	NA	NA	NA
Lube Oil	2000	61 U	60 U	59	NA	NA	NA	NA
VOCs (mg/kg)								
Acetone		0.0074 U	0.0086 U	0.0082 U	NA	NA	NA	NA
Carbon Disulfide		0.0015 U	0.0017 U	0.0016 U	NA	NA	NA	NA
Ethylbenzene	6	0.0015 U	0.0017 U	0.0016 U	NA	NA	NA	NA
m, p-Xylene	9	0.003 U	0.0034 U	0.0033 U	NA	NA	NA	NA
o-Xylene	9	0.0015 U	0.0017 U	0.0016 U	NA	NA	NA	NA
Isopropylbenzene		0.0015 U	0.0017 U	0.0016 U	NA	NA	NA	NA
n-Propylbenzene		0.0015 U	0.0017 U	0.0016 U	NA	NA	NA	NA
1,3,5-Trimethylbenzene		0.0015 U	0.0017 U	0.0016 U	NA	NA	NA	NA
1,2,4-Trimethylbenzene		0.0015 U	0.0017 U	0.0016 U	NA	NA	NA	NA
Sec-Butylbenzene		0.0015 U	0.0017 U	0.0016 U	NA	NA	NA	NA
p-Isopropyltoluene		0.0015 U	0.0017 U	0.0016 U	NA	NA	NA	NA
Naphthalene	5	0.0015 U	0.0017 U	0.0016 U	NA	NA	NA	NA
Tetrachloroethene	0.05	0.027	**15**	**0.1**	0.029	**0.22**	0.021	**0.75**
Trichloroethene	0.03	0.0015 U	0.0021	0.0016 U	0.00058 U	0.0023	0.00059 U	0.0016
Vinyl Chloride		0.0015 U	0.0017 U	0.0016 U	0.00058 U	0.00058 U	0.00059 U	0.00059 U
1,1-Dichloroethene		0.0015 U	0.0017 U	0.0016 U	0.00058 U	0.00058 U	0.00059 U	0.00059 U
cis-1,2-Dichloroethene		0.0015 U	0.0017 U	0.0016 U	0.00058 U	0.00058 U	0.00059 U	0.00059 U
Metals (mg/kg)								
Chromium	2,000	59	56	56	NA	NA	NA	NA

TABLE 2
DETECTED ANALYTES IN SOIL

Area		East Side								
Exploration Designation:	**MTCA**	**GP-15**		**GP-16**		**GP-17**		**GP-18**	**GP-19**	**GP-20**
Sample Number	**Method A**	**GP-15:5.0**	**GP-15:12.0**	**GP-16:8.0**	**GP-16:11.5**	**GP-17:6.0**	**GP-17:14.0**	**GP-18:11.0**	**GP-19:11.0**	**GP-20:4.0**
Sample Depth (feet)	**Cleanup**	**5**	**12**	**8**	**11.5**	**6**	**14**	**11**	**11**	**4**
ANALYTE	**Level**									
Petroleum Hydrocarbons (mg/kg)										
Gasoline Range Organics	100	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lube Oil	2000	NA	NA	NA	NA	NA	NA	NA	NA	NA
VOCs (mg/kg)										
Acetone		NA	NA	0.0023 U	NA	NA	NA	NA	NA	NA
Carbon Disulfide		NA	NA	0.00046 U	NA	NA	NA	NA	NA	NA
Ethylbenzene	6	NA	NA	0.00046 U	NA	NA	NA	NA	NA	NA
m, p-Xylene	9	NA	NA	0.00092 U	NA	NA	NA	NA	NA	NA
o-Xylene	9	NA	NA	0.00046 U	NA	NA	NA	NA	NA	NA
Isopropylbenzene		NA	NA	0.00046 U	NA	NA	NA	NA	NA	NA
n-Propylbenzene		NA	NA	0.00046 U	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene		NA	NA	0.0046	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene		NA	NA	0.0013	NA	NA	NA	NA	NA	NA
Sec-Butylbenzene		NA	NA	0.0021	NA	NA	NA	NA	NA	NA
p-Isopropyltoluene		NA	NA	0.014	NA	NA	NA	NA	NA	NA
Naphthalene	5	NA	NA	0.00046 U	NA	NA	NA	NA	NA	NA
Tetrachloroethene	0.05	**0.13**	**8.4**	**98**	**4.5**	**1.1**	0.032	0.019	**0.064**	0.0092
Trichloroethene	0.03	0.00061 U	**0.075**	0.002	**0.04**	0.0017	0.00066 U	0.00059 U	0.00058 U	0.00048 U
Vinyl Chloride		0.00061 U	0.00099	0.00046 U	0.00097 U	0.00054 U	0.00066 U	0.00059 U	0.00058 U	0.00048 U
1,1-Dichloroethene		0.00061 U	0.0013	0.00046 U	0.00097 U	0.00054 U	0.00066 U	0.00059 U	0.00058 U	0.00048 U
cis-1,2-Dichloroethene		0.00061 U	0.001	0.00046 U	0.00097 U	0.00054 U	0.00059 U	0.00059 U	0.00058 U	0.00048 U
Metals (mg/kg)										
Chromium	2,000	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 2
DETECTED ANALYTES IN SOIL

Area		East Side						West Side	
Exploration Designation:	MTCA	GP-20	GP-21		GP-22			MW-1	
Sample Number	Method A	GP-20:9.0	GP-21:6.0	GP-21:12.0	GP-22:5.5	GP-22:13.0	STKP:1	SW-MW1-11:13	SW-MW1-11:25
Sample Depth (feet)	Cleanup	9	6	12	5.5	13	grab	13	25
ANALYTE	Level								
Petroleum Hydrocarbons (mg/kg)									
Gasoline Range Organics	100	NA	NA	NA	NA	NA	NA	5.6 U	6.3 U
Lube Oil	2000	NA	NA	NA	NA	NA	NA	54 U	58 U
VOCs (mg/kg)									
Acetone		NA	NA	NA	NA	NA	NA	0.0092	0.0058 U
Carbon Disulfide		NA	NA	NA	NA	NA	NA	0.0014	0.0012 U
Ethylbenzene	6	NA	NA	NA	NA	NA	NA	0.0012 U	0.0012 U
m, p-Xylene	9	NA	NA	NA	NA	NA	NA	0.0023 U	0.0023 U
o-Xylene	9	NA	NA	NA	NA	NA	NA	0.0012 U	0.0012 U
Isopropylbenzene		NA	NA	NA	NA	NA	NA	0.0012 U	0.0012 U
n-Propylbenzene		NA	NA	NA	NA	NA	NA	0.0012 U	0.0012 U
1,3,5-Trimethylbenzene		NA	NA	NA	NA	NA	NA	0.003	0.0012 U
1,2,4-Trimethylbenzene		NA	NA	NA	NA	NA	NA	0.004	0.0012 U
Sec-Butylbenzene		NA	NA	NA	NA	NA	NA	0.0012 U	0.0012 U
p-Isopropyltoluene		NA	NA	NA	NA	NA	NA	0.0012	0.0012 U
Naphthalene	5	NA	NA	NA	NA	NA	NA	0.0012 U	0.0012 U
Tetrachloroethene	0.05	0.036	**0.18**	**1**	0.0036	0.0023	0.017	0.0012 U	0.0012 U
Trichloroethene	0.03	0.00063 U	0.00053 U	0.0011	0.00065 U	0.0019	0.00054 U	0.0012 U	0.0012 U
Vinyl Chloride		0.00063 U	0.00053 U	0.00058 U	0.00065 U	0.00057 U	0.00054 U	0.0012 U	0.0012 U
1,1-Dichloroethene		0.00063 U	0.00053 U	0.00058 U	0.00065 U	0.00057 U	0.00054 U	0.0012 U	0.0012 U
cis-1,2-Dichloroethene		0.00063 U	0.00053 U	0.00058 U	0.00065 U	0.00057 U	0.00054 U	0.0012 U	0.0012 U
Metals (mg/kg)									
Chromium	2,000	NA	NA	NA	NA	NA	NA	33	28

TABLE 2
DETECTED ANALYTES IN SOIL

Area		East Side				
Exploration Designation:	MTCA	MW-2				
Sample Number	Method A	SW-MW2-11:5	SW-MW2-11:10	SW-MW2-11:16.5	SW-MW2-11:20	SW-MW2-11:25
Sample Depth (feet)	Cleanup	5	10	16.5	20	25
ANALYTE	Level					
Petroleum Hydrocarbons (mg/kg)						
Gasoline Range Organics	100	NA	NA	6.1 U	NA	6.3 U
Lube Oil	2000	NA	NA	58 U	NA	61 U
VOCs (mg/kg)						
Acetone		NA	NA	0.025	NA	0.007 U
Carbon Disulfide		NA	NA	0.0018	NA	0.0014 U
Ethylbenzene	6	NA	NA	0.0015 U	NA	0.0014 U
m, p-Xylene	9	NA	NA	0.003 U	NA	0.0028 U
o-Xylene	9	NA	NA	0.0015 U	NA	0.0014 U
Isopropylbenzene		NA	NA	0.0015 U	NA	0.0014 U
n-Propylbenzene		NA	NA	0.0015 U	NA	0.0014 U
1,3,5-Trimethylbenzene		NA	NA	0.0015 U	NA	0.0014 U
1,2,4-Trimethylbenzene		NA	NA	0.0015 U	NA	0.0014 U
Sec-Butylbenzene		NA	NA	0.0015 U	NA	0.0014 U
p-Isopropyltoluene		NA	NA	0.0015 U	NA	0.0014 U
Naphthalene	5	NA	NA	0.0015 U	NA	0.0014 U
Tetrachloroethene	0.05	0.00089 U	0.0012 U	0.0015 U	0.0017 U	0.0014 U
Trichloroethene	0.03	0.00089 U	0.0012 U	0.0015 U	0.0017 U	0.0014 U
Vinyl Chloride		0.00089 U	0.0012 U	0.0015 U	0.0017 U	0.0014 U
1,1-Dichloroethene		0.00089 U	0.0012 U	0.0015 U	0.0017 U	0.0014 U
cis-1,2-Dichloroethene		0.00089 U	0.0012 U	0.0015 U	0.0017 U	0.0014 U
Metals (mg/kg)						
Chromium	2,000	NA	NA	30	NA	35

