APPENDIX A
Tables from Kennedy/Jenks 2015 Remedial Investigation

Area of Concern[a]	Description	Investigation History	Remediation History	Current Conditions	Potential Ongoing Source?	Associated COCs	Potentially Affected Media
Drainage Ditch	The drainage ditch located south of the property boundary. The ditch wraps around the eastern side of the adjacent Seattle Limousine (Chiyoda) property, and receives overland flow from the Chiyoda property as well as the Precision Engineering facility property, 14th Street South, and the US-99 northbound entrance ramp. There is no apparent connectivity to a storm sewer or other drainage features to convey water in the ditch. One catch basin located near the southern property line at Former Precision Engineering discharges directly to the drainage ditch.	In April 1986, four ditch soil samples were collected. Chromium was detected at a high concentration; however, Maul Foster & Alongi (MFA) questioned the units they were presented in. In 1989, a subsequent investigation was conducted and 15 shallow soil/sediment samples were analyzed for metals, again identifying chromium concentrations of concern. MFA collected additional samples in the drainage ditch in 2006. Hexavalent chromium was identified near the stormwater outfall, and lead and arsenic were detected above Model Toxics Control Act (MTCA) cleanup levels at several other locations within the ditch.	In October 2007, approximately 100 cubic yards (CY) of soil were excavated from the ditch and disposed offsite. Following confirmation sampling, additional excavation was conducted at two ditch locations in March 2008. Excavated areas were backfilled and reseeded. Not all impacted soil was removed.	One confirmation soil sample had concentrations of lead and arsenic above the cleanup level.	The ditch received impacted surface runoff and possible process wastes. It could be either and ongoing source or a sink.	Chromium, arsenic, lead.	Surface soil, surface water.
Former Plating Tank 1	Installed in an in-ground containment vault in 1968. Removed and reconstructed in early 1990s during remedial action, removed from the Site in 2005.	Sweet Edwards/EMCON in 1988 and 1989. Yellow-stained soil was observed in an opening in the concrete floor. Thirteen hand-augered borings and borings B-1 through B-5 were completed adjacent to former Plating Tanks 1 and 2. Additional investigation was conducted in 2005 & 2006 by MFA to characterize soils near Plating Tanks 1 and 2.	Tanks removed following 1989 investigation. Contaminated soil excavated in 1990. Approximately 114 CY of soil and concrete removed - soils excavated up to 13 feet below ground surface (bgs) (1993). Groundwater was encountered in base of excavation.	Hexavalent chromium detected in four of five confirmation samples up to 73 milligrams per kilogram (mg/kg).	Possible source area.	Trichloroethene (TCE), chromium and hexavalent chromium in soil.	Soil and groundwater.
Former Plating Tank 2	Installed in an in-ground containment vault in 1968. Removed and reconstructed in early 1990s during remedial action, removed from the Site in 2005.	Sweet Edwards/EMCON in 1988 and 1989. Yellow-stained soil was observed in an opening in the concrete floor. Thirteen hand-augered borings and borings B-1 through B-5 were completed adjacent to former Plating Tanks 1 and 2. Additional investigation was conducted in 2005 and 2006 by MFA to characterize soils near Plating Tanks 1 and 2.	Tanks removed following 1989 investigation. Contaminated soil excavated in 1990. Approximately 114 CY of soil and concrete removed - soils excavated up to 13 feet bgs (1993). Groundwater was encountered in base of excavation.	Hexavalent chromium detected in four of five confirmation samples up to 73 mg/kg.	Possible source area.	TCE, chromium and hexavalent chromium in soil.	Soil and groundwater.
Former Plating Tank 3	Aboveground tank with a concrete curb surround. Concrete-lined floor trenches located to the east and west. Located in the plating shop. Removed in the early 1990s during remedial action and replaced by Tanks 3 and 4.	In 1992, Plating Tanks 3, 4, 5 and 6 were removed, as was a 35-foot by 40-foot section of concrete below the tanks. Visibly contaminated soils were removed with the excavation extending up to 28 inches bgs. Chromium [Toxicity Characteristic Leaching Procedure (TCLP)] was detected in soils and concrete, and soil and concrete with low detections was used as excavation backfill. Additional geoprobe drilling was conducted in 2005 by MFA for soil and groundwater analysis. TCE and hexavalent chromium concentrations exceeded MTCA Method A cleanup levels.	Tanks removed in 1992, some soil excavated, concrete below the tanks was also removed. Excavation backfilled with excavated material.	2005 soil sampling suggests hexavalent chromium present in soils.	Yes.	TCE, chromium and hexavalent chromium in soil.	Soil and groundwater.
Former Plating Tank 4	Aboveground tank with a concrete curb surround. Concrete-lined floor trenches located to the east and west. Located in the plating shop. Removed in the early 1990s during remedial action and replaced by Tanks 3 & 4.	In 1992, Plating Tanks 3, 4, 5, and 6 were removed, as was a 35-foot by 40-foot section of concrete below the tanks. Visibly contaminated soils were removed with the excavation extending up to 28 inches bgs. Chromium (TCLP) was detected in soils and concrete, and soil and concrete with low detections was used as excavation backfill. Additional geoprobe drilling was conducted in 2005 by MFA for soil and groundwater analysis. TCE and hexavalent chromium concentrations exceeded MTCA Method A cleanup levels.	Tanks removed in 1992, some soil excavated, concrete below the tanks was also removed. Excavation backfilled with excavated material.	2005 soil sampling suggests hexavalent chromium present in soils.	Yes.	TCE, chromium, and hexavalent chromium in soil.	Soil and groundwater.
Former Plating Tank 5	Aboveground tank with a concrete curb surround. Concrete-lined floor trenches located to the east and west. Located in the plating shop. Removed in the early 1990s during remedial action and replaced by Tanks 3 and 4.	In 1992, Plating Tanks 3, 4, 5, and 6 were removed, as was a 35-foot by 40-foot section of concrete below the tanks. Visibly contaminated soils were removed with the excavation extending up to 28 inches bgs. Chromium (TCLP) was detected in soils and concrete, and soil and concrete with low detections was used as excavation backfill. Additional geoprobe drilling was conducted in 2005 by MFA for soil and groundwater analysis. TCE and hexavalent chromium concentrations exceeded MTCA Method A cleanup levels.	Tanks removed in 1992, some soil excavated, concrete below the tanks was also removed. Excavation backfilled with excavated material	2005 soil sampling suggests hexavalent chromium present in soils.	Yes.	TCE, chromium, and hexavalent chromium in soil.	Soil and groundwater.

Table 1: Summary of Areas of Concern

Area of Concern[a]	Description	Investigation History	Remediation History	Current Conditions	Potential Ongoing Source?	Associated COCs	Potentially Affected Media
Former Plating Tank 6	Aboveground tank with a concrete curb surround. Concrete-lined floor trenches located to the east and west. Located in the plating shop. Removed in the early 1990s during remedial action and replaced by Tanks 3 and 4.	In 1992, Plating Tanks 3, 4, 5, and 6 were removed, as was a 35-foot by 40-foot section of concrete below the tanks. Visibly contaminated soils were removed with the excavation extending up to 28 inches bgs. Chromium (TCLP) was detected in soils and concrete, and soil and concrete with low detections was used as excavation backfill. Additional geoprobe drilling in 2005 by MFA for soil and groundwater analysis. TCE and hexavalent chromium concentrations exceeded MTCA Method A cleanup levels.	Tanks removed in 1992, some soil excavated, concrete below the tanks was also removed. Excavation backfilled with excavated material	2005 soil sampling suggests hexavalent chromium present in soils.	Yes.	TCE, chromium, and hexavalent chromium in soil.	Soil and groundwater.
Tank 7 vault	A large single containment vault 24 feet long, 8 feet wide, and 16 feet deep held three tanks. These tanks included Tank 7, a sodium hydroxide strip tank and a sodium bicarbonate strip tank. Tank 7 was 9 feet long, 7.5 feet wide, and 16 feet deep. All tanks in the large vault were removed in 2005.	One 20-foot soil boring was drilled northeast of Tank 7 in 1989. Groundwater was encountered at 9 feet bgs. Soil was sampled for pH and metals. Chromium was not detected in leachate above the Extraction Procedure Toxicity Test (EP Tox) Method reporting limit of 0.005 milligrams per liter (mg/L). Three additional soil borings, GP-7, GP-9, and GP-10 were drilled north of the Tank 7 vault during MFA's 2005 investigation. Soil samples were not collected from depths below that of the adjacent vault.	In 1989 groundwater was sampled from within the vault, concrete repaired, a liner installed at the base, and a new concrete slab was poured at the base of the vault. Current status/condition of the Tank 7 sump/vault not specified.	Unknown; vault no longer in use.	Possible source area. Apparently groundwater has previously infiltratated the vault surrounding Tank 7. Current conditions not specified.	Hexavalent chromium, 1,1-dichloroethene (1,1-DCE), methylene chloride (MC), and total petroleum hydrocarbons (TPHs) below MTCA Method A cleanup levels for soil. Hexavalent chromium in groundwater at GP-7 above MTCA Method B cleanup level.	Groundwater, possibly soil.
Trenches and drains	Prior to 1986, floor drains and trenches discharged to METRO's sanitary sewer system. Chrome-plating rinse water was permitted to discharge from a small rinse tank to the sanitary system. After July 1986, trenches and drains were re-routed to drain to containment vaults.	Several soil borings were advanced in 2005 and 2006 near trench and drain features. TCE, chromium, and hexavalent chromium were observed in one or more locations at concentrations exceeding MTCA Method A cleanup levels.	Upon facility closure, trenches were apparently filled with concrete. Other specifics of closure are not specified.	2005 soil samples suggest hexavalent chromium and TCE present in soils. Trenches and drains no longer in use.	Former drain lines may be a preferential pathway for vapor migration.	TCE, chromium and hexavalent chromium in soil.	Soil and groundwater.
Hydraulic cylinder test vault	Reportedly, a hydraulic cylinder test vault was located outside the building, approximately 10 feet from the western wall of the building. This vault measured 4 feet in diameter and was reportedly 25 feet deep.	Two soil samples were collected in 2005 at location GP-5, near the hydraulic cylinder test vault. Hexavalent chromium was detected in groundwater in excess of the MTCA Method B cleanup level.	None. Current status/condition of test vault not specified.	Unknown; vault no longer in use.	Unknown.	Hexavalent chromium in groundwater above MTCA Method B cleanup level.	Groundwater.
Temporary plating tanks	Temporary aboveground plating tanks were used in the area north of Tank 7.	Several soil borings were advanced in 2005 near the temporary plating area. Soil samples were analyzed for chromium and hexavalent chromium; however, concentrations were below the MTCA Method A cleanup level. The reconnaissance groundwater sample collected from location GP-7 contained hexavalent chromium at a concentration of 101 micrograms per liter (μg/L), which is above the MTCA Method B (non-carcinogen) cleanup level.	None.	No longer in use.	Unknown.	Hexavalent chromium.	Possibly soil and/or groundwater.
Scrubber room	A cooling-water tank, chromic-acid evaporator, chromic-acid purification unit, and large aboveground chromic-acid holding tank were located in the scrubber room. The evaporator was located in an in-ground containment vault and used to concentrate chromic-acid wastes.	Two soil borings were advanced in 2005 south of the scrubber room. Soil samples from both locations were analyzed for chromium and hexavalent chromium; however, reported concentrations were below MTCA Method A cleanup levels.	None.	No longer in use.	Unknown.	Hexavalent chromium.	Possibly soil and/or groundwater.
Parts washing	Parts washing and degreasing was conducted throughout the building. Solvents used included methyl ethyl ketone (MEK), stoddard solvent, and TCE. Prior to 1986, a closed-loop vapor degreaser system in the cylinder shop used TCE. A TCE tank was located in the chrome plating area.	Exact locations not specified. Parts washing areas may have been investigated in conjunction with sampling at other areas of concern.	None.	No longer in use.	Unknown.	TCE and degradation products.	Surface soil, surface water runoff.
Steam Cleaning Area	An outdoor steam-cleaning area was located southeast of the building prior to 1986. Liquids were discharged to an oil/water separator. In 1986, the oil/water separator was dismantled and steam cleaning operations were moved inside. A sodium hydroxide stripping tank was also located in this area.	Surface water and surface soil samples were collected in the southern ditch, which would have received surface water runoff. Lead was detected in shallow soil at location HA-17 at a concentration of 278 mg/kg, above the MTCA Method A cleanup level.	None.	Unknown; not believed to be in use.	Not expected to be an ongoing source.	Oil & grease, copper, nickel, zinc, chromium, caustics.	Surface soil, surface water runoff.
Solid Waste Dumpster	A solid waste dumpster was located near the southeastern corner of the Former Precision Engineering facility. Surface runoff from the dumpster area drains into the drainage ditch.	Surface water and surface soil samples were collected in the southern ditch, which would have received surface water runoff. Oil, arsenic, and lead were detected in shallow soil at one or more locations at concentrations exceeding MTCA Method A cleanup levels.	None.	Waste storage area still present at this location.	Unknown.	Oil & grease. Copper, nickel, zinc, and benzo(a)pyrene.	Surface soil, surface water runoff.

