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REMEDIAL INVESTIGATION AND REMEDIAL ACTION REPORT FORMER CHEVRON SERVICE STATION NO. 20-9335 1225 North 45th Street Seattle, Washington

December 22, 2010

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3/28/2011

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On Behalf of:
Chevron Environmental Management Company
6111 Bollinger Canyon Road
San Ramon, California 94583

SAIC From Science to Solutions
The Benham Companies, LLC
A Wholly Owned Subsidiary

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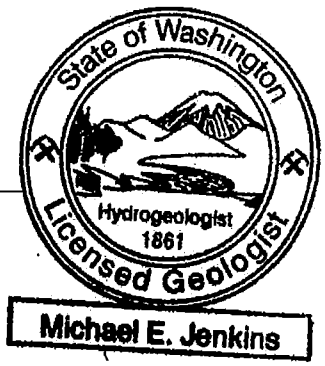

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REMEDIAL INVESTIGATION AND REMEDIAL ACTION REPORT

1. INTRODUCTION

This report documents the activities and findings of a remedial investigation and remedial action (RI/RA) performed by Chevron Environmental Management Company (CEMC). This RI/RA was performed as an Independent Cleanup Action to further define the nature and extent of contamination existing at the former Standard Oil service station (site) located at 1225 North 45th Street in Seattle, Washington, and to gather necessary data to complete subsequent remedial cleanup actions. This report is being submitted to the Washington State Department of Ecology (Ecology) in partial fulfillment of the requirements established by the Model Toxics Control Act (MTCA) Cleanup Regulation, Chapter 173-340 of the Washington Administrative Code (WAC).

1.1 SITE DESCRIPTION

The site is located at 1225 North 45th Street in Seattle, Washington, in a commercial/mixed retail and residential neighborhood (Figure 1). Current features include a seven-story, mixed-use retail/residential building. The site is bounded to the north by single-family residences and a multistory mixed retail/residential building, to the east by Stone Way North, to the south by Big Wheels Auto Parts and a residential neighborhood with single-family dwellings, and to the west by a residential neighborhood. A site map depicting current and historic features is shown on Figure 2.

1.2 SITE HISTORY

1.2.1 Operating History

According to archive records, a gasoline service station and service garage operated at this location beginning in approximately 1935. The original station included two 1,000-gallon fuel underground storage tanks (USTs), one 550-gallon UST, and one hydraulic hoist. Standard Oil Company (a predecessor of Chevron) purchased the property in 1954. In 1956, the original station was redeveloped, and one 3,000-gallon UST, one 2,000 gallon UST, and one 550-gallon UST were installed. In 1969, the service station building and service garage were removed. Chevron sold the property in 1978 to the Seattle Housing Authority (SHA). The SHA subsequently sold the Chevron property and the property adjacent to the west (the former Wallingford Medical building) to The Housing Resources Group (HRG) in 2005. The site has been developed by HRG into a seven-story, mixed-use retail/residential building with an underground parking garage, spanning the footprint of the former Chevron facility and the former Wallingford Medical Building properties.

1.2.2 Previous Environmental Investigations and Remedial Actions

The following is a summary of environmental actions and investigations that are known to have been performed at the site.

Environmental Associates Inc., August 20, 1999, Phase 1 Environmental Audit, Former Chevron Site and Wallingford Medical Building, 1225 North 45th Street, Seattle, Washington

In August 1999, a Phase 1 Environmental Audit of the former Chevron Service Station property and the Wallingford Medical Building was conducted. This audit was performed in accordance with the American Society for Testing and Materials (ASTM) E 1527-97 "Standard Practice for Environmental Site Assessment: Phase 1 Environmental Site Assessment Process." This site

audit included a review of ownership, site history, and aerial photography of the area over time to evaluate former land use. This audit also included a review of local, state, and federal databases to identify properties in the vicinity of the site that could potentially pose environmental issues. A site reconnaissance visit was also made to identify any potential visual evidence of contamination.

The results of this Phase 1 Environmental Audit identified the possibility of unknown impacts to soil and groundwater in relation to activities conducted at the former service stations and in relation to an identified heating oil UST. Asbestos and polychlorinated biphenyls (PCBs) related to construction materials in the Medical Building were also noted as a concern.

Environmental Associates Inc., September 20, 1999, Preliminary Subsurface Environmental Study, Former Gasoline Station, Vacant Lot East of 1225 North 45th Street, Seattle (Wallingford), Washington

In August 1999, four soil borings were drilled on the site as part of a preliminary subsurface assessment. Soil samples were collected from borings B-1, B-2, B-3, and B-4 to assess the potential for petroleum-hydrocarbon impacts related to the former service stations. Prior to drilling, a magnetometer survey was performed to identify buried metallic objects that could potentially represent USTs or associated piping. During the magnetometer survey a metallic anomaly was observed in the north-central portion of the site in the vicinity of the former gasoline stations. Borings were advanced in areas of assumed locations of former site features as well as the metallic anomaly identified during the magnetometer survey. Borings B-1 and B-2 were advanced in the vicinity of the metallic anomaly, boring B-3 was advanced in the vicinity of the former pump island, and boring B-4 was advanced in the footprint of the former service station building.

Soil samples collected from borings B-1 and B-2 contained gasoline-range hydrocarbons above MTCA Method A cleanup levels (CULs). Soil samples collected from boring B-2 also contained total xylenes above its MTCA Method A CUL. Diesel- and heavy oil-range hydrocarbons were detected above their respective MTCA Method A CULs in boring B-4.

Soil results are provided in Table 1.

Environmental Associates Inc., September 29, 1999, Additional Subsurface Assessment, Former Gasoline Station, Vacant Lot East of 1225 North 45th Street, Seattle (Wallingford), Washington

In September 1999, two soil borings were installed as part of an Additional Subsurface Assessment. These borings were advanced in areas identified in the previous investigation as having petroleum-hydrocarbon impacts to soil. Soil boring B-5 was advanced west of boring B-1, and soil boring B-6 was advanced north of boring B-2. Soil samples were collected from these boring locations and a grab groundwater sample was collected from boring B-5. The soil sample collected from boring B-5 between 37.5 feet to 39 feet below ground surface (bgs) contained gasoline-range hydrocarbons at concentrations exceeding MTCA Method A CULs. None of the other soil samples from these two borings contained gasoline-, diesel-, heavy oil-range hydrocarbons, or benzene, ethylbenzene, toluene, or total xylenes (BTEX) at concentrations exceeding their respective MTCA Method A CULs. The groundwater sample collected from boring B-5 contained gasoline-range hydrocarbons and BTEX at concentrations exceeding MTCA Method A CULs.

Soil results are provided in Table 1.

Delta Environmental Consultants Inc., March 28, 2001, Environmental Investigation, Chevron Service Station 20-9335, 1225 North 45th Street, Seattle, Washington

On February 5, 2001, a 1,000-gallon UST identified during monitoring well installation was excavated and removed from the west-central portion of the site. The UST was presumed to be a former heating-oil tank based on its proximity to the former service station building. It was determined to be of steel construction and measured approximately 12-feet long and 4 feet in diameter. Liquid was pumped from the UST and the tank was inerted with carbon dioxide prior to removal. Following its removal, the tank was visually inspected for structural integrity and possible holes. One hole was observed in the top of the UST, which was likely caused by the drill rig during the attempted well installation. No other holes were identified, and no evidence of leaking was observed. Once the UST was removed, five soil samples were collected from each sidewall and from the bottom of the excavation. The final dimensions of the excavation were approximately 11-feet by 13-feet by 7.5-feet deep. Gasoline-, diesel-, heavy oil-range hydrocarbons, and BTEX were not detected above the laboratory method detection limits in the samples collected from the excavation. The excavated soil was used as backfill material along with clean fill material to bring the excavation back to existing grade. The excavation was compacted and patched with asphalt.

Soil results are also included in Table 1.

Delta Environmental Consultants Inc., July 17, 2001, Environmental Investigation, Chevron Service Station 20-9335, 1225 North 45th Street, Seattle, Washington

Between November 10, 2000, and February 8, 2001, five groundwater monitoring wells were installed on the site. Monitoring wells MW-1 through MW-5 were drilled to depths ranging from 42 to 45 feet bgs. Soil and groundwater samples were collected from each monitoring well location. The soil sample collected from MW-2 at 35 feet bgs contained gasoline-range hydrocarbons at concentrations exceeding MTCA Method A CULs. No other soil sample contained gasoline-, diesel-, heavy oil-range hydrocarbons, or BTEX at concentrations exceeding their respective MTCA Method A CULs. The groundwater samples collected from MW-2, MW-4, and MW-5 contained gasoline-range hydrocarbons and one or more of the BTEX compounds at concentrations exceeding MTCA Method A CULs. The groundwater samples collected from MW-2 and MW-5 contained diesel-range hydrocarbons at concentrations exceeding its MTCA Method A CUL.

Soil and groundwater results are also included in Tables 1 and 4, respectively.

SAIC, September 28, 2004, Supplemental Site Investigation, ChevronTexaco Facility 20-9335, 1225 North 45th Street, Seattle, Washington

In May 2004, 10 soil borings (SB-1 through SB-10) were drilled to depths ranging from approximately 43 to 46 feet bgs (Figure 3). Prior to drilling, a geophysical survey was performed to identify potential USTs and associated piping in the subsurface. Three areas were identified during the geophysical survey as locations of interest: in the southeast corner of the property, near the northeast corner of the former 1935 service station building, and near the east wall of the former 1956 service station building. These locations were investigated using an airknife/vacuum truck. A section of metal piping was observed in the southeast corner of the property. An abandoned-in-place UST, filled with concrete, was encountered near the northeast corner of the former 1935 service station building. Metal debris scraps were observed near the east wall of the former 1956 service station building.

Soil samples were collected from selected depth intervals from each of the 10 soil boring locations. Soil samples collected from SB-3, SB-5, SB-8, and SB-9 contained gasoline-range hydrocarbons at concentrations exceeding MTCA Method A CULs. Soil samples collected from SB-3 and SB-5 also contained ethylbenzene, toluene, and total xylenes at concentrations exceeding their respective MTCA Method A CULs. Benzene was not reported at concentrations exceeding MTCA Method A CULs for any of the soil samples analyzed; however, laboratory method detection limits were elevated above CULs for some samples collected from SB-3, SB-5, SB-8, and SB-9.

Results for the soil samples collected during this investigation are provided in Table 1.

Gettler-Ryan, Inc., June 9, 2010, Groundwater Monitoring Report, Former Chevron Service Station 20-9335, 1225 North 45th Street, Seattle, Washington (Event of December 11, 2009)

Groundwater monitoring and sampling has been performed at the site since October 2000. Monitoring wells MW-1 through MW-5 were sampled on a quarterly basis from October 2000 until January 2005. During this monitoring period, hydrocarbon concentrations were detected at concentrations exceeding MTCA Method A CULs in monitoring wells MW-2, MW-4, and MW-5. Light non-aqueous phase liquid (LNAPL) was detected in wells MW-2 (beginning in the first quarter 2002) and MW-5 (beginning in the third quarter 2001). Small amounts of LNAPL were observed in MW-4 sporadically during this monitoring period. All five wells were decommissioned in 2005 as part of site redevelopment.

Three groundwater monitoring wells (MW-6, MW-7, and MW-8) were installed at the site in November 2005 following site redevelopment. Two additional wells (MW-9 and MW-10) were installed off-property to the southeast in December 2006 (see section 2.8). These five wells were sampled annually in 2006 and 2007 and quarterly beginning in June 2009. Gasoline- and diesel-range hydrocarbons have been detected in samples collected from MW-6 and MW-8 at concentrations exceeding MTCA Method A CULs. However, analytical results indicate that concentrations of petroleum constituents are decreasing when compared with previous analytical results. LNAPL has been consistently observed in MW-7.

Historic and recent groundwater data are provided in Table 4, and recorded LNAPL thicknesses are provided in Table 5.

1.3 POTENTIAL CONTAMINANTS OF CONCERN

Previous investigations have identified gasoline- and diesel-range hydrocarbons and BTEX in soil and groundwater at the site. Prior to the remedial investigation and remedial action activities, soil samples were collected from numerous soil borings and groundwater monitoring wells were installed to characterize soil and groundwater impacts at the site. Results from previous investigations indicated two distinct areas of petroleum-hydrocarbon impacted soil: a shallow to deep zone of impacted soil in the northeast corner of the site, and a deep zone of impacted soil in the west-central portion of the site. The impacted soil in the northeastern portion of the property extends from approximately 8 to 10 feet bgs to depths of approximately 43 feet bgs. The impacted soil in the west-central portion of the site was present from 34 to 43 feet bgs (Figure 3).

1.4 REGULATORY HISTORY

The site was enrolled in the Voluntary Cleanup Program (VCP) in March 2005, and it was removed from the VCP by Ecology in October 2009 due to inactivity. The site was re-enrolled in the VCP in November 2009.

2. REMEDIAL INVESTIGATION/REMEDIAL ACTION ACTIVITIES

2.1 OBJECTIVES AND SCOPE OF WORK

The primary objective of the RI/RA was to better define the nature and extent of petroleum-hydrocarbon impacts at the site by addressing data gaps identified in previous site investigations, and to gather necessary data to complete subsequent remedial cleanup actions. The scope of work consisted of the following tasks:

- Soil sampling;
- Monitoring well decommissioning;
- Vapor intrusion evaluation;
- Remedial excavation;
- Deep soil remediation;
- Supplemental excavation;
- Monitoring well installation and development;
- Monitoring well survey;
- Groundwater sampling; and
- LNAPL recovery.

These tasks are discussed in sections 2.2 through 2.11.

2.2 SOIL SAMPLING

Six additional exploratory soil borings (SB-11 through SB-16) were installed in April 2005. Soil boring locations are shown on Figure 3, and boring logs for each boring are provided as Appendix A. Each soil boring was advanced from ground surface to depths ranging from approximately 39.5 to 46 feet bgs with the exception of soil boring SB-15, which was completed at a total depth of 8 feet bgs. Groundwater was encountered in each of the borings, with the exception of soil boring SB-15, at approximately 38 feet bgs.

Each soil boring was logged in accordance with the Unified Soil Classification System and field screened by a Washington State-licensed geologist. Each hollow-stem auger boring was advanced to at least 8 feet bgs using an air-knife to further ensure that no utilities or other subsurface infrastructure would be encountered.

During air-knife operations, soil samples were collected between 0 and 8 feet bgs with a hand auger. Drilling and air-knifing activities were performed by Cascade Drilling under the supervision of a Washington State-licensed driller.

Soil borings SB-11 through SB-16 were installed to delineate the lateral and vertical extent of hydrocarbon impacts and estimate the volume of impacted soil. Soil samples from these borings

were not collected for laboratory analysis. Field screening techniques were used to identify impacts.

2.3 MONITORING WELL ABANDONMENT

Monitoring wells MW-1 through MW-5 were abandoned in March 2005 prior to site redevelopment and remedial excavation activities. These wells were over-drilled to remove all well-construction material. After the wells were over-drilled, the holes were backfilled with bentonite to just below the ground surface and patched with asphalt to the existing grade.

2.4 VAPOR INTRUSION EVALUATION

Prior to the start of site development and as part of the RI/RA planning, vapor intrusion models were run using the building plans and soil conditions beneath the site. The Johnson and Ettinger model was used in the modeling effort. The memo detailing these results is provided as Appendix C and summarized below.

The Johnson and Ettinger worksheet results indicate that insignificant incremental risk to human health would be present in the sub-grade parking garage of the mixed-use building. This determination was reached with conservative assumptions, including that the soils beneath the proposed building are continuously affected from 15 to 45 feet bgs at the highest level of petroleum hydrocarbons detected on site, across the entire footprint of the building. In actuality, contamination is limited to one corner of the building and the most heavily contaminated deep soil hot spots and shallow soil were removed by large-diameter, bucket-auger borings. The model inputs also assume that removal of affected soil through excavation extends to 15 feet bgs, the total air exchange rate in the garage area is 2.7, and that individuals spend 30 minutes a day for 365 days per year in the garage. The model results follow:

- Total carcinogenic risk: 1.7×10^{-7}
- Total non-carcinogenic risk: 8.0×10^{-8}

Based on these very conservative assumptions and the resulting risk calculations, additional vapor mitigation following soil remediation activities is not required to reduce the risk to human health in the parking garage.

2.5 REMEDIAL EXCAVATION

As part of site redevelopment activities, a property-wide excavation to a depth of 13 feet below the original grade was completed between August 31 and September 22, 2005. During the excavation activities, a total of five previously undocumented USTs were discovered. Four of the USTs were discovered adjacent to one another during the excavation along the eastern property boundary near the northeast corner. These four USTs were each 500-gallon tanks, oriented east-west, and were at 5 to 6 feet bgs. The USTs had been previously abandoned in place and partially filled with pea gravel. All four USTs were steel and in good condition with no visible holes, dents, or cracks. The fifth UST was discovered in the west-central portion of the former Chevron property (just north of MW-2) at a depth of 4 feet bgs. The tank was observed to be in good condition with no apparent holes or cracks and only slight rusting. This UST was located above the deep zone of impacted soil and adjacent to decommissioned monitoring well MW-2. All USTs were properly removed, photographs were taken, and soil samples were collected for field screening and laboratory analysis.

As the excavation proceeded laterally and vertically, soil was field screened for hydrocarbon impacts. Field screening included observation of soil for any visible sheen, visual hydrocarbon staining, or volatilization using a photo-ionization detector (PID) or a flame-ionization detector (FID). Soil samples were also collected to confirm unaffected soil boundaries. A total of 23 samples were collected from the excavation sidewalls using ENCORE™ samplers and one 4-ounce jar. The samples were placed on ice to preserve volatile constituents.

All samples were analyzed by Lancaster Laboratories, Inc. (Lancaster) in Pennsylvania, which is an Ecology-certified laboratory.

All soil samples were analyzed for:

- Gasoline-range hydrocarbons by Ecology Method NWTPH-Gx;
- Diesel-range and heavy oil-range hydrocarbons by Ecology Method NWTPH-Dx extended with silica-gel cleanup; and
- BTEX by United States Environmental Protection Agency (EPA) Method 8021.

Analytical results show that one sample location (EX-W8-10) along the northern sidewall in the northeast corner of the site contained gasoline-range hydrocarbons, ethylbenzene, toluene, and total xylenes at concentrations exceeding MTCA Method A CULs. Benzene was not detected at concentrations exceeding its MTCA Method A CUL for this sample, but the laboratory method detection limits were elevated above the CUL for benzene.

All concentrations were below MTCA Method A CULs for all other excavation sampling locations. Analytical data are summarized in Table 2, and the laboratory reports are provided as Appendix B.

An area of shallow petroleum-hydrocarbon impacted soil was observed in the northeast corner of the property, where four of the USTs were found. These impacts were observed to be continuous down to groundwater at approximately 38 feet bgs. Any impacted soil observed below 13 feet bgs was noted and mapped for supplemental excavation. Approximately 1,450 tons of impacted soil were removed during this initial remedial excavation. Impacted soil was transported to Waste Management's Seattle terminal for transport and disposal at their Arlington, Oregon landfill.

2.6 DEEP SOIL REMEDIATION

Between October 3 and 7, 2005, additional remedial actions were completed to address petroleum-hydrocarbon impacted soils below the extent of the site redevelopment excavation. A total of 20 large-diameter bucket auger borings were drilled on the site to remove deep petroleum-hydrocarbon impacted soil (Figure 5). The locations of the bucket auger borings were based on data collected from previous soil borings and designed to remove the soil with the highest contamination. Two areas of the site were targeted for deep-soil remediation: the first area was in the northeast corner of the site in the vicinity of the four previously undocumented USTs, and the second area was in the west-central portion of the site in the vicinity the fifth undocumented UST and former monitoring well MW-2.

Each bucket auger boring was 6.5 feet in diameter and drilled to approximately 42 feet below the original ground surface to remove all soil to below the smear zone, where petroleum-hydrocarbons were observed to be the greatest. During drilling, conductor casing was installed to prevent any caving or slumping of material into the borehole. After each borehole was

completed, the casing was removed and the void space was backfilled with approximately 40 cubic yards of Control Density Fill (CDF), soil-cement slurry.

Soil from the bucket-auger borings was field screened for petroleum-hydrocarbon impacts. Field screening included observation of soil for any visible sheen, visual hydrocarbon staining, or volatilization using a PID or an FID. Samples were collected to depths where field screening observations indicated impacts were no longer present.

Twenty-one soil samples from the large-diameter, bucket-auger drilling activities were submitted to the laboratory for analysis. Each sample was collected in two 2-ounce jars and one 4-ounce jar and placed on ice to preserve volatile constituents.

All samples were analyzed by Lancaster.

All bucket auger soil samples were analyzed for:

- Gasoline-range hydrocarbons by Ecology Method NWTPH-Gx;
- Diesel-range and heavy oil-range hydrocarbons by Ecology Method NWTPH-Dx extended with silica-gel cleanup; and
- BTEX by EPA Method 8021.

Analytical results for soil samples collected from the bottom of each bucket-auger boring indicate that all concentrations are below MTCA Method A CULs (Table 3).

Approximately 920 tons of impacted soil were removed by the large-diameter auger activities, and the excavated soil was transported to Rinker Materials in Everett, Washington for treatment and disposal.

2.7 SUPPLEMENTAL EXCAVATION

After the large-diameter, bucket-auger activities were completed, soil at the base of the excavation was field screened for possible residual impacted soil remaining in the northeastern corner. The areas that contained impacted soil underwent additional excavation until field screening indicated that soil was no longer impacted. An additional 20 cubic yards of impacted soil were removed. Two samples (SS1-13.5 and SS2-13.5) were collected at the base of the supplemental excavation in the northeast portion of the property to confirm the unaffected limits of the excavation.

SS1-13.5 and SS2-13.5 were analyzed for:

- Gasoline-range hydrocarbons by Ecology Method NWTPH-Gx;
- Diesel-range and heavy oil-range hydrocarbons by Ecology Method NWTPH-Dx extended with silica-gel cleanup; and
- BTEX by EPA Method 8021.

Analytical results for soil samples collected from the base of the supplemental excavation indicate that concentrations for all constituents are below MTCA Method A CULs (Table 2).

The impacted soil was transported to Rinker Materials for treatment and disposal, and the supplemental excavation was backfilled and compacted to design requirements.

2.8 MONITORING WELL INSTALLATION AND DEVELOPMENT

Three groundwater monitor wells (MW-6, MW-7, and MW-8) were installed in the north and west portions of the site in November 2005. Two additional wells (MW-9 and MW-10) were installed to the southeast off the property and down gradient from the site in December 2006 (Figure 3).

Monitoring wells MW-6, MW-7, and MW-8 were installed at 35 feet below the base of the 13-foot-deep excavation or 48 feet below the original ground surface. Monitoring wells MW-9 and MW-10 were installed at 45 feet bgs. Each well was completed with a 2-inch-diameter, schedule 40 PVC well casing with 0.010-inch, factory-slotted well screen. Well construction details are shown on the boring logs (Appendix A).

One soil sample from monitoring wells MW-9 and MW-10 was collected from the observed soil/groundwater interface or smear zone and submitted for laboratory analysis. Additional samples were collected when field screening techniques indicated that impacts were present. Samples collected from these borings were analyzed by Lancaster.

All soil samples were analyzed for:

- Gasoline-range hydrocarbons by Ecology Method NWTPH-Gx;
- Diesel-range and heavy oil-range hydrocarbons by Ecology Method NWTPH-Dx extended with silica-gel cleanup;
- BTEX and methyl tertiary butyl ether (MTBE) by EPA Method 8260B.

Soil sample analytical results are summarized in Table 1. Complete laboratory reports are provided as Appendix B.

After the new monitoring wells were installed, they were developed to remove fine-grained material and to stabilize the filter pack. The development procedure was completed by lowering and raising either an aluminum bailer or down-well pump into the bottom of the well. The pump or bailer was then raised and lowered repeatedly to surge the groundwater in the well. Groundwater was removed from the well until approximately 10 casing volumes of water had been removed and water clarity had improved.

During monitoring well development, approximately 0.5 foot of LNAPL was observed in MW-7. The LNAPL was removed using a disposable bailer, and the well was developed.

Soil cuttings generated during drilling and groundwater produced during well development were contained in 55-gallon U.S. Department of Transportation (DOT)-approved drums and temporarily stored until transported from the site along.

Quality Assurance/Quality Control (QA/QC) field duplicates and trip blank samples were collected and analyzed. QA/QC sample analytical results are presented in the laboratory reports (Appendix B).

2.9 MONITORING WELL SURVEY

All monitoring wells installed during this investigation (MW-6 through MW-10) were surveyed for relative elevation. A survey reference mark was scribed on the rim of each new well casing for future groundwater elevation measurements. The location of each monitoring well installed was determined with respect to existing buildings or other site features. Well locations were measured to the nearest 0.5 foot using a survey tape or rolling-wheel measuring device.

2.10 GROUNDWATER SAMPLING

Monitoring wells MW-6 through MW-10 have been monitored and sampled since February 2006. These wells are currently monitored and sampled on a semiannual basis. The most recent sampling event occurred on June 9, 2010, and was conducted by Gettler-Ryan Inc. (Gettler-Ryan). Depth-to-groundwater measurements were recorded from monitoring wells MW-6, MW-8, MW-9, and MW-10. Each well was also checked for the presence of LNAPL. LNAPL was observed in MW-7 and was, therefore, not sampled.

At the time of this monitoring event, groundwater elevations ranged from 170.34 feet in well MW-6 to 169.81 feet in well MW-10. Groundwater flow at the time of this event was to the southeast at a gradient of approximately 0.002 feet per foot.

Samples were collected by disposable bailer (no purging) in accordance with Gettler-Ryan Standard Operating Procedures. All samples were submitted to Lancaster and analyzed for the following:

- Gasoline-range hydrocarbons by Ecology Method NWTPH-Gx;
- Diesel-range and heavy oil-range hydrocarbons by Ecology Method NWTPH-Dx;
- BTEX by EPA Method 8021B; and
- Total lead by EPA Method 6020.

Gasoline-range hydrocarbons were detected in monitoring well MW-6 at concentrations exceeding the MTCA Method A CUL of 800 micrograms per liter (µg/L). Total lead was detected in monitoring wells MW-8 and MW-9 at concentrations exceeding the MTCA Method A CUL of 15 µg/L. Groundwater sample analytical results are summarized in Table 4.

2.11 LIGHT NON-AQUEOUS PHASE LIQUID RECOVERY

Beginning in August 2004 and continuing until March 2005, LNAPL was recovered from monitoring well MW-2. LNAPL was recovered on a varying schedule, ranging from bi-weekly to daily events, using a disposable bailer. During this time span, approximately 26 gallons of LNAPL were recovered from well MW-2. Monitoring well MW-2 was decommissioned in March 2005 as part of site redevelopment.

Following the installation of MW-7 in November 2005, approximately 0.5 foot of LNAPL was observed during monitoring well development. The LNAPL was removed using a disposable bailer, and the well was developed. Beginning in February 2006 and continuing until August 2006, LNAPL was recovered from monitoring well MW-7. LNAPL was recovered on a varying schedule that ranged from bi-weekly to daily events using a disposable bailer. During this time, approximately 4 gallons of LNAPL were recovered from well MW-7. LNAPL recovery events for well MW-7 have been suspended due to storage issues raised by the current property owner, HRG.

LNAPL recovered during these events was placed in a drum that was located on the property and was removed and disposed of by Waste Management. LNAPL recovery results are summarized in Table 5.

2.12 STORAGE AND DISPOSAL OF RESIDUALS

Drill cuttings, debris (concrete and asphalt), and all other investigation-derived waste (decontamination water, purge water) were contained in 55-gallon, DOT-approved drums.

Following receipt of laboratory analytical data, arrangements were made for transport of all sampling residuals to Rinker Materials in Everett, Washington.

Approximately 1,450 tons of impacted soil were removed during the initial excavation. Impacted soil was transported to Waste Management's Seattle terminal for transport and disposal at their Arlington, Oregon landfill in September of 2005. Approximately 920 tons of impacted soil were removed by the large-diameter auger activities, and approximately 120 cubic yards of impacted soil were removed during the supplemental excavation. Impacted soil excavated during the bucket auger and supplemental excavation activities was transported to Rinker Materials for treatment and disposal in October of 2005.

3. SITE PHYSICAL SETTING

3.1 SITE GEOLOGY

The regional geology of the site includes deposits from advancing and retreating glaciers. These deposits consist of a sequence of sand, silt, and gravel that were likely associated with glacial drift. The site is located on the Seattle Drift Plain, which was formed during the last period of continental glaciation.

The local geology is defined by the environmental borings that have been drilled at the site. The ground surface at the boring locations is overlain by 4 to 6 inches of asphalt. The material underlying the asphalt is typically comprised of dense to very dense, well-graded, fine- to medium-grained sand with some silt and rounded gravel, extending from approximately 8.5 to 20 feet bgs. Underlying this layer is a thick layer of very dense, brown to light brown, poorly graded, fine- to medium-grained sand that is present to the total depth explored of approximately 45.5 feet bgs.

3.2 SITE HYDROGEOLOGY

The site is underlain by a relatively deep, productive, water-table aquifer that occurs in a poorly graded sand layer. During drilling, saturated soils were typically encountered at depths of approximately 38 feet bgs within the poorly graded sand layer. This is consistent with historic groundwater levels, which were on average approximately 37 feet bgs. Groundwater levels fluctuate between 34 and 40 feet bgs with a gradient toward the southeast. Figure 4 shows the direction of groundwater flow recorded during the June 2010 groundwater sampling event.

4. DATA ANALYSIS AND INTERPRETATION

4.1 PETROLEUM CONTAMINATION

In this report, the term "contaminant" is used as defined by MTCA: "*Contaminant* means any hazardous substance that does not occur naturally or occurs at greater than natural background levels" [WAC 173-340-200]. Thus, the word "contaminant" does not imply that the substance is above a regulatory CUL or is hazardous to a receptor, but merely that it is impacting some environmental media beyond natural levels.

In discussions below, reference will be made to MTCA Method A CULs. These CULs are the standard formula values listed in the state regulation that are applicable as cleanup criteria at relatively simple sites. Method A CULs are utilized as these levels represent a well-known benchmark for comparison purposes. The actual site-specific CULs and the full application of MTCA regarding these chemicals will be explained in greater detail later in this report.

The discussion below involves impacts within two environmental media: soil and groundwater. Contaminants include petroleum constituents of gasoline-range, diesel-range, and heavy oil-range hydrocarbons. The specific constituents that have been identified at the site above Method A CULs include:

- Gasoline-range hydrocarbons;
- Diesel-range hydrocarbons;
- Toluene, ethylbenzene, and total xylenes; and
- Total Lead.

Other constituents were also analyzed, but were either not detected at or above method detection limits or were detected below the MTCA Method A CULs.

4.2 DATA QUALITY ASSESSMENT

Analytical procedures were carried out in accordance with the requirements of WAC 173-340-830 and the appropriate work plans for the task. All laboratory analyses were performed by Lancaster under WAC 173-50 for the analytical methods performed for this project.

One laboratory-supplied trip blank that contained certified VOC-free water was placed in each sample cooler with ground water samples to be analyzed for volatile constituents (TB-1-052704, TB-1 [2/17/06], TB-1 [5/17/07]). The trip blanks accompanied the samples as they were being collected and during shipment to the laboratory. Each trip blank was analyzed for MTBE and BTEX by EPA Method 8260B. All trip-blank samples submitted for analysis were below method detection limits (Appendix B).

4.3 NATURE AND DISTRIBUTION OF SOIL CONTAMINANTS

The results from the soil borings and previous investigations show that there were two areas of contamination at the site: a shallow-to-deep zone of impacted soil in the northeast corner; and a deep zone of contamination in the west-central portion of the site (Figure 5). The extent of impact can be seen in greater detail on cross sections A-A', B-B', and C-C' (Figure 6 through Figure 8). The impacted soil in the northeastern portion of the property began from approximately 8 to 10 feet bgs and extended to approximately 43 feet bgs. The impacted soil in the west-central portion of the site, in the vicinity of MW-2, was present from 34 to 43 feet bgs. The contamination was only continuous in the northeastern corner; otherwise, the shallow and deep zones of contamination were separated by non-impacted soil (Figure 6).