TABLE 2
DETECTED ANALYTES IN SOIL

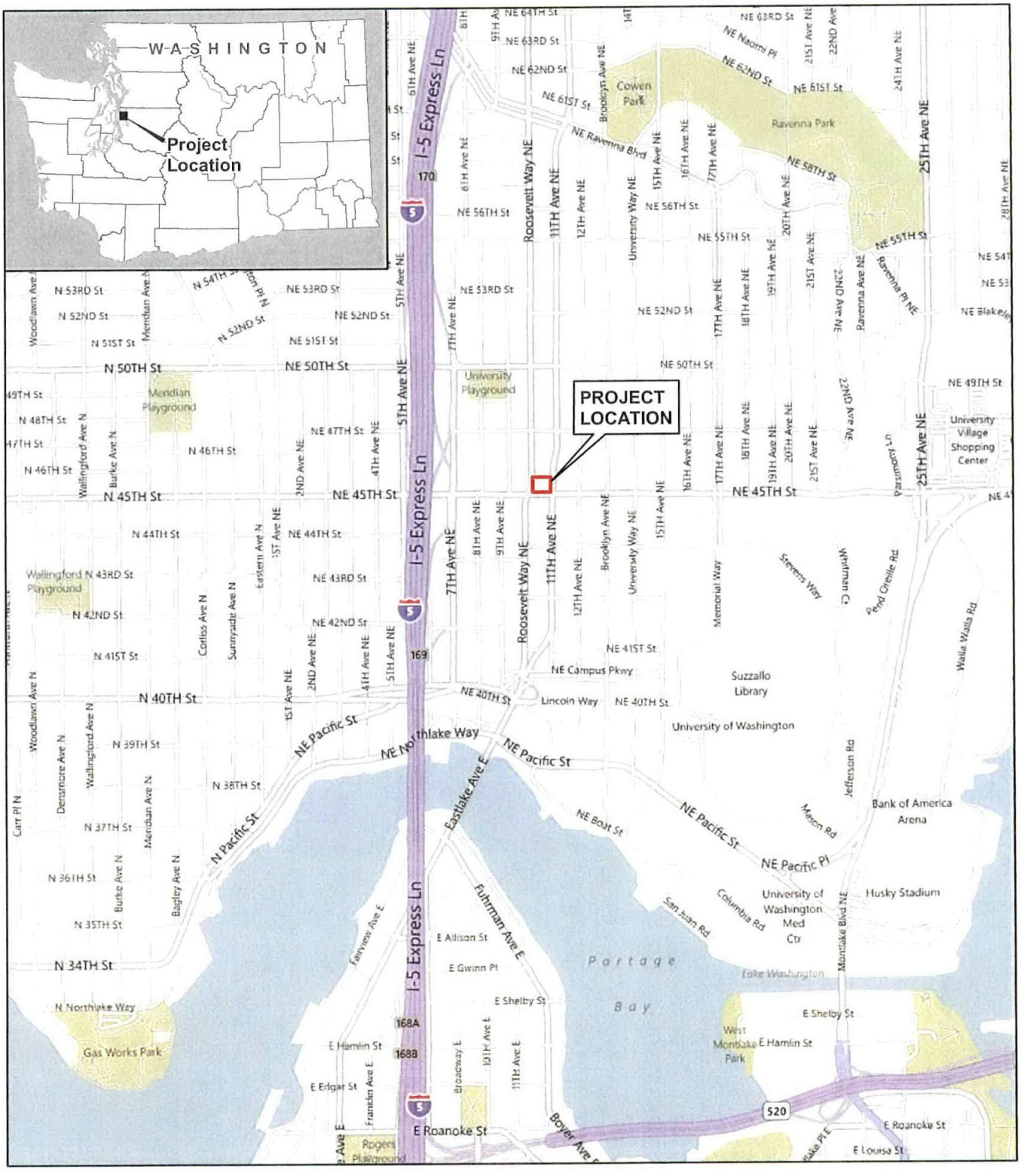
Area		East Side					
Exploration Designation:	MTCA	MW-3					
Sample Number	Method A	SW-MW3-11:5	SW-MW3-11:10	SW-MW3-11:18	SW-MW3-11:25	SW-MW3-11:30	SW-MW3-11:35
Sample Depth (feet)	Cleanup	5	10	18	25	30	35
ANALYTE	Level						
Petroleum Hydrocarbons (mg/kg)							
Gasoline Range Organics	100	NA	6.6 U	6.3 U	NA	NA	NA
Lube Oil	2000	NA	60 U	59 U	NA	NA	NA
VOCs (mg/kg)							
Acetone		NA	0.0093	0.0068 U	NA	NA	NA
Carbon Disulfide		NA	0.0028	0.0014 U	NA	NA	NA
Ethylbenzene	6	NA	0.001 U	0.0014 U	NA	NA	NA
m, p-Xylene	9	NA	0.0021 U	0.0027 U	NA	NA	NA
o-Xylene	9	NA	0.001 U	0.0014 U	NA	NA	NA
Isopropylbenzene		NA	0.001 U	0.0014 U	NA	NA	NA
n-Propylbenzene		NA	0.001 U	0.0014 U	NA	NA	NA
1,3,5-Trimethylbenzene		NA	0.001 U	0.0014 U	NA	NA	NA
1,2,4-Trimethylbenzene		NA	0.001 U	0.0014 U	NA	NA	NA
Sec-Butylbenzene		NA	0.001 U	0.0014 U	NA	NA	NA
p-Isopropyltoluene		NA	0.001 U	0.0014 U	NA	NA	NA
Naphthalene	5	NA	0.001 U	0.0014 U	NA	NA	NA
Tetrachloroethene	0.05	0.014	0.025	**0.096**	0.048	0.038	0.033
Trichloroethene	0.03	0.0013 U	0.0032	0.0014 U	0.0013 U	0.0016 U	0.0025 U
Vinyl Chloride		0.0013 U	0.001 U	0.0014 U	0.0013 U	0.0016 U	0.0025 U
1,1-Dichloroethene		0.0013 U	0.001 U	0.0014 U	0.0013 U	0.0016 U	0.0025 U
cis-1,2-Dichloroethene		0.0013 U	0.001 U	0.0014 U	0.0013 U	0.0016 U	0.0025 U
Metals (mg/kg)							
Chromium	2,000	NA	47	36	NA	NA	NA

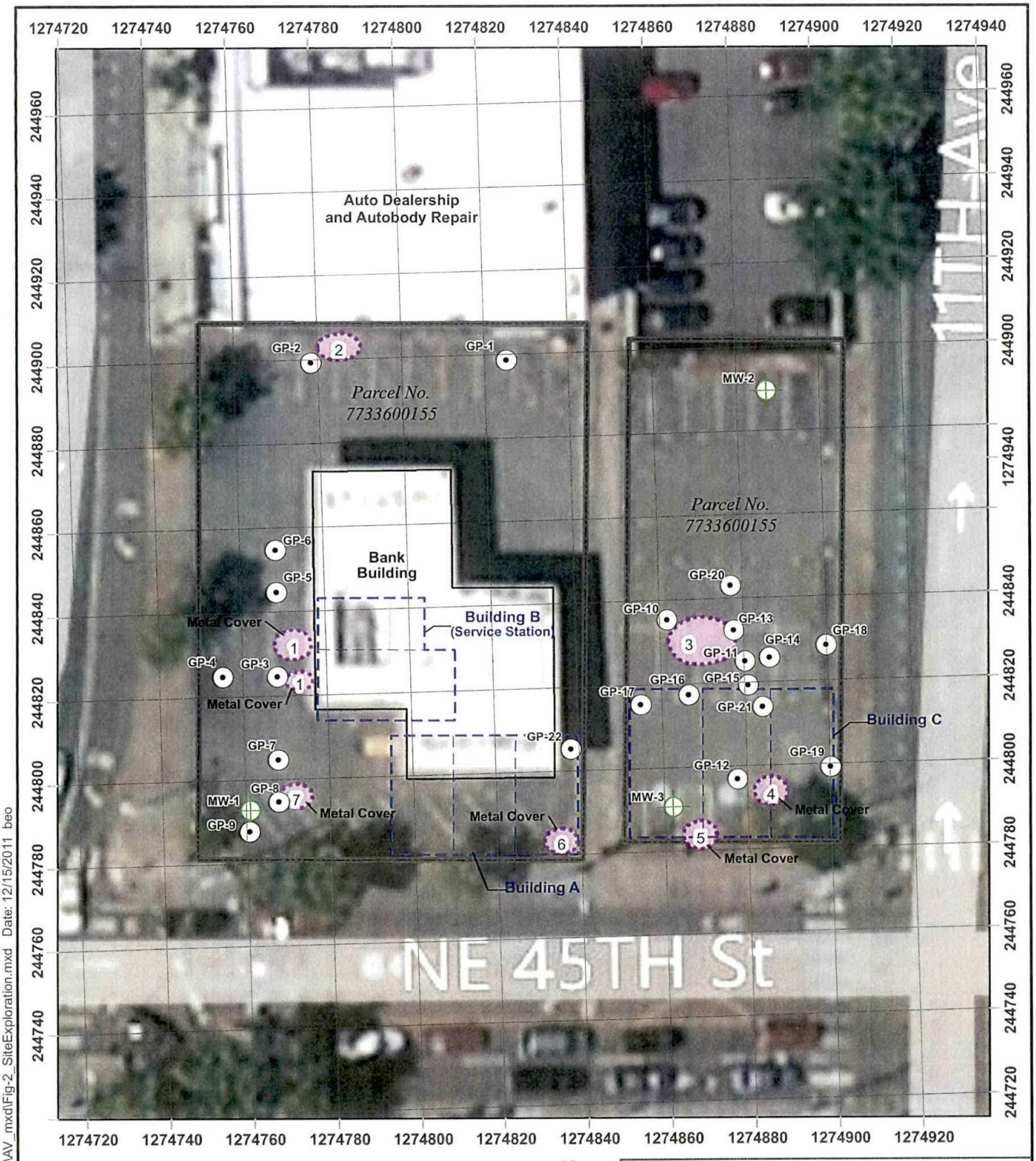
Notes: MTCA = Model Toxics Control Act
mg/kg = milligrams per kilogram
VOCs = volatile organic compounds
U = not detected at the reporting limit
NA = not analyzed
Bold = Exceeds MTCA Method A cleanup criteria