Notes:
(a) Refer to Figures 2 and 3 for locations of Areas of Concern.

Table 2: Summary of Previous Site Investigations

Date of Work	Associated Reference	Locations	Media Sampled	Laboratory Analysis Conducted	Data Location	Summary of Activities
May 1988	Sweet-Edwards/EMCON, Inc. 1988. Status Report Soils/Ground Water Investigation, Seattle Facility. Dated 15 December 1988.	HA-1 through HA-6	Soil	Extraction Procedure Toxicity Test (EP Tox) Chromium	Appendix A Table A1	Hand-augered locations adjacent to Plating Tank 1.
June 1988	Sweet-Edwards/EMCON, Inc. 1988. Status Report Soils/Ground Water Investigation, Seattle Facility. Dated 15 December 1988.	MW1 through MW4	Groundwater	Total Chromium	Appendix A Table A2	Four groundwater monitoring wells constructed No soil samples were submitted for chemical analysis.
August 1988	Sweet-Edwards/EMCON, Inc. 1988. Status Report Soils/Ground Water Investigation, Seattle Facility. Dated 15 December 1988.	P-1	None	NA	NA	Piezometer installed in August 1988 for evaluation of groundwater elevations. A boring log for P-2, installed in April 1989, was appended to this report.
March 1989	Sweet-Edwards/EMCON, Inc. 1989a. Tank #7 Precision Engineering, Inc Seattle, Washington. June 1989.	B-1	Soil	EP Tox metals, pH	Appendix A Table A1	Characterization of deep soils near Chromic Acid Tank 7 pit. Temporary well installed (no aqueous samples); however, was abandoned in April 1989.
March 1989	Sweet-Edwards/EMCON, Inc. 1989b. Precision Engineering, Drainage Ditch Soil EP Tox Results. Dated 28 April 1989.	S1 through S6	Surface soil	EP Tox metals	Appendix A Table A1, A3	Surface soil samples from the drainage ditch south of the Former Precision Engineering property.
March 1989	Sweet-Edwards/EMCON, Inc. 1989c. Precision Engineering. Letter regarding results from soil and groundwater investigation. Dated 24 August 1989.	S1 through S6, PEI-B1 through PEI-B4	Surface and drainage ditch soil	EP Tox metals	Appendix A Table A1	Results only; interpretation in the February 1990 Sediment Sampling report.
September 1989	Sweet-Edwards/EMCON, Inc. 1989d. Surface Soil Sampling, Precision Engineering Seattle Facility. Dated 30 August 1989.	HA-7 through HA-13	Soil	EP Tox Chromium	Appendix A Table A1	Second phase of hand auger investigation locations near Plating Tanks 1 and 2.
November 1989	Sweet-Edwards/EMCON, Inc. 1990. Soil Sample Results; Tank No. 1 and Drainage Ditch, Precision Engineering, Inc., Seattle Facility. Dated 4 January 1990.	B-1 through B-5	Soil	EP Tox Chromium	Appendix A Table A1	Additional soil samples near Plating Tank 1.
November 1989	Sweet-Edwards/EMCON, Inc. 1990. Soil Sample Results; Tank No. 1 and Drainage Ditch, Precision Engineering, Inc., Seattle Facility. Dated 4 January 1990.	S-7 through S-13	Surface soil	EP Tox Chromium	Appendix A Table A3	Soil samples in the drainage ditch near the S-6 sampling location.
March 1989 and November 1989	Sweet-Edwards/EMCON, Inc. 1990. Sediment Sampling, Precision Engineering, Inc., Seattle, Washington. Dated 26 February 1990.	S1 through S13 and B1 through B4	Surface soil	EP Tox Chromium	Appendix A Table A1	Summarizes Phase I (locations S1 through S6),"background" samples B1 through B4, Phase II (S7 through S13)

Table 2: Summary of Previous Site Investigations

Date of Work	Associated Reference	Locations	Media Sampled	Laboratory Analysis Conducted	Data Location	Summary of Activities
March and April 1993	Precision Engineering, Inc. 1993. Independent Remedial Action Report. 21 July 1993.	WP-1 through WP-14, NW-1, EW-1, WW-1, BW-1, PE-430B, PE-430E, PE-430S, PE-430W, PE-430N, BW-2	Soil and concrete	TCLP chromium and total chromium	Appendix A Tables A4, A5	Summarizes removal of Plating Tanks 3 through 6, and repairs to Tank 7. Also summarizes characterization activities conducted previously in 1988 through 1990, and remediation during excavation of Tanks 1 and 2.
June 2005	Maul Foster Alongi. 2005. Preliminary Soil and Groundwater Site Assessment Report. 5 August 2005	GP1 through GP11	Soil and groundwater	Metals, VOCs, petroleum hydrocarbons, hexavalent chromium, PCBs and PAHs	Appendix A Table A6	Summarizes soil and groundwater sampling conducted following closure of Precision Engineering operations.
December 2005	Maul Foster Alongi. 2006. Supplemental Remedial Investigation. 22 February 2006.	GP12 through GP31, MW5 through MW8, HA1 through HA5	Soil, surface soil, and groundwater	Metals, VOCs, petroleum hydrocarbons, hexavalent chromium, PCBs and PAHs	Appendix A Tables A2, A6, A7	Summarizes second phase of soil sampling by Geoprobe, groundwater reconnaissance sampling, and construction of three additional monitoring wells. Includes investigation in the drainage ditch.
April 2006 through January 2007	Maul Foster Alongi. 2008. Final Remedial Investigation and Risk Assessment Report. 21 July 2008.	HA6 through HA12, A1 through A7, and IA1 through IA9	Surface soil, groundwater, indoor air and sub-slab soil vapor	VOCs, hexavalent chromium, PAHs	Appendix A Tables A7, A8	Compilation of prior sampling activities, with additional indoor air and sub-slab vapor sampling, and further characterization in the drainage ditch.
October 2007 through July 2010	Maul Foster Alongi. 2011. Final Feasibility Study. 3 March 2011	B1 through B13, P1 through P9, SS1 through SS6, C1 through C3	Surface and near-surface soil, groundwater	Metals, VOCs, petroleum hydrocarbons, hexavalent chromium, and PAHs	Appendix A Tables A7, A8	Additional groundwater samples from existing monitoring well network. An interim action was conducted in the drainage ditch.

Notes:

NA = not applicable

VOCs = volatile organic compounds

PAHs = polycyclic aromatic hydrocarbons

PCBs = polychlorinated biphenyls

APPENDIX B
MFA 2008 RI and Remedial Action

FINAL REMEDIAL INVESTIGATION AND RISK ASSESSMENT REPORT

STOEL RIVES, LLP

FORMER PRECISION ENGINEERING, INC. SITE
1231 SOUTH DIRECTOR STREET
SEATTLE, WASHINGTON
V[illegible] ID NUMBER NW 1511

Project No. 8006.08.04

July 21, 2008

MAUL FOSTER ALONGI INC
ENVIRONMENTAL & ENG
Vancouver, WA | Portland

FINAL REMEDIAL INVESTIGATION AND RISK ASSESSMENT REPORT

FORMER PRECISION ENGINEERING, INC. SITE
1231 SOUTH DIRECTOR STREET
SEATTLE, WASHINGTON
VCP ID NUMBER NW 1511

Prepared for

Stoel Rives, LLP

July 21, 2008

Prepared by

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Project No. 8006.08.04

Final Remedial Investigation and Risk Assessment Report
Former Precision Engineering, Inc. Site
1231 South Director Street, Seattle, Washington
VCP ID Number NW 1511

The material and data in this report were prepared under the supervision and direction of the undersigned.

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ACRONYMS AND ABBREVIATIONS

ATL	Air Toxics Ltd.
bgs	below ground surface
cPAH	carcinogenic polycyclic aromatic hydrocarbons
CSM	conceptual site model
CUL	cleanup level
DCA	dichloroethane
DCE	dichloroethene
DEQ	Oregon Department of Environmental Quality
DRO	diesel-range organics
Ecology	Washington State Department of Ecology
GRO	gasoline-range organics
IHS	indicator hazardous substance
KCBOH	King County Board of Health
Metro	Municipality of Metropolitan Seattle
MFA	Maul Foster & Alongi, Inc.
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
ml/min	milliliters per minute
MTCA	Model Toxics Control Act
μg/kg	micrograms per kilogram
μg/L	micrograms per liter
$\mu g/m^3$	micrograms per cubic meter
ORO	oil-range organics
PAH	polycyclic aromatic hydrocarbon
POTW	publicly owned treatment works
ppmv	parts per million by volume
Precision	Precision Engineering, Inc.
RA	risk assessment
RBC	risk-based concentration
RI	remedial investigation
TCE	trichloroethene
TPH	total petroleum hydrocarbons
USEPA	U.S. Environmental Protection Agency
UST	underground storage tank
VCP	Voluntary Cleanup Program
VOC	volatile organic compound
WAC	Washington Administrative Code

ACRONYMS AND ABBREVIATIONS (Continued)

WBZ	water-bearing zone

1 SUMMARY

1.1 Introduction

Maul Foster & Alongi, Inc. (MFA) has prepared this final remedial investigation (RI) and risk assessment (RA) report for the former Precision Engineering, Inc. (Precision) site at 1231 South Director Street in Seattle, Washington (see Figures 1 and 2). Precision formerly manufactured and repaired large hydraulic cylinders. Repair work included chrome-plating operations.

The RI and RA are being conducted under the Washington State Department of Ecology (Ecology) Voluntary Cleanup Program (VCP). The site's VCP identification number is NW 1511. Precision entered the VCP in October 2005, after completing a preliminary soil and groundwater assessment in June 2005. A Supplemental Remedial Investigation (MFA, 2006a) was submitted to Ecology, summarizing investigations completed by MFA between June and December 2005. Based on that report, Ecology issued an opinion letter on March 27, 2006, that concluded that the work completed was not sufficient to meet specific substantive requirements contained in the Washington State Model Toxics Control Act (MTCA) and its implementing regulations, Chapter 70.105D Revised Code of Washington and Chapter 173-340 Washington Administrative Code (WAC), for characterizing the site (Ecology, 2006c). Precision submitted an RI/RA report on July 17, 2006. Ecology has issued a number of comments on the RI/RA report by electronic mail. This final RI/RA report is meant to supersede all previous submittals and to incorporate Ecology's comments.

1.2 Findings

1.2.1 Soil on Former Precision Property

Indicator Hazardous Substances

As discussed in Section 4.1, indicator hazardous substances (IHSs) identified in soil on the former Precision property are:

- Hexavalent and trivalent chromium

- Petroleum hydrocarbons (diesel-range organics [DRO] and oil-range organics [ORO])
- Trichloroethene (TCE)

Nature and Extent

Hexavalent chromium was detected in soil samples collected under the building footprint, with the highest concentrations located beneath the former chrome-shop area. The highest concentrations of trivalent chromium were also found in this area. DRO and ORO were generally detected in and directly outside the southeast quadrant of the building. The highest concentrations of TCE were detected under the building, in the former chrome-shop and grinding-shop areas (see Figure 3). Section 4.1 contains additional information on the nature and extent of IHSs in on-site soil.

Reasonable Maximum Exposure

Exposure scenarios for soil are described in Section 6.4.1. The reasonable maximum exposure for soil is based on industrial workers who may contact IHSs in soil through incidental ingestion of impacted soil, inhalation of vapors or soil particulates, and dermal contact with chemicals in soil in an industrial setting. Also, indoor industrial workers may have indirect exposure to volatile chemicals (TCE) that migrate from vadose zone soil to indoor air.

CULs and Exceedances

Site-specific soil CULs based on direct-contact exposures were developed for each IHS, and a soil CUL based on vapor intrusion into buildings was developed for TCE (see Section 7.1.1).

CUL exceedances are described in detail in Section 7.2.1.1. Hexavalent chromium concentrations were above the direct-contact CUL in a limited area of shallow soil immediately beneath the building slab in the former chrome-plating area. The building prevents workers from having direct contact with hexavalent chromium in soil. No other IHSs were detected in soil on the property at a concentration exceeding a site-specific CUL for the direct-contact pathways.

TCE was detected in soil at a concentration greater than the vapor-intrusion CUL. Indoor-air sampling was performed to better evaluate this potential exposure scenario. Risks associated with potential exposure to IHSs in indoor air are summarized in Section 1.2.4 below.