Maximum concentration levels were generally found to occur at or near the soil/groundwater interface. The maximum detected concentration of gasoline-range hydrocarbons (5,000 milligrams per kilogram [mg/kg)]), toluene (48 mg/kg), ethylbenzene (61 mg/kg), and total xylenes (320 mg/kg) were all detected at boring SB-8 (37.5 feet bgs). Analytical results for diesel- and heavy oil-range hydrocarbons, benzene, and MTBE indicate concentrations below the method detection limit or below MTCA Method A CULs for these constituents (Table 1).

To the maximum extent practicable, all impacted soil identified as exceeding MTCA Method A CULs during previous site investigations was removed from the site during the remedial activities completed as part of this RI/RA. These activities include the remedial excavation, the deep soil remediation, and the supplemental excavation. The volume of petroleum-contaminated soil (PCS) that was removed during the remediation activities is shown on Figures 5 through 8. The remedial activities removed the majority of the most-impacted soil. However, soil analytical

data from sidewall sample EX-W8-10 indicate that soil containing concentrations of gasoline-range hydrocarbons, toluene, ethylbenzene, and total xylenes exceeding their respective MTCA Method A CULs remain along the northeastern portion of the excavation at 10 feet bgs. Continued lateral excavation and removal of these impacted soils could not be performed due to the close proximity of the sidewalk, utilities, and the rights of way (ROWs) for Stone Way North and North 45th Street.

4.4 NATURE AND DISTRIBUTION OF GROUNDWATER CONTAMINANTS

Groundwater analytical data, after the remedial excavation activities, indicate that gasoline- and diesel-range hydrocarbons are present at concentrations exceeding their respective MTCA Method A CULs in monitoring wells MW-6 and MW-8. However, analytical results from the last three sampling events indicate that concentrations of petroleum constituents are decreasing. The latest sampling event indicates that only gasoline-range hydrocarbons are present at a concentration exceeding the MTCA Method A CUL in monitoring well MW-6.

4.5 NATURE AND DISTRIBUTION OF LIGHT NON-AQUEOUS PHASE LIQUID

Subsequent to the remediation activities, LNAPL has been observed in monitoring well MW-7 up to 0.78 foot thick (Table 5). Groundwater measurements and analytical data indicate that neither the LNAPL plume nor the dissolved-phase hydrocarbon plume extend to down-gradient monitoring well MW-8. The LNAPL observed in monitoring well MW-7 appears to be a remnant of LNAPL saturated soil that was left behind in the annular space between the bucket-auger borings. The CDF-filled bucket-auger borings likely confine the LNAPL plume to the north, east, and west (Figure 3).

An LNAPL recovery test was conducted on September 10, 2010, when approximately 1.5 gallons of LNAPL and water mixture was bailed from monitoring well MW-7. After removing the LNAPL, depth-to-water and depth-to-product measurements were recorded at sporadic intervals for 3 hours. After 3 hours, the LNAPL thickness was recorded at 0.38 foot, and the recovery rate is shown on Figure 9.

5. CONCEPTUAL SITE MODEL

To more fully understand the relationships between contaminants, affected environmental media, indoor media, and human and ecological receptors, the following conceptual site model was developed.

5.1 POTENTIAL SOURCES OF CONTAMINATION

The results from this RI/RA, previous site investigations, environmental reports, and site history suggest that the petroleum contamination in soil and groundwater resulted from historic service station operations. Multiple source areas have been identified that include former gasoline USTs located in the northeast portion of the site. It is likely that the primary sources for contamination were leaks from former USTs and dispenser lines, and that surface releases from service station operations serve as a secondary source.

5.2 CURRENT AND POTENTIAL LAND USES

The site is designated a NC2P-40 zone, which is defined by the City of Seattle as a Neighborhood Commercial 2, Pedestrian-Designated Zone, 40-foot height limit. Allowable uses

for NC2P-40 zones include residential use above the first floor. The first floor, or street level, is intended for pedestrian-oriented, non-residential uses such as retail, entertainment, restaurants, and personal services.

The site and neighboring properties were converted into a mixed-use apartment complex by the current property owner (HRG) in 2005. The complex consists of basement parking, retail stores, and apartments. Surrounding property use includes single-family homes, apartment buildings, office/retail buildings, and mixed-use complexes.

The current mixed-use apartment complex was recently developed and the current property owner has provided no communication to CEMC of impending or future intent to change the current land use of the site. Therefore, it is anticipated that the site will continue to be used as a mixed-use apartment complex.

5.3 EXPOSURE PATHWAYS AND POTENTIAL RECEPTORS

Contaminated media at the site include soil and groundwater. MTCA (WAC 173-340-200) defines an exposure pathway as "the path a hazardous substance takes or could take from a source to an exposed organism. An exposure pathway describes the mechanism by which an individual or population is exposed or has the potential to be exposed to hazardous substances at or originating from a site."

The remedial excavation activities focused on removing soil with the highest contamination. Subsequent to these activities, the remaining contaminants of concern (COCs) in impacted media include gasoline-range hydrocarbons, toluene, ethylbenzene, and total xylenes. The potential exposure pathways associated with groundwater, soil, and soil vapor are discussed in sections 5.3.1 through 5.3.3, along with the rationale for excluding or including each potential pathway.

5.3.1 Exposure Pathways and Potential Receptors – Soil

Current land use at the site prevents direct exposure to site contaminants in soil by site workers and the general public due to ground surface covers such as asphalt, concrete, and building structures. Impacted soil to approximately 42 feet below original grade was removed from the site as a result of the excavation and large-diameter auger borings. Approximately 940 cubic yards of PCS was removed from the deep zone leaving only a minimal volume of PCS in the annular space between the large-diameter, bucket-auger borings. Construction workers performing subsurface work on the property would not encounter soil impacts because any residual soil impacts are approximately 25 feet bgs, below the 15 foot bgs point of compliance for direct contact.

Soil analytical data from sidewall sample EX-W8-10 suggest that PCS remains along the northeastern corner of the excavation at 10 feet bgs. Continued lateral excavation and removal of these impacted soils could not be performed due to the close proximity of the sidewalk, utilities, and the ROWs for Stone Way North and North 45th Street. PCS in this area is not accessible. The impacts are at a depth beneath the current utilities, and there are building tie-backs between the utilities and the PCS. Any utility repairs or new installations would encounter the tie-backs before encountering the PCS. Therefore, any potential risk for an exposure to direct contact by utility workers is not likely.

5.3.2 Exposure Pathways and Potential Receptors – Groundwater and Light Non-Aqueous Phase Liquid

The site is underlain by a deep, productive water-table aquifer that occurs in poorly graded sand from between 34 and 40 feet below grade. The site is located in an urban setting where municipal water is supplied. Groundwater sampling results from this RI/RA and previous environmental investigations, the southeast trending groundwater gradient, and the spatial distribution of groundwater contaminants including the "clean boundary" formed by wells MW-8, MW-9, and MW-10, indicate that the LNAPL and the dissolved-phase groundwater plume has not migrated off the property to the southeast. Therefore, there are no exposures to LNAPL or impacted groundwater because the groundwater is not potable, is deeper than 15 feet bgs, and does not migrate to any surface water.

5.3.3 Exposure Pathways and Potential Receptors –- Vapor

Vapor intrusion modeling indicated that the deep in-place soil does not pose any incremental risk to residents or on-site workers

Vapor modeling results were obtained using the Johnson and Ettinger (J&E) model for subsurface vapor intrusion into buildings. The results are used to determine the predicted incremental risk from soil vapor intrusion of volatile compounds to indoor air affecting occupants with a hypothetical slab-on-grade residential housing and current service station dimensions. The vapor modeling memo and the J&E results are included as Appendix C.

The J&E model results show that incremental risk from vapor intrusion to indoor air is insignificant in the sub-grade parking garage of the mixed-use building. This determination was reached with conservative assumptions, including that soils beneath the proposed building are continuously contaminated from 15 to 45 feet bgs at the highest level of contamination detected on site across the entire footprint of the building. In actuality, contamination is limited to one corner of the building and the most heavily contaminated deep soil hot spots and all of the shallow soil was removed by large-diameter, bucket-auger borings.

It is anticipated that future land use at the site will not change in the foreseeable future. However, if land use does change, it is likely that direct exposure to contaminants would continue to be prevented by site improvements.

5.4 TERRESTRIAL ECOLOGICAL EVALUATION

In addition to evaluation of human health risk, MTCA (WAC 173-340-7490) requires that one of the following actions be taken after the release of hazardous substances to the soil at a site to determine the potential impacts to terrestrial organisms at the site:

- Documentation of an exclusion from any further terrestrial ecological evaluation (TEE) using the criteria in WAC 173-340-7491.
- Completion of a simplified TEE as specified in WAC 173-340-7492.
- Completion of a site-specific TEE as specified in WAC 173-340-7493.

A site may be excluded from the requirement for a TEE if any of the following criteria are met:

- All soil contaminated with hazardous substances is, or will be, located below the point of compliance established under WAC 173-340-7490(4).

- All soil contaminated with hazardous substances is, or will be, covered by buildings, paved roads, pavement, or other physical barriers that will prevent plants or wildlife from being exposed to the soil contamination.
- There is less than 0.25 acre of contiguous undeveloped land on or within 500 feet of any area of the site contaminated with chlorinated dioxins or furans, PCB mixtures, dichlorodiphenyltrichloroethane (DDT), dichlorodiphenyldichloroethylene (DDE), dichlorodiphenyldichloroethane (DDD), aldrin, chlordane, dieldrin, endosulfan, endrin, heptachlor, heptachlor epoxide, benzene hexachloride, toxaphene, hexachlorobenzene, pentachlorophenol, or pentachlorobenzene.
- There is less than 1.5 acres of contiguous undeveloped land on the site or within 500 feet of any area of the site, and the contamination at the site does not include any of the contaminants listed in the preceding bullet.

This site may be excluded from a TEE because it meets all of the above criteria.

6. CLEANUP LEVELS

Under MTCA (WAC 173-340-200), a CUL is defined as "the concentration of a hazardous substance in soil, water, air, or sediment that is determined to be protective of human health and the environment under specified exposure conditions." CULs, in combination with points of compliance, typically define the area or volume of soil, water, air, or sediment at a site that must be cleaned up. MTCA further specifies that the first step in determining CULs is to identify the potentially contaminated media, the current and potential pathways of exposure, the current and potential receptors, and the current and potential land and resource uses. The potentially contaminated media are discussed in this section. The current and potential pathways of exposure are discussed and summarized in sections 6.1 and 6.2. The current potential receptors and development of the site-specific CULs are provided in sections 6.1 and 6.2.

6.1 POINT OF COMPLIANCE FOR SOIL AND SOIL VAPOR

An evaluation of the appropriate point of compliance for soil CULs for the site is provided in the following table.

Determination of Point of Compliance for Soil Cleanup Levels

Potential Exposure Pathway	MTCA Defined Point of Compliance	Applicability to Site	Site-Specific Point of Compliance
Surface water receptor	Throughout the site	Applicable. Lake Union is approximately 1 mile down gradient of the site. The distance of Lake Union from the site precludes the likelihood of impacts to surface water.	Throughout the site.
Soil to vapors (indoor air)	Throughout the site from the ground surface to the uppermost groundwater saturated zone	Applicable. J&E model results show that incremental risk from vapor intrusion to indoor air is insignificant for occupants of the sub-grade parking garage of the mixed-use building.	Throughout the site in indoor air.
Human direct contact	Throughout the site from ground surface to 15 feet bgs	Applicable. Although the site is completely capped by concrete or asphalt, subsurface soil could be potentially disturbed during utility activities.	Surface to 15 feet bgs
Ecological	Standard point of compliance to 15 feet bgs; conditional point of compliance to 6 feet bgs with institutional controls to prevent disturbance of subsurface soils.		Surface to 6 feet bgs

From the results provided in the preceding table, the point of compliance for the site is based on the potential for direct contact by both human and ecological receptors. Therefore, the point of compliance for soil CULs is from ground surface to 15 feet bgs. The point of compliance for soil vapors is within the sub-grade parking garage of the mixed-use building (soil to indoor air pathway).

MTCA provides three approaches for establishing soil CULs: Method A, Method B, and Method C.

Method A may be used on sites involving relatively few hazardous substances or where cleanup action may be routine. Under Method A, CULs are determined by the most stringent criteria specified under state and federal laws and Tables 720-1, 740-1, and 745-1 of MTCA.

Method B is the universal method for determining CULS at all sites. For sites contaminated with total petroleum hydrocarbons, Method B CULs are determined by using the fractionated

analytical approach for petroleum. This approach involves testing of the samples to determine the LNAPL composition. CULs must consider the measured or predicted ability of the fractions to migrate from one medium to other media. When multiple exposure pathways are identified for a single media, the most stringent CUL is selected.

Method C is used in situations such as industrial sites. Site cleanups under Method C will require restrictions placed on the property to ensure future protection of human health and the environment.

The potential COCs at the site are limited to petroleum products and petroleum additives. In addition, the site is located in an area currently surrounded by businesses and residential dwellings, which does not qualify the site as an industrial setting so it is appropriate to use Method A soil CULs.

Only one soil sample was identified with concentrations exceeding MTCA Method A CULs within the point of compliance for direct contact by humans and ecological receptors (i.e., less than 15 feet bgs).

- Analytical results from soil sample EX-W8-10 indicate gasoline-range hydrocarbons, toluene, ethylbenzene, and total xylenes at concentrations exceeding their respective MTCA Method A CULs. This sample was collected from the north sidewall near the northeast corner at 10 feet bgs. The only remaining soil impact is present beneath current utilities and building tie-backs. It is unlikely that utility workers will encounter these impacts.

Additionally, site-specific soil CULs need to consider the potential risk to humans resulting from soil vapor. Potential receptors for the contaminants in soil vapor include occupants of the sub-grade parking garage of the mixed-use building. The vapor modeling results indicate that the cancer risk for the reasonable maximum exposure for occupants is insignificant (Appendix C).

6.2 POINT OF COMPLIANCE FOR GROUNDWATER

Groundwater CULs are based on estimates of the highest beneficial use and the reasonable maximum exposure expected to occur under both current and potential future site use. Under MTCA 173-340-720, drinking water is the beneficial use requiring the highest groundwater quality. Therefore, exposure to contaminants through ingestion and other domestic uses represents the reasonable maximum exposure for all sites unless the groundwater at the site can be demonstrated to be not potable.

A summary of the potential groundwater exposure pathways at the site is provided in the following table.

Potential Groundwater Exposure Pathways

Potential Groundwater Exposure Pathways	Applicability
Ingestion/household contact	Primary. The site is underlain by a deep, productive water-table aquifer that occurs in poorly graded sand from between 34 and 40 feet below grade. The site is located in an urban setting where municipal water is supplied.
Incidental exposure resulting from site development or utility construction	Precluded. Because groundwater is encountered at depths ranging from 34 to 40 feet bgs, groundwater is not expected to be encountered during routine site development or utility construction activities.
Groundwater to surface water	Precluded. Lake Union is approximately 1 mile down gradient of the site. The distance to Lake Union from the site precludes the likelihood of impacts to surface water. In addition, groundwater analytical results from down-gradient monitoring well MW-10 have been below laboratory detection limits or below MTCA Method A CULs for all constituents.
Groundwater/LNAPL to vapor (indoor air)	Secondary. The presence of contamination in groundwater could result in the introduction of sub-slab vapors into the sub-grade parking garage of the mixed-use building.

Two of the four potential exposure pathways (incidental exposure resulting from site development or utility construction and groundwater to surface water) discussed in the preceding table are precluded because the pathways are not possible based on physical evidence and analytical data. Because the groundwater is located between 34 and 40 feet bgs, groundwater would not be encountered during routine site development or utility construction. Contaminant transport to the surface water does not appear to be a concern. The nearest surface water, Lake Union, is approximately 1 mile south and down gradient of the site. The groundwater analytical results from down-gradient monitoring wells MW-9 and MW-10 have been below laboratory detection limits or below MTCA Method A CULs for all constituents. Therefore, the distance to Lake Union and analytical results from the down-gradient wells precludes the likelihood of impacts to surface water.

Two of the potential pathways (ingestion/household contact and groundwater/LNAPL to vapor) although possible, pose no risk to human health resulting from contaminant releases at the site.

- The primary pathway of concern is groundwater ingestion. Consumption of groundwater is unlikely due to the fact that the site is located in an urban setting where municipal water is supplied and groundwater is not a primary source of drinking water. In addition, the contaminants are confined to the property and are not migrating off-property as

evidenced by analytical results from down-gradient monitoring wells MW-8, MW-9, and MW-10.

- The soil vapor to indoor air pathway has been determined to present an insignificant risk for vapor intrusion (see Section 5.3.3).

Because groundwater is not a likely source of drinking water and transport to surface water is not a concern, MTCA Method A CULs (based on the drinking water scenario) do not apply to this site. However, groundwater results are compared to Method A CULs in the tables as a screening-tool level of assessment.

7. SUPPLEMENTAL REMEDIAL ACTION

All readily accessible soil on the site containing COCs at concentrations exceeding the remediation levels for soil has been removed during the remediation activities. In addition, there are no current pathways for exposure to impacted groundwater. Due to the current land use and nature and distribution of the remaining soil and groundwater impacts, there is no threat to human health and the environment. The primary remedial driver remaining is to eliminate the remaining residual LNAPL on the site. This will be accomplished by conducting single-well surfactant treatment.

7.1 OVERVIEW OF SURFACTANT TREATMENT

The concept of single-well surfactant treatment is to soak the soil with surfactant, such that the LNAPL is contacted and enveloped, but not displaced, by the introduced surfactant. The actual volume injected is determined in the field by observing surrounding existing monitoring wells. When surfactant solution is observed in nearby wells, surfactant injection should cease.

The surfactant solution is allowed to soak the soil overnight, and groundwater extraction is commenced on the following day using a vacuum truck or pumps. At least three times the volume of injected solution should be extracted. Extracted water is sampled periodically or measured at the end of extraction to collect samples for dissolved concentration analysis and quantification of LNAPL recovered. Extraction should continue beyond the minimum volume if LNAPL is observed in the water and until LNAPL is no longer observed.

Single-well surfactant applications are likely to be beneficial due to the following site characteristics:

- The primary remedial driver is to eliminate LNAPL, and the driver is purely regulatory;
- The site is considered to be a "low risk" category with no sensitive receptors or potential sensitive receptors nearby, such as surface water;
- The LNAPL plume is stable and immobile;
- The LNAPL at the site is limited in extent and maximum thickness;
- The soil consists of permeable, fine-to-medium, poorly graded sand; and
- Other remedial alternatives for managing or eliminating LNAPL occurrence are not as feasible or cost effective.

7.2 OBJECTIVES

Surfactant treatment is the preferred supplemental remedial action because it meets the criteria set forth in WAC 173-340-360, which specifies that a remedial alternative must meet the following threshold requirements:

- Protect human health and the environment;
- Comply with cleanup standards;
- Comply with applicable state and federal laws; and
- Provide for compliance monitoring

In addition, surfactant treatment will also meet the following criteria (WAC 173-340-360[2][b]):

- The supplemental remedial action is the most feasible and easily implemented solution given the current site conditions and existing monitoring well locations; and
- The supplemental remedial action is considered a permanent solution with a short restoration time frame.

The remainder of this report will focus on the details of the supplemental remedial action components being proposed at the site.

8. SCOPE OF WORK

The supplemental remedial action will involve a number of activities, which are described in the following subsections.

8.1 NOTIFICATIONS

SAIC-Benham will make the necessary notifications to the property owner and tenants to conduct the supplemental remedial action.

8.2 SURFACTANT INJECTION

The soil composition and locations of monitoring wells MW-6 and MW-8 in relation to MW-7 provide ideal conditions for surfactant treatment. A non-toxic, food-grade, non-ionic, and biodegradable surfactant will be injected into monitoring well MW-7. A suggested and field-tested surfactant solution is called Accelerate, which is supplied by Environmental Chemical Solutions, Inc.

Surfactant treatment will include the following elements:

- A surfactant solution with 4-percent by volume surfactant concentration in water, which is mixed on site in a batch tank.
- Application of 50 to 250 gallons of surfactant solution into monitoring well MW-7 via gravity feed. Surfactant solution will not be injected under pressure to minimize potential outward displacement of LNAPL in the soil.
- The surfactant injection is ceased when the surfactant is observed in either monitoring well MW-6 or MW-8. The field test for the presence of surfactant is a qualitative visual analysis, based on observation of suds when a sample is shaken vigorously in a sample bottle, or via use of a methylene blue (MBAS) test kit.

- The surfactant solution is allowed to soak the soil overnight.

8.3 GROUNDWATER EXTRACTION

After the surfactant solution has soaked overnight, groundwater extraction is commenced on the following day using a vacuum truck. At least three to four times the volume of injected solution should be extracted. Extracted water samples will be collected periodically or at the end of extraction for dissolved concentration analysis and quantification of LNAPL recovered. Groundwater extraction will continue beyond the minimum volume if LNAPL is observed in the water and until LNAPL is no longer observed.

8.4 SURFACTANT TREATMENT-DERIVED WASTE

The groundwater collected by the vacuum truck during the extraction activities will be transported to an approved treatment facility.

8.5 GROUNDWATER AND LIGHT NON-AQUEOUS PHASE LIQUID GAUGING

Monitoring wells MW-6, MW-7, and MW-8 will be gauged with an interface probe prior to, during, and after the surfactant treatment activities. Groundwater gauging and LNAPL occurrence monitoring will be conducted:

- Prior to surfactant application;
- Periodically during the injection treatment;
- Immediately following the conclusion of surfactant injection;
- Immediately prior to extraction;
- Periodically during extraction;
- Immediately following the cessation of the extraction treatment;
- Weekly for 1 month following the extraction activities;
- Monthly for 3 months; and
- Quarterly for at least 1 year following treatment.

8.6 GROUNDWATER MONITORING AND SAMPLING

Groundwater monitoring and sampling will be performed by Gettler-Ryan. On completion of the surfactant treatment activities, Gettler-Ryan will be notified and will perform a groundwater sampling event. Subsequent groundwater monitoring events will also be performed by Gettler-Ryan on a quarterly basis to monitor natural attenuation.

Prior to purging and sampling each monitoring well, depth to groundwater will be measured using an electronic water-level indicator tape. Subsequently, each monitoring well will be purged of stagnant casing water using a disposable polyethylene bailer until a minimum of three casing volumes of groundwater have been removed. In the event a monitoring well runs dry during purging, the groundwater level in the well will be allowed to recover to approximately 75 percent of its original static level and purging will continue. If the well is again purged dry, it will be allowed to recover to 75 percent of its original static water level (if possible), at which point it will be considered sufficiently purged.

After purging is complete, groundwater samples will be collected by bailer. Groundwater samples will be collected in laboratory-supplied sample containers and immediately placed in a pre-chilled sample cooler for storage prior to transport to Lancaster.

Groundwater samples will be shipped to Lancaster via overnight courier and analyzed for the following:

- Gasoline-range hydrocarbons by Ecology Method NWTPH-Gx;
- Diesel- and oil-range hydrocarbons by Ecology Method NWTPH-D extended with silica-gel cleanup; and
- BTEX by EPA Method 8260B.

9. SCHEDULE

SAIC-Benham will finalize the fieldwork schedule following review and approval by Ecology. The anticipated schedule for implementation of this investigation follows:

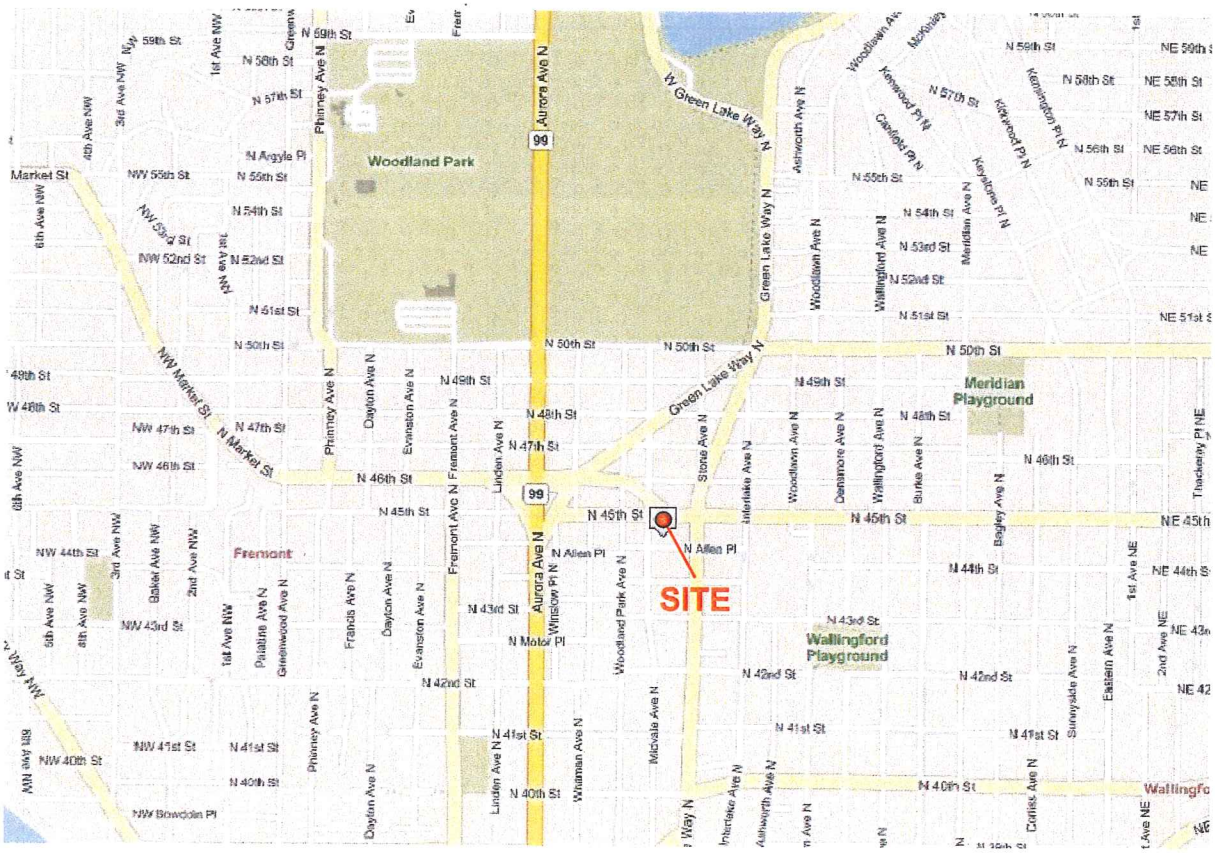
1) Preparation for fieldwork – 2 to 4 weeks (contingent on work plan approval and field staff availability);

2) Completion of field activities (surfactant treatment) – 2 to 3 days; and

3) Groundwater sampling – ongoing with Gettler-Ryan.

Figures

NORTH



Maps Provided by Seattle.gov

Z:\2004\ChevronTexaco\WA Portfolio\209335 Seattle - 45th\209335 Vicinity Map.dwg kangem 14/12/10 - 10:01 A

SAIC From Science to Solutions

The Benham Companies, LLC
A Wholly Owned Subsidiary

Former Chevron Service Station No. 20-9335
1225 North 45th Street
Seattle, Washington

FIGURE 1
Vicinity Map

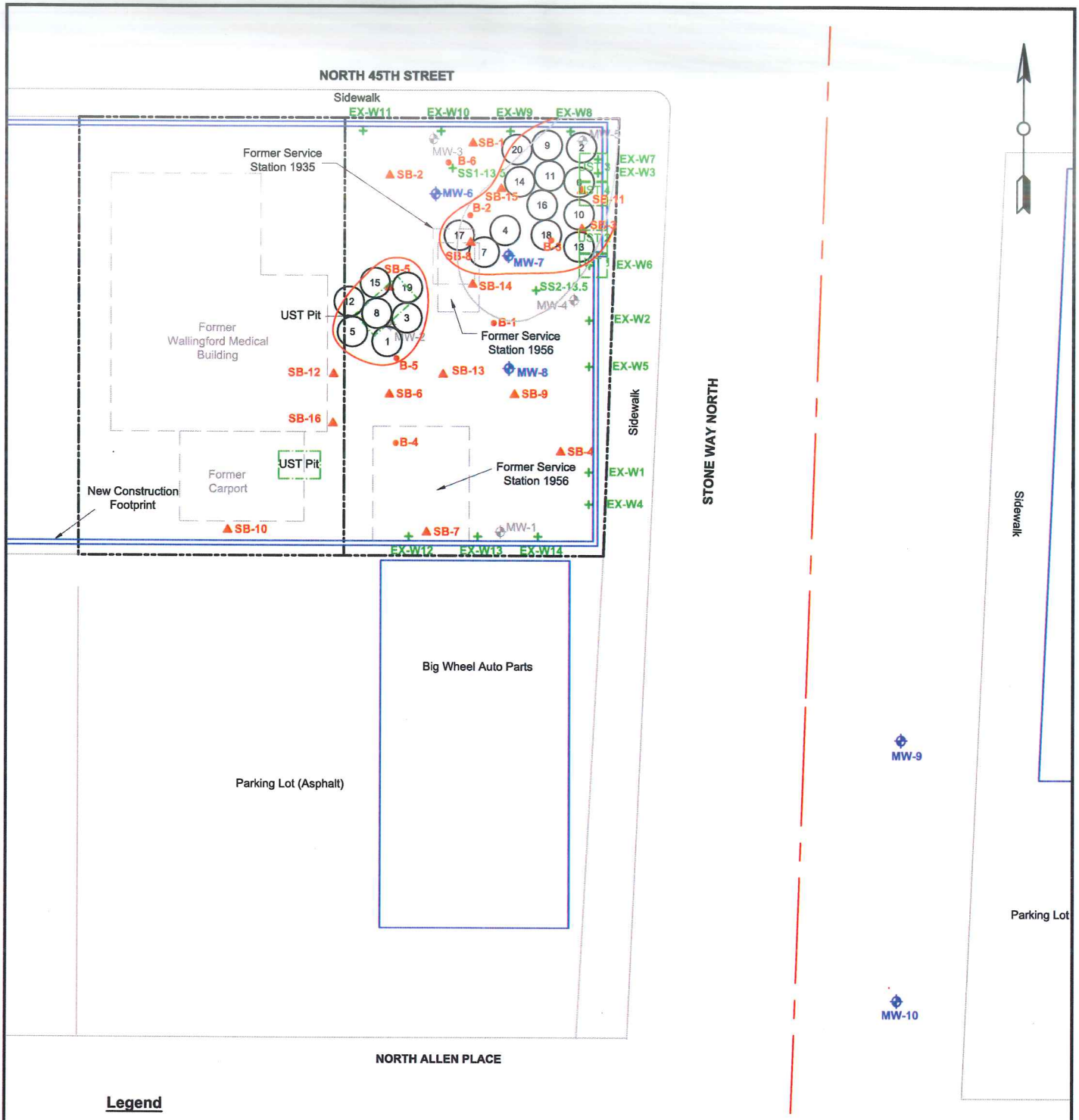
FILE NAME:	DATE:
20-9335 Vicinity Map.dwg	12/14/2010

SAIC
From Science to Solutions

FORMER CHEVRON SERVICE STATION NO. 20-9335
1225 NORTH 45TH STREET
SEATTLE, WASHINGTON

FIGURE 2
Site Map

DATE: 11/24/2010 | DRAWING: 209335_SiteMapExtended.dwg



Legend

- MW-7 — Groundwater Monitoring Well Location
- SB-1 — SAIC Soil Boring Location
- B-1 — EA Soil Boring Location
- Property Boundary
- 8 — Bucket Auger Location
- MW-5 — Former (Decommissioned) Monitoring Well Location
- MW-5 + — Excavation Sample Location
- Deep Contamination Above MTCA Method A Cleanup Levels Less Than 30 feet Below Ground Surface (bgs)
- Shallow Contamination Above MTCA Method A Cleanup Levels at Depths Less Than 18 Feet bgs