TABLE 3
DETECTED ANALYTES IN GROUNDWATER

Area		West Side		East Side	
Exploration Designation:	**MTCA**	**GP-3**	**MW-1**	**MW-2**	**MW-3**
Sample Number	**Method A**	**GP-3-11:GW**	**MW-1**	**MW-2**	**MW-3**
Sample Depth	**Cleanup**				
ANALYTE	**Level**				
Petroleum Hydrocarbons (ug/L)					
Gasoline Range Organics	800	**54000**	**1100**	400 U	160
VOCs (ug/L)					
Chloroform		10 U	0.22	0.37	1 U
Ethylbenzene	700	**1100**	17	0.2 U	1 U
m, p-Xylene	1,000	**3000**	11	0.4 U	2 U
o-Xylene	1,000	990	1.1	0.2 U	1 U
Isopropylbenzene		95	8.5	0.2 U	1 U
n-Propylbenzene		130	3.7	0.2 U	1 U
1,3,5-Trimethylbenzene		260	22	0.2 U	1 U
1,2,4-Trimethylbenzene		910	15	0.2 U	1 U
Sec-Butylbenzene		14	2.9	0.2 U	1 U
tert-Butylbenzene		10 U	1	0.2 U	1 U
p-Isopropyltoluene		20	2.3	0.2 U	1 U
Naphthalene	160	**320**	2.2	1 U	5 U
Toluene	1,000	150	1 U	1 U	5 U
Tetrachloroethene	5	**11**	0.2 U	0.2 U	**130**
Trichloroethene	5	10 U	0.2 U	0.2 U	1.8
cis-1,2-Dichloroethene		44	0.2 U	0.2 U	1 U
Metals (ug/L)					
Arsenic (total)	5	NA	**9.9**	4.6	NA
Chromium (total)	50	NA	**78**	32	NA
Lead (total)	15	NA	10	5.2	NA

Notes: MTCA = Model Toxics Control Act
ug/L = micrograms per Liter
VOCs = volatile organic compounds
U = not detected at the reporting limit
NA = not analyzed
Bold = Exceeds MTCA Method A cleanup criteria


WASHINGTON
Project Location
PROJECT LOCATION
I-5 Express Ln
Roosevelt Way NE
11TH Ave NE
7TH Ave NE
5TH Ave NE
25TH Ave NE
N 50TH St
NE 50TH St
N 45TH St
NE 45TH St
N 40TH St
NE 40TH St
NE 41ST St
NE 42ND St
NE 43RD St
NE 44TH St
NE 47TH St
N 46TH St
NE 53RD St
NE 52ND St
NE 51ST St
NE 62ND St
NE 61ST St
NE 63RD St
NE 64TH St
NE 56TH St
NE 55TH St
NE 58TH St
NE Ravenna Blvd
NE Campus Pkwy
Lincoln Way
NE Pacific St
NE Northlake Way
N Pacific St
NE Boat St
NE Pacific Pl
Eastlake Ave E
Fuhrman Ave E
E Allison St
E Gwinn Pl
E Shelby St
E Hamlin St
E Edgar St
E Roanoke St
Boyer Ave E
Montlake Blvd NE
Columbia Rd
San Juan Rd
Mason Rd
Jefferson Rd
Memorial Way
Stevens Way
Pend Oreille Rd
Walla Walla Rd
Brooklyn Ave NE
University Way NE
15TH Ave NE
16TH Ave NE
17TH Ave NE
18TH Ave NE
19TH Ave NE
20TH Ave NE
21ST Ave NE
22ND Ave NE
Ravenna Ave NE
Ravenna Pl NE
Parsmary Ln
Ravenna Park
Cowen Park
University Playground
Meridian Playground
Wallingford N 43RD St Playground
Gas Works Park
Rogers Playground
West Montlake Park
Suzzallo Library
University of Washington
University of Washington Med Ctr
Husky Stadium
Bank of America Arena
University Village Shopping Center
Portage Bay
Lake Washington
520
168A
168B
169
170
5
(c) 2010 Microsoft Corporation and its data suppliers
N
W
E
S
0
1,500
3,000
Feet
Sound Transit
Former Key Bank
Seattle, Washington
VICINITY MAP
January 2012
21-1-16604-005
SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS
FIG. 1
Filename: T:\Project\21-1116604_NE45TH\AV_mxd\Fig-1_VicinityMap.mxd Date: 12/15/2011 beo



LEGEND

Geoprobe

Monitoring Well

Historic Building

Subsurface Anomaly

Parcel Boundary

Gridline coordinates are in WA State Plane North feet (NAD83)

0 25 50 Feet

N W E S

Sound Transit
Former Key Bank
Seattle, Washington

SITE AND EXPLORATION PLAN

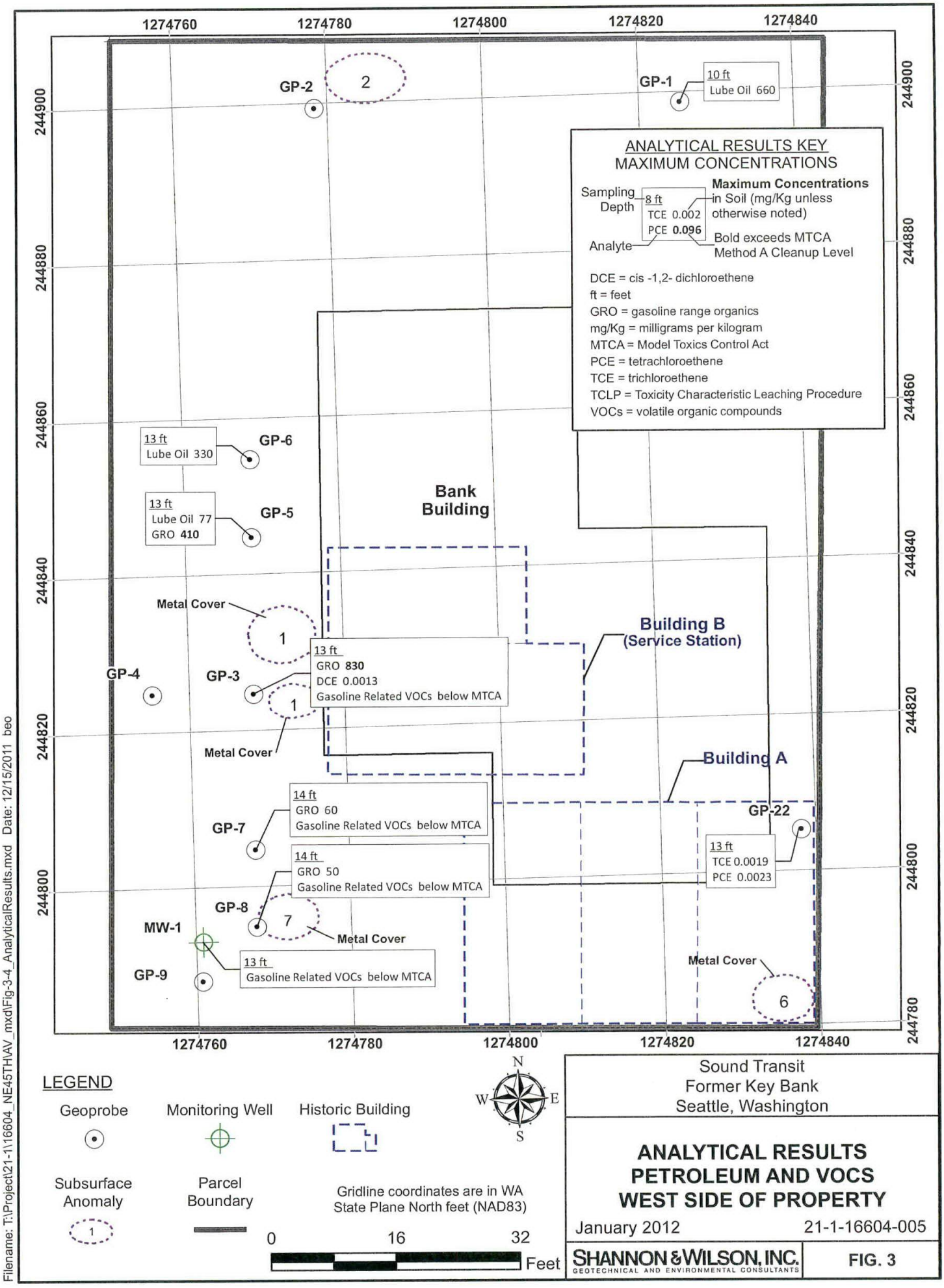
January 2012

21-1-16604-005

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 2

Filename: T:\Project\21-1\16604_NE45THAV_mxd\Fig-2_SiteExploration.mxd Date: 12/15/2011 beo