1.2.2 Soil in Off-Property Drainage Ditch

Indicator Hazardous Substances

For the purpose of the site investigation, Ecology requested that Precision's investigation include the drainage ditch located south of the former Precision property. As described in Section 4.2, IHSs in soil in the drainage ditch south of the former Precision property boundary are:

- Metals (arsenic, cadmium, copper, hexavalent chromium, trivalent chromium, lead)
- Chrysene
- Petroleum hydrocarbons (DRO and ORO)

Nature and Extent

The nature and extent of IHSs in ditch soil are described in detail in Section 4.2. Hexavalent chromium was detected in a soil sample near the stormwater outfall from the west side of the property. All other IHSs were detected in areas of the ditch that receive runoff from multiple sources besides the former Precision property, and Precision is not believed to be the source of these contaminants.

Reasonable Maximum Exposure

The reasonable maximum exposure for the ditch soil is by direct contact in an industrial setting (see Section 6.4).

CULs and Exceedances

Site-specific soil CULs based on direct-contact exposures were developed for each IHS, as described in Section 7.1.1. Exceedances of CULs are discussed in Section 7.2.2. The concentrations of lead and arsenic in some shallow-soil samples collected from the drainage ditch south of the former Precision property were above direct-contact CULs. These samples were in locations that receive runoff from multiple sources: from the former Precision property; from properties east and west of the former Precision property; from 14th Avenue; and from the Highway 99/W Marginal Way S on-ramp. MFA believes that the lead and arsenic in samples from the ditch originated primarily from sources other than the former Precision property. This conclusion is supported by site characterization data from the property. Neither lead nor arsenic was detected above CULs in the sample collected near the discharge pipe from the western part of the former Precision property, or in samples collected just south of the paved area directly in the path of sheet flow from the former Precision property. It should also be noted that lead and arsenic concentrations detected on the north side of the ditch, near the site, were similar in magnitude to concentrations from the south side of the ditch, receiving sheet flow from a different source, the highway on-ramp. During the ditch investigation, the highest lead and arsenic concentrations were detected directly beneath the neighboring outfall and in the area around its discharge path.

Cleanup Action

Despite evidence of multiple sources of contamination, Ecology indicated that Precision may be at least partially responsible for the exceedances of CULs and did not accept Precision's previous proposal of taking no action in the off-property ditch. Therefore, to address the comments and concerns expressed by Ecology, Precision proposed to excavate all ditch soil containing IHSs at concentrations that exceed CULs. A separate work plan for removal of soil from the ditch (MFA, 2007) was approved by Ecology via electronic mail on August 2, 2007 (Ecology, 2007a).

Ditch excavation work and confirmation sampling were completed on October 24 and 25, 2007 (see Section 8). Approximately 100 cubic yards of soil was removed and properly disposed of off site. After excavation was complete, the entire area of soil disturbance was backfilled and stabilized with hydroseed. A total of 13 confirmation soil samples were collected at the bottom of the excavation and ten soil samples were collected around the perimeter of the excavation. Because two perimeter confirmation samples exceeded CULs, additional sampling was conducted on November 19, 2007, to delineate any potential contamination surrounding the samples. The results of this additional sampling indicated that there is no widespread contamination outside the area excavated.

As a precautionary measure, the two additional small areas mentioned above where chemical concentrations in confirmation samples were above the CULs were excavated on March 27, 2008. Approximately 4 cubic yards of soil was removed and properly disposed of off site. The excavated areas were backfilled with clean soil and stabilized with grass seed. Confirmation soil samples were collected from the bottom of the excavation. One confirmation sample had concentrations of arsenic and lead that exceeded CULs by 8 percent and 2 percent, respectively. Because these concentrations are only slightly above CULs, residual soil impacts are both isolated and small in extent, and over a foot of clean fill material covers the sample location, no additional removal activities were warranted.

1.2.3 Groundwater

IHSs

As discussed in Section 4.3, IHSs identified in groundwater are:

- Metals (arsenic, copper, hexavalent chromium, trivalent chromium, and selenium)
- Petroleum hydrocarbons (DRO and ORO)

- Volatile organic compounds (VOCs) (TCE and vinyl chloride)

Nature and Extent

The nature and extent of IHSs in groundwater are described in detail in Section 4.3. Arsenic was ubiquitous in groundwater throughout the site at concentrations that appear to be consistent with naturally occurring background levels, and there is no indication that the former Precision property is a source of the arsenic in groundwater. Copper was present in six of eight monitoring wells throughout the property. Hexavalent chromium was detected in four of the eight monitoring wells. Trivalent chromium was detected in six of the eight monitoring wells. Elevated concentrations of both hexavalent chromium and trivalent chromium were found in groundwater samples collected beneath the building footprint, with highest concentrations in or near the former chrome-plating shop. Selenium was detected in four of the eight monitoring wells. However, because selenium was not detected in soil at the site, it does not appear that Precision is the source of the selenium detected in groundwater.

DRO were detected in five of the eight monitoring wells. ORO were detected in three of the eight monitoring wells. Generally, the highest concentrations of both DRO and ORO occurred in shallow groundwater in the southeast quadrant of the site.

TCE was detected only in samples from under the building footprint. The highest concentrations of TCE were in samples from below and downgradient of the former chrome shop. There was no indication of TCE free product at the site. The presence of TCE is interpreted to be the result of small releases over time that penetrated cracks or seams in the concrete floor, and not the result of a larger release of product that would result in free product in the subsurface. The use of TCE at the site ended in the mid-1980s. Vinyl chloride, a breakdown product of TCE, was detected in one reconnaissance groundwater sample (under the building footprint in the former cylinder shop, which is downgradient of the grinding shop). Vinyl chloride was also detected in one shallow monitoring well southeast of the building. The presence of vinyl chloride in groundwater and the lack of TCE in downgradient wells indicate that degradation of TCE is occurring and that nearly all TCE is degraded by the time groundwater reaches the downgradient property line.

Reasonable Maximum Exposure

Groundwater exposure scenarios are discussed in Section 6.4.2. The reasonable maximum exposure for groundwater at the site includes industrial workers who inhale volatile chemicals that migrate from groundwater. Other groundwater exposure pathways include excavation workers who directly contact groundwater, and potential discharge of groundwater to surface water. Shallow groundwater near the site is not used for potable water or domestic water supply and cannot be used as a potable or domestic water supply source in the foreseeable future.

CUL Development

The development of CULs for groundwater is discussed in Section 7.1.2. CULs protective of industrial workers who may inhale volatile IHSs that migrate from groundwater to indoor air were developed for TCE and vinyl chloride.

Neither CULs nor methods to calculate CULs for potential excavation workers who may directly contact chemicals in groundwater of an excavation are included in MTCA WAC 173-340-700 through WAC 173-340-760. However, Ecology approved the use of Oregon Department of Environmental Quality (DEQ) risk-based concentrations (RBCs) for comparison to site data to evaluate this direct-contact exposure scenario. It should be noted that Occupational Safety and Health Administration standards require dewatering of excavations before workers enter an excavation, and direct contact with groundwater is expected to be minimal.

Because groundwater fate and transport modeling shows that IHSs present at the site will not reach the Duwamish River (see Section 6.3 or Appendix A), groundwater CULs that exceed surface-water CULs can be established consistent with WAC 173-340-720(6)(c)(i)(E). Through fate-and-transport modeling, groundwater CULs with a point of compliance at the eastern property boundary were developed for the protection of surface water.

CUL Exceedances

Exceedances of groundwater CULs are discussed in detail in Section 7.2.3. The concentration of TCE in a reconnaissance groundwater sample from beneath the building exceeded both the groundwater CUL protective of indoor industrial workers who may have indirect exposure to chemicals that migrate from groundwater to indoor air and the RBC protective of excavation workers. Risks associated with potential exposure to IHSs in indoor air are summarized in Section 1.2.4. It appears that groundwater with concentrations of TCE above screening criteria is restricted to a relatively small area beneath the building.

In addition, concentrations of arsenic in groundwater samples from almost all monitoring wells on the site were above the excavation-worker RBC. Arsenic was ubiquitous in groundwater throughout the site at concentrations that appear to be consistent with naturally occurring background levels, and it appears that natural concentrations of arsenic in groundwater are above this RBC. There is no indication that the former Precision property is a source of the arsenic in groundwater.

Concentrations of all modeled IHSs at the eastern property boundary were below the calculated groundwater CULs for the protection of surface water. Hexavalent chromium concentrations that exceeded CULs for the protection of surface water were detected in groundwater samples collected from borings and MW5, located within the building footprint, and from one sample collected from MW1, located upgradient of the building.

Concentrations of hexavalent chromium in wells located near the eastern property line were not detected above their method reporting limits and did not exceed CULs.

1.2.4 Air

Reasonable maximum exposure to potential air contamination at the site is by inhalation by an industrial worker. TCE was detected in soil and groundwater at concentrations above model-derived CULs protective of indoor industrial workers. To better evaluate risks that airborne IHSs may pose to potential industrial workers, samples of sub-slab soil vapor were collected in April 2006, and samples of indoor air were collected in June 2006. TCE was detected in sub-slab soil-gas samples collected beneath the building at concentrations above model-derived preliminary CULs protective of indoor industrial workers for sub-slab soil gas. However, concentrations of TCE measured in indoor air were below the applicable CUL (see Section 7.2.5). TCE was detected in ambient air (outdoor air) at the property, indicating that there may be other sources of TCE near the site that are unrelated to the former Precision facility. These results indicate that the transport models used to estimate soil, groundwater, and sub-slab soil-gas CULs overpredicted concentrations of TCE in indoor air.

The presence of TCE breakdown products (e.g., vinyl chloride) in groundwater downgradient of the source area indicates that TCE is degrading in situ. The TCE release must have occurred before the mid-1980s, when Precision stopped using TCE. TCE concentrations in soil and groundwater are expected to continue to decline over time, due to natural degradation processes. Absent any new TCE releases, current conditions represent the worst-case conditions for the foreseeable future. TCE concentrations in indoor air are currently below MTCA Method C CULs. Based on empirical indoor-air sample results, site-related volatile chemicals do not appear to pose unacceptable risks to future workers.

Ecology has requested that Precision complete additional investigation of the indoor-air pathway. However, Precision has decided that the most cost-effective way to address this pathway is to proceed with the installation of a sub-slab vapor mitigation system to remediate any potential risks associated with the presence of sub-slab TCE concentrations. On February 13, 2008, Precision submitted a separate cleanup action plan to Ecology that described the proposed sub-slab vapor mitigation system (Pioneer, 2008).

1.3 Conclusions and Recommendations

Investigations at the site have fully delineated the extent of IHSs in soil and groundwater on the property. Delineation has included extensive soil and reconnaissance groundwater sampling; at least two rounds of groundwater monitoring in eight monitoring wells; and modeling of the extent of TCE, vinyl chloride, metals, petroleum hydrocarbons, and polycyclic aromatic hydrocarbons (PAHs). No additional investigation of soil or groundwater at the site is recommended.

Hexavalent chromium concentrations are above the direct-contact soil CUL for industrial workers in a limited area of shallow soil immediately beneath the building slab in the former chrome-plating area. The building prevents workers from having direct contact with hexavalent chromium in soil, and there is no current unacceptable risk to human health, based on hexavalent chromium in soil. No other IHSs were detected in soil on the former Precision property at a concentration exceeding a site-specific CUL for the direct-contact pathways.

To address the comments and concerns expressed by Ecology, Precision excavated ditch soil containing IHSs at concentrations that exceed CULs. Removal actions were completed on October 24 and 25, 2007, and March 27, 2008, and the area of disturbance was backfilled and stabilized with hydroseed. Based on confirmation sampling, a small area of less than 2 yards of soil remains with concentrations exceeding CULs. Residual soil impacts are both isolated and small in extent, and over a foot of clean fill material covers the sample location; therefore, no additional removal activities are warranted.

No IHSs were detected in downgradient monitoring wells near the eastern property boundary at concentrations that exceeded site-specific CULs, indicating that there is no off-site migration of contaminants at concentrations exceeding CULs. Additionally, fate and transport modeling predicts that no site-related IHSs will reach the Duwamish River at concentrations above method detection limits.

Concentrations of arsenic are ubiquitous in groundwater throughout the site at concentrations above the excavation-worker RBC, but these appear to be consistent with naturally occurring background levels. There is no indication that the former Precision property is a source of the arsenic in groundwater.

Inhalation of volatile chemicals that migrate from groundwater to indoor and outdoor air and direct contact, in the case of excavation workers, are the only potential pathways by which industrial workers at the site may be exposed to chemicals in groundwater. Concentrations of volatile chemicals, including TCE, in groundwater appear to be restricted to a relatively small area beneath the building, and TCE and vinyl chloride in indoor air of the building are below the applicable CULs, indicating that site-related volatile chemicals do not pose unacceptable risks to future workers. Ecology has requested that Precision complete additional investigation of the indoor-air pathway. However, Precision has decided that the most cost-effective way to address this pathway is to proceed with the installation of a sub-slab vapor mitigation system to remediate any potential risks associated with the presence of sub-slab TCE concentrations. On February 13, 2008, Precision submitted a separate cleanup action plan to Ecology that described the proposed sub-slab vapor mitigation system (Pioneer, 2008).