0 20' 40'

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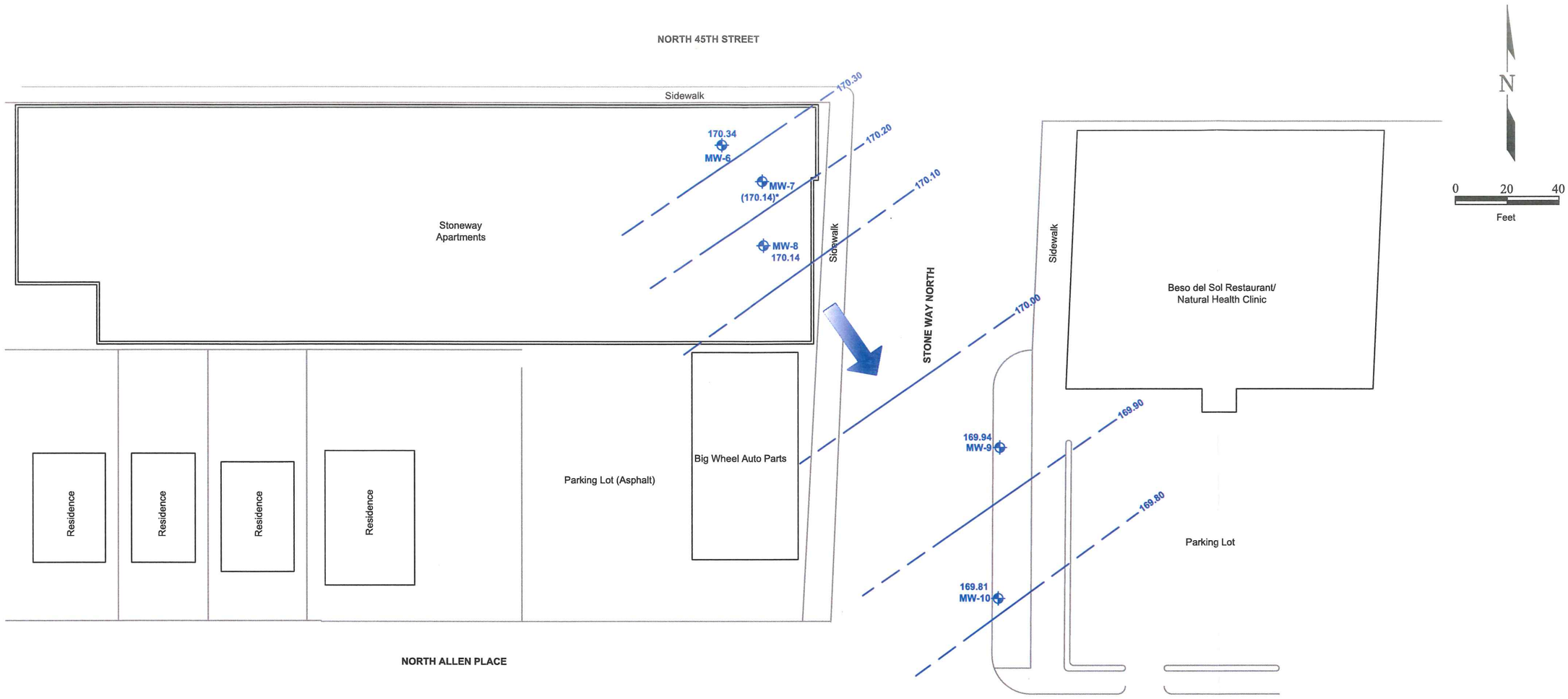
FORMER CHEVRON SERVICE STATION
NO.20-9335
1225 NORTH 45TH STREET
SEATTLE, WASHINGTON

FIGURE 3
SOIL SAMPLE LOCATIONS

FILE NAME: 209335_SiteMap-RI Figure 3.dwg

DATE: 11/24/10



Legend

⊕	Groundwater Monitoring Well
170.34	Groundwater Elevation in Feet
170.20 ——	Groundwater Eleavtion Contour at an 0.1 Foot Interval (Dashed Where Inferred
(170.14)*	Groundwater Elevation not used in Contour Map
◀	Approximate Groundwater Flow Direction at a Gradient of 0.002 to 0.004 Feet per Foot

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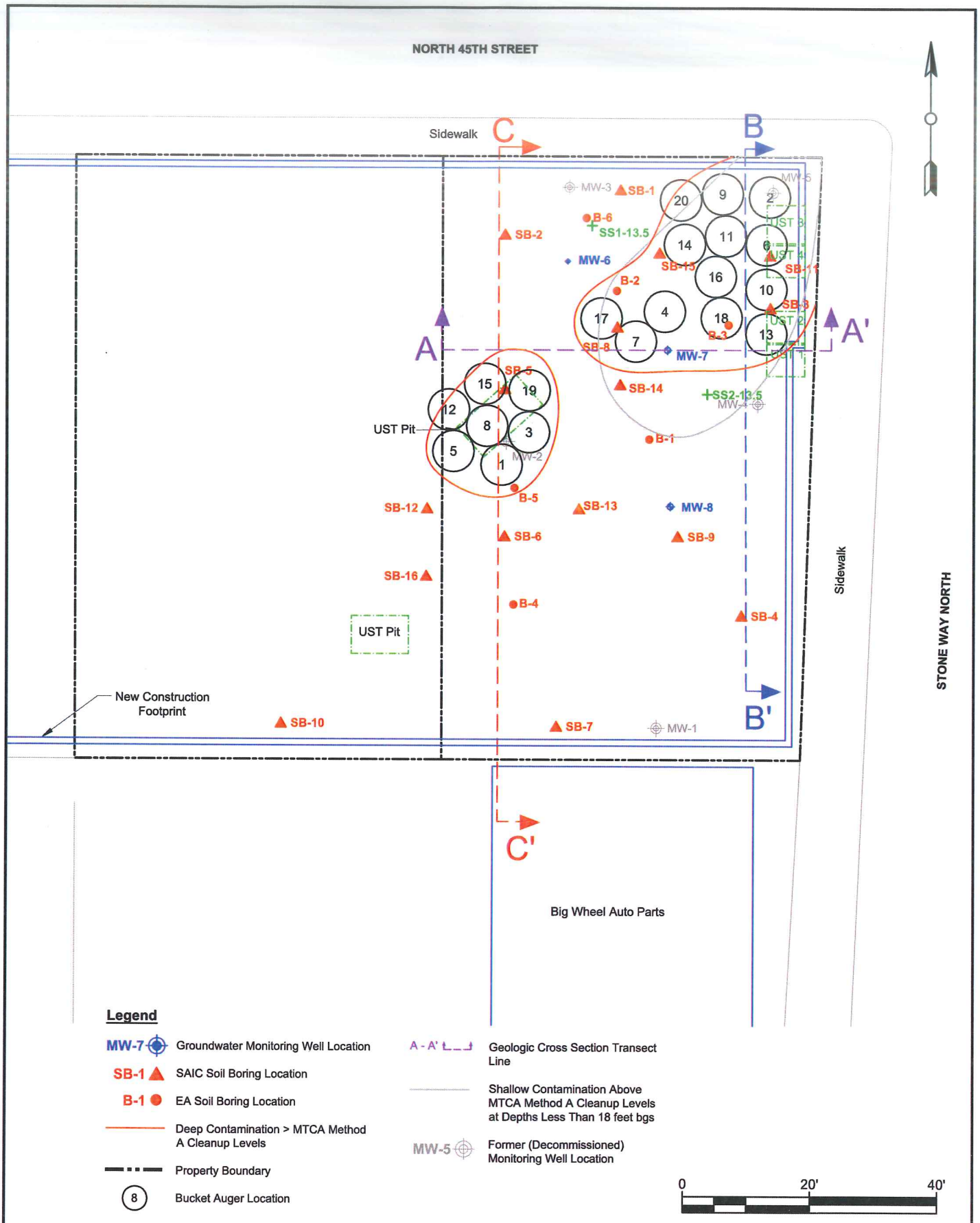
1225 NORTH 45TH STREET
SEATTLE, WASHINGTON

FIGURE 4
Potentiometric Map
June 9, 2010

DATE: 11/18/2010 | DRAWING: 209335_GW Contours.dwg



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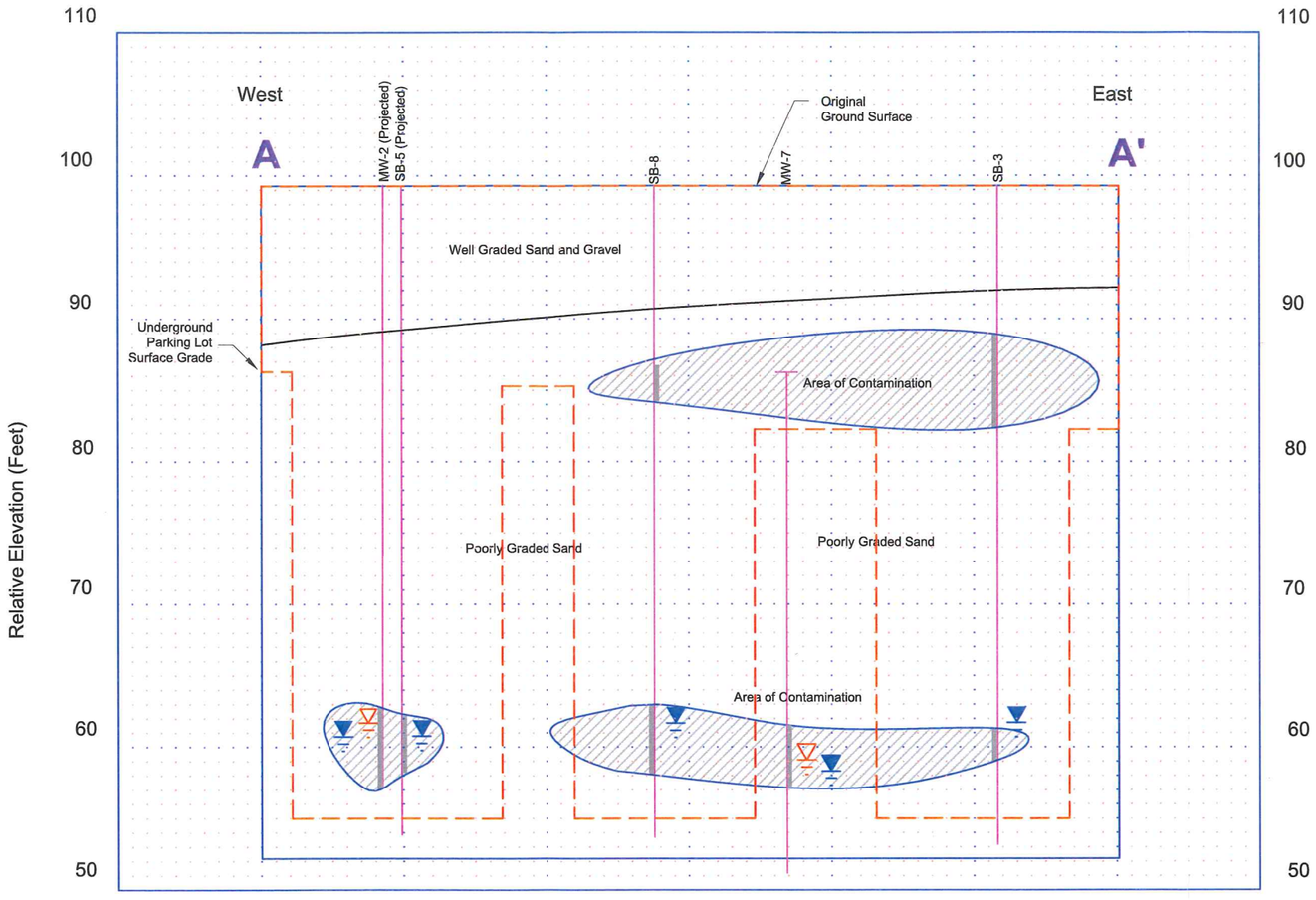
No. 20-9335
1225 NORTH 45TH STREET
SEATTLE, WASHINGTON

FIGURE 5
Geologic Cross Section Transects

FILE NAME:	DATE:
209335_SiteMap-10-11-05.dwg	11/24/2010

Legend

- Estimated Area of Contamination (Based on Analysis & Field Sampling)
- Boring
- Zone of Contamination above MTCA Method A (Based on Analysis)
- Top of Water Elevation 5/27/04 - 6/01/04 (Except MW-7 Measured 9/13/10)
- Top of Product Elevation 5/27/04 - 6/01/04 (Except MW-7 Measured 9/13/10)
- Outlined Zone Represents Soil That Was Removed Through Excavation And Bucket Auger Borings



0 5 10
Feet
No Vertical Exaggeration

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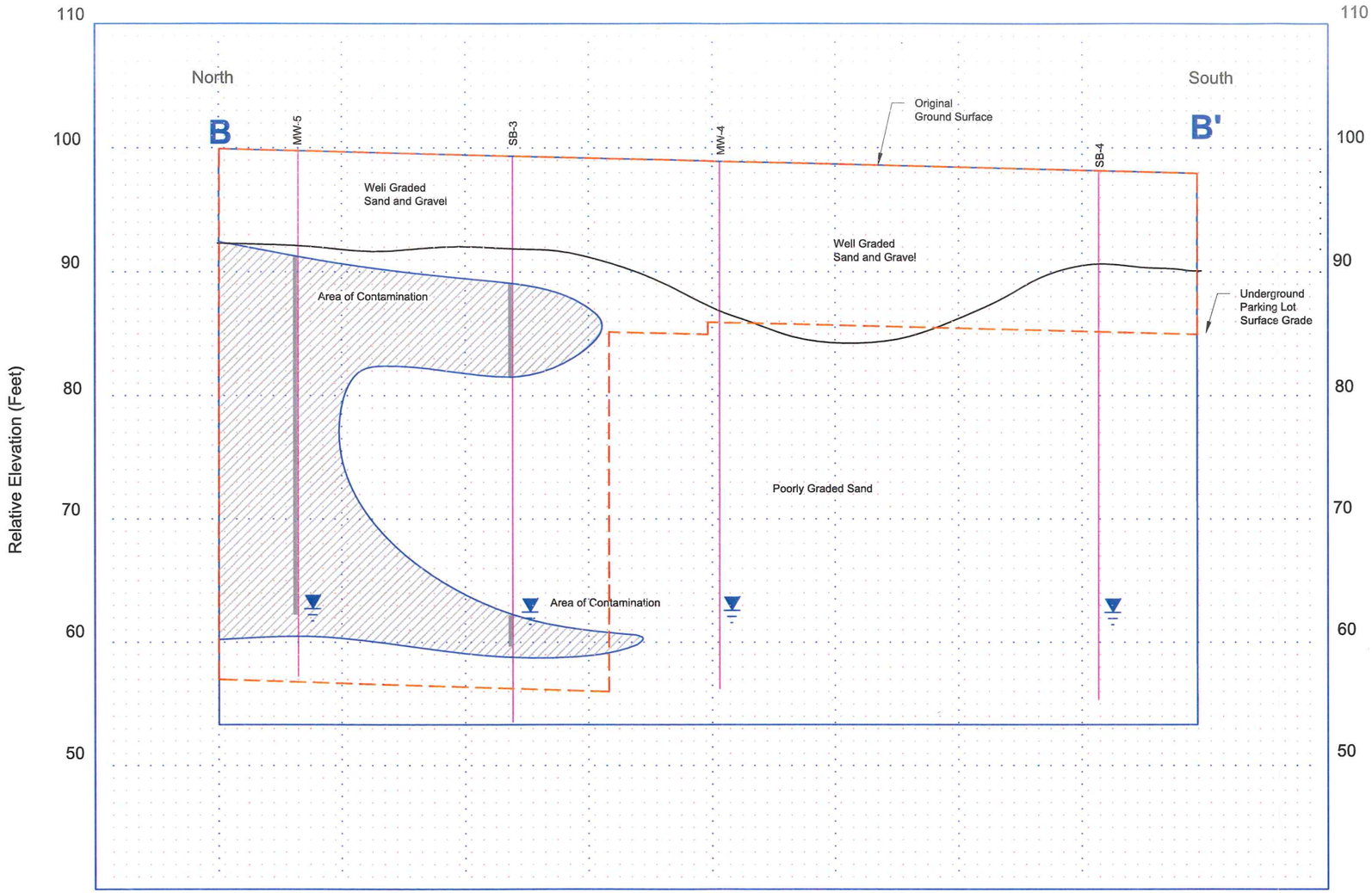
Former Chevron Service Station No. 20-9335
1225 North 45th Street
Seattle, Washington

FIGURE 6
Geologic Cross Section
A - A'

FILE NAME: 209335 Seattle - 45th\X-SEC.dwg
DATE: 11/24/2010



Legend

- Estimated Area of Contamination (Based on Analysis & Field Screening)
- Boring
- Zone of Contamination above MTCA Method A (Based on Analysis)
- Top of Water Elevation 5/27/04 - 6/01/04
- Outlined Zone Represents Soil That Was Removed Through Excavation And Bucket Auger Borings

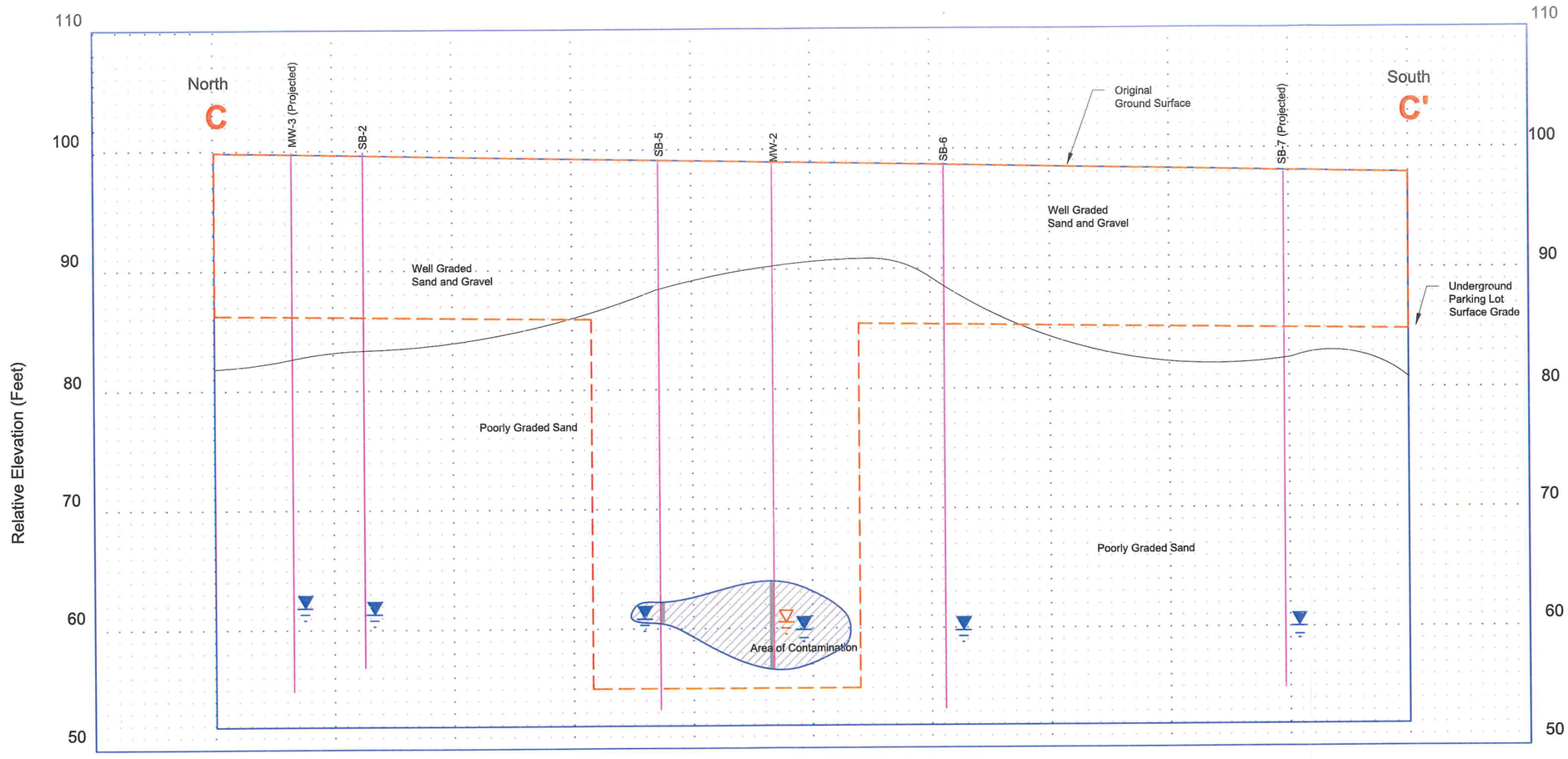
0 5 10
Feet
No Vertical Exaggeration

SAIC
From Science to Solutions

Former Chevron Service Station No. 20-9335
1225 North 45th Street
Seattle, Washington

FIGURE 7
Geologic Cross Section
B - B'

FILE NAME: 209335 Seattle - 45th\X-Sec.dwg
DATE: 11/24/2010



Legend

- Estimated Area of Contamination (Based on Analysis & Field Screening)
- Boring
- Zone of Contamination above MTCA Method A (Based on Analysis)
- Top of Water Elevation 5/27/04 - 6/01/04
- Outlined Zone Represents Soil That Was Removed Through Excavation And Bucket Auger Borings
- Top of Product Elevation 5/27/04 - 6/01/04

0 5 10
Feet
No Vertical Exaggeration

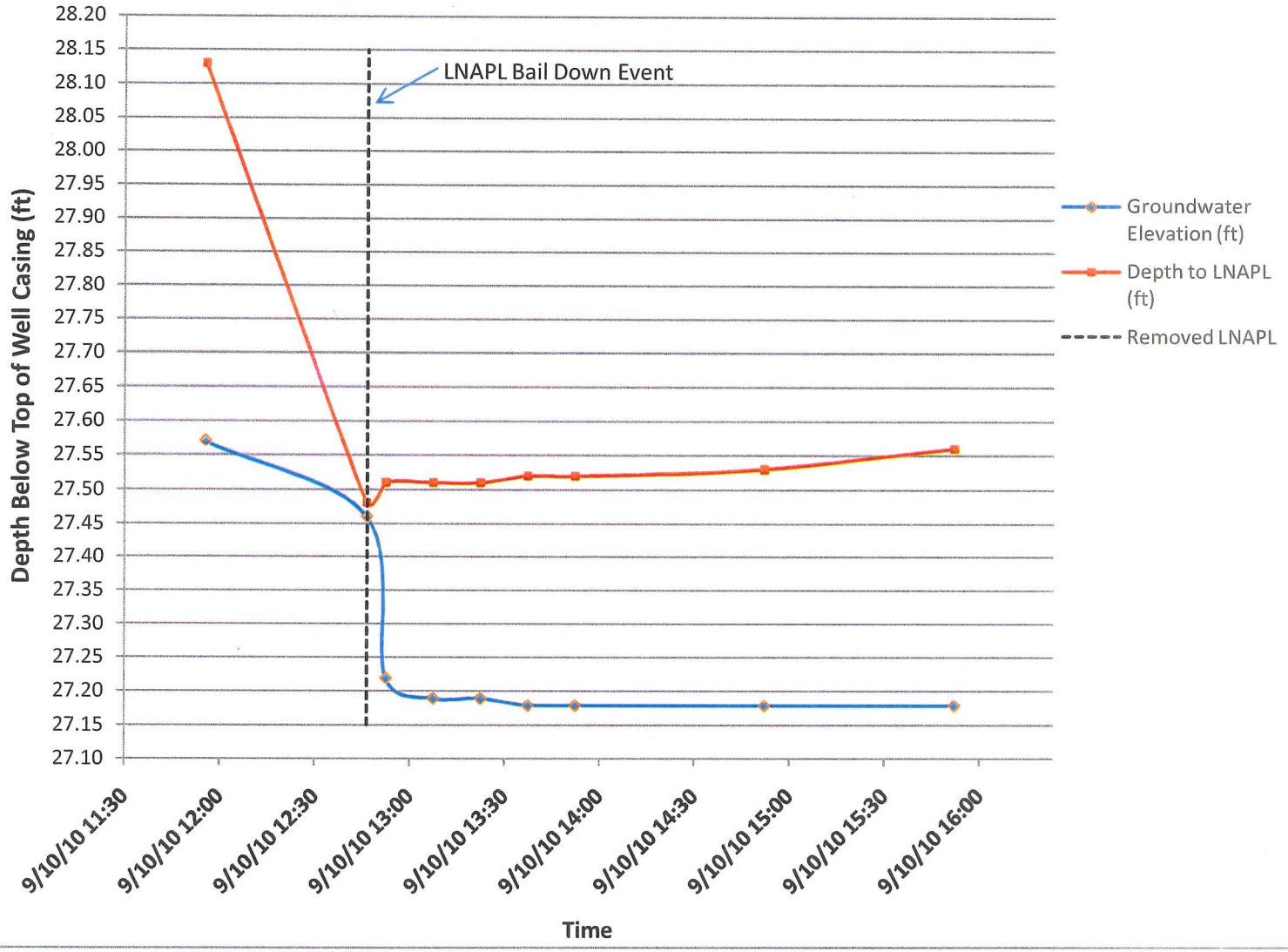
SAIC
From Science to Solutions

Former Chevron Service Station No. 20-9335
1225 North 45th Street
Seattle, Washington

FIGURE 8
Geologic Cross Section
C - C'

FILE NAME: 209335 Seattle - 45thX-Sec.dwg
DATE: 11/24/2010

Figure 9
LNAPL Recovery Test
Former Chevron Service Station No. 20-9335
1225 N 45th Street, Seattle, Washington



Tables

TABLE 1
SOIL BORING ANALYTICAL RESULTS
FORMER CHEVRON SERVICE STATION NO. 20-9335
1225 North 45th Street
Seattle, Washington

Concentrations reported in mg/kg

Sample ID	Date	Gasoline-Range Hydrocarbons	Diesel-Range Hydrocarbons	Heavy Oil-Range Hydrocarbons	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE
SB1-38	5/27/04	1.0 U	3.0 U	10.0 U	0.005 U	0.008	0.005 U	0.02 U	0.05 U
SB2-37.5	5/27/04	1.0 U	3.0 U	10.0 U	0.005 U	0.02	0.01	0.09	0.05 U
SB3-12.5	5/27/04	**4,100**	410	200 U	0.5 U	0.5 U	0.7	5.6	5.0 U
SB3-37.5	5/27/04	**2,900**	560	200 U	1.0 U	**37**	**33**	**200**	10 U
SB3-45.5	5/27/04	3.7	3.5	10.0 U	0.005 U	0.01	0.006	0.03	0.05 U
SB3-20	5/27/04	6.6	3.0 U	10 U	0.005 U	0.005 U	0.005 U	0.02	0.05 U
SB4-37.5	5/28/04	1.0 U	3.0 U	10.0 U	0.005 U	0.005 U	0.005 U	0.02 U	0.05 U
SB5-37.5	5/28/04	**240**	23	10.0 U	0.1 U	0.2	1.3	7.2	1.0 U
SB5-45	5/28/04	1.7	3.0 U	10.0 U	0.005 U	0.02	0.01	0.08	0.05 U
SB6-37.5	5/28/04	1.0 U	3.0 U	10.0 U	0.005 U	0.01	0.008	0.04	0.05 U
SB6-40	5/28/04	1.0 U	3.0 U	10.0 U	0.005 U	0.02	0.01	0.07	0.05 U
SB7-37.5	5/28/04	1.0 U	3.0 U	10.0 U	0.005 U	0.009	0.005 U	0.02	0.05 U
SB8-12.5	6/1/04	**860**	160	20 U	0.1 U	0.1 U	0.1	0.3	1.0 U
SB8-25	6/1/04	1.0 U	3.0 U	10 U	0.005 U	0.01	0.005 U	0.04	0.05 U
SB8-37.5	6/1/04	**5,000**	980	500 U	1.0 U	**48**	**61**	**320**	10 U
SB9-37.5	6/1/04	56	130	100 U	0.02 U	0.04	0.2	1.0	0.2 U
SB9-45	6/1/04	1.0 U	3.0 U	10.0 U	0.005 U	0.02	0.01	0.06	0.05 U
SB10-37.5	6/1/04	1.0 U	3.0 U	10.0 U	0.005 U	0.005 U	0.005 U	0.02 U	0.05 U
SB8-45	6/1/04	1.0 U	3.0 U	10.0 U	0.005 U	0.005	0.005 U	0.02 U	0.05 U
SB3-42.5	6/1/04	1.0 U	3.0 U	10.0 U	0.005 U	0.02	0.005 U	0.02	0.05 U
B1-7.5-8.5	8/29/99	**1,200**	na	na	0.29 U	0.29 U	0.45	2.6	na
B1-17.5-19	8/29/99	5.4 U	27 U	54 U	0.54 U	0.54 U	0.54 U	0.54 U	na
B2-12.5-14	8/29/99	**1,900**	na	na	0.26 U	2.9	**12**	**94**	na
B2-22.5-24	8/29/99	**230**	27 U	53 U	0.27 U	0.27 U	0.27 U	5	na
B3-2.5-4	8/29/99	74	na	na	0.27 U	0.27 U	0.27 U	1.87	na
B4-2.5-9	8/29/99	na	28 U	230	na	na	na	na	na
B5-32.5-34	9/21/99	5.3 U	na	na	0.053 U	0.053 U	0.053 U	0.053 U	na
B5-37.5-39	9/21/99	**210**	na	na	0.30 U	2.5	2.3	**12.6**	na
B6-17.5-18.5	9/21/99	28 U	na	na	0.28 U	0.28 U	0.28 U	0.28 U	na

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TABLE 1
SOIL BORING ANALYTICAL RESULTS
FORMER CHEVRON SERVICE STATION NO. 20-9335
1225 North 45th Street
Seattle, Washington

Concentrations reported in mg/kg

Sample ID	Date	Gasoline-Range Hydrocarbons	Diesel-Range Hydrocarbons	Heavy Oil-Range Hydrocarbons	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE
B7-22.5-24	9/21/99	5.5 U	na	na	0.055 U	0.055 U	0.055 U	0.055 U	na
MW1-35	10/10/00	5.00 U	10 U	25 U	0.005 U	0.050 U	0.050 U	0.10 U	na
MW2-35	10/11/00	**430**	94.1	25 U	0.005 U	0.057 U	2.45 U	7.65 U	na
MW3-35	10/10/00	5.00 U	10 U	25 U	0.005 U	0.050 U	0.050 U	0.10 U	na
MW4-35	10/11/00	5.00 U	10 U	25 U	0.005 U	0.050 U	0.050 U	0.10 U	na
MW5-5	10/11/00	5.00 U	10 U	25 U	0.005 U	0.050 U	0.050 U	0.10 U	na
MW5-35	10/11/00	9.41	10 U	25 U	0.005 U	0.050 U	0.050 U	0.328	na
MW-9-37.5	12/4/06	1.0 U	3.0 U	10.0 U	0.0005 U	0.0009 U	0.0009 U	0.0009 U	0.0005 U
MW-10-37.5	12/4/06	1.0 U	3.0 U	10.0 U	0.0005 U	0.0009 U	0.0009 U	0.0009 U	0.0005 U
MTCA Method A CULs		30/100*	2,000	2,000	0.03	7	6	9	0.1

EXPLANATIONS:

Bold values exceed MTCA Method A CULs

BTEX analyzed by Method USEPA 8021B

Laboratory Analysis Report included in Appendix B

CULs = Cleanup Levels

mg/kg = Milligrams per kilogram

MTBE = Methyl tertiary butyl ether

MTCA = Model Toxics Control Act

na = Not available or not applicable

U = Undetected at detection limit

USEPA = United States Environmental Protection Agency

* = 100 mg/kg is the CUL for gasoline because benzene is not present.