Sound Transit
Former Key Bank
Seattle, Washington

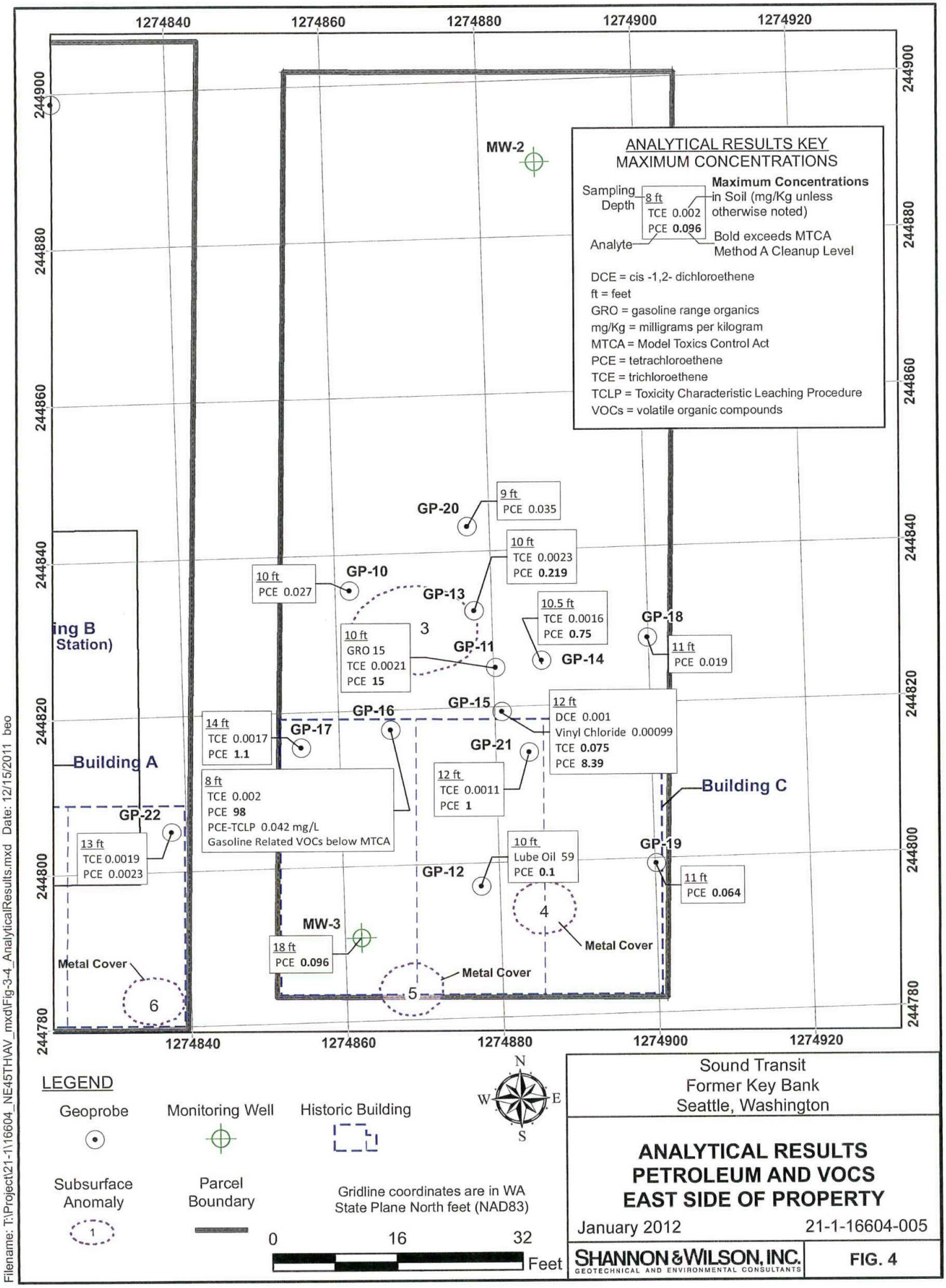
ANALYTICAL RESULTS PETROLEUM AND VOCS WEST SIDE OF PROPERTY

January 2012 21-1-16604-005

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 3

Filename: T:\Project\21-1\16604_NE45TH\AV_mxd\Fig-3-4_AnalyticalResults.mxd Date: 12/15/2011 beo



Sound Transit
Former Key Bank
Seattle, Washington

ANALYTICAL RESULTS PETROLEUM AND VOCS EAST SIDE OF PROPERTY

January 2012 21-1-16604-005

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 4

Filename: T:\Project\21-1\16604_NE45THAV_mxd\Fig-3-4_AnalyticalResults.mxd Date: 12/15/2011 beo

Appendix E

APPENDIX E

SHELL OIL – SITE INVESTIGATION DATA

NE 45TH STREET

11TH AVENUE NE

ALLEY

FORMER DISPENSER ISLAND
PLANTER
SIGN
MW-2
PLANTER
LAMP
PLANTER
UST VENTS
MW-28
USTS
FORMER USTS
PAY PHONES
GP-2
GP-1
V-1
MW-12
RW-2
MW-11
APPROXIMATE LOCATION OF FORMER HOIST
C.B.
C.B.
SELF-SERVE PROPANE KIOSK
MW-21
SB-21
FORMER DISPENSER ISLAND
DISPENSER ISLANDS
FORMER DISPENSER ISLANDS
UST VENTS
FORMER WASTE OIL TANK
CANOPY
RW-1
STATION BUILDING
APPROXIMATE LOCATION OF FORMER STATION BUILDING (1979?-1992)
MW-10
FORMER HEATING OIL TANKS
MW-20
MW-1
APPROXIMATE LOCATION OF FORMER STATION BUILDING (1950-1979?)
LAMP
C.B.
MW-26
AIR/WATER STATION
TWIN 2,000 GALLON WATER TANKS FOR CAR WASH
MW-17
MW-13
VACUUM
OIL/WATER SEPARATOR
PLANTER
CAR WASH
SB-14
MW-27
MW-22
C.B.
PLANTER
FORMER TREATMENT SYSTEM PIPING
FORMER TREATMENT SYSTEM
MW-24
MW-15
MW-23
MW-25
MW-16