Other than those described above for the indoor air, no additional investigation or remedial measures for soil, groundwater, or indoor air are proposed.

2 BACKGROUND

2.1 Property Location and Description

The former Precision facility is located at 1231 South Director Street in Seattle, Washington (see Figure 1). The approximately 3.5-acre site is in King County, Washington, section 32, township 24 north, range 4 east, Willamette Meridian. The site is approximately 1,800 feet (less than 0.5 mile) west of the Duwamish River. The area surrounding the site is characterized by mixed industrial and residential use. The site is zoned I (Industrial). A single 62,000-square-foot building is located at the site. The east side of the building was constructed in 1968, and the west part was added in 1979. The building is surrounded by an asphalt parking lot (see Figure 2).

Precision operated continuously at the property between 1968 and 2005, ceasing operations on March 1, 2005. Precision specialized in the manufacture and repair of large hydraulic cylinders, large rolls used in the manufacture of paper and metal sheet products, and other equipment. Services included precision grinding and polishing, honing, hard-chrome plating, milling, welding, and a large number of flame- and arc-applied metal coatings. Much of Precision's work involved the use of chromic acid. Approximately 10,000 square feet of the west side of the building was leased to Baszile Metals Service, an aluminum distributorship, between approximately 1985 and 2003. Former operational areas and tanks inside the building are shown on Figure 3.

West of the former Precision property is a business that repairs and sells refrigerators. East of the former Precision property is a towing and limousine service business. According to former Precision personnel, the property to the east was used as a paint shop in the 1970s, and before that it was a fiberglass-boat-manufacturing operation.

2.2 Features of Interest

The features of interest are described in detail below and are shown on Figure 3. The features of interest have been investigated as part of the RI.

2.2.1 Containment Vault Holding Former Plating Tanks 1 and 2

Former Plating Tanks 1 and 2 were installed in an in-ground containment vault in the southeast corner of the plating area in 1968, when the building was constructed (see

Figure 3). The tanks and vaults were removed and then reconstructed during an independent remedial action completed at the site in the early 1990s (MFA, 2005b). The tanks were removed from the site in 2005.

2.2.2 Former Plating Tanks 3, 4, 5, and 6

Former Plating Tanks 3, 4, 5, and 6 included one aboveground tank with a concrete curb around it and three in-ground tanks located in containment vaults (Neely, 2002). Two concrete-lined trenches penetrated the floor on both sides of the former tanks (see Figure 3). The trenches had been filled with concrete by July 1986. The tanks and vaults were removed in the early 1990s during an independent remedial action. The tanks were replaced by a small aboveground tank (Tank 3) and a long, horizontal aboveground tank (Tank 4) (see Figure 3). Tanks 3 and 4 were removed from the site in 2005.

2.2.3 Large Containment Vault Holding Former Plating Tank 7 and Caustic Tanks

The largest containment vault at the site was constructed in 1980 on the west side of the chrome-plating shop as part of the building expansion. The vault is approximately 24 feet long, 8 feet wide, and 16 feet deep. The vault held Plating Tank 7, a sodium hydroxide strip tank, and a sodium bicarbonate strip tank (see Figure 3). Tank 7 measured 9 feet long, 7.5 feet wide, and 16 feet deep. The tanks in the vault were removed from the site in 2005.

2.2.4 Former Floor Trenches and Drains

Until 1985 or 1986, the floor drains and trenches in the chrome-plating shop discharged to the Municipality of Metropolitan Seattle (Metro) publicly owned treatment works (POTW) sanitary sewer system. Precision was permitted by Metro to discharge chrome-plating rinse water from a small rinse tank to the POTW. By July 1986, Precision had sealed or otherwise disconnected the floor drains and trenches from the City sanitary sewer system and rerouted them to the containment vaults.

2.2.5 Hydraulic Cylinder Test Vault

A covered, in-ground hydraulic cylinder test vault measuring approximately 4 feet in diameter and 25 feet deep is located outside the building, approximately 10 feet from the west wall of the building.

2.2.6 Former Temporary Plating Tank Area

Temporary aboveground plating tanks were sometimes used to plate parts in the area north of Plating Tank 7.

2.2.7 Former Scrubber Room and Chromic Acid Evaporator

The former scrubber room contained a chromic acid evaporator, a chromic-acid purification unit, and a large aboveground chromic-acid holding tank. These were removed by November 2006.

2.2.8 Former TCE Tank, Parts Washers, Degreasers, and Other Solvent Usage

Parts were cleaned in the chrome-plating shop both before and after plating, using TCE and other solvents. The use of TCE was discontinued at the site by the mid-1980s. Parts washers were also located in the grinding shop and cylinder shop.

2.2.9 Former Steam-Cleaning Area

A covered outside steam-cleaning area including a sodium hydroxide stripping tank was located at the southeast corner of the building before 1986.

2.2.10 Former Boiler UST

A former underground storage tank (UST) located beneath the floor of the boiler room in the south part of the building was used to fuel a boiler. The tank was abandoned in place and filled with "slurry" in 1992 (Environmental Associates, Inc., 1992). No testing of soil or groundwater was completed during the UST decommissioning.

2.3 Site Definition

Ecology's MTCA regulations (WAC 173-340-200) define a site or facility as:

> [A]ny building, structure, installation, equipment, pipe or pipeline (including any pipe into a sewer or publicly owned treatment works), well, pit, pond, lagoon, impoundment, ditch, landfill, storage container, motor vehicle, rolling stock, vessel, or aircraft; or any site or area where a hazardous substance, other than a consumer product in consumer use, has been deposited, stored, disposed of, or placed, or otherwise come to be located.

The former Precision site includes areas where contamination is currently present at concentrations above screening level values, which could impact human health or the environment. Ecology (2006b) has defined the site as the extent of contamination caused by:

- DRO and ORO in soil and groundwater
- Chromium and other metals in soil and groundwater
- TCE and its breakdown products in soil, groundwater and air

Ecology requested that Precision's RI include the drainage ditch located south of the former Precision property. Therefore, the site includes the off-property drainage ditch.

2.4 Environmental Setting

The former Precision facility is located at the base of a hill along South Director Street. The site is generally flat except for the northern and western edges of the property, which consist of a steep excavated slope. The property is located in the lowland area of the Duwamish River Estuary. The Duwamish River is approximately 1,800 feet (less than 0.5 mile) east of the site and flows north to Elliot Bay.

2.4.1 Surface Water and Stormwater System

Stormwater from the western portion of the property flows into a catch basin south of the building. The catch basin drains south to a manhole that in turn discharges to a drainage ditch south of the property boundary. Stormwater from the east side of the property flows east and southeast and mixes with stormwater from the property that lies east of the former Precision property. An asphalt curb approximately 2 inches high on the property east of the former Precision property causes localized ponding and sediment accumulation on the pavement southeast of the former Precision building. Stormwater from the ponded area flows from the southeast corner of the property into the drainage ditch south of the property. A 1989 survey by John R. Ewing and Associates shows a catch basin at the property directly east of the former Precision property. The catch basin is shown with an outfall to the ditch (see Figure 2). Both the catch basin and the outfall were observed in the field.

The off-property drainage ditch empties into a 24-inch storm drain and then through a network of pipes until it discharges to the Duwamish River (Sweet-Edwards/EMCON, 1990). The pavement on the Highway 99/W Marginal Way S on-ramp south of the property slopes toward the drainage ditch such that stormwater from the on-ramp drains into the ditch via sheet flow. In addition to receiving runoff from the site and the Highway 99/W Marginal Way S on-ramp, the ditch receives surface-water runoff from properties to the west and east of the former Precision property, and water from a ditch that parallels 14th Avenue.

2.4.2 Geology

The site is underlain by localized fill up to 10 feet thick (observed only in the eastern portion of the site); alluvium comprised of silt and sand (from the surface to a depth of approximately 20 feet, observed only on the eastern portion of the site); dense, gravelly, sandy silt glacial till (observed from surface to approximately 20 feet below ground surface [bgs] in the western part of the site and observed from 20 feet to 30 feet bgs in the eastern part of the site); and alluvium comprising sand and gravel (advanced outwash, observed from 30 feet bgs and below). The geology observed during the site investigations is generally consistent with a cross section prepared by Sweet-Edwards/EMCON, Inc. (Precision, 1993) and provided as Appendix B. The only change from this cross section is that the advanced outwash was observed in MW7 at approximately 29 feet bgs (at a shallower depth than depicted in the cross section). See Appendix C for boring and well logs.

2.4.3 Hydrogeology

Two water-bearing zones (WBZs) are present beneath the site: (1) a confined alluvial WBZ beneath the eastern side of the site that flows easterly toward the Duwamish River (shallow WBZ), and (2) a confined sand and gravel WBZ beneath the low-permeability glacial till (deep WBZ, which is also referred to as the advanced outwash WBZ) (Precision, 1993). East of the facility, the glacial till appears to hydraulically separate the two WBZs (Precision, 1993).

Four monitoring wells (MW1 through MW4) and two piezometers (P1 and P2) were installed at the site in June 1988. The piezometers could not be located during the 2005 and 2006 sampling events, and it is assumed that these were decommissioned. In December 2005, four additional monitoring wells, MW5 through MW8, were installed (see Figure 2). Monitoring wells MW1 and MW7 are completed in the deep WBZ; monitoring wells MW2, MW3, MW5, MW6, and MW8 are installed in the shallow WBZ; and monitoring well MW4 is interpreted to be installed in the glacial till and is most likely representative of the shallow WBZ. Well logs and well-development forms for the monitoring wells are provided in Appendix C.

The first groundwater in the alluvium is encountered between 5 to 8 feet bgs. Saturated conditions are first encountered deeper in the till (between approximately 7 and 14 feet bgs). Depth-to-water measurements were collected at monitoring wells MW1 through MW8 just before the start of the December 2005 and April 2006 groundwater sampling. The depth to groundwater in wells installed in the shallow WBZ is between 3.49 and 6.39 feet bgs (see Table 1). The higher static groundwater elevations in the monitoring wells indicate confined conditions in the alluvium and the till. Figures 4 and 5 show the potentiometric surface for the shallow WBZ in December 2005 and April 2006, respectively. Estimated potentiometric contours show that the shallow WBZ generally flows from west to east. The hydraulic gradient of the shallow WBZ downgradient of the property was calculated to be 0.003, using site groundwater-elevation data collected from MW6 (located at the property boundary) on April 17, 2006, and an average daily staff gauge elevation for the Duwamish on the same day (USGS, 2007).

In the deep WBZ (confined sand and gravel WBZ), MW1 exhibited flowing artesian conditions and MW7 showed a water level below that of MW1 and the shallow WBZ (see Figures 4 and 5). A deep potentiometric surface map was not created because of insufficient data (only two data points). Based on the available data from MW1 and MW7, it is assumed that MW1 is upgradient of the site and MW7 is downgradient of the site.

A staff gauge was installed in the ditch south of the property and adjacent to the 24-inch-diameter storm-drain line where the surface water in the ditch drains. The elevation of the ditch at the staff gauge is 11.61 feet National Geodetic Vertical Datum of 1929. The staff gauge was dry during both sampling events (December 2005 and April 2006), but in April 2006, there was approximately 0.5 feet of water ponded in the bottom of the ditch below the bottom of the staff gauge. Based on the lack of water in the ditch in December 2005, shallow groundwater does not discharge to the ditch year-round. Shallow groundwater may seasonally discharge to the ditch during periods of higher groundwater elevations (e.g., April 2005), but it is likely that the source of the water observed in the ditch is surface-water runoff. Note that the staff gauge was removed at the same time as the off-property ditch soil removal action.

The site-specific hydrogeology described above is generally consistent with that described for the central Duwamish Valley in the shallow groundwater use designation report prepared by the Duwamish Coalition (Duwamish Coalition, 1998b).

3 DESCRIPTION OF INVESTIGATIONS

Investigations completed before 2005 are summarized in the RI work plan (MFA, 2005b). Investigations completed from June 2005 through January 2007 are described in detail in this section. Investigations completed in June and December 2005 involved collecting soil, reconnaissance groundwater, and groundwater samples from 32 Geoprobe™ borings; surface soil samples from five locations in the ditch just south of the property; and groundwater samples from eight monitoring wells (see Figure 6). On April 18 and 19, 2006, shallow-soil samples were collected from six additional locations in the ditch south of the property, groundwater samples were collected from the eight monitoring wells, and sub-slab soil-vapor samples were collected from seven probes inside the building (see Figures 6 and 7). On June 13, 2006, indoor air samples were collected from eight locations inside the building, and one air sample was collected outside the building (see Figure 7). On January 7, 2007, additional samples were collected from 13 locations in the ditch to further investigate the nature and extent of lead and arsenic in and around the ditch. Laboratory reports and data validation memorandums are included in Appendices D and E, respectively.