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TABLE 2
REMEDIAL EXCAVATION SOIL ANALYTICAL RESULTS
FORMER CHEVRON SERVICE STATION NO. 20-9335
1225 North 45th Street
Seattle, Washington
Concentrations reported in mg/kg

Sample ID	Sample Depth (feet)	Sample Date	Gasoline-Range Hydrocarbons	Diesel-Range Hydrocarbons	Heavy Oil-Range Hydrocarbons	Benzene	Toluene	Ethyl-benzene	Total Xylenes
EX-W1-3	3.0	1/10/04	1.0 U	3.0 U	10.0 U	0.005 U	0.005 U	0.005 U	0.01 U
EX-W2-3	3.0	1/10/04	0.8 U	3.0 U	10.0 U	0.004 U	0.004 U	0.004 U	0.01 U
EX-W3-3	3.0	1/10/04	0.9 U	4.1	31.0	0.005 U	0.005 U	0.005 U	0.01 U
EX-W4-7	7.0	9/12/05	1.1 U	3.0 U	10.0 U	0.005 U	0.005 U	0.005 U	0.02 U
EX-W5-7.5	7.5	9/12/05	1.1 U	4.2	80.0	0.005 U	0.005 U	0.005 U	0.02 U
EX-W5-13	13.0	9/19/05	0.9 U	3.0 U	10.0 U	0.005 U	0.005 U	0.005 U	0.01 U
EX-W6-7.5	7.5	9/12/05	1.1 U	3.2	28.0	0.005 U	0.005 U	0.005 U	0.02 U
EX-W6-10	10.0	9/15/05	1.3 U	3.0 U	10.0 U	0.006 U	0.006 U	0.006 U	0.02 U
EX-W6-13	13.0	9/19/05	1.0 U	3.0 U	10.0 U	0.005 U	0.005 U	0.005 U	0.02 U
EX-W7-7.5	7.5	9/12/05	0.9 U	3.0 U	10.0 U	0.005 U	0.005 U	0.005 U	0.01 U
EX-W7-10	10.0	9/15/05	0.9 U	3.0 U	10.0 U	0.005 U	0.005 U	0.005 U	0.01 U
EX-W7-13	13.0	9/19/05	1.0 U	3.0 U	10.0 U	0.005 U	0.005 U	0.005 U	0.02 U
EX-W8-7.5	7.5	9/12/05	0.9 U	3.0 U	10.0 U	0.005 U	0.005 U	0.005 U	0.01 U
EX-W8-10	10.0	9/15/05	**26,000**	60	10.0 U	1.0 U	**42.0**	**110**	**870**
EX-W8-13	13.0	9/19/05	1.1 U	3.0 U	10.0 U	0.006 U	0.006 U	0.006 U	0.02 U
EX-W9-7.5	7.5	9/12/05	1.0 U	3.0 U	10.0 U	0.005 U	0.005 U	0.005 U	0.02 U
EX-W9-13	13.0	9/19/05	0.9 U	3.0 U	10.0 U	0.005 U	0.005 U	0.005 U	0.01 U
EX-W10-7.5	7.5	9/12/05	1.1 U	7.7	36.0	0.005 U	0.005 U	0.005 U	0.02 U
EX-W10-13	13.0	9/19/05	1.0 U	3.0 U	10.0 U	0.005 U	0.005 U	0.005 U	0.02 U
EX-W11-7.5	7.5	9/12/05	0.9 U	3.0 U	10.0 U	0.004 U	0.004 U	0.004 U	0.01 U
EX-W12-8	8.0	9/15/05	1.8 U	3.0 U	10.0 U	0.009 U	0.009 U	0.009 U	0.03 U
EX-W13-8	8.0	9/15/05	1.0 U	3.0 U	10.0 U	0.005 U	0.005 U	0.005 U	0.02 U
EX-W14-8	8.0	9/15/05	1.0 U	3.0 U	10.0 U	0.005 U	0.005 U	0.005 U	0.02 U

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TABLE 2

REMEDIAL EXCAVATION SOIL ANALYTICAL RESULTS

FORMER CHEVRON SERVICE STATION NO. 20-9335

1225 North 45th Street

Seattle, Washington

Concentrations reported in mg/kg

Sample ID	Sample Depth (feet)	Sample Date	Gasoline-Range Hydrocarbons	Diesel-Range Hydrocarbons	Heavy Oil-Range Hydrocarbons	Benzene	Toluene	Ethyl-benzene	Total Xylenes
SS1-13.5	13.5	10/7/05	4.3	3.1	10.0 U	0.005 U	0.03	0.03	0.1
SS2-13.5	13..5	10/7/05	1.0 U	3.0 U	10.0 U	0.005 U	0.005 U	0.005 U	0.02 U
MTCA Method A CULs			30/100	2,000	2,000	0.03	7	6	9

EXPLANATIONS:

Bold values exceed MTCA Method A CULs

BTEX analyzed by Method USEPA 8021B

Laboratory Analysis Report included in Appendix B

CULs = Cleanup Levels

mg/kg = Milligrams per kilogram

MTCA = Model Toxics Control Act

na = Not available or not applicable

U = Undetected at detection limit

USEPA = United States Environmental Protection Agency

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TABLE 3

BUCKET-AUGER BORING SOIL ANALYTICAL RESULTS

FORMER CHEVRON SERVICE STATION NO. 20-9335

1225 North 45th Street

Seattle, Washington

Concentrations reported in mg/kg

Sample ID	Sample Depth (feet)	Sample Date	Gasoline-Range Hydrocarbons	Diesel-Range Hydrocarbons	Heavy Oil-Range Hydrocarbons	Benzene	Toluene	Ethyl-benzene	Total Xylenes
BA1-42	42	9/26/05	3.7	3.0 U	10.0 U	0.005 U	0.04	0.04	0.2
BA2-42	42	9/27/05	4.3	3.0 U	10.0 U	0.005 U	0.1	0.08	0.5
BA3-42	42	9/27/05	4.5	3.0 U	10.0 U	0.005 U	0.04	0.05	0.3
BA4-42	42	9/28/05	1.0 U	3.0 U	10.0 U	0.005 U	0.005 U	0.005 U	0.02 U
BA5-42	42	9/28/05	1.0 U	3.0 U	10.0 U	0.005 U	0.005	0.005 U	0.02 U
BA6-42	42	9/29/05	1.0 U	3.0 U	10.0 U	0.005 U	0.005 U	0.005 U	0.02 U
BA7-42	42	9/29/05	1.0 U	3.0 U	10.0 U	0.005 U	0.005 U	0.005 U	0.02 U
BA8-42	42	9/29/05	1.0 U	3.0 U	10.0 U	0.005 U	0.005 U	0.005 U	0.02 U
BA9-42	42	9/30/05	1.0 U	3.0 U	10.0 U	0.005 U	0.006	0.005 U	0.02
BA10-42	42	9/30/05	1.0 U	3.0 U	10.0 U	0.005 U	0.005 U	0.005 U	0.02 U
BA11-42	42	10/3/05	1.0 U	3.0 U	10.0 U	0.005 U	0.01	0.007	0.04
BA12-42	42	10/3/05	1.0 U	3.0 U	10.0 U	0.005 U	0.01	0.007	0.03
BA13-40	40	10/4/05	19	3.0 U	10.0 U	0.009	0.2	0.2	1.0
BA13-42	42	10/4/05	1.0 U	3.0 U	10.0 U	0.005 U	0.005 U	0.005 U	0.02
BA14-42	42	10/4/05	1.8	3.0 U	10.0 U	0.006	0.09	0.03	0.2
BA15-42	42	10/4/05	1.0 U	3.0 U	10.0 U	0.005 U	0.008	0.009	0.04
BA17-42	42	10/5/05	1.0 U	3.0 U	10.0 U	0.005 U	0.01	0.007	0.04
BA18-42	42	10/6/05	1.0 U	3.0 U	10.0 U	0.005 U	0.005 U	0.005 U	0.02 U
BA19-42	42	10/6/05	1.0 U	3.0 U	10.0 U	0.005 U	0.01	0.03	0.09
BA20-39	39	10/6/05	**4,200**	190	50.0 U	0.2 U	**18.0**	**31.0**	**180**
BA20-42	42	10/6/05	1.0 U	3.0 U	10.0 U	0.005 U	0.005 U	0.005 U	0.02 U
MTCA Method A CULs			30/100	2,000	2,000	0.03	7	6	9

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TABLE 3

BUCKET-AUGER BORING SOIL ANALYTICAL RESULTS

FORMER CHEVRON SERVICE STATION NO. 20-9335

1225 North 45th Street

Seattle, Washington

Concentrations reported in mg/kg

EXPLANATIONS:

Bold values exceed MTCA Method A CULs

BTEX analyzed by Method USEPA 8021B

Laboratory Analysis Report included in Appendix B

CULs = Cleanup Levels

mg/kg = Milligrams per kilogram

MTCA = Model Toxics Control Act

na = Not available or not applicable

U = Undetected at detection limit

USEPA = United States Environmental Protection Agency

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TABLE 4
GROUNDWATER MONITORING DATA AND ANALYTICAL RESULTS
FORMER CHEVRON SERVICE STATION NO. 20-9335
Seattle, Washington
Concentrations reported in µ/L unless otherwise noted

WELL ID/ DATE	TOC*	DTP	DTW	SPHT	GWE	TPH-DRO	TPH-HRO	TPH-GRO	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE	D. Lead (mg/L)
MW-1														
10/11/00[1]	97.95	--	34.50	--	63.45	--	--	--	--	--	--	--	--	--
12/16/00	97.95	--	35.91	0.00	62.04	ND[2,3]	ND[2,3]	74.4	ND	ND	ND	ND	ND	ND[4]
3/26/01	97.95	--	36.54	0.00	61.41	ND[3]	ND[3]	ND	ND	ND	ND	ND	ND	--
6/25/01	97.95	--	36.78	0.00	61.17	<281[3]	<842[3]	<50.0	<0.500	<0.500	<0.500	<1.00	--	--
9/24/01	97.95	--	37.14	0.00	60.81	<250[3,8]	<500[3,8]	<50.0	<0.500	<0.500	<0.500	<1.00	--	--
12/13/01	97.95	--	37.25	0.00	60.70	<250[3]	<500[3]	<80.0	<0.500	<0.500	<0.500	<1.00	--	--
3/8/02 NP	97.95	--	36.79	0.00	61.16	<250[3]	<750[3]	<50	<0.50	<0.50	<0.50	<1.5	--	--
5/29/02	97.95	--	36.44	0.00	61.51	SAMPLED SEMI-ANNUALLY			--	--	--	--	--	--
9/16/02 NP	97.95	--	36.71	0.00	61.24	<250[3]	<250[3]	<50	<0.50	<0.50	<0.50	<1.5	--	--
12/5/02	97.95	--	37.09	0.00	60.86	SAMPLED SEMI-ANNUALLY			--	--	--	--	--	--
3/4/03 NP	97.95	--	37.26	0.00	60.69	<250[3]	<250[3]	100	<0.50	<0.50	<0.50	<3.0	--	--
6/3/03	97.95	--	37.09	0.00	60.86	SAMPLED SEMI-ANNUALLY			--	--	--	--	--	--
10/27/03	97.95	--	37.42	0.00	60.53	NOT SAMPLED DUE TO INSUFFICIENT WATER					--	--	--	--
3/31/04 NP	97.95	--	37.12	0.00	60.83	<800[3]	<1,000[3]	<50	<0.5	<0.5	<0.5	<1.5	--	--
6/28/04	97.95	--	37.14	0.00	60.81	SAMPLED SEMI-ANNUALLY			--	--	--	--	--	--
9/29/04	97.95	--	37.50	0.00	60.45	NOT SAMPLED DUE TO INSUFFICIENT WATER					--	--	--	--
1/4/05	97.95	--	37.61	0.00	60.34	SAMPLED SEMI-ANNUALLY			--	--	--	--	--	--
ABANDONED														
MW-2														
10/11/00[1]	98.70	--	34.50	--	64.20	--	--	--	--	--	--	--	--	--
12/16/00	98.70	--	36.46	0.00	62.24	1,000[3]	ND[3]	28,100	283	2,560	693	4,020	ND[2]	0.00194[4]
3/26/01	98.70	--	37.12	0.00	61.58	1,180[3,5]	ND[3]	17,000	143	1,450	378	2,180	ND[2]/ND[6]	--
6/25/01	98.70	--	37.37	0.00	61.33	418[3,5]	<750[3]	11,700	92.3	547	181	1,010	--	--
9/24/01	98.70	--	37.72	0.00	60.98	4,840[3,7,8]	<557[3,8]	22,100	120	1,380	658	4,100	--	--
12/13/01	98.70	--	37.89	0.00	60.81	5,540[3,5]	<500[3]	84,000	185	3,960	1,590	9,950	--	--
3/8/02	98.70	37.24	38.00	0.76	61.31***	NOT SAMPLED DUE TO THE PRESENCE OF SPH					--	--	--	--
5/29/02	98.70	36.81	37.54	0.73	61.74***	NOT SAMPLED DUE TO THE PRESENCE OF SPH					--	--	--	--
9/16/02	98.70	37.19	37.61	0.42	61.43***	NOT SAMPLED DUE TO THE PRESENCE OF SPH					--	--	--	--
10/15/02	98.70	37.24	37.68	0.44	61.37***	--	--	--	--	--	--	--	--	--
11/22/02	98.70	37.12	37.63	0.51	61.48***	--	--	--	--	--	--	--	--	--
12/5/02	98.70	37.51	38.10	0.59	61.07***	NOT SAMPLED DUE TO THE PRESENCE OF SPH					--	--	--	--
1/28/03	98.70	36.77	37.33	0.56	61.82***	--	--	--	--	--	--	--	--	--
2/13/03	98.70	37.44	38.02	0.58	61.14***	--	--	--	--	--	--	--	--	--
3/4/03	98.70	INACCESSIBLE - VEHICLE PARKED OVER WELL				--	--	--	--	--	--	--	--	--

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TABLE 4
GROUNDWATER MONITORING DATA AND ANALYTICAL RESULTS
FORMER CHEVRON SERVICE STATION NO. 20-9335
Seattle, Washington
Concentrations reported in µ/L unless otherwise noted

WELL ID/ DATE	TOC*	DTP	DTW	SPHT	GWE	TPH-DRO	TPH-HRO	TPH-GRO	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE	D. Lead (mg/L)
MW-2 (cont)														
4/21/03	98.70	37.21	37.78	0.57	61.38***	--	--	--	--	--	--	--	--	--
5/8/03	98.70	37.43	37.94	0.51	61.17***	--	--	--	--	--	--	--	--	--
6/3/03	98.70	37.37	37.91	0.54	61.22***	NOT SAMPLED DUE TO THE PRESENCE OF SPH					--	--	--	--
7/6/03	98.70	36.96	37.51	0.55	61.63***	--	--	--	--	--	--	--	--	--
8/18/03	98.70	37.49	38.02	0.53	61.10***	--	--	--	--	--	--	--	--	--
10/27/03	98.70	37.54	39.98	2.44	60.67**	NOT SAMPLED DUE TO THE PRESENCE OF SPH					--	--	--	--
11/17/03	98.70	37.10	37.58	0.48	61.50**	--	--	--	--	--	--	--	--	--
12/31/03	98.70	36.18	38.19	2.01	62.12**	--	--	--	--	--	--	--	--	--
2/9/04	98.70	37.00	37.49	0.49	61.60**	--	--	--	--	--	--	--	--	--
3/4/04	98.70	35.85	37.06	1.21	62.61**	--	--	--	--	--	--	--	--	--
3/31/04	98.70	37.32	39.05	1.73	61.03**	NOT SAMPLED DUE TO THE PRESENCE OF SPH					--	--	--	--
6/28/04	98.70	37.32	39.05	1.73	61.03**	NOT SAMPLED DUE TO THE PRESENCE OF SPH					--	--	--	--
9/11/04	98.70	37.65	39.10	1.45	60.76**	--	--	--	--	--	--	--	--	--
9/29/04	98.70	37.71	39.39	1.68	60.65**	NOT SAMPLED DUE TO THE PRESENCE OF SPH					--	--	--	--
11/22/04	98.70	36.89	38.16	1.27	61.56**	--	--	--	--	--	--	--	--	--
1/4/05	98.70	37.88	39.80	1.92	60.44**	NOT SAMPLED DUE TO THE PRESENCE OF SPH					--	--	--	--
1/14/05	98.70	37.49	39.02	1.53	60.90**	--	--	--	--	--	--	--	--	--
ABANDONED														
MW-3														
10/11/00[1]	98.76	--	34.00	--	64.76	--	--	--	--	--	--	--	--	--
12/16/00	98.76	--	36.39	0.00	62.37	ND[3]	ND[3]	ND	ND	0.612	ND	1.95	ND	ND[4]
3/26/01	98.76	--	37.05	0.00	61.71	ND[3]	ND[3]	ND	ND	ND	ND	ND	ND	--
6/25/01	98.76	--	37.29	0.00	61.47	<250[3]	<750[3]	<50.0	<0.500	<0.500	<0.500	<1.00	--	--
9/24/01	98.76	--	37.64	0.00	61.12	<250[3,8]	<500[3,8]	<50.0	<0.500	<0.500	<0.500	<1.00	--	--
12/13/01	98.76	--	37.78	0.00	60.98	<250[3]	<500[3]	<80.0	<0.500	<0.500	<0.500	<1.00	--	--
3/8/02 NP	98.76	--	37.28	0.00	61.48	<250[3]	<750[3]	320	<0.50	0.64	2.1	15	--	--
5/29/02	98.76	--	36.92	0.00	61.84	SAMPLED SEMI-ANNUALLY			--	--	--	--	--	--
9/16/02 NP	98.76	--	37.21	0.00	61.55	<250[3]	<250[3]	<50	<0.50	<0.50	<0.50	<1.5	--	--
12/5/02	98.76	--	37.58	0.00	61.18	SAMPLED SEMI-ANNUALLY			--	--	--	--	--	--
3/4/03 NP	98.76	--	37.79	0.00	60.97	<250[3]	<250[3]	<50	<0.50	<0.50	<0.50	<1.5	--	--
6/3/03	98.76	--	37.68	0.00	61.08	SAMPLED SEMI-ANNUALLY			--	--	--	--	--	--
10/27/03 NP	98.76	--	38.00	0.00	60.76	<250[3]	<250[3]	<50	<0.5	<0.5	<0.5	<1.5	--	--
3/31/04 NP	98.76	--	37.65	0.00	61.11	<800[3]	<1,000[3]	<50	<0.5	<0.5	<0.5	<1.5	--	--

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TABLE 4
GROUNDWATER MONITORING DATA AND ANALYTICAL RESULTS
FORMER CHEVRON SERVICE STATION NO. 20-9335
Seattle, Washington
Concentrations reported in µ/L unless otherwise noted

WELL ID/ DATE	TOC*	DTP	DTW	SPHT	GWE	TPH-DRO	TPH-HRO	TPH-GRO	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE	D. Lead (mg/L)
MW-3 (cont)														
6/28/04	98.76	--	37.68	0.00	61.08	SAMPLED SEMI-ANNUALLY			--	--	--	--	--	--
9/29/04 NP	98.76	--	38.01	0.00	60.75	<250[3]	<250[3]	<50	<0.5	<0.5	<0.5	<1.5	--	--
1/4/05	98.76	--	38.19	0.00	60.57	SAMPLED SEMI-ANNUALLY			--	--	--	--	--	--
ABANDONED														
MW-4														
10/11/00[1]	98.52	--	35.00	--	63.52	--	--	--	--	--	--	--	--	--
12/16/00	98.52	--	36.35	0.00	62.17	ND[2,3]	ND[2,3]	58,200	326	5,520	1,430	8,520	ND[2]	0.0123[4]
3/26/01	98.52	--	37.00	0.00	61.52	266[3,5]	ND[3]	27,200	178	2,160	785	4,160	ND[2]/ND[6]	--
6/25/01	98.52	--	37.25	0.00	61.27	<250[3]	<750[3]	12,300	69.0	654	416	1,910	--	--
9/24/01	98.52	--	37.60	0.00	60.92	<250[3,8]	<500[3,8]	4,130	30.1	154	197	684	--	--
12/13/01	98.52	--	37.72	0.00	60.80	<250[3]	<500[3]	5,490	30.3	175	177	679	--	--
3/8/02 NP	98.52	--	38.36	0.00	60.16	<250[3]	<750[3]	9,000	<50	150	170	710	--	--
5/29/02 NP	98.52	--	36.86	0.00	61.66	<250[3]	<750[3]	6,700	22	150	190	780	--	--
8/7/02	98.52	--	36.92	0.00	61.60	--	--	--	--	--	--	--	--	--
9/16/02 NP	98.52	--	37.16	0.00	61.36	<250[3]	<250[3]	7,500	46	230	240	630	--	--
12/5/02 NP	98.52	--	37.53	0.00	60.99	<250[3]	<250[3]	14,000	73	400	540	1,500	--	--
3/4/03	98.52	36.68	36.71	0.03	61.83***	NOT SAMPLED DUE TO THE PRESENCE OF SPH					--	--	--	--
6/3/03	98.52	36.59	36.63	0.04	61.92***	NOT SAMPLED DUE TO THE PRESENCE OF SPH					--	--	--	--
7/6/03	98.52	36.90	36.93	0.03	61.61***	--	--	--	--	--	--	--	--	--
8/18/03	98.52	36.76	36.80	0.04	61.75***	--	--	--	--	--	--	--	--	--
10/27/03 NP	98.52	--	37.96	0.00	60.56	<400[3]	<500[3]	2,200	16	55	76	170	--	--
11/17/03	98.52	36.34	36.37	0.03	62.17**	--	--	--	--	--	--	--	--	--
12/31/03	98.52	--	36.88	0.00	61.64	--	--	--	--	--	--	--	--	--
2/9/04	98.52	36.14	36.17	0.03	62.37**	--	--	--	--	--	--	--	--	--
3/4/04	98.52	--	36.74	0.00	61.78	--	--	--	--	--	--	--	--	--
3/31/04 NP	98.52	--	37.59	0.00	60.93	<250[3]	<250[3]	3,900	14	96	110	340	--	--
6/28/04 NP	98.52	--	37.54	0.00	60.98	<250[3]	<250[3]	1,600	8.5	15	59	110	--	--
9/11/04	98.52	37.78	37.81	0.03	60.73**	--	--	--	--	--	--	--	--	--
9/29/04 NP	98.52	--	37.86	0.00	60.66	<250[3]	<250[3]	1,500	18	40	76	170	--	--
11/22/04	98.52	--	36.81	0.00	61.71	--	--	--	--	--	--	--	--	--
1/4/05 NP	98.52	--	38.11	0.00	60.41	1,600[3]	<250[3]	1,600	10	13	60	110	--	--
1/14/05	98.52	--	37.58	0.00	60.94	--	--	--	--	--	--	--	--	--
ABANDONED														

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FORMER CHEVRON SERVICE STATION NO. 20-9335
Seattle, Washington
Concentrations reported in µ/L unless otherwise noted

WELL ID/ DATE	TOC*	DTP	DTW	SPHT	GWE	TPH-DRO	TPH-HRO	TPH-GRO	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE	D. Lead (mg/L)
MW-5														
10/11/00[1]	99.42	--	34.50	--	64.92	--	--	--	--	--	--	--	--	--
12/16/00	99.42	--	37.18	0.00	62.24	5,080[3]	ND[3]	146,000	ND[2]	15,100	4,160	24,100	ND[2]	0.0200[4]
3/26/01	99.42	--	37.91	0.00	61.51	77,900[3,5]	ND[3]	149,000	256	10,600	4,000	24,200	ND[2]/ND[6]	--
6/25/01	99.42	--	38.14	0.00	61.28	109,000[3]	<18,100[3]	127,000	210	9,580	3,730	21,500	--	--
9/24/01	99.42	38.40	38.44	0.04	61.01***	NOT SAMPLED DUE TO THE PRESENCE OF SPH					--	--	--	--
12/13/01	99.42	38.55	38.59	0.04	60.86***	NOT SAMPLED DUE TO THE PRESENCE OF SPH					--	--	--	--
3/8/02	99.42	37.96	38.46	0.50	61.36***	NOT SAMPLED DUE TO THE PRESENCE OF SPH					--	--	--	--
5/29/02	99.42	37.60	38.05	0.45	61.73***	NOT SAMPLED DUE TO THE PRESENCE OF SPH					--	--	--	--
8/7/02	99.42	37.73	38.12	0.39	61.61***	--	--	--	--	--	--	--	--	--
9/16/02	99.42	38.00	38.39	0.39	61.34***	NOT SAMPLED DUE TO THE PRESENCE OF SPH					--	--	--	--
10/15/02	99.42	38.09	38.47	0.38	61.25***	--	--	--	--	--	--	--	--	--
11/22/02	99.42	37.84	38.26	0.42	61.50***	--	--	--	--	--	--	--	--	--
12/5/02	99.42	38.42	38.78	0.36	60.93***	NOT SAMPLED DUE TO THE PRESENCE OF SPH					--	--	--	--
1/28/03	99.42	37.88	38.24	0.36	61.47***	--	--	--	--	--	--	--	--	--
2/13/03	99.42	38.33	38.68	0.35	61.02***	--	--	--	--	--	--	--	--	--
3/4/03	99.42	37.54	37.89	0.35	61.81***	NOT SAMPLED DUE TO THE PRESENCE OF SPH					--	--	--	--
4/21/03	99.42	37.96	38.29	0.33	61.39***	--	--	--	--	--	--	--	--	--
5/8/03	99.42	38.50	38.82	0.32	60.86***	--	--	--	--	--	--	--	--	--
6/3/03	99.42	37.42	37.76	0.34	61.93***	NOT SAMPLED DUE TO THE PRESENCE OF SPH					--	--	--	--
7/6/03	99.42	37.77	38.11	0.34	61.58***	--	--	--	--	--	--	--	--	--
8/18/03	99.42	38.54	38.86	0.32	60.82***	--	--	--	--	--	--	--	--	--
10/27/03	99.42	WELL DRY/OBSTRUCTED			--	--	--	--	--	--	--	--	--	--
11/17/03	99.42	37.87	38.17	0.30	61.49**	--	--	--	--	--	--	--	--	--
12/31/03	99.42	WELL DRY/OBSTRUCTED			--	--	--	--	--	--	--	--	--	--
2/9/04	99.42	WELL DRY/OBSTRUCTED			--	--	--	--	--	--	--	--	--	--
3/4/04	99.42	WELL DRY/OBSTRUCTED			--	--	--	--	--	--	--	--	--	--
3/31/04	99.42	WELL DRY/OBSTRUCTED			--	--	--	--	--	--	--	--	--	--
6/28/04	99.42	WELL DRY/OBSTRUCTED			--	--	--	--	--	--	--	--	--	--
9/11/04	99.42	WELL DRY/OBSTRUCTED			--	--	--	--	--	--	--	--	--	--
9/29/04	99.42	WELL DRY/OBSTRUCTED			--	--	--	--	--	--	--	--	--	--
11/22/04	99.42	WELL DRY/OBSTRUCTED			--	--	--	--	--	--	--	--	--	--
1/4/05	99.42	WELL DRY/OBSTRUCTED			--	--	--	--	--	--	--	--	--	--
1/14/05	99.42	WELL DRY/OBSTRUCTED			--	--	--	--	--	--	--	--	--	--
ABANDONED														

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TABLE 4
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FORMER CHEVRON SERVICE STATION NO. 20-9335
Seattle, Washington
Concentrations reported in µ/L unless otherwise noted

WELL ID/ DATE	TOC*	DTP	DTW	SPHT	GWE	TPH-DRO	TPH-HRO	TPH-GRO	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE	D. Lead (mg/L)
MW-6														
2/9/06	197.18	--	36.74	0.00	160.44	680	98	1500	0.5 U	0.7	1.2	37	--	--
5/3/07	197.18	--	36.74	0.00	160.44	1000	130	380	29	1	4	30	--	--
6/16/09	197.18	INACCESSIBLE		--	--	--	--	--	--	--	--	--	--	--
7/1/09	197.18	--	27.46	0.00	169.72	270	<70	<50	<0.5	<0.5	<0.5	<1.5	--	22.9
12/11/09	197.18	--	27.55	0.00	169.63	35	<69	<50	<0.5	<0.5	<0.5	<1.5	--	0.76
6/9/10	197.18		26.84	0.00	170.34	360	<340	**5,900**	<0.5	<0.5	<0.5	350	--	13.2
MW-7														
2/9/06	197.42	37.87	38.17	0.30	159.49**	--	--	--	--	--	--	--	--	--
5/3/07	197.42	26.55	27.80	1.25	170.62**	--	--	--	--	--	--	--	--	--
6/16/09	197.42	INACCESSIBLE		--	--	--	--	--	--	--	--	--	--	--
7/1/09	197.42	27.39	--	--	--	NOT SAMPLED DUE TO THE PRESENCE OF SPH					--	--	--	--
12/11/09	197.42	27.5	--	--	--	NOT SAMPLED DUE TO THE PRESENCE OF SPH					--	--	--	--
6/9/10	197.42	27.03	28.26	1.23	170.14**	NOT SAMPLED DUE TO THE PRESENCE OF SPH					--	--	--	--
MW-8														
2/9/06	197.35	--	36.74	0.00	160.61	280	<96	440	<0.5	1.1	3.3	28	--	--
5/3/07	197.35	--	36.74	0.00	160.61	940	<200	2600	<0.5	<0.5	<0.5	<0.5	--	--
6/16/09	197.35	INACCESSIBLE		--	--	--	--	--	--	--	--	--	--	--
7/1/09	197.35	--	27.84	0.00	169.51	390	<700	430	<0.5	<0.5	<0.5	2.2	--	3.5
12/11/09	197.35	--	27.91	0.00	169.44	300	<69	<50	<0.5	<0.5	<0.5	<1.5	--	7.3
6/9/10	197.35		27.21	0.00	170.14	280	180	350	<0.5	<0.5	<0.5	<1.5	--	**16.5**
MW-9														
05/03/07	208.11	--	36.74	0.00	171.37	<400	<500	<50	<0.5	<0.5	4	18	--	--
6/16/09	208.11	--	38.72	0.00	169.39	--	--	--	--	--	--	--	--	--
7/1/09	208.11	--	38.03	0.00	170.08	<31	<71	--	--	--	--	--	--	--
12/11/09	208.11	--	38.86	0.00	169.25	76	<69	<50	<0.5	<0.5	<0.5	<1.5	--	14.5
6/9/10	208.11		38.17	0.00	169.94	42	110	<50	<0.5	<0.5	<0.5	<1.5	--	**21.2**
MW-10														
5/3/07	207.29	--	36.74	0.00	170.55	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	--
6/16/09	207.29	INACCESSIBLE		--	--	--	--	--	--	--	--	--	--	--
7/1/09	207.29	--	38.72	0.00	168.57	<30	<69	<50	<0.5	<0.5	<0.5	<1.5	--	10.9
12/11/09	207.29	--	35.91	0.00	171.38	49	<69	<50	<0.5	<0.5	<0.5	<1.5	--	13.4
6/9/10	207.29		37.48	0.00	169.81	50	88	<50	<0.5	<0.5	<0.5	<1.5	--	7.2

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WELL ID/ DATE	TOC*	DTP	DTW	SPHT	GWE	TPH-DRO	TPH-HRO	TPH-GRO	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE	D. Lead (mg/L)
TRIP BLANK														
12/16/00	--	--	--	--	--	--	--	ND	ND	ND	ND	ND	ND	--
3/26/01	--	--	--	--	--	--	--	ND	ND	ND	ND	ND	ND	--
6/25/01	--	--	--	--	--	--	--	<50.0	<0.500	<0.500	<0.500	<1.00	--	--
9/24/01	--	--	--	--	--	--	--	<50.0	<0.500	<0.500	<0.500	<1.00	--	--
12/13/01	--	--	--	--	--	--	--	<80.0	<0.500	<0.500	<0.500	<1.00	--	--
3/8/02	--	--	--	--	--	--	--	<50	<0.50	<0.50	<0.50	<1.5	--	--
5/29/02	--	--	--	--	--	--	--	<50	<0.50	<0.50	<0.50	<1.5	--	--
9/16/02	--	--	--	--	--	--	--	<50	<0.50	<0.50	<0.50	<1.5	--	--
12/5/02	--	--	--	--	--	--	--	<50	<0.50	<0.50	<0.50	<1.5	--	--
3/4/03	--	--	--	--	--	--	--	<50	<0.50	<0.50	<0.50	<1.5	--	--
10/27/03	--	--	--	--	--	--	--	<50	<0.50	<0.50	<0.50	<1.5	--	--
QA														
03/31/04	--	--	--	--	--	--	--	<50	<0.5	<0.5	<0.5	<1.5	--	--
06/28/04	--	--	--	--	--	--	--	<50	<0.5	<0.5	<0.5	<1.5	--	--
09/29/04	--	--	--	--	--	--	--	<50	<0.5	<0.5	<0.5	<1.5	--	--
01/04/05	--	--	--	--	--	--	--	<50	<0.5	<0.5	<0.5	<1.5	--	--
						TPH-D	**TPH-O**	**TPH-G**	**B**	**T**	**E**	**X**	**MTBE**	**D. Lead**
Standard Laboratory Reporting Limits:						**--**	**--**	**50**	**0.5**	**0.5**	**0.5**	**1.5**	**--**	**0.00100**
MTCA Method A CULs:						**500**	**500**	**800/1,000**	**5**	**1,000**	**700**	**1,000**	**20**	**--**
Current Method:						**NWTPH-D + Extended**		**NWTPH-G and EPA 8021**						**EPA 6020**

EXPLANATIONS:

Groundwater monitoring data and laboratory analytical results prior to December 16, 2000, were compiled from reports prepared by Delta Environmental Consultants Inc.
Groundwater monitoring data and laboratory analytical results on February 9, 2006 and May 3, 2007, for wells MW-6 thru Mw-10, were compiled from reports prepared by SAIC.