0 15 30ft

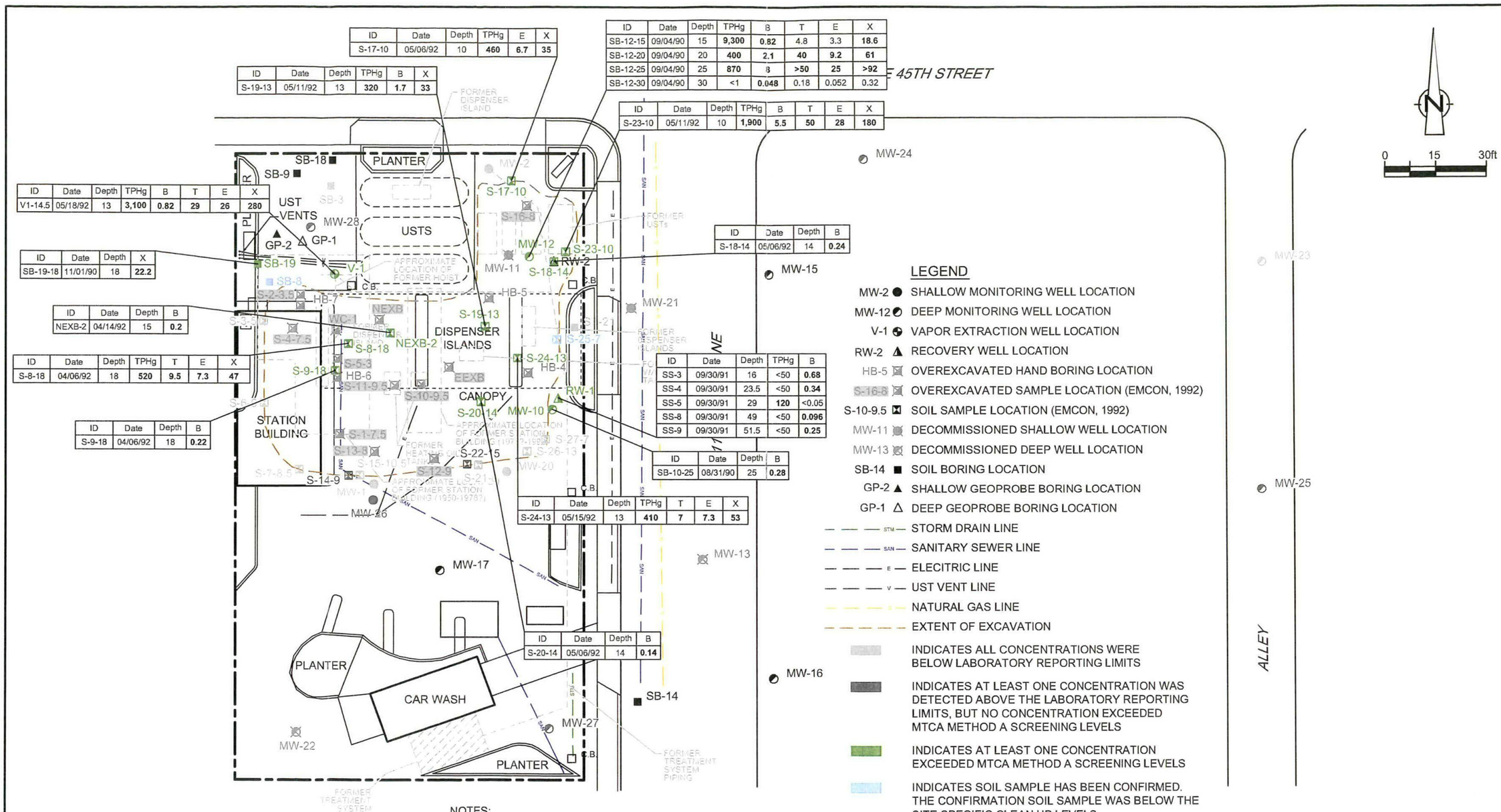
LEGEND

- MW-2 ● SHALLOW MONITORING WELL LOCATION
- MW-12 ◐ DEEP MONITORING WELL LOCATION
- V-1 ◓ VAPOR EXTRACTION WELL LOCATION
- RW-2 ◭ RECOVERY WELL LOCATION
- MW-11 ⊠ DECOMMISSIONED SHALLOW WELL LOCATION
- MW-13 ⊠ DECOMMISSIONED DEEP WELL LOCATION
- SB-14 ■ SOIL BORING LOCATION
- GP-2 ▲ SHALLOW GEOPROBE BORING LOCATION
- GP-1 △ DEEP GEOPROBE BORING LOCATION
- STM STORM DRAIN LINE
- SAN SANITARY SEWER LINE
- E ELECITRIC LINE
- V UST VENT LINE
- NATURAL GAS LINE
- EXTENT OF EXCAVATION

figure 2

SITE PLAN
SHELL-BRANDED WHOLESALE FACILITY
1013 NORTHEAST 45TH STREET
Seattle, Washington

BASEMAP MODIFIED FROM DRAWING PROVIDED BY SECOR; WELL LOCATIONS BY STATEWIDE LAND SURVEYING INC., 04/23/11.



ID	Date	Depth	TPHg	E	X
S-17-10	05/06/92	10	**460**	**6.7**	**35**

ID	Date	Depth	TPHg	B	X
S-19-13	05/11/92	13	**320**	**1.7**	**33**

ID	Date	Depth	TPHg	B	T	E	X
SB-12-15	09/04/90	15	**9,300**	**0.82**	4.8	3.3	**18.6**
SB-12-20	09/04/90	20	**400**	**2.1**	**40**	**9.2**	**61**
SB-12-25	09/04/90	25	**870**	**8**	**>50**	**25**	**>92**
SB-12-30	09/04/90	30	<1	**0.048**	0.18	0.052	0.32

ID	Date	Depth	TPHg	B	T	E	X
S-23-10	05/11/92	10	**1,900**	**5.5**	**50**	**28**	**180**

ID	Date	Depth	TPHg	B	T	E	X
V1-14.5	05/18/92	13	**3,100**	**0.82**	**29**	**26**	**280**

ID	Date	Depth	B
S-18-14	05/06/92	14	**0.24**

ID	Date	Depth	X
SB-19-18	11/01/90	18	**22.2**

ID	Date	Depth	B
NEXB-2	04/14/92	15	**0.2**

ID	Date	Depth	TPHg	T	E	X
S-8-18	04/06/92	18	**520**	**9.5**	**7.3**	**47**

ID	Date	Depth	TPHg	B
SS-3	09/30/91	16	<50	**0.68**
SS-4	09/30/91	23.5	<50	**0.34**
SS-5	09/30/91	29	**120**	<0.05
SS-8	09/30/91	49	<50	**0.096**
SS-9	09/30/91	51.5	<50	**0.25**

ID	Date	Depth	B
S-9-18	04/06/92	18	**0.22**

ID	Date	Depth	B
SB-10-25	08/31/90	25	**0.28**

ID	Date	Depth	TPHg	T	E	X
S-24-13	05/15/92	13	**410**	**7**	**7.3**	**53**

ID	Date	Depth	B
S-20-14	05/06/92	14	**0.14**

LEGEND

- MW-2 ● SHALLOW MONITORING WELL LOCATION
- MW-12 ◐ DEEP MONITORING WELL LOCATION
- V-1 ◓ VAPOR EXTRACTION WELL LOCATION
- RW-2 ▲ RECOVERY WELL LOCATION
- HB-5 ▣ OVEREXCAVATED HAND BORING LOCATION
- S-16-8 ▣ OVEREXCAVATED SAMPLE LOCATION (EMCON, 1992)
- S-10-9.5 ▣ SOIL SAMPLE LOCATION (EMCON, 1992)
- MW-11 ⊠ DECOMMISSIONED SHALLOW WELL LOCATION
- MW-13 ⊠ DECOMMISSIONED DEEP WELL LOCATION
- SB-14 ■ SOIL BORING LOCATION
- GP-2 ▲ SHALLOW GEOPROBE BORING LOCATION
- GP-1 △ DEEP GEOPROBE BORING LOCATION
- STM STORM DRAIN LINE
- SAN SANITARY SEWER LINE
- E ELECITRIC LINE
- V UST VENT LINE
- NG NATURAL GAS LINE
- EXTENT OF EXCAVATION

INDICATES ALL CONCENTRATIONS WERE BELOW LABORATORY REPORTING LIMITS

INDICATES AT LEAST ONE CONCENTRATION WAS DETECTED ABOVE THE LABORATORY REPORTING LIMITS, BUT NO CONCENTRATION EXCEEDED MTCA METHOD A SCREENING LEVELS

INDICATES AT LEAST ONE CONCENTRATION EXCEEDED MTCA METHOD A SCREENING LEVELS

INDICATES SOIL SAMPLE HAS BEEN CONFIRMED. THE CONFIRMATION SOIL SAMPLE WAS BELOW THE SITE SPECIFIC CLEAN UP LEVELS

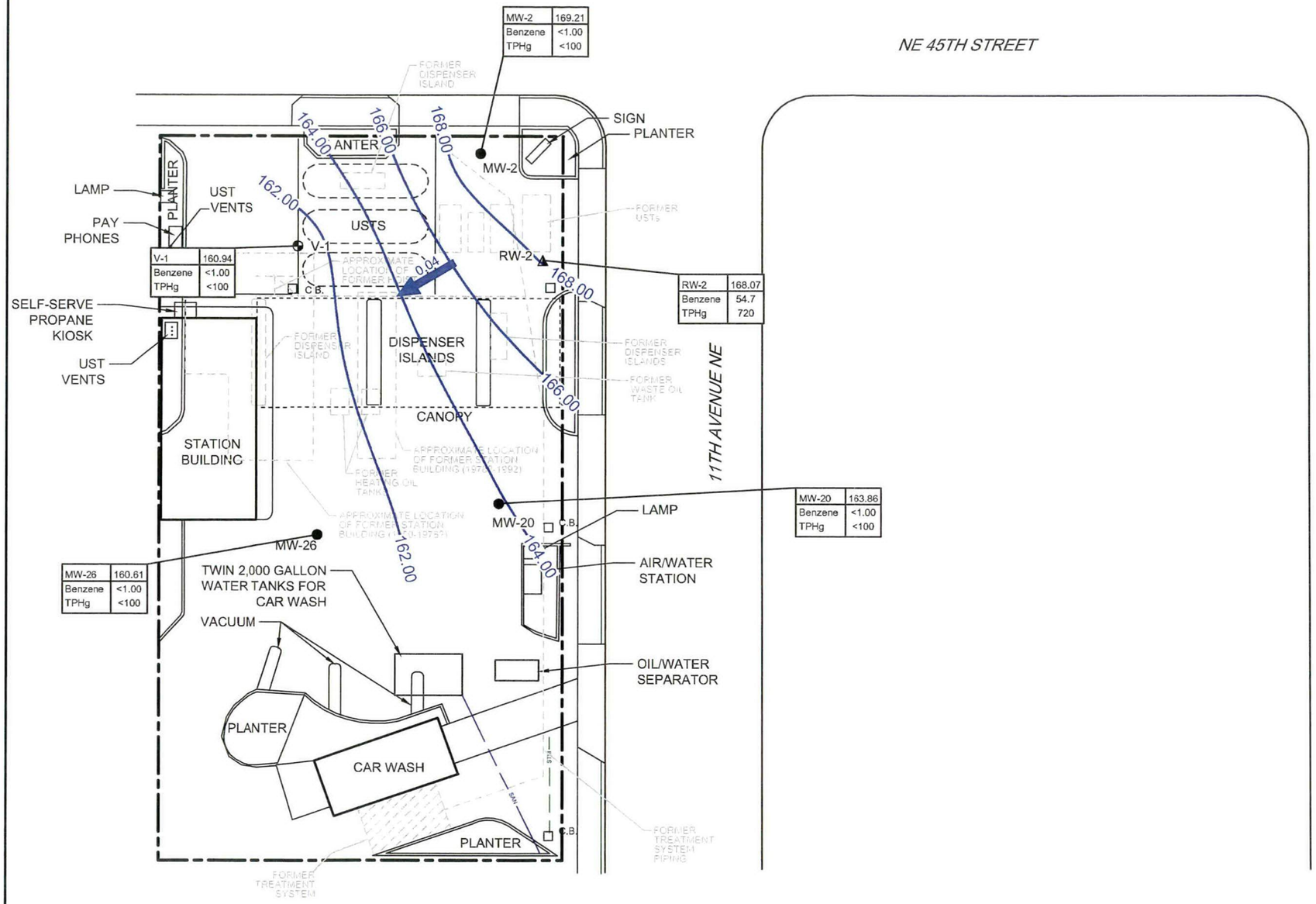
NOTES:

1. ALL RESULTS IN MILLIGRAMS PER KILOGRAM (MG/KG)
2. <X = NOT DETECTED AT LABORATORY REPORTING LIMIT X
3. TPHG = TOTAL PETROLEUM HYDROCARBONS AS GASOLINE
4. B = BENZENE
5. T = TOLUENE
6. E = ETHYLBENZENE
7. X = TOTAL XYLENES
8. CONCENTRATIONS IN BOLD EXCEED MODEL TOXICS CONTROL ACT (MTCA) METHOD A CLEANUP LEVELS
9. ID = SOIL SAMPLE IDENTIFICATION NUMBER
10. DEPTH IN FEET BELOW GROUND SURFACE
11. LOCATION SB-14 ONLY SAMPLED FOR BTEX IN WATER; NO SOIL SAMPLES COLLECTED
12. NO SOIL SAMPLES COLLECTED FOR LOCATIONS MW-15, MW-16, MW-17, SB-18, MW-21, AND RW-2

BASEMAP MODIFIED FROM DRAWING PROVIDED BY SECOR

figure 3

SOIL INVESTIGATION DATA MAP
SHELL-BRANDED WHOLESALE FACILITY
1013 NORTHEAST 45TH STREET
Seattle, Washington



LEGEND

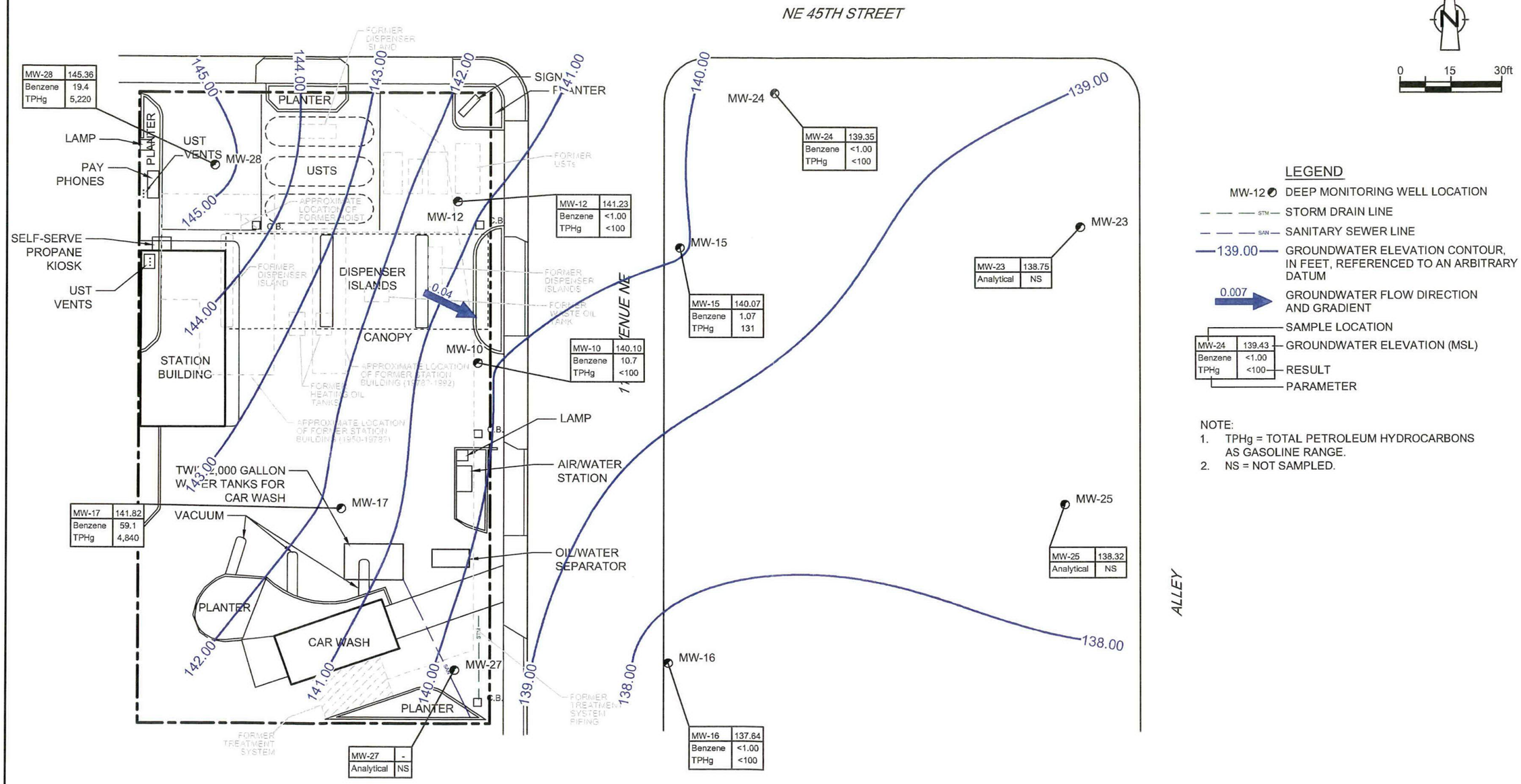
- MW-2 ● SHALLOW MONITORING WELL LOCATION
- V-1 ◔ VAPOR EXTRACTION WELL LOCATION
- RW-2 ▲ RECOVERY WELL LOCATION
- STM STORM DRAIN LINE
- SAN SANITARY SEWER LINE
- 166.00 GROUNDWATER ELEVATION CONTOUR, IN FEET, REFERENCED TO AN ARBITRARY DATUM
- 0.08 GROUNDWATER FLOW DIRECTION AND GRADIENT
- SAMPLE LOCATION
- MW-20 | 164.46 — GROUNDWATER ELEVATION (MSL)
- Benzene | <1.00
- TPHg | <100 — RESULT
- PARAMETER

NOTE:
1. TPHg = TOTAL PETROLEUM HYDROCARBONS AS GASOLINE RANGE.
2. NS = NOT SAMPLED.

figure 4A

GROUNDWATER CONTOUR AND CHEMICAL CONCENTRATION MAP - SHALLOW ZONE - AUGUST 12, 2011
SHELL-BRANDED WHOLESALE FACILITY
1013 NORTHEAST 45TH STREET
Seattle, Washington

BASEMAP MODIFIED FROM DRAWING PROVIDED BY SECOR



LEGEND

- MW-12 — DEEP MONITORING WELL LOCATION
- STM — STORM DRAIN LINE
- SAN — SANITARY SEWER LINE
- 139.00 — GROUNDWATER ELEVATION CONTOUR, IN FEET, REFERENCED TO AN ARBITRARY DATUM
- 0.007 — GROUNDWATER FLOW DIRECTION AND GRADIENT
- SAMPLE LOCATION
- MW-24 / 139.43 / Benzene <1.00 / TPHg <100 — GROUNDWATER ELEVATION (MSL); RESULT; PARAMETER

NOTE:
1. TPHg = TOTAL PETROLEUM HYDROCARBONS AS GASOLINE RANGE.
2. NS = NOT SAMPLED.

figure 4B

GROUNDWATER CONTOUR AND CHEMICAL CONCENTRATION MAP - DEEP ZONE - AUGUST 12, 2011
SHELL-BRANDED WHOLESALE FACILITY
1013 NORTHEAST 45TH STREET
Seattle, Washington

BASEMAP MODIFIED FROM DRAWING PROVIDED BY SECOR

241831-95(009)GN-WA003 NOV 04/2011

STATEWIDE LAND SURVEYING INC.