3.1 Investigation of Soil on Former Precision Property

In June 2005 and December 2005, soil sampling was completed to assess the nature and extent of contamination at the former Precision property. Thirty-two Geoprobe borings were advanced inside and outside the building on the former Precision property (see Figure 6).

Geoprobe borings were advanced to approximately 15 feet bgs or the top of the water table, whichever was encountered first. Soil samples were submitted for analysis of hexavalent chromium, Priority Pollutant metals (antimony, arsenic, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, thallium, and zinc), VOCs, DRO, and ORO.

3.2 Investigation of Soil in Off-Property Ditch

In December 2005, soil samples were collected in the ditch south of the property boundary at the surface (0.5 feet bgs) and at approximately 1.5 feet bgs in five locations (HA1 through HA5) (see Figure 6). In April 2006, additional surface samples were collected from seven locations (HA6 through HA12) at 0.5 feet bgs and 1.0 or 1.5 feet bgs. The primary purpose of the April 2006 ditch-soil sampling was to delineate the nature and extent of hexavalent chromium in soil that was detected in a sample collected from 0.5 feet bgs at HA2 in December 2005. In January 2007, additional samples were collected from 13 locations (HA13 through HA25) at 0.5 feet bgs and 1.5 feet bgs. The primary purpose of the January 2007 sampling event was to delineate the nature and extent of arsenic and lead that were detected in soil samples collected from 0.5 feet bgs at HA3, HA4, and HA5 in December 2005.

Sampling procedures were generally consistent with the RI work plan (MFA, 2005b). Samples from HA1 through HA5, collected in December 2005, were analyzed for metals, VOCs, PAHs, and petroleum hydrocarbons including gasoline-range organics (GRO), DRO, and ORO. Samples from HA6 through HA11, collected in April 2006, were analyzed for hexavalent chromium to delineate the extent of hexavalent chromium in soil near the location of HA2. One sample collected at HA12 was analyzed for arsenic, cadmium, copper, and lead to delineate the extent of these metals in soil near the location of HA3, HA4, and HA5. Samples from HA13 through HA27 were collected in January 2007. Samples from HA13 through HA16, HA26, and HA27 were placed on hold with the laboratory, pending results from the other locations. Samples from HA17 through HA25 were analyzed for lead and arsenic to delineate the extent of lead and arsenic in soil near locations HA3, HA4, and HA5.

3.3 Investigation of Reconnaissance Groundwater

In June 2005 and December 2005, reconnaissance groundwater samples were collected and analyzed for dissolved total chromium, hexavalent chromium, total petroleum hydrocarbons (TPH), VOCs, PAHs, and/or PCBs by the methods referenced in the Preliminary Assessment Report and the Supplemental RI Work Plan (MFA, 2005a,b). Reconnaissance groundwater samples were collected from borings GP-2, GP-4, GP-5, GP-6, GP-7, GP-8, GP-13, and GP-15 (see Figure 6).

3.4 Investigation of Groundwater

MFA sampled on-site monitoring wells MW1 through MW4 in June 2005, and MW1 through MW8 on December 27, 2005, and April 18, 2006. Sampling procedures were generally consistent with the RI work plan (MFA, 2005b). Samples were analyzed for metals (arsenic, copper, hexavalent chromium, lead, selenium, and trivalent chromium), DRO, ORO, and TCE and its breakdown products (*cis*-1,2-dichloroethene [DCE], *trans*-1,2-DCE, and vinyl chloride).

3.5 Investigation of Sub-Slab Soil Vapor

MFA installed seven sub-slab vapor probes (A1 through A7) on April 17 and 18, 2006, in the eastern portion of the building where soil and groundwater appear to have been impacted by TCE and its degradation products. Sampling procedures and results are discussed in detail in the 2006 Remedial Investigation and Risk Assessment (MFA, 2006b). Two of the seven probes, A3 and A5, were advanced near Geoprobe locations GP11 and GP06, respectively, where elevated concentrations of TCE had been detected in soil and groundwater samples. The remaining probes (A1, A2, A4, A6, and A7) were located outside the area of elevated TCE concentrations (see Figure 7).

MFA installed the sub-slab vapor probes and conducted vapor sampling consistent with procedures in the draft U.S. Environmental Protection Agency (USEPA) guidance titled *Standard Operating Procedure for Installation of Sub-Slab Vapor Probes and Sampling Using USEPA Method TO-15 to Support Vapor Intrusion Investigations* (USEPA, undated). The probes were installed as shown in Appendix F and as described below:

- A 1.375-inch outer hole was drilled approximately 2 inches into the slab.
- Drilling dust was removed with a vacuum.
- A 0.25-inch inner hole was drilled through the center of the base [or bottom] of the outer hole. The thickness of the concrete slab ranged from approximately 0.5 feet to approximately 0.8 feet. The inner hole was drilled 3 to 4 inches below the slab into the sub-slab material.
- The drilling dust was removed with a vacuum and the vapor probes were inserted into the hole so that the cap on the probe was flush with the top of the slab.
- The outer hole was filled with fast-setting Sakrete® cement (a blend of fine and coarse aggregates and special cements for quick setting) and allowed to dry a minimum of 24 hours before sampling.

Seven sub-slab vapor samples were collected from the sub-slab vapor probes on April 28, 2006. The analytical laboratory, Air Toxics Ltd. (ATL) in Folsom, California, provided a 6-liter, stainless steel sample canister (Summa® canister) and a 1-liter purge canister to accompany each sample. Each sample canister was attached to a purge canister with a T-bar connection. A flow controller was also attached to the T-bar connection to regulate the flow of soil vapor into the sample container. Tubing was connected from the sub-slab vapor sampling point to the flow controller. Photograph 1 in Appendix F shows the sampling layout.

The flow controller was set to collect soil vapor at a volumetric flow rate of approximately 167 milliliters per minute (ml/min). At the location where a field duplicate sample was collected, A4, an additional T-bar connected the two sets of purge and sample canisters (see Photograph 2 in Appendix F). Before sample collection, the sampling equipment was purged of approximately 56 milliliters (3.5 pore volumes) of air into a purge canister. After purging of all the sample locations, the sub-slab vapor sample was drawn into the canister over a period of 30 minutes. Shaving cream containing isobutane and butane was applied to all connections as a leak check.

During sampling, the vacuum pressure gauge on the flow controllers for samples A3a, A4, A5a, A6, and A7 showed a loss of vacuum faster than 167 ml/min (the flow rate set by ATL). This rapid loss of vacuum indicates that ambient air may have leaked into the sample canister, likely through one of the connections between the flow controller and the canister. Because of this loss of vacuum, two locations, A3 and A5, were resampled (sample IDs A3b and A5b). The loss of vacuum was especially rapid at sampling location A4, possibly because of the increased number of connections required to collect both a primary and a duplicate sample. Because the primary and duplicate samples from sample point A4 are expected to be significantly impacted by ambient air and therefore not representative of conditions below the slab, these samples were not submitted for analysis.

The laboratory set the flow controllers so that the final vacuum on the canisters should be approximately 5 inches of mercury. The laboratory received the canisters at final vacuums ranging from 3.0 to 8.0 inches of mercury for samples A1, A2, A3b, and A5b. The final vacuums for both A6 and A7 were 0.81 inches of mercury. As mentioned above, the loss of vacuum in A6 and A7 is an indication that ambient air may have leaked into the sample canister.

The samples were analyzed for TCE, *cis*-1,2-DCE, *trans*-1,2-DCE, vinyl chloride, isobutene, and butane (the leak-check compound) by USEPA Method TO-15.

3.6 Investigation of Indoor Air

On June 13, 2006, nine indoor air samples were collected from eight locations inside the building, and one ambient air sample (IA7) was collected outside of the south side of the building and upwind of the building. A sample and a duplicate (IA4 and IA8) were collected near Geoprobe location GP06, where elevated concentrations of TCE had been detected in soil and groundwater samples. The remaining sampling locations (IA1, IA2, IA3, IA5, IA6, and IA7) were outside the area of elevated TCE concentrations in soil and groundwater (see Figure 7). A heating, ventilation, and air-conditioning system was not operating at the time of sampling, and all doors and windows were closed for at least 24 hours before sample collection.

ATL provided a 6-liter Summa canister for each sample. A flow controller was attached to each canister, which was preset for an eight-hour collection period. Tubing was connected from the flow controller, with the air intake end of the tubing set at a height of approximately 5 feet above ground surface, using a laboratory-supplied stand. The sample was drawn into the canister over a period of eight hours. The laboratory set the flow controllers so that the final vacuum on the canisters should be approximately 5 inches of mercury. The laboratory received the canisters at final vacuums ranging from 3.5 to 10 inches of mercury.

Temperature and pressure readings were collected at each sample location: when sampling started, four hours later, and at the end of sampling (see Table 2).

The samples were analyzed for TCE, *cis*-1,2-DCE, *trans*-1,2-DCE, vinyl chloride, 1,1-DCE, and 1,1-dichloroethane (1,1-DCA) by USEPA Method TO-15. One trip-blank canister was also submitted for analysis.

4 NATURE AND EXTENT

This section describes the nature and extent of IHSs at the site. Laboratory analytical reports for samples collected as part of the RI are included in Appendix D. MFA downloaded all analytical data into the site database and validated all data (see Appendix E).

4.1 Soil on Property

Tables 3 through 8 summarize soil analytical results for metals, VOCs, petroleum hydrocarbons, and PAHs. Sample locations are shown on Figure 6. IHSs in soil, including hexavalent chromium and TCE, were initially identified in the February 22, 2006, RI report (MFA, 2006a) by comparing soil analytical results to MTCA Method C CULs for direct contact (ingestion) and protection of groundwater, except for arsenic, lead, DROs, and OROs, which were compared to the MTCA Method A soil CULs. MTCA rules for cPAHs changed on October 12, 2007, so that cPAHs are now considered as a single hazardous substance when establishing compliance with CULs. Toxicity equivalency factors (TEFs) are used for each constituent, with the sum of the results screened against criteria for benzo(a)pyrene. However the MTCA rule amendment does not change the outcome of the IHS selection and subsequent risk evaluation for soil on property. Subsequent to the 2006 screening, Ecology requested the addition of trivalent chromium, DRO, and ORO as IHSs. IHSs identified in on-site soil are:

- Hexavalent chromium and trivalent chromium
- Petroleum hydrocarbons (DRO and ORO)
- TCE

The nature and extent of IHSs in soil on the property have been adequately characterized, as described below. Based on the work described in the 2006 RI report (MFA, 2006b), Ecology did not request any additional characterization for soil on the property (Ecology, 2006c).

4.1.1 Hexavalent Chromium and Trivalent Chromium

Hexavalent chromium detections ranged from 0.119 milligrams per kilogram (mg/kg) (GP7 at 2.0 feet bgs) to 3,500 mg/kg (GP32 at 1.0 feet bgs) (see Table 3). The highest concentrations of hexavalent chromium are located in the former chrome-shop area.

Hexavalent chromium was not detected in on-site soil samples collected from outside the building.

Trivalent chromium was detected at concentrations ranging from 16.93 mg/kg (GP11 at 6.5 feet bgs) to 3,250 mg/kg (GP32 at 1.0 foot bgs). The highest concentrations of trivalent chromium on site are in the former chrome-shop area inside the building footprint.

4.1.2 Petroleum Hydrocarbons (DRO and ORO)

DRO were detected in soil at concentrations below 200 mg/kg, except for a sample from GP21 at 6.5 feet bgs, which contained DRO at 5,270 mg/kg (see Table 7). ORO were detected in soil at concentrations below 1,500 mg/kg, except for a sample from GP21 at 6.5 feet bgs, which contained ORO at 19,900 mg/kg. Concentrations of DRO and ORO at GP21 increase with depth. The chromatogram for the samples from GP21 showed elution patterns that are characteristic of lube oil. Possible sources of the elevated petroleum hydrocarbons are former operations associated with the machine shop, the former steam-cleaning operations, or the former boiler UST (see Figure 3). However, according to former Precision employees, the former boiler UST contained heating oil, which would not match the elution patterns of lube oil.