TOC = Top of Casing
(ft.) = Feet
DTP = Depth to Product
DTW = Depth to Water
GWE = Groundwater Elevation
SPH = Separate Phase Hydrocarbon
SPHT = Separate Phase Hydrocarbon Thickness
TPH = Total Petroleum Hydrocarbons

DRO = Diesel Range Organics
HRO = Heavy Range Organics
GRO = Gasoline Range Organics
B = Benzene
T = Toluene
E = Ethylbenzene
X = Xylenes
MTBE = Methyl Tertiary Butyl Ether

D. Lead = Dissolved Lead
ND = Not Detected
NP = No Purge
-- = Not Measured/Not Analyzed
QA = Quality Assurance/Trip Blank
MTCA = Model Toxics Control Act Cleanup Regulations [WAC 173-340-720(2)(a)(I), as amended 02/01].
CULs = Cleanup levels

* TOC elevations have been provided by Delta Environmental Consultants, Inc. referenced to an assumed datum in feet.
** GWE has been corrected for the presence of SPH; correction factor = [(TOC - DTW) + (SPHT x 0.80)]
*** GWE has been corrected for the presence of SPH; correction factor = [(TOC - DTP - SPHT) + (SPHT x 0.80)]; Historical data has been altered to correct error in original reporting of depth to product as depth to water.
1 Data provided by Delta Environmental Consultants, Inc.
2 Detection limit raised. Refer to analytical reports.
3 Analyzed with silica-gel cleanup.
4 Filtered at the laboratory.
5 Laboratory report indicates results in the diesel organics range are primarily due to overlap from a gasoline range product.
6 MTBE by EPA Method 8260.
7 Laboratory report indicates the sample chromatographic pattern does not resemble the fuel standard used for quantitation.
8 Laboratory report indicates the sample was prepared outside of the method established holding time.

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TABLE 5
MW-2 AND MW-7 LNAPL THICKNESS AND REMOVAL
FORMER CHEVRON SERVICE STATION NO. 20-9335
1225 North 45th Street
Seattle, Washington

Well ID	Date	Time	Depth to Product (feet below TOC)	Depth to Water (feet below TOC)	Product Thickness (feet)	Amount Bailed (gallons)
MW-2	8/30/04	1200	37.61	38.99	1.38	1.50
	9/7/04	1230	37.61	39.19	1.58	0.75
	9/14/04	645	37.65	39.25	1.6	0.53
	9/21/04	1200	37.61	39.3	1.69	0.79
	9/28/04	1045	37.7	39.23	1.53	1.00
	10/5/04	1620	37.72	39.27	1.55	1.00
	10/6/04	1345	37.86	39.02	1.16	0.75
	10/7/04	1315	37.9	38.59	0.69	0.75
	10/8/04	1215	37.89	38.65	0.76	0.70
	10/11/04	1800	37.79	39.15	1.36	0.90
	10/12/04	1555	37.89	38.78	0.89	0.75
	10/16/04	1600	--	--	0.9	0.75
	10/18/04	1830	--	--	1.1	0.75
	10/19/04	600	37.96	38.61	0.65	0.75
	10/20/04	1400	37.99	38.47	0.48	0.25
	10/21/04	1620	37.96	38.55	0.59	0.50
	10/22/04	620	38.01	38.35	0.34	0.20
	10/25/04	1715	37.90	38.80	0.90	0.75
	10/26/04	1545	38.05	38.36	0.31	0.10
	10/27/04	1945	38.05	38.35	0.3	0.10
	10/28/04	1345	38.10	38.23	0.13	0.10
	10/29/04	645	38.11	38.15	0.04	0.05
	11/1/04	1500	37.94	38.75	0.81	0.50
	11/2/04	600	38.04	38.49	0.45	0.20
	11/4/04	700	38.01	38.65	0.64	0.25
	11/5/04	620	38.05	38.53	0.48	0.20
	11/8/04	1515	37.92	38.93	1.01	0.75
	11/9/04	1545	38.13	38.24	0.11	0.10
	11/16/04	1132	--	--	1.7	1.00
	11/23/04	1140	--	--	1.6	1.20
	1/4/05	1130	38.01	39.19	1.18	0.75
	1/10/05	1110	37.90	39.59	1.69	1.20
	1/18/05	1130	37.89	39.64	1.75	1.00
	1/28/05	600	--	--	1.5	1.00
	2/2/05	645	--	--	1.75	0.75

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TABLE 5
MW-2 AND MW-7 LNAPL THICKNESS AND REMOVAL
FORMER CHEVRON SERVICE STATION NO. 20-9335
1225 North 45th Street
Seattle, Washington

Well ID	Date	Time	Depth to Product (feet below TOC)	Depth to Water (feet below TOC)	Product Thickness (feet)	Amount Bailed (gallons)
MW-2 (cont.)	2/9/05	630	37.90	39.64	1.74	0.75
	2/18/05	900	37.88	39.60	1.72	1.00
	2/22/05	1120	37.92	39.53	1.61	0.75
	3/1/05	1115	37.89	39.56	1.67	0.75
MW-7	2/8/06	930	--	--	0.5	--
	2/9/06	830	27.28	27.91	0.63	0.50
	2/12/06	1420	27.27	27.68	0.41	0.50
	2/13/06	1500	27.22	27.74	0.52	0.52
	2/14/06	1530	27.24	27.59	0.35	0.063
	2/17/06	1530	27.3	27.39	0.09	0.031
	2/22/06	1600	27.22	27.53	0.31	0.125
	2/24/06	1530	--	--	0.2	0.035
	2/27/06	1600	--	--	0.3	0.109
	2/28/06	1500	--	--	0.01	0.120
	3/1/06	1600	--	--	0.01	0.078
	3/2/06	1600	27.21	27.22	0.01	0.023
	3/3/06	1530	--	--	0.01	0.039
	3/6/06	1530	--	--	0.01	0.054
	3/7/06	1530	--	--	0.01	0.023
	3/8/06	1230	--	--	0.01	0.016
	3/13/06	1530	--	--	0.01	0.094
	3/15/06	1545	--	--	0.01	0.023
	3/17/06	1530	--	--	0.01	0.031
	3/20/06	1500	27.02	27.13	0.11	0.117
	3/22/06	1100	--	--	0.01	0.094
	3/24/06	1430	--	--	0.01	0.047
	3/27/06	1600	--	--	0.01	0.117
	3/29/06	1445	--	--	0.01	0.094
	3/31/06	1600	--	--	0.01	0.094
	4/3/06	1545	26.99	27.03	0.04	0.102
	4/5/06	1400	--	--	0.01	0.063
	4/7/06	1400	--	--	0.01	0.031
	4/10/06	1520	26.92	26.97	0.05	0.078
	4/12/06	830	26.93	26.94	0.01	0.016
	4/18/06	1530	--	--	0.3	0.078

TABLE 5
MW-2 AND MW-7 LNAPL THICKNESS AND REMOVAL
FORMER CHEVRON SERVICE STATION NO. 20-9335
1225 North 45th Street
Seattle, Washington

Well ID	Date	Time	Depth to Product (feet below TOC)	Depth to Water (feet below TOC)	Product Thickness (feet)	Amount Bailed (gallons)
MW-7 (cont.)	4/19/06	1530	--	--	0.01	0.031
	4/24/06	1430	--	--	0.01	0.087
	5/1/06	1530	26.90	26.98	0.08	0.016
	5/19/06	1430	--	--	0.01	0.132
	5/26/06	1315	--	--	0.01	0.066
	6/1/06	1445	--	--	0.01	0.066
	6/8/06	1500	--	--	0.01	0.066
	6/15/06	1400	26.90	26.91	0.01	0.066
	6/22/06	1500	--	--	0.01	0.033
	6/29/06	1500	26.86	26.89	0.03	0.066
	7/5/06	1500	26.97	26.97	0	0.050
	7/14/06	1500	--	--	0	0.106
	8/3/06	1530	--	--	0	0.198
	8/15/06	1130	27.00	27.13	0.13	0.044
	8/31/06	1400	--	--	0	0.001
	10/10/10	1247	27.57	28.13	0.56	1.500
					Total Gallons Bailed (MW-2) =	25.87
					Total Gallons Bailed (MW-7) =	5.84
					Total Gallons Bailed =	31.71

EXPLANATIONS:

LNAPL = Light non-aqueous phase liquid

TOC = Top of casing

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Appendix A:
Boring Logs

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Boring Log No: SB-1

Project: 20-9335 Seattle, WA	**Drill Date: 5/27/04**	**Hammer Weight: 300 lbs**
Location: 1225 N 45th St	**Drilled by: Cascade Drilling Inc.**	**Borehole Diameter: 8"**
Client: Chevron	**Drill Method: Hollow-Stem Auger**	**Boring Depth: 43'**
Logged By: G. Cisneros and M. King	**Sample Method: Split-Spoon**	

MOISTURE	PID (PPM)	BLOWS - 6"	DEPTH	GRAPHIC LOG	SAMPLE INTERVAL	DESCRIPTION	BACKFILL MATERIAL
			0			**Ground Surface**	Backfilled with Bentonite
			1			**Silty, Gravelly Sand** Asphalt top 4" Airknife to 8'	
			2				
			3				
			4				
			5				
			6				
			7				
			8				
Moist	0	30 30 25	9			**SAND (SW)** Light brown, dense, well-graded, fine SAND with 10 percent gravel and cobbles; no odor; no sheen.	
			10				
Moist	2.7	29 50	11			**SAND (SW)** Same as above; very dense with <5 percent silt; no odor; no sheen.	
			12				
Moist	0	39 50	13			**SAND (SW-SM)** Light brown, dense to very dense, well graded, fine SAND with 10 percent silt and <5 percent gravel; no odor; no sheen.	
			14				
Moist	0	37 50	15			**SAND (SW-SM)** Same as above; no odor; no sheen.	
			16				
			17				
Moist	0	31 50	18			**SAND (SP)** Light brown, dense to very dense, poorly graded, fine SAND; no odor; no sheen.	
			19				
			20				

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Boring Log No: SB-1

Project: 20-9335 Seattle, WA
Location: 1225 N 45th St
Client: Chevron
Logged By: G. Cisneros and M. King

Drill Date: 5/27/04
Drilled by: Cascade Drilling Inc.
Drill Method: Hollow-Stem Auger
Sample Method: Split-Spoon

Hammer Weight: 300 lbs
Borehole Diameter: 8"
Boring Depth: 43'

MOISTURE	PID (PPM)	BLOWS - 6"	DEPTH	GRAPHIC LOG	SAMPLE INTERVAL	DESCRIPTION	BACKFILL MATERIAL
Moist	0	50	20			**SAND (SP)** Same as above; no odor; no sheen.	
			21				
			22				
Moist	0	50	23			**SAND (SP)** Same as above; no odor; no sheen.	
			24				
Moist	0	30 50	25			**SAND (SP)** Same as above; no odor; no sheen.	
			26				
			27				
Moist	0	26 50	28			**SAND (SP)** Same as above; light brown, very dense, poorly graded, clean, fine SAND; no silt; no gravel; no odor; no sheen.	
			29				
Moist	0	27 50	30			**SAND (SP)** Same as above; no odor; no sheen.	
			31				
			32				
Moist	0	36 50	33			**SAND (SP)** Same as above; no odor; no sheen.	
			34				
Moist	0	50	35			**SAND (SP)** Same as above; no odor; no sheen.	
			36				
			37				
Wet to Sat.	0	32 50	38			**SAND (SP)** Same as above; no odor; no sheen.	◀ 5/27/04
			39				

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Boring Log No: SB-1

Project: 20-9335 Seattle, WA
Location: 1225 N 45th St
Client: Chevron
Logged By: G. Cisneros and M. King

Drill Date: 5/27/04
Drilled by: Cascade Drilling Inc.
Drill Method: Hollow-Stem Auger
Sample Method: Split-Spoon

Hammer Weight: 300 lbs
Borehole Diameter: 8"
Boring Depth: 43'

MOISTURE	PID (PPM)	BLOWS - 6"	DEPTH	GRAPHIC LOG	SAMPLE INTERVAL	DESCRIPTION	BACKFILL MATERIAL
Sat.	0	50	40			**SAND (SP)** Same as above; no odor; no sheen.	
			41				
			42			**SAND (SP)** Same as above; no odor; no sheen.	
Sat.	0	50	43				
			44				
			45				
			46				
			47				
			48				
			49				
			50				
			51				
			52				
			53				
			54				
			55				
			56				
			57				
			58				
			59				

Boring Log No: SB-2

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Project: 20-9335 Seattle, WA	**Drill Date: 5/27/04**	**Hammer Weight: 300 lbs**
Location: 1225 N 45th St	**Drilled by: Cascade Drilling Inc.**	**Borehole Diameter: 8"**
Client: Chevron	**Drill Method: Hollow-Stem Auger**	**Boring Depth: 43'**
Logged By: G. Cisneros and M. King	**Sample Method: Split-Spoon**	

MOISTURE	PID (PPM)	BLOWS - 6"	DEPTH	GRAPHIC LOG	SAMPLE INTERVAL	DESCRIPTION	BACKFILL MATERIAL
			0			**Ground Surface**	Backfilled with Bentonite
			1			**Silty, Gravelly Sand** Asphalt top 4" Airknife to 8' Silty SAND with large cobbles and gravel.	
			2				
			3				
			4				
			5				
			6				
			7				
			8				
			9				
Moist	0	50	10			**SAND (SW-SM)** Medium brown, very dense, well-graded, silty fine SAND with gravel and 10 percent silt; no odor; no sheen.	
			11				
			12			**SAND (SW-SM)** Medium brown, very dense, well-graded, fine SAND with <15 percent silt and 10 percent gravel; no odor; no sheen.	
Moist	0	50	13				
			14				
			15			**SAND (SW-SM)** Light brown, very dense, well-graded, fine to medium SAND with 10 percent silt and 20 percent gravel; no odor; no sheen.	
Moist	0	50	16				
			17			**SAND (SP)** Light brown, very dense, poorly graded, fine SAND; with <10 percent gravel; no odor; no sheen.	
Dry	0	50	18				
			19				
			20				

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Boring Log No: SB-2

Project: 20-9335 Seattle, WA	**Drill Date: 5/27/04**	**Hammer Weight: 300 lbs**
Location: 1225 N 45th St	**Drilled by: Cascade Drilling Inc.**	**Borehole Diameter: 8"**
Client: Chevron	**Drill Method: Hollow-Stem Auger**	**Boring Depth: 43'**
Logged By: G. Cisneros and M. King	**Sample Method: Split-Spoon**	

MOISTURE	PID (PPM)	BLOWS - 6"	DEPTH	GRAPHIC LOG	SAMPLE INTERVAL	DESCRIPTION	BACKFILL MATERIAL
Moist	0	50	20			**SAND (SP)** Light brown, very dense, poorly graded, clean, fine SAND; no odor; no sheen.	
			21				
			22				
Moist	0	50	23			**SAND (SP)** Same as above; no odor; no sheen.	
			24				
Moist	0	33 50	25			**SAND (SP)** Same as above; no odor; no sheen.	
			26				
			27				
Moist	0	40 50	28			**SAND (SP)** Same as above; no odor; no sheen.	
			29				
Moist	0	50	30			**SAND (SP)** Light brown; very dense, poorly graded, fine SAND; no odor; no sheen.	
			31				
			32				
Moist	0	50	33			**SAND (SP)** Same as above; with charcoal fragments in top 6-inches (1" max size); no odor; no sheen.	
			34				
			35				
Moist	0	37 50	36			**SAND (SP)** Light brown, very dense, fine to medium SAND; no odor; no sheen.	
			37				
Wet	0	33 50	38			**SAND (SP)** Brown, very dense, poorly graded, fine to medium SAND with iron oxidation staining; no odor; no sheen.	5/27/04
			39				
						SAND (SP) Same as above; no odor; no sheen	

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Boring Log No: SB-2

Project: 20-9335 Seattle, WA
Location: 1225 N 45th St
Client: Chevron
Logged By: G. Cisneros and M. King

Drill Date: 5/27/04
Drilled by: Cascade Drilling Inc.
Drill Method: Hollow-Stem Auger
Sample Method: Split-Spoon

Hammer Weight: 300 lbs
Borehole Diameter: 8"
Boring Depth: 43'

MOISTURE	PID (PPM)	BLOWS - 6"	DEPTH	GRAPHIC LOG	SAMPLE INTERVAL	DESCRIPTION	BACKFILL MATERIAL
Wet	0	50	40			**Silty SAND (SM)** Medium brown, very dense, silty fine SAND.	
			41			**SILT (ML)** Brown, very dense, SILT; no odor; no sheen.	
			42			**SAND (SP)** Light brown; very dense, poorly graded, fine SAND; no odor; no sheen.	
Wet	0	50	43				
			44				
			45				
			46				
			47				
			48				
			49				
			50				
			51				
			52				
			53				
			54				
			55				
			56				
			57				
			58				
			59				

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Boring Log No: SB-3

Project: 20-9335 Seattle, WA
Location: 1225 N 45th St
Client: Chevron
Logged By: G. Cisneros and M. King

Drill Date: 5/27/04
Drilled by: Cascade Drilling Inc.
Drill Method: Hollow-Stem Auger
Sample Method: Split-Spoon

Hammer Weight: 300 lbs
Borehole Diameter: 8"
Boring Depth: 46'

MOISTURE	PID (PPM)	BLOWS - 6"	DEPTH	GRAPHIC LOG	SAMPLE INTERVAL	DESCRIPTION	BACKFILL MATERIAL
			0			**Ground Surface**	Backfilled with Bentonite
			1			**Silty, Gravelly Sand** Asphalt top 4" Airknife to 8' Silty SAND with large cobbles and gravel.	
			2				
			3				
			4				
			5				
			6				
			7				
			8			**Silty SAND (SW-SM)** Brown, medium dense, well-graded, silty, gravelly, fine SAND with <15 percent silt and 15 percent gravel; no odor; no sheen.	
Moist	0	18 15 23	9			**SAND (SP)** Brown, medium dense, poorly graded, fine to medium SAND; no odor; no sheen.	
			10				
Moist	340	22 23 30	11			**SAND (SP)** Medium brown, dense, poorly graded, fine to medium SAND; strong hydrocarbon (HC) odor; slight sheen.	
			12				
Moist	400	29 50	13			**SAND (SP)** Same as above; strong odor; slight sheen.	
			14				
Moist	131.3	50	15			**SAND (SP)** Same as above; strong odor; slight sheen.	
			16				
Dry	235	50	17			**SAND (SP)** Same as above; however, a 2-inch gray clay layer exists at 18'; slight odor; moderate sheen.	
			18				
			19				
			20				

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Boring Log No: SB-3

Project: 20-9335 Seattle, WA	**Drill Date: 5/27/04**	**Hammer Weight: 300 lbs**
Location: 1225 N 45th St	**Drilled by: Cascade Drilling Inc.**	**Borehole Diameter: 8"**
Client: Chevron	**Drill Method: Hollow-Stem Auger**	**Boring Depth: 46'**
Logged By: G. Cisneros and M. King	**Sample Method: Split-Spoon**	

MOISTURE	PID (PPM)	BLOWS - 6"	DEPTH	GRAPHIC LOG	SAMPLE INTERVAL	DESCRIPTION	BACKFILL MATERIAL
Moist to Dry	7.3	50	20			**SAND (SP)** Light brown, very dense, poorly graded, clean, fine to medium SAND; slight odor; slight sheen.	
			21				
			22				
Moist to Dry	6.8	50	23			**SAND (SP)** Same as above; no odor; no sheen.	
			24				
Moist to Dry	0	50	25			**SAND (SP)** Same as above; no odor; no sheen.	
			26				
			27				
Moist	0	50	28			**SAND (SP)** Same as above; no odor; no sheen.	
			29				
Moist to Dry	0	50	30			**SAND (SP)** Same as above; fine to medium SAND; no odor; no sheen.	
			31				
			32				
Moist	4.7	50 50	33			**SAND (SP)** Same as above for top 6-inches; no odor; no sheen. Bottom 6-inches: Gray, very dense SAND; slight HC odor; no sheen.	
			34				
Moist	6.8	50	35			**SAND (SP)** Gray, very dense, poorly sorted, fine to medium SAND; HC odor; no sheen.	
			36				
			37				
Wet	3111	40 50	38			**SAND (SP)** Gray, very dense, poorly graded, fine to medium SAND; HC odor; medium sheen.	▼ 5/27/04
			39				

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Boring Log No: SB-3

Project: 20-9335 Seattle, WA
Location: 1225 N 45th St
Client: Chevron
Logged By: G. Cisneros and M. King

Drill Date: 5/27/04
Drilled by: Cascade Drilling Inc.
Drill Method: Hollow-Stem Auger
Sample Method: Split-Spoon

Hammer Weight: 300 lbs
Borehole Diameter: 8"
Boring Depth: 46'

MOISTURE	PID (PPM)	BLOWS - 6"	DEPTH	GRAPHIC LOG	SAMPLE INTERVAL	DESCRIPTION	BACKFILL MATERIAL
Sat.	73 4.1	50 50	40			**SAND (SP)** Same as above; Top 6-inches: Gray SAND; slight odor; no sheen. Bottom 6-inches: Brown SAND; no odor; no sheen.	
			41				
			42				
Sat.	0	50 50	43			**SAND (SP)** Brown; very dense, poorly graded, fine SAND; no odor; no sheen.	
			44				
Sat.	0 0	50 50	45			**SAND (SP)** Same as above; no odor; no sheen.	
			46				
			47				
			48				
			49				
			50				
			51				
			52				
			53				
			54				
			55				
			56				
			57				
			58				
			59				

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Boring Log No: SB-4

Project: 20-9335 Seattle, WA	**Drill Date: 5/27-28/04**	**Hammer Weight: 300 lbs**
Location: 1225 N 45th St	**Drilled by: Cascade Drilling Inc.**	**Borehole Diameter: 8"**
Client: Chevron	**Drill Method: Hollow-Stem Auger**	**Boring Depth: 43'**
Logged By: G. Cisneros and M. King	**Sample Method: Split-Spoon**	

MOISTURE	PID (PPM)	BLOWS - 6"	DEPTH	GRAPHIC LOG	SAMPLE INTERVAL	DESCRIPTION	BACKFILL MATERIAL
			0			**Ground Surface**	
			1			**Silty, Gravelly Sand** Asphalt top 4" Airknife to 8' Silty SAND with large cobbles, gravel, and concrete.	
			2				
			3				
			4				
			5				
			6				
			7				
Moist to Dry	0	50	8			**Silty SAND (SW)** Brown, very dense, well-graded, gravelly, fine to medium SAND with 15 percent rounded gravel; no odor; no sheen.	Backfilled with Bentonite
			9				
Moist to Dry	0	50	10			**Silty, Gravelly SAND (SW-SM)** Medium brown, very dense, well-graded, fine SAND with <10 percent silt and 20 percent gravel; no odor; no sheen.	
			11			**Sandy SILT (ML)** Brownish gray, very hard silt with fine SAND; no odor; no sheen.	
Moist to Dry	0	27 50	12			**SAND (SP)** Light brown, very dense, poorly graded, fine SAND; no odor; no sheen.	
			13				
			14				
Moist to Dry	0	41 50	15			**SAND (SP)** Light brown, very dense, fine SAND; no odor; no sheen.	
			16				
			17				
Moist to Dry	0	36 50	18			**SAND (SP)** Light brown, very dense, fine SAND; no odor; no sheen.	
			19				
			20				

SAIC
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Boring Log No: SB-4

Project: 20-9335 Seattle, WA
Location: 1225 N 45th St
Client: Chevron
Logged By: G. Cisneros and M. King

Drill Date: 5/27-28/04
Drilled by: Cascade Drilling Inc.
Drill Method: Hollow-Stem Auger
Sample Method: Split-Spoon

Hammer Weight: 300 lbs
Borehole Diameter: 8"
Boring Depth: 43'

MOISTURE	PID (PPM)	BLOWS - 6"	DEPTH	GRAPHIC LOG	SAMPLE INTERVAL	DESCRIPTION	BACKFILL MATERIAL
Moist to Dry	0	31 50	20			**SAND (SP)** Light brown, very dense, poorly graded, clean, fine SAND; no odor; no sheen.	
			21				
			22				
Moist	0	50	23			**SAND (SP)** Same as above; no odor; no sheen.	
			24				
Moist	0	50	25			**SAND (SP)** Same as above; no odor; no sheen.	
			26				
			27				
Moist	0	50	28			**SAND (SP)** Same as above; no odor; no sheen.	
			29				
Moist	0	50	30			**SAND (SP)** Same as above; no odor; no sheen.	
			31				
			32				
Moist	0	50	33			**SAND (SP)** Same as above; no odor; no sheen.	
			34				
Moist to Wet	0	50	35			**SAND (SP)** Same as above; no odor; no sheen.	
			36				
			37				
Wet to Sat	0	39 50	38			**SAND (SP)** Light brown, very dense, poorly graded, fine to medium SAND; no odor; no sheen.	5/28/04
			39				

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Boring Log No: SB-4

Project: 20-9335 Seattle, WA
Location: 1225 N 45th St
Client: Chevron
Logged By: G. Cisneros and M. King

Drill Date: 5/27-28/04
Drilled by: Cascade Drilling Inc.
Drill Method: Hollow-Stem Auger
Sample Method: Split-Spoon

Hammer Weight: 300 lbs
Borehole Diameter: 8"
Boring Depth: 43'

MOISTURE	PID (PPM)	BLOWS - 6"	DEPTH	GRAPHIC LOG	SAMPLE INTERVAL	DESCRIPTION	BACKFILL MATERIAL
Sat.	0	50	40			**SAND (SP)** Same as above; no odor; no sheen.	
			41				
			42			**SAND (SP)** Same as above; no odor; no sheen.	
Sat.	0	50	43				
			44				
			45				
			46				
			47				
			48				
			49				
			50				
			51				
			52				
			53				
			54				
			55				
			56				
			57				
			58				
			59				

Boring Log No: SB-5

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Project: 20-9335 Seattle, WA	**Drill Date: 5/28/04**	**Hammer Weight: 300 lbs**
Location: 1225 N 45th St	**Drilled by: Cascade Drilling Inc.**	**Borehole Diameter: 8"**
Client: Chevron	**Drill Method: Hollow-Stem Auger**	**Boring Depth: 45.5'**
Logged By: G. Cisneros and A. Curry	**Sample Method: Split-Spoon**	

MOISTURE	PID (PPM)	BLOWS - 6"	DEPTH	GRAPHIC LOG	SAMPLE INTERVAL	DESCRIPTION	BACKFILL MATERIAL
			0			**Ground Surface**	Backfilled with Bentonite
			1			**Gravelly Sand** Asphalt top 4" Airknife to 8' Gravelly, silty SAND with large concrete blocks.	
			2				
			3				
			4				
			5				
			6				
			7				
Moist	0	22 50	8			**Gravelly SAND (SW)** Top 6": Reddish brown, medium dense Bottom 6": Brown, very dense, well-graded, gravelly, fine to coarse SAND with 15 percent rounded gravel and 5 percent silt; no odor; no sheen.	
			9				
Moist	0	31 50	10			**Gravelly SAND (SW)** Light brown, dense to very dense, well-graded, gravelly SAND; no odor; no sheen.	
			11				
			12				
Moist to Dry	0	27 50	13			**SAND (SP)** Light brown, very dense, poorly graded, fine SAND; no odor; no sheen.	
			14				
Moist to Dry	0	34 50	15			**SAND (SP)** Light brown, dense to very dense, poorly graded, fine to medium SAND; no odor; no sheen	
			16				
			17				
Moist to Dry	0	28 50	18			**SAND (SP)** Same as above; no odor; no sheen.	
			19				
			20				

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Boring Log No: SB-5

Project: 20-9335 Seattle, WA	**Drill Date: 5/28/04**	**Hammer Weight: 300 lbs**
Location: 1225 N 45th St	**Drilled by: Cascade Drilling Inc.**	**Borehole Diameter: 8"**
Client: Chevron	**Drill Method: Hollow-Stem Auger**	**Boring Depth: 45.5'**
Logged By: G. Cisneros and A. Curry	**Sample Method: Split-Spoon**	

MOISTURE	PID (PPM)	BLOWS - 6"	DEPTH	GRAPHIC LOG	SAMPLE INTERVAL	DESCRIPTION	BACKFILL MATERIAL
Moist to Dry	0	50	20			**SAND (SP)** Same as above; no odor; no sheen.	
			21				
			22				
Moist	0	50	23			**SAND (SP)** Same as above; no odor; no sheen.	
			24				
Moist	0	50	25			**SAND (SP)** Same as above; no odor; no sheen.	
			26				
			27				
Moist	0	26 50	28			**SAND (SP)** Same as above; no odor; no sheen.	
			29				
Moist	0	50	30			**SAND (SP)** Same as above; no odor; no sheen.	
			31				
			32				
Moist	0	50	33			**SAND (SP)** Same as above; no odor; no sheen.	
			34				
Moist	0	50	35			**SAND (SP)** Same as above; no odor; no sheen.	
			36				
			37				
Wet to Sat	7653	37 50	38			**SAND (SP)** Gray to brown (brown at bottom), dense to very dense, poorly graded, fine to medium fine SAND; strong HC odor; moderate sheen.	◀ 5/28/04
			39				

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Boring Log No: SB-5

Project: 20-9335 Seattle, WA
Location: 1225 N 45th St
Client: Chevron
Logged By: G. Cisneros and A. Curry

Drill Date: 5/28/04
Drilled by: Cascade Drilling Inc.
Drill Method: Hollow-Stem Auger
Sample Method: Split-Spoon

Hammer Weight: 300 lbs
Borehole Diameter: 8"
Boring Depth: 45.5'