Coordinate System		UTM Zone	Vertical Datum	Quad Map	Station No.	Address	
Nad 83/Cors 96		10	NAVD 88	Seattle North	Shell	1013 NE 45th St	
Washinton North 4601						Seattle, Wa	
US Survey Feet							
Well	**Northing (Y)**	**Easting (X)**	**Latitude**	**Longitude**	**El. Surface**	**El. Rim**	**El. PVC**
MW-2	244704.82	1274872.35	N47°39'40.281"	W122°19'00.519"	176.03	176.01	175.60
MW-10	244629.78	1274889.57	N47°39'39.544"	W122°19'00.247"	173.65	173.64	173.13
MW-12	244677.23	1274884.04	N47°39'40.011"	W122°19'00.341"	174.92	174.90	173.60
MW-12A	244677.32	1274883.68	N47°39'40.012"	W122°19'00.346"	174.92	174.90	173.95
MW-15	244663.79	1274948.73	N47°39'39.891"	W122°18'59.392"	173.81	173.81	173.38
MW-16	244541.22	1274945.41	N47°39'38.680"	W122°18'59.406"	169.96	169.98	169.46
MW-17	244586.70	1274849.75	N47°39'39.111"	W122°19'00.816"	173.21	173.20	172.76
MW-20	244614.92	1274876.79	N47°39'39.395"	W122°19'00.429"	174.03	174.02	173.64
MW-23	244670.03	1275065.87	N47°39'39.974"	W122°18'57.683"	177.04	177.02	176.76
MW-24	244709.34	1274976.42	N47°39'40.345"	W122°18'59.001"	175.81	175.83	175.33
MW-25	244588.23	1275061.28	N47°39'39.166"	W122°18'57.727"	174.49	174.51	174.18
MW-26	244606.94	1274830.90	N47°39'39.307"	W122°19'01.097"	175.11	175.08	174.67
MW-27	244539.04	1274882.95	N47°39'38.647"	W122°19'00.318"	170.01	170.00	169.60
MW-28	244687.96	1274812.16	N47°39'40.103"	W122°19'01.394"	177.44	177.39	176.89
RW-2	244677.48	1274888.10	N47°39'40.014"	W122°19'00.282"	174.78	174.78	173.56
V-1	244681.11	1274825.80	N47°39'40.038"	W122°19'01.193"	176.60	176.60	176.10

227 N. Main Ave. Gresham, Or 97030
www.statewidesurveying.com survey@statewidesurveying.com
(o) 503.665-7777 (f) 503-665.7988

LOG OF EXPLORATORY BORING

PROJECT NAME	Shell/Texaco	BORING NO.	SB-15
LOCATION	1013 NE 45th Street, Seattle, Washington	PAGE	1 OF 2
DRILLED BY	McDonald Holt	REFERENCE ELEV.	97.16'
DRILL METHOD	H.S. Auger	TOTAL DEPTH	40.00'
LOGGED BY	Steve Nelson	DATE COMPLETED	10/29/90

SAMPLE NUMBER/ METHOD	PID (in ppm)	BLOW COUNTS	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHO-LOGIC COLUMN	WELL DETAILS	LITHOLOGIC DESCRIPTION
								0 - 1 feet: CONCRETE.
								1 - 5 feet: SANDY with GRAVEL (SM), brown, fine to medium, fine subrounded gravel, dense, moist. (FILL)
				5				5 - 26 feet: SANDY SILT with GRAVEL (ML), brown to grey, non- to low-plasticity fines, fine to medium sand, fine to medium gravel, hard, dry. (TILL)
SB/1	--	75						
SB/2	0	50		10				-- @ 10 feet: density decreases, sand increases, gravel decreases.
SB/3	0	50		15				
SB/4	0	26 50		20				

REMARKS
1) SB = Split barrel samples collected using a modified Dames and Moore 2.5" OD core barrel using a 140# hammer. 2) Blow counts do not represent Standard Penetration Test results. 3) MW-15 was installed in SB-15. 4) PID = Model 580B photoionization detector.

LOG OF EXPLORATORY BORING

PROJECT NAME	Shell/Texaco	BORING NO.	SB-15
LOCATION	1013 NE 45th Street, Seattle, Washington	PAGE	2 OF 2
DRILLED BY	McDonald Holt	REFERENCE ELEV.	97.16'
DRILL METHOD	H.S. Auger	TOTAL DEPTH	40.00'
LOGGED BY	Steve Nelson	DATE COMPLETED	10/29/90

SAMPLE NUMBER/ METHOD	PID (in ppm)	BLOW COUNTS	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHO-LOGIC COLUMN	WELL DETAILS	LITHOLOGIC DESCRIPTION
				25				26 - 40 feet: SAND (SP), brown to grey, fine to medium, dense, wet below 34 feet. (ALLUVIUM)
SB/5	0	31 50						
				30				WELL COMPLETION DETAILS 0.5 - 29 feet: 2-inch Schedule 40 PVC blank riser 29 - 39 feet: 2-inch Schedule 40 PVC 0.010" slotted screen 39 - 39.2 feet: 2-inch Schedule 40 PVC end cap 0 - 1 feet: Concrete 1 - 27 feet: Wyo-Ben bentonite slurry 27 - 40 feet: 10x20 Colorado silica sand
SB/6	0	30 50	▽					
				35				
SB/7	0	24 50		40				Bottom of boring at 40 feet.

REMARKS

1) SB = Split barrel samples collected using a modified Dames and Moore 2.5" OD core barrel using a 140# hammer. 2) Blow counts do not represent Standard Penetration Test results. 3) MW-15 was installed in SB-15. 4) PID = Model 580B photoionization detector.

LOG OF EXPLORATORY BORING

PROJECT NAME	Shell/University	BORING NO.	MW-23
LOCATION	1013 Northeast 45th Street, Seattle, WA	PAGE	1 OF 3
DRILLED BY	Holt Testing, Inc.	REFERENCE ELEV.	97.39'
DRILL METHOD	H.S. Auger	TOTAL DEPTH	51.50'
LOGGED BY	Jeff Kirtland	DATE COMPLETED	08/02/91

SAMPLING METHOD AND NUMBER	PID READING (ppm)	BLOWS PER 6-INCHES	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHO-LOGIC COLUMN	WELL DETAILS	LITHOLOGIC DESCRIPTION
G-1								0 to 0.5 foot: CONCRETE.
								0.5 to 14.0 feet: GRAVELLY SAND (SW-SM), brown, fine to coarse, little to few fine to coarse rounded gravel, few to trace fines, few organic debris, trace cobbles, damp, dense to very dense. Becoming more gravelly at 10 feet. (FILL)
SB-2	2.5	50/2"		5				
SB-3	2.2	37-50/3"		10				
								14.0 to 20.0 feet: SANDY GRAVEL (GW), gray, brown, fine to coarse, some fine to coarse sand, trace fines, trace cobbles, damp, very dense.
SB-4	< 1	50/5"		15				
				20				

REMARKS

(1) Blow counts do not represent Standard Penetration Test results. (2) SB = 2.5-inch O.D. split barrel sampler with brass rings, driven by 300 lb jars. (3) PID = Photoionization detector results, in ppm. (4) G = Grab sample. (5) REFERENCE ELEVATION represents top of casing relative to a site datum. (6) ATD = At time of drilling. (7) -- = not analyzed.

LOG OF EXPLORATORY BORING

PROJECT NAME	Shell/University	BORING NO.	MW-23
LOCATION	1013 NE 45th Street, Seattle, WA	PAGE	2 OF 3
DRILLED BY	Holt Testing, Inc.	REFERENCE ELEV.	97.39'
DRILL METHOD	H.S. Auger	TOTAL DEPTH	51.50'
LOGGED BY	Jeff Kirtland	DATE COMPLETED	08/02/91

SAMPLING METHOD AND NUMBER	PID READING (ppm)	BLOWS PER 6 INCHES	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHO-LOGIC COLUMN	WELL DETAILS	LITHOLOGIC DESCRIPTION
SB-5	< 1	50/4"						20.0 to 22.5 feet: SILTY SAND (SM), gray, fine to coarse, few fine to coarse gravel, few fines, damp, very dense. (TILL)
								22.5 to 30.0 feet: SILT (ML), gray, trace fine sand, damp, very stiff.
SB-6	< 1	15-25-21		25				
SB-7	< 1	15-31-50/6"		30				30.0 to 35.0 feet: SILTY SAND (SM), gray, fine to medium, little fines, moist, very dense.
SB-8	< 1	50/4"		35				35.0 to 45.0 feet: SILT (ML), gray, trace fine sand, damp to wet, very stiff.
				40				

REMARKS

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LOG OF EXPLORATORY BORING

PROJECT NAME	Shell/University	BORING NO.	MW-23
LOCATION	1013 NE 45th Street, Seattle, WA	PAGE	3 OF 3
DRILLED BY	Holt Testing, Inc.	REFERENCE ELEV.	97.39'
DRILL METHOD	H.S. Auger	TOTAL DEPTH	51.50'
LOGGED BY	Jeff Kirtland	DATE COMPLETED	08/02/91

SAMPLING METHOD AND NUMBER	PID READING (ppm)	BLOWS PER 6 INCHES	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHOLOGIC COLUMN	WELL DETAILS	LITHOLOGIC DESCRIPTION
SB-9	2.3	28-50/5"	ATD ▽					
SB-10	2.2	50/5"		45				45.0 to 51.5 feet: SAND (SP), gray, fine to medium, trace fines, wet, very dense.
SB-11	--	15-50/6"		50				
				55				Total depth drilled = 50.0 feet. Total depth sampled = 51.5 feet WELL COMPLETION DETAILS 0.3 to 35.24 feet: 2-inch-diameter flush-threaded schedule 40 PVC blank riser pipe. 35.24 to 50.24 feet: 2-inch-diameter flush-threaded schedule 40 PVC well screen with 0.010-inch machined slots. 50.24 to 50.49 feet: 2-inch-diameter schedule 40 PVC threaded end-cap. 0 to 2.0 feet: concrete. 2.0 to 32.0 feet: cement bentonite grout. 32.0 to 33.8 feet: bentonite chips hydrated with potable water. 33.8 to 51.5 feet: 10 - 20 Colorado silica sand.
				60				

REMARKS

(1) Blow counts do not represent Standard Penetration Test results. (2) SB = 2.5-inch O.D. split barrel sampler with brass rings, driven by 300 lb jars. (3) PID = Photoionization detector results, in ppm. (4) G = Grab sample. (5) REFERENCE ELEVATION represents top of casing relative to a site datum. (6) ATD = At time of drilling. (7) -- = not analyzed.