4.1.3 TCE

TCE was detected in seven of the 64 on-site soil samples that were analyzed for VOCs at concentrations ranging from 3.43 micrograms per kilogram (μg/kg) (GP18 at 1.0 feet bgs) to 1,160 μg/kg (GP6 at 14.5 feet bgs) (see Table 5). All detections were in the former chrome shop and former grinding shop (see Figure 3). Concentrations of TCE in soil at GP6 and GP11 increased with depth. GP6 was completed approximately 10 to 20 feet away from the former TCE tank. It is not known exactly where this tank was situated, but the approximate location is shown on Figure 3, based on descriptions from former Precision employees. Samples collected at a depth of 1 foot bgs from two borings completed near the area of the former TCE tank (GP18 and GP32) did not contain TCE at elevated concentrations. Deeper samples at these locations could not be collected because of drilling refusal.

4.2 Soil in Off-Property Ditch

Tables 3 through 8 summarize soil analytical results for metals, VOCs, petroleum hydrocarbons, and PAHs. Sample locations are shown on Figure 6. As part of the 2006 RI report (MFA, 2006b), IHSs in soil, including arsenic, cadmium, copper, hexavalent chromium, lead, and chrysene were initially identified based on a screening of soil analytical results compared to MTCA Method C CULs for direct contact (ingestion) and protection of groundwater, except for arsenic, lead, DROs, and OROs, which were compared to the MTCA Method A soil CULs (MFA 2006a). MTCA rules for cPAHs changed on October 12, 2007 so that cPAHs are now considered as a single hazardous substance when establishing compliance with CULs. TEFs are used for each constituent, with the sum of the results screened against criteria for benzo(a)pyrene. The only PAH in soil that was originally considered to be an IHS was chrysene. For the purposes of this evaluation, chrysene continues to be considered an IHS, even though under the new rules it may not be. Subsequent to the 2006 screening, Ecology asked that trivalent chromium, DRO, and ORO also be included as IHSs. IHSs identified in ditch soil are:

- Metals (arsenic, cadmium, copper, hexavalent chromium, trivalent chromium, and lead)
- Petroleum hydrocarbons (DRO and ORO)
- Chrysene

The nature and extent of IHSs in the ditch soil are described below.

4.2.1 Metals

Arsenic

Arsenic was detected in the soil samples from the ditch at concentrations ranging from non-detect (HA20 at 0.5 and 1.5 feet bgs, and HA 18 at 1.5 feet bgs) to 53.9 mg/kg (HA3 at 0.5 feet bgs). The highest concentrations of arsenic were in soil samples at 0.5 feet bgs from HA3, HA4, HA5, and HA22. These samples are from locations that would receive runoff from the former Precision property, from properties east and west of Precision, from 14th Avenue, and from the Highway 99/W Marginal Way S on-ramp. Arsenic was not detected above CULs in the sample collected near the discharge pipe from the western part of the former Precision property, or in samples collected just south of the paved area directly in the path of sheet flow from the former Precision property. It should also be noted that arsenic concentrations detected on the north side of the ditch, receiving flow from the former Precision property, were similar in magnitude to concentrations from the south side of the ditch, receiving sheet flow from the highway on-ramp. In addition, the highest arsenic concentrations were detected directly beneath the neighboring outfall to the west and in the area around its discharge path. Concentrations of arsenic generally decrease with depth in all locations (see Table 4).

Cadmium

Cadmium was detected in six of the 12 ditch-soil samples analyzed for cadmium. Concentrations were below 5 mg/kg, except in one sample with a concentration of 28.7 mg/kg collected from HA4 at a depth of 0.5 feet bgs. HA4 is the lowest point in the ditch.

Copper

Copper was detected in soil samples from the ditch at concentrations ranging from 16.4 (HA3 at 1.5 feet bgs) to 978 mg/kg (HA4 at 0.5 feet bgs). The highest concentrations of copper were in soil samples at 0.5 feet bgs from HA3, HA4, and HA5, located near the lowest point of the ditch. Concentrations of copper generally decrease with depth (see Table 4).

Hexavalent Chromium and Trivalent Chromium

Hexavalent chromium was detected in shallow surface samples located near the stormwater outfall from the former Precision property. One sample collected directly at the outfall pipe (HA2 at 0.5 feet bgs) contained hexavalent chromium at a concentration of 89 mg/kg. Concentrations in all other samples were below 7 mg/kg (see Table 3).

Trivalent chromium was detected at a maximum concentration of 8,480 mg/kg (HA4 at 0.5 feet bgs), located in the lowest point of the ditch.

Lead

Lead was detected in soil samples at concentrations ranging from non-detect (HA18 at 1.5 feet bgs) to 1,710 mg/kg (HA4 at 0.5 feet bgs). The highest concentrations of lead were in soil samples at 0.5 feet bgs from HA3, HA4, HA5, and HA22, located near the lowest point of the ditch. Concentrations of lead generally decreased with depth (see Table 4).

4.2.2 Petroleum Hydrocarbons (DRO and ORO)

Generally, DRO were detected in the ditch-soil samples at concentrations below 1,500 mg/kg, except in the soil sample from HA4 at 0.5 feet bgs (35,900 mg/kg). ORO were detected in the ditch soil samples at concentrations ranging from 30.1 mg/kg (HA3 at 1.5 feet bgs) to 106,000 mg/kg (HA4 at 0.5 feet bgs). The highest concentrations of petroleum hydrocarbons were in samples from HA4, which is located near the lowest point of the ditch. Concentrations of petroleum hydrocarbons decreased with depth.

4.2.3 Chrysene

Chrysene, a PAH, was detected in seven of the 11 ditch-soil samples analyzed for chrysene. Concentrations of chrysene were below 0.1 mg/kg, except in soil samples from HA4 at 0.5 feet bgs (0.899 mg/kg) and HA5 at 0.5 feet bgs (1.54 mg/kg). HA4 and HA5 are located near the lowest point of the ditch. Based on the lack of elevated chrysene concentrations in HA2 and HA3, it does not appear that Precision is the source of the elevated chrysene concentrations in the ditch.

4.3 Groundwater

Reconnaissance groundwater samples were collected from GP2, GP4 through GP8, GP13, and GP15. Tables 9 through 14 summarize reconnaissance groundwater analytical results for metals, VOCs, petroleum hydrocarbons, PAHs, and PCBs. Groundwater analytical results from monitoring well samples for metals, VOCs, petroleum hydrocarbons, and PAHs are summarized in Tables 15 through 20. Measured field parameters for groundwater samples are provided in Table 21. Sample locations are shown on Figure 6.

As part of the 2006 RI report (MFA, 2006a), IHSs in groundwater were identified by comparing analytical results for reconnaissance groundwater samples and groundwater samples collected from monitoring wells to MTCA Method C groundwater CULs, except for arsenic, DROs, and OROs, which were compared to the MTCA Method A groundwater CULs. Note that MTCA CULs for cPAHs have changed since the 2006 RI report to consider cPAHs as a single hazardous substance when screening. However the MTCA rule amendment (October 12, 2007) does not change the outcome of the IHS selection and subsequent risk evaluation for groundwater. Analytical data from samples collected in April 2006 (after the 2006 RI report) were also compared to screening levels, and no additional IHSs resulted. IHSs identified in groundwater are:

- Metals (arsenic, copper, hexavalent chromium, trivalent chromium, and selenium)
- Petroleum hydrocarbons (DRO and ORO)
- VOCs (TCE and vinyl chloride)

4.3.1 Metals

Arsenic

Reconnaissance groundwater samples were not analyzed for arsenic. Arsenic was detected in groundwater samples collected from monitoring wells at concentrations ranging from 4.59 micrograms per liter (µg/L) (MW5) to 33 µg/L (MW1) (see Table 16). The highest concentration was in MW1, which is in the deep WBZ and assumed to be upgradient of the former Precision building. Based on the presence of arsenic at similar concentrations in groundwater throughout the site, there is no indication that the former Precision property is a source of arsenic contamination.

Copper

Reconnaissance groundwater samples were not analyzed for copper. Copper was detected in groundwater samples from six of the eight monitoring wells at concentrations of up to 5.1 µg/L (MW6 in April 2006) (see Table 16). As with arsenic, copper was found at similar concentrations throughout the site and it is therefore difficult to conclude that the former Precision property is a source of copper contamination.

Hexavalent Chromium

Hexavalent chromium was detected in reconnaissance groundwater samples at concentrations of up to 300 milligrams per liter (mg/L) (GP6), with higher concentrations in the former chrome shop (see Table 9). Hexavalent chromium was detected in groundwater samples from MW1 (only in June 2005), MW4 (only in April 2006), MW5, and MW7 (only in December 2005) (see Table 15). MW1 is a deep well and is assumed to be upgradient of the site features of interest. The hexavalent chromium concentration detected in MW1 in June was 0.269 mg/L. The hexavalent chromium concentration detected in MW4, a shallow well south of the building, was 0.023 mg/L. MW5 is a shallow well located in the former chrome shop and had the highest concentrations of hexavalent chromium (450 mg/L in December). The hexavalent chromium concentration detected in MW7, a deep well assumed to be downgradient of the former chrome shop, in December 2005 was 0.00738 mg/L.

Trivalent Chromium

Trivalent chromium was calculated by subtracting the hexavalent chromium results from the chromium results. If hexavalent chromium was not detected, then the chromium value was assumed to be trivalent chromium. The only reconnaissance groundwater samples in which chromium was detected were in the former chrome shop, except for GP8, which is located within the building footprint and downgradient of the chrome shop. The maximum calculated concentration of trivalent chromium was in the groundwater sample from GP8 (61 mg/L; see Table 9).

The calculated trivalent chromium concentrations from monitoring wells ranged from 0.00215 mg/L (MW3 in December 2005) to 47 mg/L (MW5 in December 2005) (see Table 15).

Selenium

Reconnaissance groundwater samples were not analyzed for selenium. Selenium was detected in groundwater samples collected from MW2, MW6, MW7, and MW8, with the highest concentration (19 mg/L) in MW6 (see Table 16). Because selenium was not detected in soil at the site, it does not appear that Precision is the source of the detected concentrations of selenium in the groundwater.

4.3.2 Petroleum Hydrocarbons

The reconnaissance groundwater samples from GP2 and GP4 through GP8 were analyzed for petroleum hydrocarbons, using NWTPH-HCID, with detections quantified for GRO, DRO, and ORO using NWTPH-Gx and NWTPH-Dx (see Tables 11 and 12). The maximum concentrations of DRO (0.814 mg/L) were from a sample collected at GP8, located near the former boiler UST. ORO were not detected in the quantification analyses.

Samples from monitoring wells were analyzed for DRO and ORO. DRO were detected in shallow monitoring wells MW2, MW3, MW5, MW6, and MW8 at concentrations of up to 2.64 mg/L (MW6 in December 2005) (Table 19). DRO were not detected in deep monitoring wells or in shallow monitoring well MW4. ORO were detected in shallow monitoring wells MW2, MW6, and MW8 at concentrations of up to 1.32 mg/L (MW6 in December 2005). ORO were not detected in deep monitoring wells or in MW3, MW4, or MW5. Generally, the highest concentrations of DRO and ORO occurred in shallow groundwater in the southeast quadrant of the site.

4.3.3 VOCs

TCE

TCE was detected in three reconnaissance groundwater samples (see Table 10): GP6 (1,130 µg/L), GP8 (16.8 µg/L), and GP13 (0.220 µg/L). The highest concentrations were in samples from below and downgradient of the former chrome shop. TCE was detected in only one monitoring well (MW5) at concentrations of up to 22.1 µg/L (see Table 17). The maximum concentration of TCE in groundwater (1,130 µg/L in a reconnaissance groundwater sample from GP6) was approximately 0.1 percent of the TCE solubility limit of 1,100,000 µg/L, and there is no indication of TCE free product at the site.

Vinyl Chloride

Vinyl chloride, a breakdown product of TCE, was detected in only one reconnaissance groundwater sample, from GP13 at 16.5 µg/L (see Table 10). This vinyl chloride detection occurred within the footprint of the building in the former cylinder shop and downgradient of TCE detections in soil at GP11. Vinyl chloride was detected in only one monitoring well (MW8), at concentrations of up to 0.80 µg/L (see Table 17).

The presence of vinyl chloride in groundwater indicates that biodegradation of TCE is occurring. The lack of TCE in groundwater at monitoring wells near the downgradient property line indicates that TCE concentrations significantly attenuate through biodegradation and other processes by the time groundwater reaches the downgradient property line.

4.4 Investigation of Soil Vapor

Sub-slab soil-vapor samples were collected from probes A1 through A7 (see Figure 7). Table 22 summarizes results for TCE and its breakdown products (*cis*-1,2-DCE, *trans*-1,2-DCE, vinyl chloride), as well as leak-check compounds (isobutane and butane).