MOISTURE	PID (PPM)	BLOWS - 6"	DEPTH	GRAPHIC LOG	SAMPLE INTERVAL	DESCRIPTION	BACKFILL MATERIAL
Sat.	0	50	40			**SAND (SP)** Medium brown, very dense, poorly graded, fine to medium SAND; no odor; no sheen.	
			41				
			42				
Sat.	0	50	43			**SAND (SP)** Same as above; no odor; no sheen.	
			44				
Sat.	0	50	45			**SAND (SP)** Same as above; no odor; no sheen.	
			46				
			47				
			48				
			49				
			50				
			51				
			52				
			53				
			54				
			55				
			56				
			57				
			58				
			59				

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Boring Log No: SB-6

Project: 20-9335 Seattle, WA	**Drill Date: 5/28/04**	**Hammer Weight: 300 lbs**
Location: 1225 N 45th St	**Drilled by: Cascade Drilling Inc.**	**Borehole Diameter: 8"**
Client: Chevron	**Drill Method: Hollow-Stem Auger**	**Boring Depth: 45.5'**
Logged By: G. Cisneros and A. Curry	**Sample Method: Split-Spoon**	

MOISTURE	PID (PPM)	BLOWS - 6"	DEPTH	GRAPHIC LOG	SAMPLE INTERVAL	DESCRIPTION	BACKFILL MATERIAL
			0			**Ground Surface**	Backfilled with Bentonite
			1			**Gravelly Sand** Asphalt top 4" Airknife to 8' Gravelly, silty SAND with large concrete blocks.	
			2				
			3				
			4				
			5				
			6				
			7				
Moist	0	50	8			**Gravelly SAND (SW)** Top 6": Reddish brown, medium dense. Bottom 6": Light brown, very dense, well-graded, silty, gravelly, fine to medium SAND with 10 percent rounded gravel and 5 percent silt; no odor; no sheen.	
			9				
Moist	0	26 50	10			**SAND (SP)** Light brown, very dense, poorly graded SAND; no gravel; no silt; no odor; no sheen.	
			11				
			12				
Moist	0	29 50	13			**SAND (SP)** Light brown, very dense, poorly graded, fine to medium SAND; no odor; no sheen.	
			14				
Moist	0	50-5"	15			**Gravelly SAND (SP)** Light brown, very dense, well-graded, fine to medium SAND with <5 percent silt and 10 percent gravel; no odor; no sheen	
			16				
			17			**Gravelly SAND (SP)** Same as above; no odor; no sheen.	
Moist	0	50	18			**SAND (SP)** Light brown, very dense, poorly graded, fine to medium SAND; no odor; no sheen.	
			19				
			20				

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Boring Log No: SB-6

Project: 20-9335 Seattle, WA
Location: 1225 N 45th St
Client: Chevron
Logged By: G. Cisneros and A. Curry

Drill Date: 5/28/04
Drilled by: Cascade Drilling Inc.
Drill Method: Hollow-Stem Auger
Sample Method: Split-Spoon

Hammer Weight: 300 lbs
Borehole Diameter: 8"
Boring Depth: 45.5'

MOISTURE	PID (PPM)	BLOWS - 6"	DEPTH	GRAPHIC LOG	SAMPLE INTERVAL	DESCRIPTION	BACKFILL MATERIAL
Moist	0	50	20			**SAND (SP)** Same as above; no odor; no sheen.	
			21				
			22				
Moist	0	50	23			**SAND (SP)** Same as above; no odor; no sheen.	
			24				
Moist	0	50	25			**SAND (SP)** Same as above; no odor; no sheen.	
			26				
			27				
Moist	0	50	28			**SAND (SP)** Same as above; no odor; no sheen.	
			29				
Moist	0	50	30			**SAND (SP)** Same as above; no odor; no sheen.	
			31				
			32				
Moist	0	50	33			**SAND (SP)** Same as above; no odor; no sheen.	
			34				
Moist	0	36 50	35			**SAND (SP)** Same as above; no odor; no sheen.	
			36				
			37				
Moist to Wet	0	33 50	38			**SAND (SP)** Light to medium brown, very dense, poorly graded, fine SAND; no odor; no sheen.	5/28/04
			39				

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Boring Log No: SB-6

Project: 20-9335 Seattle, WA
Location: 1225 N 45th St
Client: Chevron
Logged By: G. Cisneros and A. Curry

Drill Date: 5/28/04
Drilled by: Cascade Drilling Inc.
Drill Method: Hollow-Stem Auger
Sample Method: Split-Spoon

Hammer Weight: 300 lbs
Borehole Diameter: 8"
Boring Depth: 45.5'

MOISTURE	PID (PPM)	BLOWS - 6"	DEPTH	GRAPHIC LOG	SAMPLE INTERVAL	DESCRIPTION	BACKFILL MATERIAL
Wet to Sat	34.3	28 50	40 41			**SAND (SP)** Gray, very dense, poorly graded, fine to medium SAND; HC odor; no sheen.	
			42				
Sat.	15	20 27 31	43			**SAND (SP)** Brown, very dense, poorly graded, fine to medium SAND; no odor; no sheen.	
			44				
Sat.	0	50	45			**SAND (SP)** Same as above; no odor; no sheen.	
			46				
			47				
			48				
			49				
			50				
			51				
			52				
			53				
			54				
			55				
			56				
			57				
			58				
			59				

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Boring Log No: SB-7

Project: 20-9335 Seattle, WA
Location: 1225 N 45th St
Client: Chevron
Logged By: G. Cisneros and A. Curry

Drill Date: 5/28/04
Drilled by: Cascade Drilling Inc.
Drill Method: Hollow-Stem Auger
Sample Method: Split-Spoon

Hammer Weight: 300 lbs
Borehole Diameter: 8"
Boring Depth: 43'

MOISTURE	PID (PPM)	BLOWS - 6"	DEPTH	GRAPHIC LOG	SAMPLE INTERVAL	DESCRIPTION	BACKFILL MATERIAL
			0			**Ground Surface**	Backfilled with Bentonite
			1			**Gravelly Sand** Asphalt top 4" Airknife to 8' Gravelly, silty SAND with large concrete blocks.	
			2				
			3				
			4				
			5				
			6				
			7				
			8				
			9				
Moist	0	50	10			**Silty, Gravelly SAND (SM)** Light brown, very dense, well graded, silty, gravelly SAND with 10 percent gravel and 15 percent silt; no odor; no sheen.	
			11				
			12			**Gravelly SAND (SW)** Reddish brown to brown, very dense, well graded, SAND with 10 percent gravel and 5 percent silt; no odor; no sheen.	
Moist	2.3	50	13				
			14				
			15			**Gravelly SAND (SW)** Brown, very dense, well-graded, fine to medium SAND with 5 percent silt and 5 percent gravel; no odor; no sheen.	
Moist	4.7	50	16				
			17				
			18			**SAND (SP)** Brown, dense to very dense, fine-grained SAND; no gravel; no silt; no odor; no sheen.	
Moist	0.7	29 50	19				
			20				

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Boring Log No: SB-7

Project: 20-9335 Seattle, WA
Location: 1225 N 45th St
Client: Chevron
Logged By: G. Cisneros and A. Curry

Drill Date: 5/28/04
Drilled by: Cascade Drilling Inc.
Drill Method: Hollow-Stem Auger
Sample Method: Split-Spoon

Hammer Weight: 300 lbs
Borehole Diameter: 8"
Boring Depth: 43'

MOISTURE	PID (PPM)	BLOWS - 6"	DEPTH	GRAPHIC LOG	SAMPLE INTERVAL	DESCRIPTION	BACKFILL MATERIAL
Moist	0	50	20			SAND (SP) Same as above; no odor; no sheen.	
			21				
			22				
Moist	0	50	23			SAND (SP) Same as above; no odor; no sheen.	
			24				
Moist	0	50	25			SAND (SP) Same as above; no odor; no sheen.	
			26				
			27				
Moist	1.5	50	28			SAND (SP) Same as above; no odor; no sheen.	
			29				
Moist	0	50	30			SAND (SP) Same as above; no odor; no sheen.	
			31				
			32				
Moist	0	37 50	33			SAND (SP) Same as above; no odor; no sheen.	
			34				
Moist	0	50	35			SAND (SP) Same as above; no odor; no sheen.	
			36				
			37				
Wet	11.9	50	38			SAND (SP) Same as above; no odor; no sheen.	5/28/04
			39				

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Boring Log No: SB-7

Project: 20-9335 Seattle, WA
Location: 1225 N 45th St
Client: Chevron
Logged By: G. Cisneros and A. Curry

Drill Date: 5/28/04
Drilled by: Cascade Drilling Inc.
Drill Method: Hollow-Stem Auger
Sample Method: Split-Spoon

Hammer Weight: 300 lbs
Borehole Diameter: 8"
Boring Depth: 43'

MOISTURE	PID (PPM)	BLOWS - 6"	DEPTH	GRAPHIC LOG	SAMPLE INTERVAL	DESCRIPTION	BACKFILL MATERIAL
Wet to Sat	0	50	40			**SAND (SP)** Same as above; no odor; no sheen.	
			41				
			42			**SAND (SP)** Brown, very dense, poorly graded, fine to medium SAND; no odor; no sheen.	
Sat.	0	50	43				
			44				
			45				
			46				
			47				
			48				
			49				
			50				
			51				
			52				
			53				
			54				
			55				
			56				
			57				
			58				
			59				

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Boring Log No: SB-8

Project: 20-9335 Seattle, WA
Location: 1225 N 45th St
Client: Chevron
Logged By: G. Cisneros and A. Curry

Drill Date: 6/1/04
Drilled by: Cascade Drilling Inc.
Drill Method: Hollow-Stem Auger
Sample Method: Split-Spoon

Hammer Weight: 300 lbs
Borehole Diameter: 8"
Boring Depth: 45.5'

MOISTURE	PID (PPM)	BLOWS - 6"	DEPTH	GRAPHIC LOG	SAMPLE INTERVAL	DESCRIPTION	BACKFILL MATERIAL
			0			**Ground Surface**	Backfilled with Bentonite
			1			**Silty, Gravelly Sand** Asphalt top 4" Airknife to 8' Gravelly, silty SAND with large concrete blocks.	
			2				
			3				
			4				
			5				
			6				
			7				
Moist	0	50	8			**Silty, gravelly SAND (SM)** Brown, very dense, well graded, fine to medium silty SAND with 20 percent silt; no odor; no sheen.	
			9			**SAND (SW-SM)** Brown, very dense, well graded, fine to medium silty SAND with 10 percen silt and 5 percent gravel; no odor; no sheen.	
Moist	5.8	36 50	10			**SAND (SP)** Light brown, very dense, poorly graded, fine to medium SAND; no silt; no gravel; no odor; no sheen.	
			11				
			12				
Moist	4.53	26 22 35	13			**SAND (SP)** Same as above; HC odor; slight sheen.	
			14				
			15				
Moist	11.1	26 50	16			**SAND (SP)** Same as above; very subtle odor; no sheen.	
			17				
Moist	10	29 50	18			**Silty, gravelly SAND (SW)** Brown, dense to very dense, fine-grained SAND with 5 percent silt and 5 percent gravel; slight odor; no sheen.	
			19				
			20				

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Boring Log No: SB-8

Project: 20-9335 Seattle, WA	**Drill Date: 6/1/04**	**Hammer Weight: 300 lbs**
Location: 1225 N 45th St	**Drilled by: Cascade Drilling Inc.**	**Borehole Diameter: 8"**
Client: Chevron	**Drill Method: Hollow-Stem Auger**	**Boring Depth: 45.5'**
Logged By: G. Cisneros and A. Curry	**Sample Method: Split-Spoon**	

MOISTURE	PID (PPM)	BLOWS - 6"	DEPTH	GRAPHIC LOG	SAMPLE INTERVAL	DESCRIPTION	BACKFILL MATERIAL
Moist	10	33 50	20–21			**SAND (SP)** Light brown, very dense, poorly graded, fine to medium SAND; slight odor; no sheen.	
Moist	3.7	50	22–23			**SAND (SP)** Same as above; slight odor; no sheen.	
Moist	12.2	50	24–25			**SAND (SP)** Same as above; slight odor; no sheen.	
Moist	0.5	27 50	26–27			**SAND (SP)** Same as above; slight odor; no sheen.	
Moist	12.2	32 50	28–29			**SAND (SP)** Same as above; slight odor; no sheen.	
Moist	40	33 50	30–31			**SAND (SP)** Same as above; moderate HC odor; no sheen.	
Wet	853	50	32–33			**SAND (SP)** Light brown, very dense, poorly graded, fine to medium SAND; HC odor; slight sheen.	
Wet to Sat	2795	24 50	34–35			**SAND (SP)** Same as above except gray to brown color; strong HC odor; strong sheen.	◀ 6/1/04
			36–37				
			38–39				

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Boring Log No: SB-8

Project: 20-9335 Seattle, WA	**Drill Date: 6/1/04**	**Hammer Weight: 300 lbs**
Location: 1225 N 45th St	**Drilled by: Cascade Drilling Inc.**	**Borehole Diameter: 8"**
Client: Chevron	**Drill Method: Hollow-Stem Auger**	**Boring Depth: 45.5'**
Logged By: G. Cisneros and A. Curry	**Sample Method: Split-Spoon**	

MOISTURE	PID (PPM)	BLOWS - 6"	DEPTH	GRAPHIC LOG	SAMPLE INTERVAL	DESCRIPTION	BACKFILL MATERIAL
Sat.	146	50	40			**SAND (SP)** Same as above; grayish brown color; HC odor; no sheen.	
			41				
			42				
Sat.	6.8	50	43			**SAND (SP)** Brown, very dense, poorly graded, fine to medium SAND; no odor; no sheen.	
			44				
Sat.	11.1	50	45			**SAND (SP)** Same as above; no odor; no sheen.	
			46				
			47				
			48				
			49				
			50				
			51				
			52				
			53				
			54				
			55				
			56				
			57				
			58				
			59				

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Boring Log No: SB-9

Project: 20-9335 Seattle, WA
Location: 1225 N 45th St
Client: Chevron
Logged By: G. Cisneros and A. Curry

Drill Date: 6/1/04
Drilled by: Cascade Drilling Inc.
Drill Method: Hollow-Stem Auger
Sample Method: Split-Spoon

Hammer Weight: 300 lbs
Borehole Diameter: 8"
Boring Depth: 45.5'

MOISTURE	PID (PPM)	BLOWS - 6"	DEPTH	GRAPHIC LOG	SAMPLE INTERVAL	DESCRIPTION	BACKFILL MATERIAL
			0			**Ground Surface**	Backfilled with Bentonite
			1			**Gravelly Sand** Asphalt top 4" Airknife to 8' Gravelly, silty SAND with large concrete blocks.	
			2				
			3				
			4				
			5				
			6				
			7				
Moist	0	50	8			**Gravelly SAND (SW)** Light to medium brown, very dense, well-graded, gravelly, silty, fine- to medium-grained SAND with 10 percent gravel and 5 percent silt; no odor; no sheen.	
			9				
Moist	0	50	10			**Silty, Gravelly SAND (SW)** Same as above; no odor; no sheen.	
			11				
			12				
Moist	0	50	13			**Silty, Gravelly SAND (SW)** Same as above; no odor; no sheen.	
			14				
Moist	0	50	15			**SAND (SP)** Light to medium brown, very dense, poorly graded, fine- to medium-grained SAND; no silt; no gravel; slight odor; no sheen.	
			16				
			17				
Moist	0	31 50	18			**SAND (SP)** Same as above; no odor; no sheen.	
			19				
			20				

SAIC
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Boring Log No: SB-9

Project: 20-9335 Seattle, WA
Location: 1225 N 45th St
Client: Chevron
Logged By: G. Cisneros and A. Curry

Drill Date: 6/1/04
Drilled by: Cascade Drilling Inc.
Drill Method: Hollow-Stem Auger
Sample Method: Split-Spoon

Hammer Weight: 300 lbs
Borehole Diameter: 8"
Boring Depth: 45.5'

MOISTURE	PID (PPM)	BLOWS - 6"	DEPTH	GRAPHIC LOG	SAMPLE INTERVAL	DESCRIPTION	BACKFILL MATERIAL
Moist	0	50	20			**SAND (SP)** Same as above; no odor; no sheen.	
			21				
			22				
Moist	0	50	23			**SAND (SP)** Same as above; no odor; no sheen.	
			24				
Moist	0	50	25			**SAND (SP)** Same as above; no odor; no sheen.	
			26				
			27				
Moist	0	50	28			**SAND (SP)** Same as above; no odor; no sheen.	
			29				
Moist	0	50	30			**SAND (SP)** Same as above; no odor; no sheen.	
			31				
			32				
Moist	0	50	33			**SAND (SP)** Same as above; no odor; no sheen.	
			34				
Moist	0	50	35			**SAND (SP)** Same as above; no odor; no sheen.	
			36				
			37				
Wet	2215	50	38			**SAND (SP)** Gray to light brown, very dense, poorly graded, fine- to medium-grained SAND; no gravel; no silt; strong HC odor; slight sheen.	▼ 6/1/04
			39				

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Boring Log No: SB-9

Project: 20-9335 Seattle, WA
Location: 1225 N 45th St
Client: Chevron
Logged By: G. Cisneros and A. Curry

Drill Date: 6/1/04
Drilled by: Cascade Drilling Inc.
Drill Method: Hollow-Stem Auger
Sample Method: Split-Spoon

Hammer Weight: 300 lbs
Borehole Diameter: 8"
Boring Depth: 45.5'

MOISTURE	PID (PPM)	BLOWS - 6"	DEPTH	GRAPHIC LOG	SAMPLE INTERVAL	DESCRIPTION	BACKFILL MATERIAL
Wet to Sat	30.2	50	40			**SAND (SP)** Same as above; no odor; no sheen.	
			41				
			42			**SAND (SP)** Light to medium brown, very dense, poorly graded, fine to medium SAND with 5 percent gravel and 5 percent silt; no odor; no sheen.	
Sat.	21.8	50	43				
			44			**SAND (SP)** Light to medium brown, very dense, poorly graded, fine to medium SAND; no silt; no gravel; no odor; no sheen.	
Sat.	0	50	45				
			46				
			47				
			48				
			49				
			50				
			51				
			52				
			53				
			54				
			55				
			56				
			57				
			58				
			59				

SAIC
An Employee Owned Company

Boring Log No: SB-10

Project: 20-9335 Seattle, WA
Location: 1225 N 45th St
Client: Chevron
Logged By: G. Cisneros and A. Curry

Drill Date: 6/1/04
Drilled by: Cascade Drilling Inc.
Drill Method: Hollow-Stem Auger
Sample Method: Split-Spoon

Hammer Weight: 300 lbs
Borehole Diameter: 8"
Boring Depth: 43'

MOISTURE	PID (PPM)	BLOWS - 6"	DEPTH	GRAPHIC LOG	SAMPLE INTERVAL	DESCRIPTION	BACKFILL MATERIAL
			0			**Ground Surface**	Backfilled with Bentonite
			1			**Silty, Gravelly Sand** Asphalt top 4" Airknife to 8' Gravelly, silty SAND.	
			2				
			3				
			4				
			5				
			6				
			7				
Moist	0	50	8			**Silty, Gravelly SAND (SW)** Reddish brown, very dense, well-graded, fine SAND with 10 percent gravel and 5 percent silt; no odor; no sheen.	
			9				
Moist	9.9	50	10			**Silty, Gravelly SAND (SW)** Same as above; no odor; no sheen.	
			11			**SAND (SP)** Light brown to medium brown, very dense, poorly graded, fine SAND; no odor; no sheen.	
			12				
Moist	30	50	13			**Silty, Gravelly SAND (SW-SM)** Light brown to medium brown, very dense, well-graded, gravelly, silty SAND with 10 percent gravel and 5-10 percent silt; no odor; no sheen.	
			14				
Moist	30	50	15			**Silty, Gravelly SAND (SW-SM)** Same as above; no odor; no sheen.	
			16				
			17				
Moist	33	50	18			**Silty, Gravelly SAND (SW-SM)** Same as above; no odor; no sheen.	
			19				
			20			**Silty, Gravelly SAND (SW-SM)** Same as above; no odor; no sheen.	

An Employee Owned Company

Boring Log No: SB-10

Project: 20-9335 Seattle, WA
Location: 1225 N 45th St
Client: Chevron
Logged By: G. Cisneros and A. Curry

Drill Date: 6/1/04
Drilled by: Cascade Drilling Inc.
Drill Method: Hollow-Stem Auger
Sample Method: Split-Spoon

Hammer Weight: 300 lbs
Borehole Diameter: 8"
Boring Depth: 43'

MOISTURE	PID (PPM)	BLOWS - 6"	DEPTH	GRAPHIC LOG	SAMPLE INTERVAL	DESCRIPTION	BACKFILL MATERIAL
Moist	.9	50	20			**SAND (SP)** Light to medium brown, very dense, poorly graded, fine- to medium-grained SAND; no silt; no gravel; slight odor; no sheen.	
			21				
			22				
Moist	0	50	23			**SAND (SP)** Same as above; no odor; no sheen.	
			24				
Moist	0	50	25			**SAND (SP)** Same as above; no odor; no sheen.	
			26				
			27				
Moist	0	50	28			**SAND (SP)** Same as above; no odor; no sheen.	
			29				
Moist	0	50	30			**SAND (SP)** Same as above; no odor; no sheen.	
			31				
			32				
Moist	30	50	33			**SAND (SP)** Same as above; no odor; no sheen.	
			34				
Moist	0	50	35			**SAND (SP)** Same as above; no odor; no sheen.	
			36				
			37				
Wet	0	50	38			**SAND (SP)** Same as above; no odor; no sheen.	▼ 6/1/04
			39				

SAIC
An Employee Owned Company

Boring Log No: SB-10

Project: 20-9335 Seattle, WA
Location: 1225 N 45th St
Client: Chevron
Logged By: G. Cisneros and A. Curry

Drill Date: 6/1/04
Drilled by: Cascade Drilling Inc.
Drill Method: Hollow-Stem Auger
Sample Method: Split-Spoon

Hammer Weight: 300 lbs
Borehole Diameter: 8"
Boring Depth: 43'

MOISTURE	PID (PPM)	BLOWS - 6"	DEPTH	GRAPHIC LOG	SAMPLE INTERVAL	DESCRIPTION	BACKFILL MATERIAL
Wet to Sat	0	50	40			**SAND (SP)** Same as above; no odor; no sheen.	
			41				
			42			**SAND (SP)** Light to medium brown, very dense, poorly graded, fine to medium SAND; no odor; no sheen.	
Wet	30	50	43				
			44				
			45				
			46				
			47				
			48				
			49				
			50				
			51				
			52				
			53				
			54				
			55				
			56				
			57				
			58				
			59				

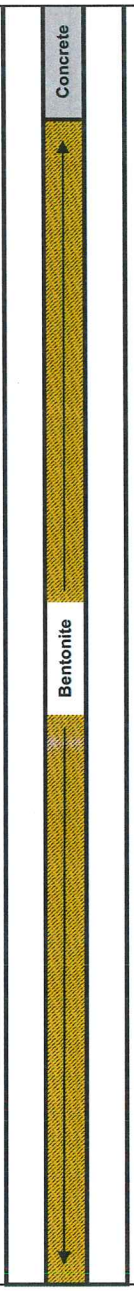
SOIL BORING LOG

BORING No: SB-11
PAGE 1 of 4

PROJECT: 20-9355	DRILLER: Cascade Drilling, Inc.	WELL DIAMETER:
LOCATION: 45th and Stone, Seattle, WA	DRILL METHOD: Hollow Stem Auger	WELL DEPTH:
CLIENT: Chevron	SAMPLE METHOD: Split Spoon	WELL CASING:
DATE: 4/21/05	HOLE DIAMETER: 8 inches	WELL SCREEN:
LOGGED BY: S. Kline	HOLE DEPTH: 41 feet	FILTER PACK:
		CASING ELEVATION: --

Analytical Sample Number	Moisture Content	PID (ppm)	BLOWS/6"	Water Level	Sample: Recovery	Sample: Interval	DEPTH (ft.)	SOIL TYPE	LITHOLOGY / DESCRIPTION
							0	AS	3 inches of Asphalt
									Hand Auger to 8 ft bgs
	Dry						1		
							2	SW/ SM	Light brown, fite SAND, silty (30-40%), roots and other organic debris, occasional cobbles up to 4" diameter. No odor, no sheen.
							3		
							4		
	Dry						5	SW	Light brown to gray, fine grained SAND, organic debris absent, less silt (10-20%), gravel and cobble clasts up to 3 inch diameter (20%). No odor, no sheen.
							6		
							7		
							8		
	Dry	3.4					9		
							10		Drilled directly to 30 ft bgs without sampling.
							11		

Well Completion/ Backfill Details



NOTES:

SAIC

SOIL BORING LOG

BORING No: SB-11

PROJECT: 20-9355	DRILLER: Cascade Drilling, Inc.	WELL DIAMETER:
LOCATION: 45th and Stone, Seattle, WA	DRILL METHOD: Hollow Stem Auger	WELL DEPTH:
CLIENT: Chevron	SAMPLE METHOD: Split Spoon	WELL CASING:
DATE: 4/21/05	HOLE DIAMETER: 8 inches	WELL SCREEN:
LOGGED BY: S. Kline	HOLE DEPTH: 41 feet	FILTER PACK:
		CASING ELEVATION: --

Analytical Sample Number	Moisture Content	PID (ppm)	BLOWS/6"	Water Level	Sample: Recovery	Sample: Interval	DEPTH (ft.)	SOIL TYPE	LITHOLOGY / DESCRIPTION	Well Completion/ Backfill Details
							12			
							13			
							14			
							15			
							16		Drilled directly to 30 ft bgs without sampling.	Bentonite
							17			
							18			
							19			
							20			
							21			
							22			

NOTES:

SOIL BORING LOG

BORING No: SB-11
PAGE 3 of 4

PROJECT: 20-9355	DRILLER: Cascade Drilling, Inc.	WELL DIAMETER:
LOCATION: 45th and Stone, Seattle, WA	DRILL METHOD: Hollow Stem Auger	WELL DEPTH:
CLIENT: Chevron	SAMPLE METHOD: Split Spoon	WELL CASING:
DATE: 4/21/05	HOLE DIAMETER: 8 inches	WELL SCREEN:
LOGGED BY: S. Kline	HOLE DEPTH: 41 feet	FILTER PACK:
		CASING ELEVATION: --

Analytical Sample Number	Moisture Content	PID (ppm)	BLOWS/6"	Water Level	Sample Recovery	Sample Interval	DEPTH (ft.)	SOIL TYPE	LITHOLOGY / DESCRIPTION	Well Completion/ Backfill Details
							23			
							24			
							25			
							26		Drilled directly to 30 ft bgs without sampling.	
							27			
							28			
							29			
							30			
	Damp	49.6	36 50				31			
							32	SW	Brown, fine to medium grained SAND, well sorted. No odor, no sheen.	
							33			

Bentonite

NOTES:

SOIL BORING LOG

BORING No: SB-11
PAGE 4 of 4

PROJECT: 20-9355	DRILLER: Cascade Drilling, Inc.	WELL DIAMETER:
LOCATION: 45th and Stone, Seattle, WA	DRILL METHOD: Hollow Stem Auger	WELL DEPTH:
CLIENT: Chevron	SAMPLE METHOD: Split Spoon	WELL CASING:
DATE: 4/21/05	HOLE DIAMETER: 8 inches	WELL SCREEN:
LOGGED BY: S. Kline	HOLE DEPTH: 41 feet	FILTER PACK:
		CASING ELEVATION: --

Analytical Sample Number	Moisture Content	PID (ppm)	BLOWS/6"	Water Level	Sample Recovery	Sample Interval	DEPTH (ft.)	SOIL TYPE	LITHOLOGY / DESCRIPTION	Well Completion/ Backfill Details
							34		Same as above.	
			29				35			
	Damp	5306	37						Same as above. Gray coloration. Slight hydrocarbon odor, no sheen.	
			50/6				36			
	Damp	5306	20				37	SW	Same as above. Moderate hydrocarbon odor, no sheen.	
			30							
				▼			38			
SB-11-38	Wet	5306	20							
			20						Same as above. SB-11-38 collected.	
	Wet	67.7	20				39			
							40		Same as above.	
							41		Total depth = 41 ft bgs.	
							42			
							43			
							44			

Bentonite

NOTES: FID maximum reading = 5306

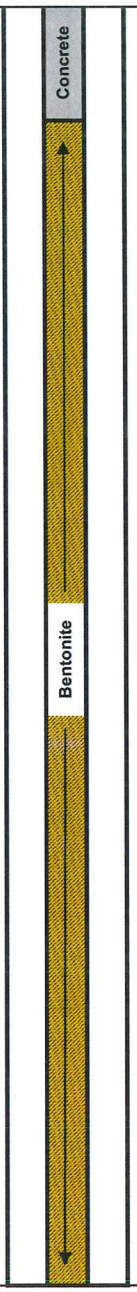
SOIL BORING LOG

BORING No: SB-12
PAGE 1 of 4

PROJECT: 20-9355	DRILLER: Cascade Drilling, Inc.	WELL DIAMETER:
LOCATION: 45th and Stone, Seattle, WA	DRILL METHOD: Hollow Stem Auger	WELL DEPTH:
CLIENT: Chevron	SAMPLE METHOD: Split Spoon	WELL CASING:
DATE: 4/21/05	HOLE DIAMETER: 8 inches	WELL SCREEN:
LOGGED BY: S. Kline	HOLE DEPTH: 40.5 feet	FILTER PACK:
		CASING ELEVATION: --

Analytical Sample Number	Moisture Content	PID (ppm)	BLOWS/6"	Water Level	Sample: Recovery	Sample: Interval	DEPTH (ft.)	SOIL TYPE	LITHOLOGY / DESCRIPTION
							0	AS	3 inches of Asphalt
									Airknife to 8 ft bgs
	Dry	8.1					1		
							2		
							3		
							4	SP	Brown, coarse to fine grained SAND, poorly sorted, 10-20% 1 inch gravel clasts, organic debris (roods and wood splinters).
							5		
							6		
							7		
	Dry						8	SW	
							9		Drilled directly to 20 ft bgs without sampling.
							10		
							11		

Well Completion/ Backfill Details



NOTES:

SOIL BORING LOG

BORING No: SB-12
PAGE 2 of 4

PROJECT: 20-9355	DRILLER: Cascade Drilling, Inc.	WELL DIAMETER:
LOCATION: 45th and Stone, Seattle, WA	DRILL METHOD: Hollow Stem Auger	WELL DEPTH:
CLIENT: Chevron	SAMPLE METHOD: Split Spoon	WELL CASING:
DATE: 4/21/05	HOLE DIAMETER: 8 inches	WELL SCREEN:
LOGGED BY: S. Kline	HOLE DEPTH: 40.5 feet	FILTER PACK:
		CASING ELEVATION: --

Analytical Sample Number	Moisture Content	PID (ppm)	BLOWS/6"	Water Level	Sample: Recovery	Sample: Interval	DEPTH (ft.)	SOIL TYPE	LITHOLOGY / DESCRIPTION	Well Completion/ Backfill Details
							12			
							13			
							14			
							15			
							16		Drilled directly to 20 ft bgs without sampling.	
							17			
							18			
							19			
			20				20			
		3.8	25				21	SW	Light brown to light gray, fine to medium, well sorted SAND, sub rounded to angular grains. No gravel, 10% silt. No odor, no sheen.	
			40				22			

Bentonite

NOTES:

SOIL BORING LOG

BORING No: SB-12
PAGE 3 of 4

PROJECT: 20-9355	DRILLER: Cascade Drilling, Inc.	WELL DIAMETER:
LOCATION: 45th and Stone, Seattle, WA	DRILL METHOD: Hollow Stem Auger	WELL DEPTH:
CLIENT: Chevron	SAMPLE METHOD: Split Spoon	WELL CASING:
DATE: 4/21/05	HOLE DIAMETER: 8 inches	WELL SCREEN:
LOGGED BY: S. Kline	HOLE DEPTH: 40.5 feet	FILTER PACK:
		CASING ELEVATION: --