LOG OF EXPLORATORY BORING

PROJECT NAME	Shell/University	BORING NO.	MW-24
LOCATION	1013 Northeast 45th Street, Seattle, WA	PAGE	1 OF 3
DRILLED BY	Holt Testing, Inc.	REFERENCE ELEV.	95.93'
DRILL METHOD	H.S. Auger	TOTAL DEPTH	46.00'
LOGGED BY	Jeff Kirtland	DATE COMPLETED	08/06/91

SAMPLING METHOD AND NUMBER	PID READING (ppm)	BLOWS PER 6-INCHES	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHO-LOGIC COLUMN	WELL DETAILS	LITHOLOGIC DESCRIPTION
G-1								0 to 0.4 foot: CONCRETE.
								0.4 to 5.0 feet: SILTY SAND (SM), brown, fine to coarse, little fines, little organic debris, few fine gravel, trace cobbles, damp, loose to medium dense. (FILL)
								5.0 to 6.2 feet: SAND (SW-SM), brown, fine to coarse, few fine gravel, few fines, trace organics, damp, dense to very dense.
SB-2	< 1	33-38-35		5				
								6.2 to 16.5 feet: SILTY SAND (SM), brown to gray, fine to medium, few fines, few fine to coarse rounded gravel, damp, dense to very dense. Interbedded with sandy silt.
SB-3	< 1	28-35-20		10				
SB-4	2	28-35-20		15				
								16.5 to 25.0 feet: SILT (ML), gray, few very fine sand, damp, very stiff. Interbedded with silty fine sand.
				20				

REMARKS

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LOG OF EXPLORATORY BORING

PROJECT NAME	Shell/University	BORING NO.	MW-24
LOCATION	1013 Northeast 45th Street, Seattle, WA	PAGE	2 OF 3
DRILLED BY	Holt Testing, Inc.	REFERENCE ELEV.	95.93'
DRILL METHOD	H.S. Auger	TOTAL DEPTH	46.00'
LOGGED BY	Jeff Kirtland	DATE COMPLETED	08/06/91

SAMPLING METHOD AND NUMBER	PID READING (ppm)	BLOWS PER 6-INCHES	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHO-LOGIC COLUMN	WELL DETAILS	LITHOLOGIC DESCRIPTION
SB-5	2	22-24-28						
SB-6	2	17-19-30		25				25.0 to 35.0 feet: SILTY SAND (SM), olive-gray, fine to coarse, little fines, few to trace fine to coarse gravel, moist, dense to very dense.
SB-7	14	40-50/3"		30				
SB-8	23	40-50/3"	ATD ▽	35				35.0 to 46.5 feet: SAND (SP), gray, fine to medium, few to trace fines, moist to wet, very dense.
				40				

REMARKS

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LOG OF EXPLORATORY BORING

PROJECT NAME	Shell/University	BORING NO.	MW-24
LOCATION	1013 Northeast 45th Street, Seattle, WA	PAGE	3 OF 3
DRILLED BY	Holt Testing, Inc.	REFERENCE ELEV.	95.93'
DRILL METHOD	H.S. Auger	TOTAL DEPTH	46.00'
LOGGED BY	Jeff Kirtland	DATE COMPLETED	08/06/91

SAMPLING METHOD AND NUMBER	PID READING (ppm)	BLOWS PER 6-INCHES	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHOLOGIC COLUMN	WELL DETAILS	LITHOLOGIC DESCRIPTION
SB-9	4.5	25-50/3"						
SB-10	6	10-50/2"		45				
				50				Total depth drilled = 45.0 feet. Total depth sampled = 46.0 feet.
				55				WELL COMPLETION DETAILS 0.3 to 29.5 feet: 2-inch-diameter flush-threaded schedule 40 PVC blank riser pipe. 29.5 to 44.5 feet: 2-inch-diameter flush-threaded schedule 40 PVC well screen with 0.010-inch machined slots. 44.5 to 44.8 feet: 2-inch-diameter schedule 40 PVC threaded end-cap. 0 to 2.1 feet: concrete. 2.1 to 26.3 feet: cement bentonite grout. 26.3 to 28.1 feet: bentonite chips, hydrated with potable water. 28.1 to 46.5 feet: 10 - 20 Colorado silica sand.
				60				

REMARKS

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LOG OF EXPLORATORY BORING

PROJECT NAME	Shell/University	BORING NO.	MW-25
LOCATION	1013 Northeast 45th Street, Seattle, WA	PAGE	1 OF 3
DRILLED BY	Holt Testing, Inc.	REFERENCE ELEV.	94.81'
DRILL METHOD	H.S.Auger	TOTAL DEPTH	51.00'
LOGGED BY	Jeff Kirtland	DATE COMPLETED	08/07/91

SAMPLING METHOD AND NUMBER	PID READING (ppm)	BLOWS PER 6-INCHES	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHOLOGIC COLUMN	WELL DETAILS	LITHOLOGIC DESCRIPTION
								0 to 0.5 foot: CONCRETE.
								0.5 to 2.9 feet: SILTY SAND (SM), brown, few to little silt, fine to coarse, trace fine gravel, trace root hairs, medium dense to dense, damp. Odorless. (FILL)
								2.9 to 6.5 feet: SILTY SAND (SM), red brown, few to little silt, fine to medium, trace coarse, trace fine gravel, medium dense to dense, damp, odorless. (ALLUVIUM)
				5				
								6.5 to 23.5 feet: SAND with SILT and GRAVEL (SW-SM), olive brown, few silt, fine to coarse, little rounded gravel, very dense, moist, odorless. (ALLUVIUM)
SB-10	1.3	40-50/3"		10				
SB-15	1.6	50/4"		15				
								@ 18.0 feet: granules encountered.
				20				

REMARKS

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LOG OF EXPLORATORY BORING

PROJECT NAME	Shell/University	BORING NO.	MW-25
LOCATION	1013 Northeast 45th Street, Seattle, WA	PAGE	2 OF 3
DRILLED BY	Holt Testing, Inc.	REFERENCE ELEV.	94.81'
DRILL METHOD	H.S.Auger	TOTAL DEPTH	51.00'
LOGGED BY	Jeff Kirtland	DATE COMPLETED	08/07/91

SAMPLING METHOD AND NUMBER	PID READING (ppm)	BLOWS PER 6-INCHES	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHOLOGIC COLUMN	WELL DETAILS	LITHOLOGIC DESCRIPTION
SB-20	NR	50/4"						
								23.5 to 34.0 feet: SILT (ML), gray, non-plastic fines, trace gravel, very dense, moist, laminated beds, odorless. Interbedded with SILTY SAND (SM), gray, some silt, fine, very dense, moist, laminated beds, odorless. (ALLUVIUM)
SB-25	1.6	20-50/5"		25				
SB-30	1.6	20-30-50/5"		30				@ 30 feet: sampler shoe wet; wet cuttings.
								34.0 to 50.9 feet: SILTY SAND (SM), gray, few to little (variable) silt, fine to medium, very dense, wet, odorless. (ALLUVIUM)
SB-35	1.6	33-50/5"		35				
			ATD ▽					
				40				

REMARKS

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LOG OF EXPLORATORY BORING

PROJECT NAME	Shell/University	BORING NO.	MW-25
LOCATION	1013 Northeast 45th Street, Seattle, WA	PAGE	3 OF 3
DRILLED BY	Holt Testing, Inc.	REFERENCE ELEV.	94.81'
DRILL METHOD	H.S.Auger	TOTAL DEPTH	51.00'
LOGGED BY	Jeff Kirtland	DATE COMPLETED	08/07/91

SAMPLING METHOD AND NUMBER	PID READING (ppm)	BLOWS PER 6-INCHES	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHO-LOGIC COLUMN	WELL DETAILS	LITHOLOGIC DESCRIPTION
SB-40	1.6	28-50/5"						
SB-45	NR	–		45				@ 45.0 feet: no sample recovery.
SB-50	1.6	33-50/4"		50				
				55				Total depth drilled = 50.0 feet. Total depth sampled = 51.0 feet. **WELL COMPLETION DETAILS** 0.3 to 38.8 feet: 2-inch-diameter flush-threaded schedule 40 PVC blank riser pipe. 38.8 to 48.8 feet: 2-inch-diameter flush-threaded schedule 40 PVC well screen with 0.010-inch machined slots. 48.8 to 49.3 feet: 2-inch-diameter schedule 40 PVC threaded end-cap. 0 to 1.5 feet: concrete. 1.5 to 30.3 feet: cement bentonite grout. 30.3 to 32.7 feet: bentonite chips, hydrated with potable water. 32.7 to 51.0 feet: 10 - 20 Colorado silica sand.
				60				

REMARKS

(1) Blow counts do not represent Standard Penetration Test results. (2) SB = 2.5-inch O.D. split barrel sampler with brass rings, driven by 300 lb jars. (3) PID = Photoionization detector results, in ppm. (4) G = Grab sample. (5) REFERENCE ELEVATION represents top of casing relative to a site datum. (6) ATD = At time of drilling. (7) – = not analyzed.