4.4.1 Evaluation of Soil Vapor Data Quality

The leak-check compound isobutane was detected in five of the six soil-vapor samples analyzed, and butane was detected in four of the samples. Detected concentrations of butane were lower than concentrations of isobutene. Isobutane results collected from probes A1, A2, and A3 were flagged "E" by the laboratory, indicating that the concentrations were above the instrument calibration range. Concentrations of isobutane for A1, A2, and A3 were 2.4 J parts per million by volume (ppmv), 2.3 J ppmv, and 1.1 J ppmv, respectively. The E-flagged values were flagged "J" by MFA, indicating that they are considered estimates (see Appendix E). Washington does not currently have a leak-check compound criterion, but some other states do. The leak-check compound reporting limit criterion used by the California Environmental Protection Agency (CA EPA et al., 2003) is 10 µg/L (approximately 4 ppmv for isobutane). This criterion applies to the reporting limit. Action is not triggered just because the compound is detected above this concentration. The New Jersey Department of Environmental Protection Vapor Intrusion Guidance indicates that resampling is required only when detection of a leak-test compound in excess of 1,000 µg/L (approximately 400 ppmv isobutane) is confirmed (NJDEP, 2005). The Missouri Department of Natural Resources suggests action if a leak-check compound is detected above 100 µg/L (40 ppmv isobutane) (MDNR, 2005). Based on the detected concentrations of isobutene in A1, A2, and A3, and the leak-check criteria described above, some leakage of ambient air into the sampling canisters may have occurred, but the estimated concentrations of the leak-test compound do not compromise the data.

Isobutane results for samples collected from probes A6 and A7 were flagged "S" by the laboratory, indicating a saturated peak. The concentrations of isobutane in these samples were far above the calibration range. The saturated peaks likely indicate that substantial leakage of ambient air into the sampling canisters occurred; therefore, A6 and A7 sub-slab sample results are not used in the nature-and-extent delineation and the risk evaluation.

Isobutane and butane were not detected in the sample collected from probe A5; the analytical results are considered usable.

4.4.2 Soil Vapor Analytical Results

TCE was detected in sub-slab vapor samples A3 and A5 at concentrations of 6,100 and 37,000 micrograms per cubic meter ($\mu g/m^3$), respectively (see Table 22). *Cis*-1,2-DCE was detected in samples A3 and A5 at concentrations of 470 and 1,700 $\mu g/m^3$, respectively. *Trans*-1,2-DCE was not detected in any samples. Vinyl chloride was detected in a sample from A5 at a concentration of 420 $\mu g/m^3$. A3 is located in the former grinding shop and A5 is located in the former chrome-plating shop. Detections of TCE and its breakdown products in soil vapor match the distribution of TCE in soil and groundwater, indicating good correlation.

4.5 Investigation of Indoor Air

Indoor-air samples were collected from stations IA1 through IA8. Table 23 summarizes results for TCE and its breakdown products (*cis*-1,2-DCE, *trans*-1,2-DCE, vinyl chloride, 1,1,-DCE, and 1,1-DCA). TCE was detected in all eight samples, ranging in concentrations from 0.046 $\mu g/m^3$ to 0.2 $\mu g/m^3$. No TCE breakdown products were detected in any of the samples. The lowest TCE concentration was detected in the sample collected outside and south of the building (IA7). The concentrations of TCE in the samples collected inside the building were similar to each other. TCE concentrations collected above the source area (IA4 and field duplicate IA8) are 0.14 and 0.15 $\mu g/m^3$, while the air sample with the highest TCE concentration (0.20 $\mu g/m^3$) was collected north of the source area.

5 LAND AND BENEFICIAL WATER USE DETERMINATION

In the late 1990s, the Duwamish Coalition completed a study on the Duwamish Industrial Area Hydrogeologic Pathways Project. The Duwamish Coalition team produced three Duwamish Industrial Area technical memoranda: *Development of a Three-Dimensional, Numerical Groundwater Flow Model for the Duwamish River Basin*; *Duwamish Basin Groundwater Pathways Conceptual Model Report*; and *Shallow Groundwater Use Designation* (Duwamish Coalition, 1997, 1998a,b). The Duwamish Coalition study concluded that shallow groundwater in the Duwamish industrial area is nonpotable and that the highest beneficial use of shallow groundwater was discharge to the Duwamish River. MFA, on behalf of Precision, completed a Beneficial Land and Water Use Determination at the request of Ecology that confirms that the conclusions reached by the Duwamish Coalition are also true for the former Precision property (see Appendix G). The former Precision property is located in the Duwamish industrial area and was included in the Duwamish Coalition study area. The conclusions of the beneficial land and water use report are summarized below.

5.1 Land Use

- Historically, the site has been used for industrial purposes. The site is currently zoned for industrial uses, and MFA understands that it will continue to be used for industrial purposes in the future.
- The only sensitive environment in the region of study that could possibly be affected by IHSs from the site is the Duwamish River.

5.2 Surface-Water Use

- The Duwamish River is located approximately 1,800 feet east of the site.
- No surface-water rights were identified in the region of study.
- Current surface-water beneficial uses include resident fish and aquatic life, wildlife habitat, fishing, boating, water-contact recreation, aesthetic quality, and commercial navigation and transportation.
- It is not reasonably anticipated that surface-water uses will change in the future.

5.3 Groundwater Use

- The shallow groundwater gradient on site and in the region of study is toward the Duwamish River.
- The Duwamish River provides a hydrologic divide between shallow groundwater at the site and shallow groundwater east of the Duwamish River.
- No groundwater rights were identified in the region of study.
- Current groundwater beneficial uses include engineering (dewatering), and surface-water recharge.
- The highest beneficial use of shallow groundwater in the Duwamish Valley is discharge to surface water.
- Deeper groundwater below the site is not currently used for and cannot be used in the foreseeable future for beneficial purposes.
- The area of the site and region of study are supplied with potable water by the City of Seattle municipal water supply; this is expected to continue in the future.

Ecology has indicated concern that a zone of contaminated groundwater associated with the Precision site may exist downgrade of the former Precision property approaching the Duwamish River (hereinafter "zone of concern"). There are numerous individual lots, both residential and commercial/industrial, located in the zone of concern between the former Precision property and the Duwamish River. Some of these properties are in the City of Seattle and some are in unincorporated King County (see Figure 8). All of the lots in the zone of concern are currently connected to a public water supply.

As mentioned previously, groundwater in the zone of concern will not be used for drinking in the foreseeable future. Stoel Rives, LLP has investigated local restrictions on the use of groundwater for drinking that have been put in place by Ecology and the King County Board of Health (KCBOH) (see Appendix H). The KCBOH code prohibits any proposed well drilling in the zone of concern, based on the Code's (1) public-service-connection requirements; (2) source quality requirements on drinking water; and (3) physical location restrictions on the placement of wells (see Appendix H for code references).

The public-service connection requires that properties undertaking new development connect to a public water supply when the land is within an existing public-water-supply system, the system meets applicable water-quality standards, and the system is willing and able to provide service in a timely and reasonable manner. Since all of the properties in the zone of concern are already connected to public water and the quality of that water is not subject to dispute, the future development in the zone of concern would be required to connect to public water rather than install a drinking-water well. In addition, the KCBOH places a limitation on the sources of drinking water, stating that it shall be obtained from the highest-quality source feasible. Seattle city water is certainly a higher-quality source than groundwater from a historically industrial area.

The KCBOH also had restrictions on the physical placement of drinking-water wells, including minimum setbacks of 100 feet from houses and garages, public roads, sewers, chemical-storage sites, surface waters, railroad tracks, power utility or gas lines, and USTs. Stoel Rives reviewed aerial photography of the area and concluded that no property has a 200-foot-diameter area free of roads and buildings sufficient to provide the sanitary control area required to protect the well site. Factor in underground tanks, sewer lines, power and gas lines, and other possible sources of contamination, and it will be impossible to legally locate a drinking-water well in the zone of concern.

6 CONCEPTUAL SITE MODEL

The conceptual site model (CSM) describes potential chemical sources, release mechanisms, environmental transport processes, exposure routes, and receptors. The primary purpose of the CSM is to describe pathways by which human and ecological receptors could be exposed to site-related chemicals. A complete exposure pathway consists of four necessary elements: (1) a source and mechanism of chemical release to the environment, (2) an environmental transport medium for a released chemical, (3) a point of potential contact with the impacted medium (referred to as the exposure point), and (4) an exposure route (e.g., soil ingestion) at the exposure point.

The human-health CSM is shown in Figure 9. Elements of potentially complete exposure scenarios are further discussed in Table 24. Processes that structure the fate and transport of IHSs in the environment, as well as potential exposure scenarios and reasonable maximum exposures, are discussed below.

6.1 Primary Sources

Of the features of interest described in Section 2.2, the following former features are considered to be potential sources for IHSs detected in soil and groundwater samples:

- Containment vaults holding former Plating Tanks 1 and 2
- Former Plating Tanks 3, 4, 5, and 6
- Former floor trenches and drains
- Former TCE tank, parts washers, degreasers, and other solvent usage
- Former steam-cleaning area
- Former boiler UST near the boiler room

Figure 3 shows the locations where these former features once stood. The primary processes by which chemicals may have been released to the environment are likely to include accidental spills of process chemicals or waste and releases from the former chromic-acid tanks, the former TCE tank, and the former UST.

6.2 Fate-and-Transport Processes

The primary mechanisms likely to influence the fate and transport of chemicals in environmental media at the site include leaching of chemicals from soil to groundwater, advection and dispersion in groundwater, sorption to the soil matrix, and natural biodegradation processes. The relative importance of these processes will vary, depending on the chemical and physical properties of a released contaminant. The properties of soil and the dynamics of groundwater flow also shape contaminant fate and transport.

Almost the entire former Precision property is paved or covered with a building (see Figure 2). In the few areas of the property not covered with an impermeable surface, precipitation that falls on the surface may percolate through the vadose zone, and it is possible that chemicals with relatively high solubility may leach from soil to pore water. In addition, when the water table rises and interacts with chemicals sorbed to soil, some may partition into groundwater. Once in groundwater, dissolved contaminants may be transported by diffusion and advection horizontally away from the original source. Dispersion, retardation, and biodegradation may act to reduce dissolved concentrations of chemicals in groundwater downgradient of the source area.

Volatile contaminants that are either adsorbed to soil or dissolved in groundwater may volatilize to soil pore spaces. Chemical vapors in pore spaces may eventually migrate through the soil matrix and enter outdoor air. Once the chemicals reach outdoor air, mixing with ambient air is expected to reduce airborne concentrations rapidly and substantially. If buildings are located over soil or groundwater that has been contaminated with volatile chemicals, it is possible that vapors may eventually enter indoor air by penetrating cracks in a building floor or foundation.

6.3 Groundwater Fate-and-Transport Modeling

The Duwamish River is located approximately 1,800 feet downgradient of the former Precision property. Fate-and-transport modeling was completed to demonstrate that site-related IHSs in groundwater would not reach the river. Fate-and-transport modeling was then used to derive site-specific CULs for groundwater that are protective of surface water. The same model parameters were used for both of the modeling exercises. The modeling was performed using the USEPA's BIOCHLOR model (USEPA, 2002). A detailed description of the model, the model inputs, and assumptions is included in Appendix A. Conservative modeling assumptions include the following:

- The models were run using a conservative hydraulic conductivity value (0.005 centimeters per second). The assumed K value is five times the Duwamish Coalition estimate (i.e., overestimates groundwater velocity and consequently potential contaminant migration).
- Because of the high propensity of PAHs to adhere to soil (e.g., high partitioning coefficients), extremely high retardation factors were calculated for the PAHs. The high retardation factors caused the model to break down and produce unrealistic results. In order to make the model function correctly, a retardation

factor of 10 was used for all PAHs. This is a conservative assumption (i.e., it will result in migration being overestimated) because it is orders of magnitude lower than the actual calculated retardation factors (see Appendix A). Therefore, the CULs developed using the lower retardation factors are much lower than CULs that would have been calculated had the model been able to use the higher retardation factors.

- CULs for TCE and vinyl chloride were modeled using degradation rates two times slower than values provided in literature, to account for the possibility that degradation rates can slow at lower concentrations. Note that performing the modeling with no degradation for TCE and vinyl chloride would not be representative of site conditions, as the mere presence of vinyl chloride suggests that degradation is occurring.

- It was conservatively assumed that the contaminant source is constant and non-degrading. Mass loading to the system is in fact finite due to TCE use at the property ending and the UST decommissioning and soil excavation conducted in the 1980's, the outside steam-cleaning area was relocated before 1986, that the boiler UST was abandoned in place and filled with a slurry in 1992, that chrome-plating operations ceased in 2005, and maximum concentrations in several cases were located an additional 50 to 130 feet west of the eastern property edge. Given that, it is unlikely that there is a significant ongoing source of IHSs to groundwater.

- The model projected contaminant migration over an assumed 35-year time frame. Given that the primary sources of the contamination are no longer present, it is unlikely that impacts will continue for this length of time.

None of the modeled constituents were predicted to reach the river at concentrations that were at or above method detection limits. The development of CULs based on fate and transport modeling is discussed in Section 7.1.2.3.