Analytical Sample Number	Moisture Content	PID (ppm)	BLOWS/6"	Water Level	Sample Recovery	Sample Interval	DEPTH (ft.)	SOIL TYPE	LITHOLOGY / DESCRIPTION	Well Completion/ Backfill Details
							23			
							24			
							25			
			14							
	Damp	1857	22				26		Same as above. Slight solvent type odor - not hydrocarbon odor, no sheen.	
			27							
							27			
								SW		
							28			
							29			
							30			
			20							
	Damp	22.2	25				31		Same as above. Slighty more silt content (10-20%).	
			30							
			32				32			
	Damp /Dry	7.1	46							
			15				33			

Bentonite

NOTES:

SOIL BORING LOG

BORING No: SB-12
PAGE 4 of 4

PROJECT: 20-9355	DRILLER: Cascade Drilling, Inc.	WELL DIAMETER:
LOCATION: 45th and Stone, Seattle, WA	DRILL METHOD: Hollow Stem Auger	WELL DEPTH:
CLIENT: Chevron	SAMPLE METHOD: Split Spoon	WELL CASING:
DATE: 4/21/05	HOLE DIAMETER: 8 inches	WELL SCREEN:
LOGGED BY: S. Kline	HOLE DEPTH: 40.5 feet	FILTER PACK:
		CASING ELEVATION: --

Analytical Sample Number	Moisture Content	PID (ppm)	BLOWS/6"	Water Level	Sample Recovery	Sample Interval	DEPTH (ft.)	SOIL TYPE	LITHOLOGY / DESCRIPTION	Well Completion/ Backfill Details
			21							
	Damp /Dry	15.4	23				34			
			21						Same as above. Gray coloration, increased moisture content. Hydrocarbon odor, no sheen. SB-12-34.5 collected.	
SB-12-36			19				35			
		5306	19							
			23				36			
SB-12-36			22							
	Wet	5306	50/2"				37	SW	Same above. Gray coloration. Moderate odor, no sheen. SB-12-36 collected.	
			14							
	Wet	1877	19				38			
			26							
			10				39		Moderate to slight odor. SB-12-39 collected.	
		58.1	30							
			30				40			
									Total depth = 40.5 ft bgs.	
							41			
							42			
							43			
							44			

Bentonite

NOTES: FID maximum reading = 5306

SOIL BORING LOG

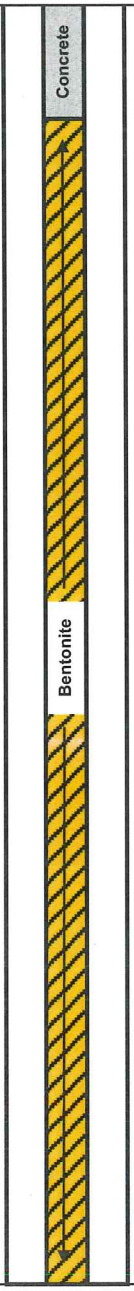
BORING No: SB-13

PAGE 1 of 4

PROJECT: 20-9355	DRILLER: Cascade Drilling, Inc.	WELL DIAMETER:
LOCATION: 45th and Stone, Seattle, WA	DRILL METHOD: Hollow Stem Auger	WELL DEPTH:
CLIENT: Chevron	SAMPLE METHOD: Split Spoon	WELL CASING:
DATE: 4/21/05	HOLE DIAMETER: 8 inches	WELL SCREEN:
LOGGED BY: S. Kline	HOLE DEPTH: 41 feet	FILTER PACK:
		CASING ELEVATION: --

Analytical Sample Number	Moisture Content	PID (ppm)	BLOWS/6"	Water Level	Sample: Recovery	Sample: Interval	DEPTH (ft.)	SOIL TYPE	LITHOLOGY / DESCRIPTION
							0	AS	3 inches of Asphalt
									Airknife to 8 ft bgs
	Dry						1		
							2		Brown, fine grained SAND, poorly sorted, coarse organic debris, gravel clasts (10%).
							3		
	Dry						4	SW/ SM	
							5		
							6		Same as above. Boulders up to 8 inches in diameter (rounded glacial erratics).
	Dry						7		
							8		
							9		
							10		Drilled directly to 30 ft bgs without sampling.
							11		

Well Completion/ Backfill Details



NOTES:

SOIL BORING LOG

BORING No: SB-14
PAGE 1 of 4

PROJECT: 20-9355	DRILLER: Cascade Drilling, Inc.	WELL DIAMETER:
LOCATION: 45th and Stone, Seattle, WA	DRILL METHOD: Hollow Stem Auger	WELL DEPTH:
CLIENT: Chevron	SAMPLE METHOD: Split Spoon	WELL CASING:
DATE: 4/21/05	HOLE DIAMETER: 8 inches	WELL SCREEN:
LOGGED BY: S. Kline	HOLE DEPTH: 39.5 feet	FILTER PACK:
		CASING ELEVATION: --

Analytical Sample Number	Moisture Content	PID (ppm)	BLOWS/6"	Water Level	Sample Recovery	Sample Interval	DEPTH (ft.)	SOIL TYPE	LITHOLOGY / DESCRIPTION
	Dry						1		Rubble top 3 inches. Airknife to 8 ft bgs.
		4.9					2		Brown, fine grained SAND, poorly sorted, 10% silt, 10-20% 1 inch rounded gravel clasts, occasional 3-4 inch cobbles. No odor, no sheen.
	Dry						3		
							4		
							5		
							6		Same as above. 1 foot rounded boulder brought out by airknife.
							7		
							8		
							9		Drilled directly to 30 ft bgs.
							10		
							11		

Well Completion/ Backfill Details

NOTES:

SOIL BORING LOG

BORING No: SB-15
PAGE 1 of 1

PROJECT: 20-9355	DRILLER: Cascade Drilling, Inc.	WELL DIAMETER:
LOCATION: 45th and Stone, Seattle, WA	DRILL METHOD: Hollow Stem Auger	WELL DEPTH:
CLIENT: Chevron	SAMPLE METHOD: Split Spoon	WELL CASING:
DATE: 4/21/05	HOLE DIAMETER: 8 inches	WELL SCREEN:
LOGGED BY: S. Kline	HOLE DEPTH: 39.5 feet	FILTER PACK:
		CASING ELEVATION: --

Analytical Sample Number	Moisture Content	PID (ppm)	BLOWS/6"	Water Level	Sample: Recovery	Sample: Interval	DEPTH (ft.)	SOIL TYPE	LITHOLOGY / DESCRIPTION	Well Completion/ Backfill Details
							0	AS	Asphalt top 3 inches. Airknife to 8 ft bgs.	Concrete
	Dry						1			
		9.2					2			
							3			
							4	SP/ SM	Brown, fine grained SAND, poorly sorted, 20% silt and fine gravel, organic debris (wood splinters) present. No odor, no sheen.	Bentonite
							5			
							6			
	Dry						7			
							8		Total depth = 8 ft bgs.	
							9			
							10			
							11			

NOTES:

SOIL BORING LOG

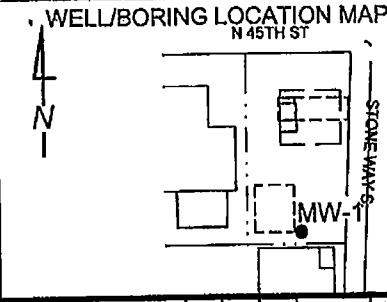
BORING No: SB-16
PAGE 1 of 4

PROJECT: 20-9355	DRILLER: Cascade Drilling, Inc.	WELL DIAMETER:
LOCATION: 45th and Stone, Seattle, WA	DRILL METHOD: Hollow Stem Auger	WELL DEPTH:
CLIENT: Chevron	SAMPLE METHOD: Split Spoon	WELL CASING:
DATE: 4/22/05	HOLE DIAMETER: 8 inches	WELL SCREEN:
LOGGED BY: S. Kline	HOLE DEPTH: 39.5 feet	FILTER PACK:
		CASING ELEVATION: --

Analytical Sample Number	Moisture Content	PID (ppm)	BLOWS/6"	Water Level	Sample: Recovery	Sample: Interval	DEPTH (ft.)	SOIL TYPE	LITHOLOGY / DESCRIPTION	Well Completion/ Backfill Details
							1		Rubble top 3 inches. Airknife to 8 ft bgs.	Concrete
							2			
							3			
							4		Brown, well sorted, fine to medium grained SAND, no rounded clasts.	
							5			
							6			Bentonite
							7			
							8			
							9		Drilled directly to 30 ft bgs.	
							10			
							11			

NOTES:

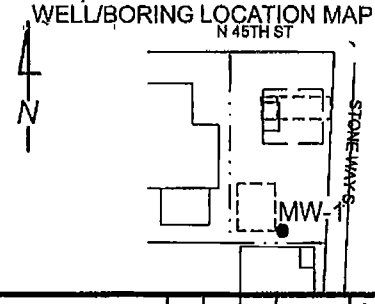
WELL/BORING LOCATION MAP



Delta Environmental Consultants, Inc.	WELL/BORING: MW-1
DATE: 10/10/00	DRILLING METHOD: Hollow Stem Auger
PROJECT: M000-524	SAMPLING METHOD: DM Split Spoon
CLIENT: Chevron 209335	BORING DIAMETER: 8"
LOCATION: E. of 1225 N. 45th St.	BORING DEPTH: 42'
CITY: Wallingford	WELL CASING: 2" SCH 40 PVC
CO./STATE: WA.	WELL SCREEN: 32-42' (0.020")
DRILLER: Cascade	SAND PACK: 30-42' (#10/20)

WELL/BORING COMPLETION	FIRST ▽	STABILIZED ▼	MOISTURE	DENSITY BLOWS / 6"	FIELD TEST PID (ppm)	SAMPLE NUMBER	DEPTH (FEET)	RECOVERY	SAMPLE INTERVAL	GRAPHIC	USCS SYMBOL	WATER LEVEL:			
												TIME:			
												DATE:			
												DESCRIPTION/LOGGED BY: Shawn M.			
Concrete							1								
							2								
							3								
							4								
			Dp	9 50	0.0		5				SM	SILTY SAND: brown; 30% fines; 20% very fine to fine sand; medium sand; 5% gravel; medium dense; no TPH odor.			
							6								
							7								
							8								
							9								
Bentonite			Dp	70	0.0		10				SP	SAND: grayish brown; 5% fines; 95% very fine to fine sand; dense; no TPH odor.			
							11								
							12								
							13								
							14								
			Dp	60	0.0		15				SP	SAND: grayish brown; 5% fines; 95% very fine to fine sand; dense; no TPH odor.			
							16								
							17								
							18								
							19								
			Dp	32 50	0.0		20				SP	SAND: grayish brown; 5% fines; 95% very fine to fine sand; dense; no TPH odor.			
							21								
							22								

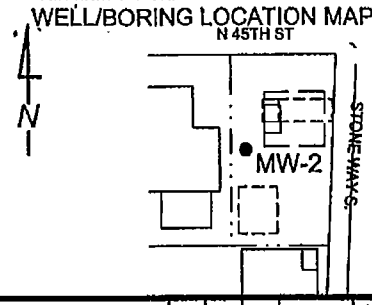
WELL/BORING LOCATION MAP



Delta Environmental Consultants, Inc.	WELL/BORING: MW-1
DATE: 10/10/00	DRILLING METHOD: Hollow Stem Auger
PROJECT: M000-524	SAMPLING METHOD: DM Split Spoon
CLIENT: Chevron 209335	BORING DIAMETER: 8"
LOCATION: E. of 1225 N. 45th St.	BORING DEPTH: 42'
CITY: Wallingford	WELL CASING: 2" SCH 40 PVC
CO./STATE: WA.	WELL SCREEN: 32-42' (0.020")
DRILLER: Cascade	SAND PACK: 30-42' (#10/20)

WELL/BORING COMPLETION	FIRST	STABILIZED	MOISTURE	DENSITY BLOWS / 6"	FIELD TEST PID (ppm)	SAMPLE NUMBER	DEPTH (FEET)	RECOVERY	SAMPLE INTERVAL	GRAPHIC	USCS SYMBOL	DESCRIPTION/LOGGED BY: Shawn M.
												WATER LEVEL: / TIME: / DATE:
Bentonite			M	50	0.0		25				SP	SAND: grayish brown; 5% fines; 95% very fine to fine sand; dense; no TPH odor.
			M	32 50	0.0		30				SP	SAND: grayish brown; 5% fines; 95% very fine to fine sand; dense; no TPH odor.
Sand	▽		W	35 50	0.0		35				SP	SAND: grayish brown; 5% fines; 95% very fine to fine sand; dense; no TPH odor.
				15 30	0.0		40				SP	SAND: grayish brown; 5% fines; 95% very fine to fine sand; dense; no TPH odor.
							42					Bottom of boring @ 42'.

WELL/BORING LOCATION MAP



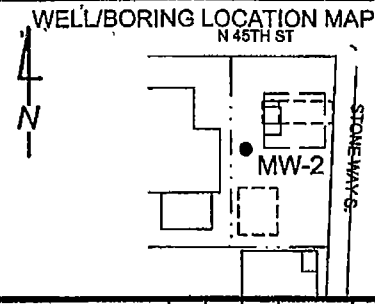
Delta Environmental Consultants, Inc.	WELL/BORING: MW-2
DATE: 10/11/00	DRILLING METHOD: Hollow Stem Auger
PROJECT: M000-524	SAMPLING METHOD: DM Split Spoon
CLIENT: Chevron 209335	BORING DIAMETER: 8"
LOCATION: E. of 1225 N. 45th St.	BORING DEPTH: 43'
CITY: Wallingford	WELL CASING: 2" SCH 40 PVC
CO./STATE: WA.	WELL SCREEN: 32-42' (0.010")
DRILLER: Cascade	SAND PACK: 30-43' (#10/20)

WATER LEVEL:			
TIME:			
DATE:			

DESCRIPTION/LOGGED BY: Shawn M.

WELL/BORING COMPLETION	FIRST ▽	STABILIZED ▼	MOISTURE	DENSITY BLOWS / 6"	FIELD TEST PID (ppm)	SAMPLE NUMBER	DEPTH (FEET)	RECOVERY	SAMPLE INTERVAL	GRAPHIC	USCS SYMBOL	DESCRIPTION
Concrete; Bentonite			Dp	8 16 16	0.0		1–6				SM	SILTY SAND: reddish brown; 25% fines; very fine to fine sand; 20% medium to coarse sand; 5% gravel; iron oxide staining; dense; no TPH odor.
			Dp	21 34 34	0.0		7–11				SP	SAND: grayish brown; 5% fines; 95% very fine to fine sand; medium dense; no TPH odor.
			Dp	24 47 31	0.0		12–16				SP	SAND: grayish brown; 5% fines; 95% very fine to fine sand; medium dense; no TPH odor.
				27 50	0.0		17–21				SP	SAND: grayish brown; 5% fines; 95% very fine to fine sand; medium dense; no TPH odor.

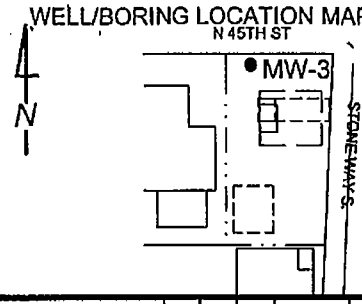
WELL/BORING LOCATION MAP



Delta Environmental Consultants, Inc.	WELL/BORING: MW-2
DATE: 10/11/00	DRILLING METHOD: Hollow Stem Auger
PROJECT: M000-524	SAMPLING METHOD: DM Split Spoon
CLIENT: Chevron 209335	BORING DIAMETER: 8"
LOCATION: E. of 1225 N. 45th St.	BORING DEPTH: 43'
CITY: Wallingford	WELL CASING: 2" SCH 40 PVC
CO./STATE: WA.	WELL SCREEN: 32-42' (0.010")
DRILLER: Cascade	SAND PACK: 30-43' (#10/20)

WELL/BORING COMPLETION	FIRST ▽	STABILIZED ▼	MOISTURE	DENSITY BLOWS / 6"	FIELD TEST PID (ppm)	SAMPLE NUMBER	DEPTH (FEET)	RECOVERY	SAMPLE INTERVAL	GRAPHIC	USCS SYMBOL	WATER LEVEL:	TIME:	DATE:	DESCRIPTION/LOGGED BY: Shawn M.
Bentonite			Dp	27 60	0.0		25				SP				SAND: grayish brown; 5% fines; 95% very fine to fine sand; medium dense; no TPH odor.
			Dp	91	6.0		30				SP				SAND: grayish brown; 5% fines; 95% very fine to fine sand; dense; no TPH odor.
Sand	▽		Dp W	21 50	8.0		35				SP				SAND: grayish brown; 5% fines; 95% very fine to fine sand; dense; no TPH odor.
			W	26 50	67		40				SP				SAND: gray; 5% fines; 95% very fine to fine sand; dense; strong TPH odor.
			W	24 50	64		42				SP				SAND: gray; 5% fines; 95% very fine to fine sand; dense; strong TPH odor.
							43								Bottom of boring @ 43'.

WELL/BORING LOCATION MAP

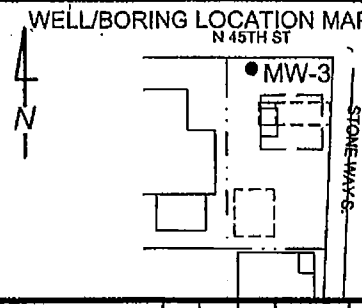


Delta Environmental Consultants, Inc.	WELL/BORING: MW-3
DATE: 10/11/00	DRILLING METHOD: Hollow Stem Auger
PROJECT: M000-524	SAMPLING METHOD: DM Split Spoon
CLIENT: Chevron 209335	BORING DIAMETER: 8"
LOCATION: E. of 1225 N. 45th St.	BORING DEPTH: 45.5'
CITY: Wallingford	WELL CASING: 2" SCH 40 PVC
CO./STATE: WA.	WELL SCREEN: 35-45' (0.010")
DRILLER: Cascade	SAND PACK: 33-45.5' (#10/20)

WELL/BORING COMPLETION	FIRST	STABILIZED	MOISTURE	DENSITY BLOWS / 6"	FIELD TEST PID (ppm)	SAMPLE NUMBER	DEPTH (FEET)	RECOVERY	SAMPLE INTERVAL	GRAPHIC	USCS SYMBOL	DESCRIPTION/LOGGED BY: Shawn M.
Concrete / Bentonite	▽	▼	Dp	8 10 30	0.0		5				SM	SILTY SAND: brown; 35% fines; 30% very fine to fine sand; medium sand; 5% gravel; loose to medium dense; no TPH odor.
			Dp	100/3	0.0		10				SM	SILTY SAND: brown; 35% fines; 30% very fine to fine sand; medium sand; 5% gravel; very dense; no TPH odor.
	▽		Dp	35 50	0.0		15				SM	SILTY SAND: brown; 35% fines; 30% very fine to fine sand; medium sand; 5% gravel; very dense; no TPH odor.
			Dp	30 50	0.0		20				SP	SAND: grayish brown; 5% fines; 95% very fine to fine sand; no TPH odor.

WATER LEVEL:			
TIME:			
DATE:			

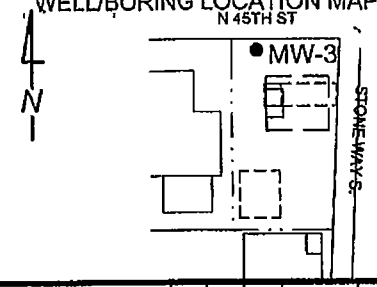
WELL/BORING LOCATION MAP



Delta Environmental Consultants, Inc.	WELL/BORING: MW-3
DATE: 10/11/00	DRILLING METHOD: Hollow Stem Auger
PROJECT: M000-524	SAMPLING METHOD: DM Split Spoon
CLIENT: Chevron 209335	BORING DIAMETER: 8"
LOCATION: E. of 1225 N. 45th St.	BORING DEPTH: 45.5'
CITY: Wallingford	WELL CASING: 2" SCH 40 PVC
CO./STATE: WA.	WELL SCREEN: 35-45' (0.010")
DRILLER: Cascade	SAND PACK: 33-45.5' (#10/20)

WELL/BORING COMPLETION	FIRST	STABILIZED	MOISTURE	DENSITY BLOWS / 6"	FIELD TEST PID (ppm)	SAMPLE NUMBER	DEPTH (FEET)	RECOVERY	SAMPLE INTERVAL	GRAPHIC	USCS SYMBOL	WATER LEVEL: / TIME: / DATE:				DESCRIPTION/LOGGED BY: Shawn M.
Bentonite							23									
							24									
			Dp	50	0.0		25				SP					SAND: grayish brown; 5% fines; 95% very fine to fine sand; no TPH odor.
							26									
							27									
							28									
							29									
			Dp	40 50	0.0		30				SP					SAND: grayish brown; 5% fines; 95% very fine to fine sand; no TPH odor.
							31									
							32									
							33									
							34									
			Dp	50	0.0		35				SP					SAND: grayish brown; 5% fines; 95% very fine to fine sand; no TPH odor.
							36									
							37									
							38									
Sand							39									
			W	40 30 35	0.0		40				SP					SAND: grayish brown; 5% fines; 95% very fine to fine sand; no TPH odor.
							41									
							42									
							43									
							44									

WELL/BORING LOCATION MAP



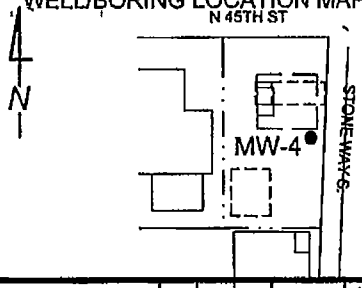
Delta Environmental Consultants, Inc.	WELL/BORING: MW-3
DATE: 10/11/00	DRILLING METHOD: Hollow Stem Auger
PROJECT: M000-524	SAMPLING METHOD: DM Split Spoon
CLIENT: Chevron 209335	BORING DIAMETER: 8"
LOCATION: E. of 1225 N. 45th St.	BORING DEPTH: 45.5'
CITY: Wallingford	WELL CASING: 2" SCH 40 PVC
CO./STATE: WA.	WELL SCREEN: 35-45' (0.010")
DRILLER: Cascade	SAND PACK: 33-45.5' (#10/20)

WATER LEVEL:			
TIME:			
DATE:			

DESCRIPTION/LOGGED BY: Shawn M.

WELL/BORING COMPLETION	FIRST ▽	STABILIZED ▼	MOISTURE	DENSITY BLOWS / 6"	FIELD TEST PID (ppm)	SAMPLE NUMBER	DEPTH (FEET)	RECOVERY	SAMPLE INTERVAL	GRAPHIC	USCS SYMBOL	DESCRIPTION
			W	60	45		45				SP	SAND: grayish brown; 5% fines; 95% very fine to fine sand; no TPH odor.
							46					Bottom of boring @ 45.5'.
							47					
							48					
							49					
							50					
							51					
							52					
							53					
							54					
							55					
							56					
							57					
							58					
							59					
							60					
							61					
							62					
							63					
							64					
							65					
							66					

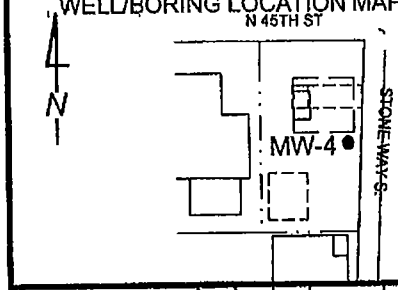
WELL/BORING LOCATION MAP



Delta Environmental Consultants, Inc.	WELL/BORING: MW-4
DATE: 10/10/00	DRILLING METHOD: Hollow Stem Auger
PROJECT: M000-524	SAMPLING METHOD: DM Split Spoon
CLIENT: Chevron 209335	BORING DIAMETER: 8"
LOCATION: E. of 1225 N. 45th St.	BORING DEPTH: 43'
CITY: Wallingford	WELL CASING: 2" SCH 40 PVC
CO./STATE: WA.	WELL SCREEN: 32-42' (0.020")
DRILLER: Cascade	SAND PACK: 30-43' (#10/20)

WATER LEVEL:			
TIME:			
DATE:			

WELL/BORING COMPLETION	FIRST ▽	STABILIZED ▼	MOISTURE	DENSITY BLOWS / 6".	FIELD TEST PID (ppm)	SAMPLE NUMBER	DEPTH (FEET)	RECOVERY	SAMPLE INTERVAL	GRAPHIC	USCS SYMBOL	DESCRIPTION/LOGGED BY: Shawn M.
Concrete / Bentonite			Dp	55	0.0		1–5				SM	SILTY SAND: brown; 30% fines; very fine to fine sand; 20% medium to coarse sand; 5% gravel; dense; no TPH odor.
			Dp	60	0.0		6–10				SM	SILTY SAND: brownish gray; 15% fines; 85% very fine to fine sand; dense; no TPH odor.
			Dp	32 50	2.0		11–15				SP	SAND: brownish gray; 5% fines; 95% very fine to fine sand; medium dense; no TPH odor.
				32 50			16–20				SP	SAND: brownish gray; 5% fines; 95% very fine to fine sand; medium dense; no TPH odor.
							21–22					

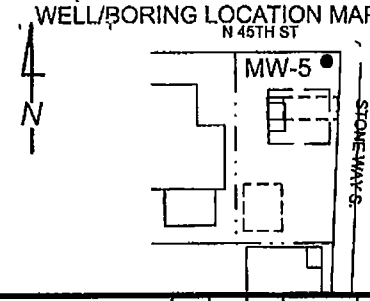


Delta Environmental Consultants, Inc. | WELL/BORING: MW-4

DATE: 10/10/00	DRILLING METHOD: Hollow Stem Auger
PROJECT: M000-524	SAMPLING METHOD: DM Split Spoon
CLIENT: Chevron 209335	BORING DIAMETER: 8"
LOCATION: E. of 1225 N. 45th St.	BORING DEPTH: 43'
CITY: Wallingford	WELL CASING: 2" SCH 40 PVC
CO./STATE: WA.	WELL SCREEN: 32-42' (0.020")
DRILLER: Cascade	SAND PACK: 30-43' (#10/20)

WELL/BORING COMPLETION	FIRST ▽	STABILIZED ▼	MOISTURE	DENSITY BLOWS / 6"	FIELD TEST PID (ppm)	SAMPLE NUMBER	DEPTH (FEET)	RECOVERY	SAMPLE INTERVAL	GRAPHIC	USCS SYMBOL	DESCRIPTION/LOGGED BY: Shawn M.
WATER LEVEL:												
TIME:												
DATE:												
Bentonite			Dp	50	0.0		25				SP	SAND: grayish brown; 5% fines; 95% very fine to fine sand; dense; no TPH odor.
			Dp	50	0.0		30				SP	SAND: grayish brown; 5% fines; 95% very fine to fine sand; dense; no TPH odor.
Sand	▽		Dp	30 50	5.0		35				SP	SAND: grayish brown; 5% fines; 95% very fine to fine sand; dense; no TPH odor.
			W	30 50	0.0		40				SP	SAND: grayish brown; 5% fines; 95% very fine to fine sand; dense; no TPH odor.
			W	40 50	0.0		42				SP	SAND: grayish brown; 5% fines; 95% very fine to fine sand; dense; no TPH odor.
							43					Bottom of boring @ 43'.

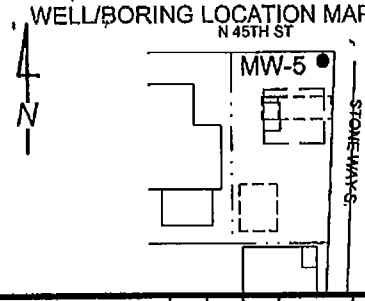
WELL/BORING LOCATION MAP



Delta Environmental Consultants, Inc.	WELL/BORING: MW-5
DATE: 10/11/00	DRILLING METHOD: Hollow Stem Auger
PROJECT: M000-524	SAMPLING METHOD: DM Split Spoon
CLIENT: Chevron 209335	BORING DIAMETER: 8"
LOCATION: E. of 1225 N. 45th St.	BORING DEPTH: 43'
CITY: Wallingford	WELL CASING: 2" SCH 40 PVC
CO./STATE: WA.	WELL SCREEN: 32-42' (0.010")
DRILLER: Cascade	SAND PACK: 30-43' (#10/20)

WELL/BORING COMPLETION	FIRST	STABILIZED	MOISTURE	DENSITY BLOWS / 6".	FIELD TEST PID (ppm)	SAMPLE NUMBER	DEPTH (FEET)	RECOVERY	SAMPLE INTERVAL	GRAPHIC	USCS SYMBOL	WATER LEVEL:			
												TIME:			
												DATE:			
												DESCRIPTION/LOGGED BY: Shawn M.			
Concrete							1								
							2								
							3								
							4								
			D	16 21 21	24		5				SM	SILTY SAND: brown; 20% fines; very fine to fine sand;15% medium to coarse sand; 5% cobble; medium dense; no TPH odor; trace iron oxide staining.			
							6								
							7								
							8								
							9								
Bentonite			Dp	16 19 20	67		10				SP	SAND: grayish brown; 5% fines; 95% very fine to fine sand; slight TPH odor.			
							11								
							12								
							13								
							14								
				50	83		15				SP	SAND: grayish brown; 5% fines; 95% very fine to fine sand; slight TPH odor.			
							16								
							17								
							18								
							19								
				50	71		20				SP	SAND: grayish brown; 5% fines; 95% very fine to fine sand; slight TPH odor.			
							21								
							22								

WELL/BORING LOCATION MAP



Delta Environmental Consultants, Inc.	WELL/BORING: MW-5
DATE: 10/11/00	DRILLING METHOD: Hollow Stem Auger
PROJECT: M000-524	SAMPLING METHOD: DM Split Spoon
CLIENT: Chevron 209335	BORING DIAMETER: 8"
LOCATION: E. of 1225 N. 45th St.	BORING DEPTH: 43'
CITY: Wallingford	WELL CASING: 2" SCH 40 PVC
CO./STATE: WA.	WELL SCREEN: 32-42' (0.010")
DRILLER: Cascade	SAND PACK: 30-43' (#10/20)

WELL/BORING COMPLETION	FIRST ▽	STABILIZED ▼	MOISTURE	DENSITY BLOWS / 6".	FIELD TEST PID (ppm)	SAMPLE NUMBER	DEPTH (FEET)	RECOVERY	SAMPLE INTERVAL	GRAPHIC	USCS SYMBOL	WATER LEVEL:			
												TIME:			
												DATE:			
												DESCRIPTION/LOGGED BY: Shawn M.			
Bentonite			Dp	30 50	73		25				SP	SAND: grayish brown; 5% fines; 95% very fine to fine sand; slight TPH odor.			
			Dp	50	64		30				SP	SAND: grayish brown; 5% fines; 95% very fine to fine sand; slight TPH odor.			
Sand	▽		Dp	50	59		35				SP	SAND: grayish brown; 5% fines; 95% very fine to fine sand; slight TPH odor.			
				40 65	7		40				SP	SAND: grayish brown; 5% fines; 95% very fine to fine sand; no TPH odor.			
				40 70	3		42				SP	SAND: grayish brown; 5% fines; 95% very fine to fine sand; no TPH odor.			
							43					Bottom of boring @ 43'.			

BORING LOG Page 1 of 4

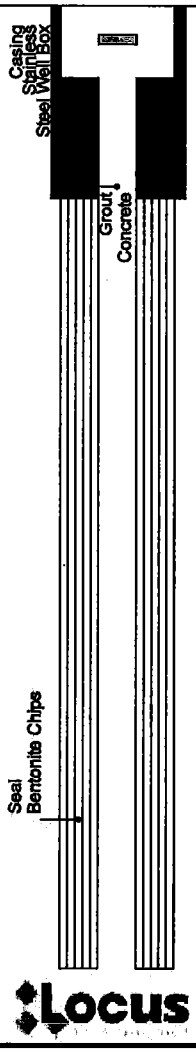
An Employee-Owned Company

Site:	209335
Boring No:	MW-6
Diameter:	8.25 inches
Date:	11/07/2005

Northing:	NA	**Driller:**	David (Cascade Drilling, Inc.)	**Total Depth:** 35.0 Ft
Easting:	NA	**Method:**	Hollow Stem	**GW Depth:** 26.0 Ft
Elevation:	NA	**Consultant:**	Simon Kline (SAIC)	

Recov.	Depth Ft	Moist.	Blow Cnt	PPM	Soil Code	Soil Pattern	Soil Description
	0	Dry			SW		(Type 17 FILL) Brown, fine to coarse SAND with well-rounded gravel and 10% silt.
	5	Moist			SP		Brown to gray, fine to medium SAND with some gravel and 5% silt.
	10						

Well Construction



Locus

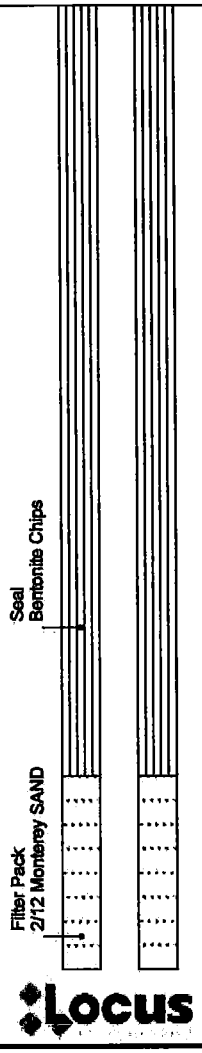
BORING LOG

An Employee-Owned Company

Site:	209335
Boring No:	MW-6
Diameter:	8.25 inches
Date:	11/07/2005

Northing:	NA	Driller:	David (Cascade Drilling, Inc.)	Total Depth:	35.0 Ft
Easting:	NA	Method:	Hollow Stem	GW Depth:	26.0 Ft
Elevation:	NA	Consultant:	Simon Kline (SAIC)		

Recov.	Depth Ft	Moist.	Blow Cnt	PPM	Soil Code	Soil Pattern	Soil Description	Well Construction
	10							
	15	Moist			SP		Brown to gray, fine to medium SAND with some gravel and 5% silt.	
	20							



Locus

BORING LOG

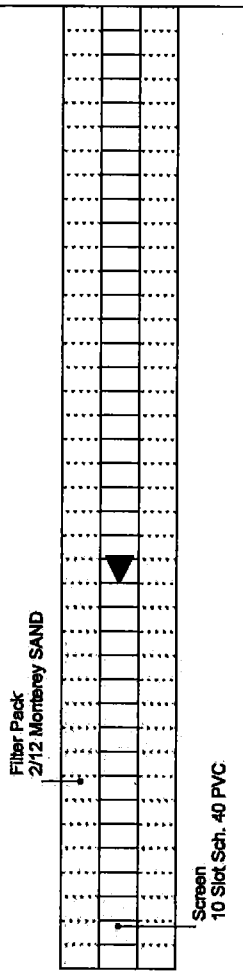
An Employee-Owned Company

Site:	209335
Boring No:	MW-6
Diameter:	8.25 inches
Date:	11/07/2005

Northing:	NA	Driller:	David (Cascade Drilling, Inc.)	Total Depth:	35.0 Ft
Easting:	NA	Method:	Hollow Stem	GW Depth:	26.0 Ft
Elevation:	NA	Consultant:	Simon Kline (SAIC)		

Recov.	Depth Ft	Moist.	Blow Cnt	PPM	Soil Code	Soil Pattern	Soil Description
	20	Moist			SP		Brown to gray, fine to medium SAND with some gravel and 5% silt.
	25	Sheen	50	0.0			Brown, fine to medium SAND with 10% silt; no odor; no sheen.
	30						

Well Construction



Locus

BORING LOG Page 4 of 4

An Employee-Owned Company

Site:	209335
Boring No:	MW-6
Diameter:	8.25 inches
Date:	11/07/2005

Northing:	NA	**Driller:**	David (Cascade Drilling, Inc.)	**Total Depth:** 35.0 Ft
Easting:	NA	**Method:**	Hollow Stem	**GW Depth:** 26.0 Ft
Elevation:	NA	**Consultant:**	Simon Kline (SAIC)	

Recov.	Depth Ft	Moist.	Blow Cnt	PPM	Soil Code	Soil Pattern	Soil Description	Well Construction
	30	Sheen		0.0	SP		Brown, fine to medium SAND with 10% silt; no odor; no sheen.	Filter Pack 2/12 Monterey SAND; Screen 10 Slot Sch. 40 PVC
	35							

Locus

BORING LOG Page 1 of 4

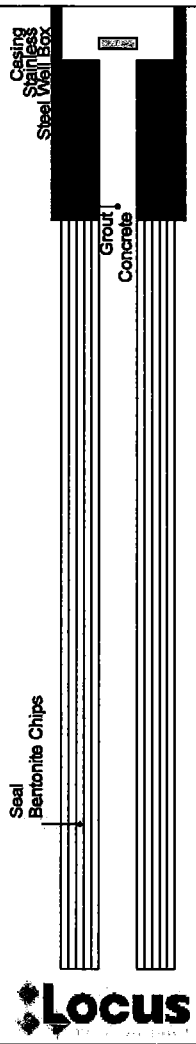
An Employee-Owned Company

Site:	209335
Boring No:	MW-7
Diameter:	8.25 inches
Date:	11/07/2005

Northing:	NA	**Driller:**	David (Cascade Drilling, Inc.)	**Total Depth:**	35.0 Ft
Easting:	NA	**Method:**	Hollow Stem	**GW Depth:**	26.0 Ft
Elevation:	NA	**Consultant:**	Simon Kline (SAIC)		

Recov.	Depth Ft	Moist.	Blow Cnt	PPM	Soil Code	Soil Pattern	Soil Description
	0	Dry			SW		(Type 17 FILL) Brown, fine to coarse SAND with well-rounded gravel.
	5	Moist			SP		Brown to gray, fine to medium SAND with gravel and 10% silt.
	9						

Well Construction



Locus

BORING LOG

An Employee-Owned Company

Site:	209335
Boring No:	MW-7
Diameter:	8.25 inches
Date:	11/07/2005

Northing:	NA	Driller:	David (Cascade Drilling, Inc.)	Total Depth:	35.0 Ft
Easting:	NA	Method:	Hollow Stem	GW Depth:	26.0 Ft
Elevation:	NA	Consultant:	Simon Kline (SAIC)		

Recov	Depth Ft	Moist.	Blow Cnt	PPM	Soil Code	Soil Pattern	Soil Description	Well Construction
	9							
	10							
		Moist			SP		Brown to gray, fine to medium SAND with gravel and 10% silt.	
	15							Seal Bentonite Chips
	18							

Locus

BORING LOG

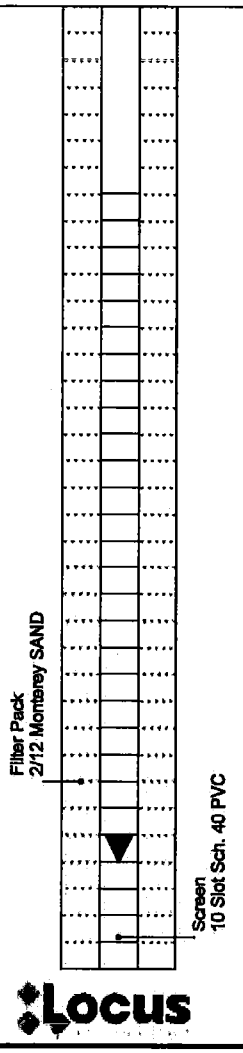
An Employee-Owned Company

Site:	209335
Boring No:	MW-7
Diameter:	8.25 inches
Date:	11/07/2005

Northing:	NA	Driller:	David (Cascade Drilling, Inc.)	Total Depth: 35.0 Ft
Easting:	NA	Method:	Hollow Stem	GW Depth: 26.0 Ft
Elevation:	NA	Consultant:	Simon Kline (SAIC)	

Recov	Depth Ft	Moist.	Blow Cnt	PPM	Soil Code	Soil Pattern	Soil Description
	18						
	20						
		Moist			SP		Brown to gray, fine to medium SAND with gravel and 10% silt.
	25						
	27						

Well Construction



Locus

BORING LOG

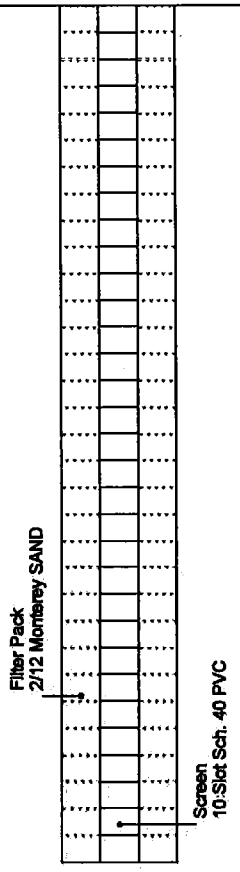
An Employee-Owned Company

Site:	209335
Boring No:	MW-7
Diameter:	8.25 inches
Date:	11/07/2005

Northing:	NA	**Driller:**	David (Cascade Drilling, Inc.)	**Total Depth:**	35.0 Ft
Easting:	NA	**Method:**	Hollow Stem	**GW Depth:**	26.0 Ft
Elevation:	NA	**Consultant:**	Simon Kline (SAIC)		

Recov.	Depth Ft	Moist.	Blow Cnt	PPM	Soil Code	Soil Pattern	Soil Description
	27	Moist					Brown to gray, fine to medium SAND with gravel and 10% silt.
			50				
	30	Wet		1194	SP		Gray, fine to coarse SAND; moderate odor; slight sheen.
	35						

Well Construction



Locus

BORING LOG Page 1 of 4

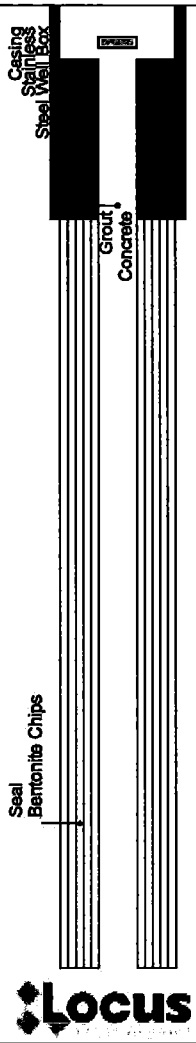
An Employee-Owned Company

Site:	**209335**
Boring No:	**MW-8**
Diameter:	**8.25 inches**
Date:	**11/07/2005**

Northing:	**NA**	**Driller:**	**David (Cascade Drilling, Inc.)**	**Total Depth:**	
Easting:	**NA**	**Method:**	**Hollow Stem**	**35.0 Ft**	
Elevation:	**NA**	**Consultant:**	**Simon Kline (SAIC)**	**GW Depth:**	
				26.0 Ft	

Recov.	Depth Ft	Moist.	Blow Cnt	PPM	Soil Code	Soil Pattern	Soil Description
	0	Dry			SW		(Type 17 FILL) Brown, fine to coarse SAND with gravel and some silt.
	5	Moist			SP		Brown, medium to coarse SAND.
	9						

Well Construction



Locus

BORING LOG

An Employee-Owned Company

Site:	209335
Boring No:	MW-8
Diameter:	8.25 inches
Date:	11/07/2005

Northing:	NA	Driller:	David (Cascade Drilling, Inc.)	Total Depth:	35.0 Ft
Easting:	NA	Method:	Hollow Stem	GW Depth:	26.0 Ft
Elevation:	NA	Consultant:	Simon Kline (SAIC)		

Recov.	Depth Ft	Moist.	Blow Cnt	PPM	Soil Code	Soil Pattern	Soil Description	Well Construction
	9							
	10							
		Moist			SP		Brown, medium to coarse SAND.	
	15							Seal Bentonite Chips
	18							

Locus

BORING LOG

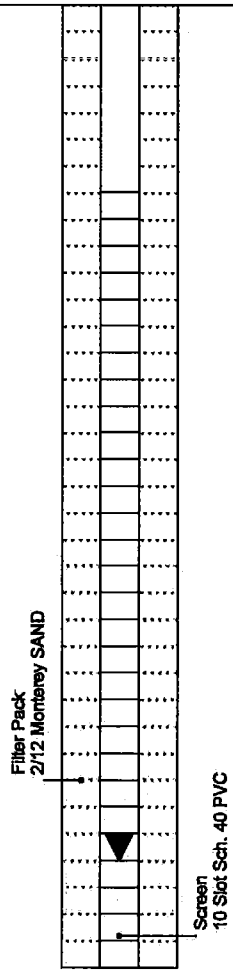
An Employee-Owned Company

Site:	209335
Boring No:	MW-8
Diameter:	8.25 inches
Date:	11/07/2005

Northing:	NA	Driller:	David (Cascade Drilling, Inc.)	Total Depth:	35.0 Ft
Easting:	NA	Method:	Hollow Stem	GW Depth:	26.0 Ft
Elevation:	NA	Consultant:	Simon Kline (SAIC)		

Recov.	Depth Ft	Moist.	Blow Cnt	PPM	Soil Code	Soil Pattern	Soil Description
	18						
	20						
		Moist			SP		Brown, medium to coarse SAND.
	25						
	27						

Well Construction



Locus

BORING LOG

An Employee-Owned Company

Site: 209335
Boring No: MW-8
Diameter: 8.25 inches
Date: 11/07/2005

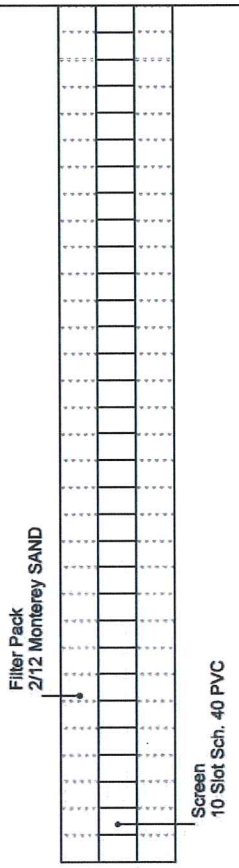
Northing: NA
Easting: NA
Elevation: NA

Driller: David (Cascade Drilling, Inc.)
Method: Hollow Stem
Consultant: Simon Kline (SAIC)

Total Depth: 35.0 Ft
GW Depth: 26.0 Ft

Recov.	Depth Ft	Moist.	Blow Cnt	PPM	Soil Code	Soil Pattern	Soil Description
	27	Moist					Brown, medium to coarse SAND.
			50				
	30	Moist		1067	SP		Gray, fine to coarse SAND with 5% silt; moderate odor; slight sheen.
	35						

Well Construction



Locus

SOIL BORING LOG

BORING No: MW-9

PAGE 1 of 4

PROJECT: 20-9355	DRILLER: Cascade Drilling, Inc.	WELL DIAMETER: 2"
LOCATION: 45th and Stone, Seattle, WA	DRILL METHOD: Hollow Stem Auger	WELL DEPTH: 44.1'
CLIENT: Chevron	SAMPLE METHOD: Split Spoon	WELL CASING: Sch. 40 PVC
DATE: 12/04/2006	HOLE DIAMETER: 8 inches	WELL SCREEN: 29.1'-44.1'
LOGGED BY: G. Cisneros	HOLE DEPTH: 45 feet	FILTER PACK: 2/12 Monterey Sand
		CASING ELEVATION: 208.11 msl

Analytical Sample Number	Moisture Content	PID (ppm)	BLOWS/6"	Water Level	Sample Recovery	Sample Interval	DEPTH (ft.)	SOIL TYPE	LITHOLOGY / DESCRIPTION	Well Completion/ Backfill Details
							0		Airknife to 8 ft bgs.	
							1			
							2			
							3			
							4		Brown, fine to medium grained SAND.	
							5	SP		
							6			
							7			
							8			
							9			
			24				10		Light brown, fine to medium SAND, no silt, no gravel; no odor; no sheen.	
	Moist	0.1	31							
			27				11			

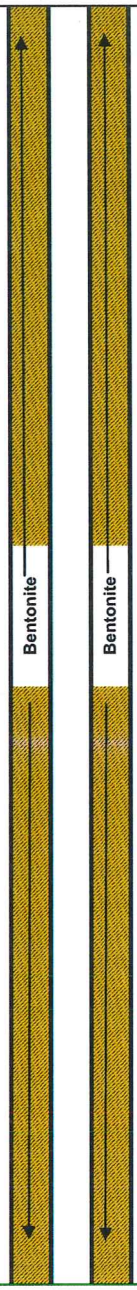
NOTES:

SOIL BORING LOG

BORING No: MW-9

PROJECT: 20-9355	DRILLER: Cascade Drilling, Inc.	WELL DIAMETER: 2"
LOCATION: 45th and Stone, Seattle, WA	DRILL METHOD: Hollow Stem Auger	WELL DEPTH: 44.1'
CLIENT: Chevron	SAMPLE METHOD: Split Spoon	WELL CASING: Sch. 40 PVC
DATE: 12/04/06	HOLE DIAMETER: 8 inches	WELL SCREEN: 29.1'-44.1'
LOGGED BY: G. Cisneros	HOLE DEPTH: 45 feet	FILTER PACK: 2/12 Monterey Sand
		CASING ELEVATION: 208.11 msl

Analytical Sample Number	Moisture Content	PID (ppm)	BLOWS/6"	Water Level	Sample: Recovery	Sample: Interval	DEPTH (ft.)	SOIL TYPE	LITHOLOGY / DESCRIPTION	Well Completion/ Backfill Details
	Moist	0.01	27				12		Light brown, fine to medium SAND; no silt; no gravel; no odor; no sheen.	
							13			
							14			
							15			
							16			
							17	SP	Drilled directly to 30 ft bgs.	
							18			
							19			
							20			
							21			
							22			



NOTES:

SOIL BORING LOG

BORING No: MW-9
PAGE 3 of 4

PROJECT: 20-9355	DRILLER: Cascade Drilling, Inc.	WELL DIAMETER: 2"
LOCATION: 45th and Stone, Seattle, WA	DRILL METHOD: Hollow Stem Auger	WELL DEPTH: 44.1'
CLIENT: Chevron	SAMPLE METHOD: Split Spoon	WELL CASING: Sch. 40 PVC
DATE: 12/04/06	HOLE DIAMETER: 8 inches	WELL SCREEN: 29.1'-44.1'
LOGGED BY: G. Cisneros	HOLE DEPTH: 45 feet	FILTER PACK: 2/12 Monterey Sand
		CASING ELEVATION: 208.11 msl

Analytical Sample Number	Moisture Content	PID (ppm)	BLOWS/6"	Water Level	Sample Recovery	Sample Interval	DEPTH (ft.)	SOIL TYPE	LITHOLOGY / DESCRIPTION	Well Completion/ Backfill Details
							23			
							24			
							25			
							26		Drilled directly to 30 ft bgs.	
							27			
							28	SP		
							29			
	Moist	0.1	50/3"				30		Light brown, fine to medium SAND; no silt; no gravel; no odor; no sheen.	
							31			
							32			
							33			

NOTES:

SOIL BORING LOG

BORING No: MW-9

PROJECT: 20-9355	DRILLER: Cascade Drilling, Inc.	WELL DIAMETER: 2"
LOCATION: 45th and Stone, Seattle, WA	DRILL METHOD: Hollow Stem Auger	WELL DEPTH: 44.1'
CLIENT: Chevron	SAMPLE METHOD: Split Spoon	WELL CASING: Sch. 40 PVC
DATE: 12/04/06	HOLE DIAMETER: 8 inches	WELL SCREEN: 29.1'-44.1'
LOGGED BY: G. Cisneros	HOLE DEPTH:45 feet	FILTER PACK: 2/12 Monterey Sand
		CASING ELEVATION: 208.11 msl

Analytical Sample Number	Moisture Content	PID (ppm)	BLOWS/6"	Water Level	Sample Recovery	Sample Interval	DEPTH (ft.)	SOIL TYPE	LITHOLOGY / DESCRIPTION	Well Completion/ Backfill Details
	Moist	0.1	50				34–35		Same as above; no odor; no sheen.	Screen
				▼			36–37			
MW-9-37.5	Wet to Sat	0.1	50				37–38		Same as above; no odor; no sheen.	
							38–39	SP		
							39–40			
							40–41			
							41–42			
							42–43			
							43–44		Total depth = 45 ft bgs.	

NOTES:

SOIL BORING LOG

BORING No: MW-10
PAGE 1 of 4

PROJECT: 20-9355	DRILLER: Cascade Drilling, Inc.	WELL DIAMETER: 2"
LOCATION: 45th and Stone, Seattle, WA	DRILL METHOD: Hollow Stem Auger	WELL DEPTH: 44.1'
CLIENT: Chevron	SAMPLE METHOD: Split Spoon	WELL CASING: Sch. 40 PVC
DATE: 12/04/2006	HOLE DIAMETER: 8 inches	WELL SCREEN: 30'-45'
LOGGED BY: G. Cisneros	HOLE DEPTH: 45 feet	FILTER PACK: 2/12 Monterey Sand
		CASING ELEVATION: 207.29 msl

Analytical Sample Number	Moisture Content	PID (ppm)	BLOWS/6"	Water Level	Sample Recovery	Sample Interval	DEPTH (ft.)	SOIL TYPE	LITHOLOGY / DESCRIPTION	Well Completion/ Backfill Details
							1		Airknife to 8 ft bgs.	
							2			
							3			
							4		Light brown, fine to medium grained SAND.	
							5			
							6	SP		
							7			
							8			
							9			
	Moist	0.3	50/5"				10		Light brown, fine to medium SAND, no silt, no gravel; no odor; no sheen.	
							11			

NOTES:

SOIL BORING LOG

BORING No: MW-10
PAGE 2 of 4

PROJECT: 20-9355	DRILLER: Cascade Drilling, Inc.	WELL DIAMETER: 2"
LOCATION: 45th and Stone, Seattle, WA	DRILL METHOD: Hollow Stem Auger	WELL DEPTH: 44.1'
CLIENT: Chevron	SAMPLE METHOD: Split Spoon	WELL CASING: Sch. 40 PVC
DATE: 12/04/06	HOLE DIAMETER: 8 inches	WELL SCREEN: 30'-45'
LOGGED BY: G. Cisneros	HOLE DEPTH: 45 feet	FILTER PACK: 2/12 Monterey Sand
		CASING ELEVATION: 207.29 msl

Analytical Sample Number	Moisture Content	PID (ppm)	BLOWS/6"	Water Level	Sample Recovery	Sample Interval	DEPTH (ft.)	SOIL TYPE	LITHOLOGY / DESCRIPTION	Well Completion/ Backfill Details
							12		Light brown, fine to medium SAND; no silt; no gravel; no odor; no sheen.	Bentonite
							13			
							14			
							15			
							16			
							17	SP	Drilled directly to 35 ft bgs.	
							18			
							19			
							20			
							21			
							22			

NOTES:

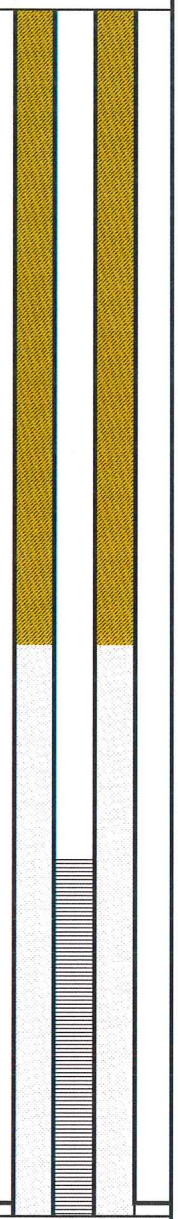
SAIC

SOIL BORING LOG

BORING No: MW-10

PROJECT: 20-9355	DRILLER: Cascade Drilling, Inc.	WELL DIAMETER: 2"
LOCATION: 45th and Stone, Seattle, WA	DRILL METHOD: Hollow Stem Auger	WELL DEPTH: 44.1'
CLIENT: Chevron	SAMPLE METHOD: Split Spoon	WELL CASING: Sch. 40 PVC
DATE: 12/04/06	HOLE DIAMETER: 8 inches	WELL SCREEN: 30'-45'
LOGGED BY: G. Cisneros	HOLE DEPTH: 45 feet	FILTER PACK: 2/12 Monterey Sand
		CASING ELEVATION: 207.29 msl

Analytical Sample Number	Moisture Content	PID (ppm)	BLOWS/6"	Water Level	Sample Recovery	Sample Interval	DEPTH (ft.)	SOIL TYPE	LITHOLOGY / DESCRIPTION	Well Completion/ Backfill Details
							23			
							24			
							25			
							26			
							27			
								SP	Drilled directly to 35 ft bgs.	
							28			
							29			
							30			
							31			
							32			
							33			



NOTES:

SOIL BORING LOG

BORING No: MW-10

PAGE 4 of 4

PROJECT: 20-9355	DRILLER: Cascade Drilling, Inc.	WELL DIAMETER: 2"
LOCATION: 45th and Stone, Seattle, WA	DRILL METHOD: Hollow Stem Auger	WELL DEPTH: 44.1'
CLIENT: Chevron	SAMPLE METHOD: Split Spoon	WELL CASING: Sch. 40 PVC
DATE: 12/04/06	HOLE DIAMETER: 8 inches	WELL SCREEN: 30'-45'
LOGGED BY: G. Cisneros	HOLE DEPTH:45 feet	FILTER PACK: 2/12 Monterey Sand
		CASING ELEVATION: 207.29 msl

Analytical Sample Number	Moisture Content	PID (ppm)	BLOWS/6"	Water Level	Sample Recovery	Sample Interval	DEPTH (ft.)	SOIL TYPE	LITHOLOGY / DESCRIPTION	Well Completion/ Backfill Details
	Moist	0.3	50				34		Light brown, fine to medium SAND; no silt; no gravel; no odor; no sheen.	
							35			
							36			
							37			
MW-10-37.5	Wet to Sat	0.3	50				38		Same as above; no odor; no sheen.	
							39	SP		
							40			
							41			
							42			
							43			
							44			
							45		Total depth = 45 ft bgs.	

Screen

NOTES: Ambient air reading from PID is 0.3-0.5 ppm

Appendix B:
Laboratory Reports

Appendix C:
Vapor Modeling Results and Memo

DATA ENTRY SHEET

SL-ADV Version 3.0; 02/03

Reset to Defaults

CALCULATE RISK-BASED SOIL CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL SOIL CONCENTRATION (enter "X" in "YES" box and initial soil conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial soil conc., C_R (µg/kg)	Chemica
71432	2.60E+02	Benzene

MORE ↓

ENTER Average soil temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to top of contamination, L_t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L_b (cm)	ENTER Totals must add up to value of L_t (cell G28)			ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
				Thickness of soil stratum A, h_A (cm)	Thickness of soil stratum B, (Enter value or 0) h_B (cm)	Thickness of soil stratum C, (Enter value or 0) h_C (cm)			
15	304.8	457	1372	320.04	136.96	0	S		

MORE ↓

ENTER Stratum A SCS soil type	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum A soil organic carbon fraction, f_{oc}^A (unitless)	ENTER Stratum B SCS soil type	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum B soil organic carbon fraction, f_{oc}^B (unitless)	ENTER Stratum C SCS soil type	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)	ENTER Stratum C soil organic carbon fraction, f_{oc}^C (unitless)
Lookup Soil Parameters					Lookup Soil Parameters					Lookup Soil Parameters				
S	1.66	0.375	0.054	0.002	S	1.66	0.375	0.054	0.002					

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
10.16	40	9457.33	2804.16	274.32	0.5	2.7	

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
75	6	30	7.6	1.0E-06	1

Used to calculate risk-based soil concentration.

END

Science Applications International Corporation
An Employee-Owned Company

MEMORANDUM

To: Paul Fitzgerald – Seattle Housing Authority

From: Don Wyll

Date: 13 May 2005

Re: Vapor Modeling, ChevronTexaco Site No. 20-9335
Seattle Housing Authority Building

This memo details the revised Johnson and Ettinger vapor modeling information for the former ChevronTexaco facility located on Stone Way and 45th Avenue in Seattle, Washington. The vapor model was completed to determine the expected soil vapor intrusion impacts in the proposed sub-grade parking garage of the new building. The following memo and attachment present the input data used, assumptions made, and the resulting risk calculations.

Previous soil sampling and analytical testing reveal that subsurface contamination exists on the property above MTCA Method A cleanup levels. The area of contamination is restricted mainly to one corner of the property (approximately 11% of the building footprint); however, model risk calculations were performed assuming the contaminated layer underlies the entire building footprint. The highest detections of petroleum constituents detected onsite were used as model input (Toluene = 48 mg/kg, Ethylbenzene = 61 mg/kg, and total xylenes = 320 mg/kg). These values are from soil sample SB-8-37.5 collected 37.5 feet below ground surface (bgs). Benzene was not detected in any soil samples collected onsite. Based on the analytical results, benzene is not present onsite and does not create an indoor air inhalation risk. However, to run the model in a conservative manner, a non-detect value of benzene (representative of site-wide analytical results, < 0.26 mg/kg) was input into the model.

Soil physical parameters have not been analytically tested, so the pertinent model values for observed soil types were used. Soils beneath the site have been described in previous investigations as sand and gravelly sand. Sand was used as the soil type based on these previous investigations and on anticipated backfill material.

The depths to the top and bottom of the contaminated zone were based on previous analytical data and the proposed depth of the remedial excavation. Risk calculations were performed assuming an excavation depth of 18 feet bgs and subsequent backfilling with clean fill, and a resultant contaminated zone extending from 18 to 45 feet bgs.

The depth below grade of the enclosed floor space and building dimensions were obtained from the architectural drawings of the proposed building. The building design drawings show the garage basement floor at ten feet bgs. The garage will extend across the entire building footprint. The building width is

shown as 92 feet, and the building length is shown as 310.28 feet. A basement ceiling height of 9 feet was input into the model.

MTCA standard exposure assumptions were used as model input for exposure duration and averaging times for carcinogens and noncarcinogens (WAC 173-340-750). Johnson and Ettinger default values for floor wall crack seam width were increased from 0.1 cm to 0.5 cm to account for the expansion joints in the garage floor. Per the building design, the slab thickness was set at four inches and model defaults were used for differential pressure. A reasonable maximum exposure frequency was calculated assuming an individual spent on a half hour in the garage per day, 365 days per year.

The final model input affecting the risk to human health is the indoor air exchange rate in the garage. The garage will contain a mechanically operated fan (26,155 CFM) that is operated by a carbon monoxide sensor. This fan will operate only if carbon monoxide concentrations are detected by the attached sensor unit. A smaller volume ventilation system (1,300 CFM) will operate continuously to meet local building codes. This lower volume exchange rate (calculated at 2.7) was used in model calculations. In reality the exchange rate will likely be much higher over each 24 hour period as the main exhaust fan is occasionally triggered by automobile exhaust.

The Johnson and Ettinger worksheet results show that insignificant incremental risk to human health will be present in the proposed sub-grade parking garage of the Seattle Housing Authority building. This determination was reached with conservative assumptions, including that the soils beneath the proposed building are continuously contaminated from 18 to 45 feet bgs at the highest level of contamination detected onsite, across the entire footprint of the building. In actuality, contamination is limited to one corner of the building and the most heavily contaminated deep soil hot spots will be removed by bucket auger borings. The model inputs also assume that removal of contaminated soil through excavation extends to 18 feet below ground surface, that the total air exchange rate in the garage area is 2.7, and that individuals spend 30 minutes everyday, 365 days per year in the garage. The model results are as follows:

- The total carcinogenic risk: 1.7×10^{-7}
- The total non-carcinogenic risk: 8.0×10^{-8}

Based on these very conservative assumptions and the resulting risk calculations, we do not believe that any additional vapor mitigation following soil excavation to 18 feet bgs is required to reduce the risk to human health in the proposed parking garage.

Enclosures