6.4 Exposure Scenarios and Reasonable Maximum Exposures

Precision performed industrial operations at the property between 1968 and 2005. As discussed in the Land and Beneficial Water Use Determination (Appendix G), the property is currently zoned for industrial use and will continue to be used for industrial purposes in the future. The site is located in the Duwamish Valley, which is a heavy-industry area south of downtown Seattle that includes approximately 5,000 acres of land designated for industrial activity. The Duwamish industrial area has been used for industrial purposes for many years, and plans for the area include maintaining the predominance of industrial use in the area (Duwamish Coalition, 1998b).

No sensitive subpopulations such as those associated with eldercare facilities, child-care facilities, or schools are located downgradient of the site (see Appendix G). No residences are located on the site, and it is unlikely that the area will be developed to support residences in the foreseeable future. Because the ditch extends off site, it is possible that nonindustrial workers (e.g., residents) could enter the ditch, as there is a residential area located north of the site. However, given that the ditch is located adjacent to a busy roadway and there is no safe and easy route for residents to access the area, an industrial-worker-exposure scenario is appropriate for the ditch.

Based on the information above, industrial workers are the type of human receptors with the greatest potential to be exposed to site-related chemicals in soil or groundwater.

As explained in more detail below, there are no significant ecological exposure pathways associated with the site.

6.4.1 Human Health Exposure Scenarios for Soil

The site is almost entirely covered by a building and asphalt, and the steep slopes on the north and west property boundaries are covered in concrete. These structures prevent workers from directly contacting IHSs in underlying soil. However, for the purposes of the risk evaluation, it is assumed that these exposure barriers may be removed in the future and that industrial workers could have direct contact with soil. Direct-contact exposure routes for workers include incidental soil ingestion, inhalation of vapors or particulates, and dermal contact.

Volatile chemicals have been detected in soil samples collected beneath the building, and it is assumed that indoor industrial workers could have indirect exposures to chemicals that migrate from vadose-zone soil to indoor air. An indirect exposure pathway involves intermedia transfer of a chemical before exposure. The vadose zone is the layer of unsaturated soil that lies above the water table. Depending on location and season, the depth of the vadose zone may range from approximately 4 feet bgs to 14 feet bgs (see Section 2.4.3).

In summary, the following potential soil-exposure scenarios are evaluated as reasonable maximum exposures in the RA:

- Future on-site industrial workers who incidentally ingest, inhale, and have dermal contact with site-related chemicals in soil (less than 15 feet bgs). For the purposes of the risk evaluation, it is assumed that future workers could be exposed to soil beneath the building if the building were removed at some point in the future.

- Indoor industrial workers who inhale volatile chemicals that migrate from vadose-zone soil to indoor air through cracks in the building foundation.

As agreed to by Ecology, soil CULs based on leaching to groundwater are not needed to protect human health and the environment. Empirical groundwater data will be used to evaluate and manage potential risks associated with exposure to groundwater.

It should be noted that there are other potential scenarios by which people may be exposed to chemicals in soil, but these other exposure scenarios are expected to be less significant than the exposure scenarios listed above. For example, it is possible that occasional site visitors could have indirect exposure to volatile chemicals that migrate from soil to indoor or outdoor air, but relative to on-site industrial workers, visitor exposures are expected to be small.

6.4.2 Terrestrial Ecological Evaluation for Soil

A simplified terrestrial ecological evaluation was performed for the site, consistent with the MTCA cleanup regulations under WAC 173-340-7492. A table illustrating the evaluation is included in Appendix I. The site is completely covered by the building and asphalt, and the steep slopes on the north and west property boundaries are covered in concrete. The site does not provide important wildlife habitats. It is surrounded by Highway 99/W Marginal Way S to the south; industrial and commercial properties to the southwest, south, and east; and residential properties to the north and northwest. The ditch along the south side of the property is less than 60 feet across and does not provide good-quality habitat. Vegetation in the ditch includes a few trees, grasses, and Himalayan blackberry.

To be conservative for the purposes of this terrestrial ecological evaluation, the ditch within 500 feet of the site, along Highway 99/W Marginal Way S and 14th Avenue, was considered an area of contiguous undeveloped land. The ditch area comprises approximately 1.53 acres. The habitat quality of the ditch is classified as low, and the area is not likely to attract wildlife because of the high levels of human disturbance in the area and the poor quality of the habitat. Soil at the site does not have the contaminants listed in Question 5 of the simplified terrestrial ecological evaluation (see Appendix I). The resulting scores of the simplified terrestrial ecological evaluation show that the ecological evaluation may be ended and that terrestrial ecological receptors are not appropriate endpoints for soil.

6.4.3 Human Health and Ecological Exposure Scenarios for Groundwater

As explained above in Section 5.3, the facility and the surrounding area are supplied with potable water by the City of Seattle municipal water supply. There are no public water-supply systems or drinking-water wells within a 1-mile radius of the site (see Appendix G). Groundwater beneath and near the site is not currently used as a source of drinking water and is unlikely to be used as a source of drinking water in the foreseeable future (see Appendix G). As a result, human receptors such as industrial workers are unlikely to contact or ingest impacted groundwater.

It is assumed that on-site workers could inhale volatile chemicals that migrate from groundwater to indoor or outdoor air. Airborne concentrations of volatile chemicals that migrate from groundwater to indoor air of a building are expected to be higher than concentrations in outdoor air because of less complete mixing when chemicals enter indoor air relative to mixing in outdoor air. Therefore, the reasonable maximum groundwater exposure scenario is indoor workers who inhale volatile chemicals that have migrated from groundwater and penetrated a building.

During reconnaissance drilling, the depth to shallow groundwater was encountered between 5 to 8 feet bgs. However, the depth to static groundwater level in wells installed in the shallow WBZ is between 3.49 and 6.39 feet bgs (see Table 1). The higher static groundwater elevations in the monitoring wells indicate confined conditions in the alluvium and the till. It is assumed that an excavation worker could directly contact shallow groundwater if an excavation were extended below the water table. It should be noted that the Occupational Safety and Health Administration rules require that excavations be dewatered before worker entry, and it is unlikely that workers will have substantial direct contact with chemicals in groundwater. However, Ecology has requested that this exposure scenario be included in the development of CULs.

As mentioned in Section 6.3, fate and transport modeling indicates that site-related IHSs in groundwater will not migrate to sediment or surface water of the Duwamish River (see Appendix A). Therefore, human receptors will not have significant exposure to site-related chemicals that migrate from groundwater to surface water. Similarly, benthic and aquatic ecological receptors in sediment or surface water of the river will not have significant exposure to site-related chemicals that migrate in groundwater. However, Ecology has requested that this exposure scenario be considered in the development of site CULs.

In summary, the following potential groundwater exposure scenarios are evaluated as reasonable maximum exposures in the RA:

- Industrial workers who inhale volatile chemicals that migrate from groundwater
- Excavation workers who directly contact groundwater
- Potential discharge of groundwater to surface water

7 RISK ASSESSMENT AND SITE-SPECIFIC CLEANUP LEVELS

The RA evaluates potential risks that site-related chemicals may pose to human health and the environment by comparing chemical concentrations in environmental media with relevant CULs.

7.1 Cleanup Levels

Site-specific CULs were estimated using standard MTCA and USEPA RA methods (USEPA, 1989, 1996, 2001, 2004b). The methods used to estimate site-specific soil, groundwater, and soil-gas CULs are detailed in Appendix J. Method C CULs were used for soil, and Method B CULs were used for groundwater. The CULs represent soil and groundwater concentrations that are not expected to result in unacceptable risks to potential human receptors with long-term exposure to impacted soil or groundwater. The Method C acceptable risk level for industrial workers exposed to carcinogens in soil is a lifetime excess cancer risk of one in one hundred thousand (10^{-5}). The Method B acceptable risk level for workers with direct or indirect (e.g., vapor intrusion) exposure to carcinogens in groundwater is a lifetime excess cancer risk of one in one million (10^{-6}). The acceptable risk level for exposure to noncarcinogens is a hazard index of less than or equal to one for both Method B and Method C (WAC 173-340-720 and WAC 173-340-745). If a chemical is present in environmental media at a concentration below the risk-based CUL, it is inferred that exposure to the chemical will not result in unacceptable health risks. CULs for soil, groundwater, soil gas, and indoor air are briefly described below.

7.1.1 Soil CULs

Modified MTCA Method C CULs protective of industrial workers were used for soil. Method C was selected for soil because the former Precision property meets WAC (173-340-745) requirements for an industrial property for the following reasons:

- The site is zoned industrial.
- People do not live on the property.
- Public access to the property is limited.
- Food is not grown or raised on the property.
- Operations on the property were characterized by use and storage of chemicals.
- The surface of the property is covered by a building or asphalt.
- There are no other facilities on the property.

Ecology has agreed that industrial cleanup standards apply to the site (Ecology, 2006b).

Site-specific soil CULs were developed for each of the following soil exposure scenarios:

- Future on-site industrial workers who incidentally ingest, inhale, and have dermal contact with site-related chemicals in soil (less than 15 feet bgs). Some of the IHSs such as hexavalent chromium and TCE are located primarily beneath the building. For the purposes of the RA, it is assumed that the building could be removed in the future and that workers could have long-term exposure to IHSs in the soil now beneath the building.

- Indoor industrial workers who inhale volatile chemicals that migrate from soil in the vadose zone to indoor air through cracks in the building foundation. The only soil IHS considered to be a volatile chemical is TCE.

As agreed to by Ecology, soil CULs based on leaching to groundwater are not needed to protect human health and the environment. Instead, empirical groundwater data will be used to evaluate and manage potential risks associated with exposure to groundwater.

The development of soil CULs is described briefly below and in detail in Appendix J. Development of soil CULs is summarized in Tables J-4 and J-5.

7.1.1.1 Outdoor Industrial Worker CUL—Direct Contact with Soil

Equations 745-4 and 745-5 in WAC 173-340-745 were slightly modified to estimate industrial soil CULs based on direct-contact exposure routes (see Appendix J). The most significant modification was the addition of an exposure route to account for inhalation of airborne chemicals originating from soil. This modification was made to comply with WAC 173-340-745(5)(c)(iv), which requires an evaluation of inhalation exposures when a site-specific CUL is significantly greater than a leaching-to-groundwater CUL for the protection of drinking water. Groundwater at the site has been classified as nonpotable, and site-specific CULs are significantly different from the CUL for the protection of drinking water. The direct-contact soil CULs protective of industrial workers are shown in Tables 25, 26, 27, and 28.

Equations 745-4 and 745-5 in WAC 173-340-745 were not used to calculate industrial soil CULs for arsenic and lead. Instead, the industrial soil CULs for arsenic and lead were set at the MTCA Method A soil CULs for industrial properties. The Method A industrial soil CUL was used for arsenic because the calculated CUL for arsenic was below natural background concentrations. The Method A value accounts for natural background levels of arsenic in soil. The Method A industrial soil CUL was used for lead because no reference dose was available to calculate a CUL for lead. The USEPA uses a unique method to evaluate risks associated with exposure to lead, in part because the toxicokinetics of lead is relatively well understood.

Note that MTCA rules were amended in October 2007 so that total cPAHs would be considered a single hazardous substance when establishing compliance with CULs. Revised direct contact soil cleanup levels for total cPAHs were not calculated. The only PAH in soil that was considered to be an IHS prior to October 2007 was chrysene. Chrysene was screened for risk using the CUL established prior to October 2007.

7.1.1.2 Indoor Industrial Worker CUL—Indirect Exposure to Volatile Chemicals in Soil

The primary route by which an indoor worker could be exposed to chemicals in soil is through inhalation of volatile chemicals that migrate from soil and penetrate buildings. The only soil IHS considered to be a volatile chemical is TCE. A soil CUL for TCE that is protective of indoor workers was estimated using a USEPA model that simulates how volatile chemicals migrate from soil into indoor air (see Appendix J). The soil CUL protective of indoor industrial workers who may have indirect exposure to TCE in indoor air is 41.5 μg/kg (Table 27).

It should be noted that vapor intrusion into a building is a complex process, and the USEPA models used to estimate soil CULs make a number of simplifying assumptions (USEPA, 2004a). Instead of using soil-sample results to infer potential risks associated with exposure to vapors in the building, more appropriate indoor-air sample results are available for this purpose.

7.1.2 Groundwater CULs

Because groundwater at the site is not used as a drinking-water source and is unlikely to be used as a source of drinking water in the foreseeable future, this exposure scenario is incomplete. Therefore, site-specific Method B CULs (WAC 173-340-720(6)(c)) have been calculated as part of this RA, based on the following exposure scenarios, which are more appropriate for the site:

- Industrial workers who inhale volatile chemicals that migrate from groundwater
- Excavation workers who directly contact groundwater
- Potential discharge of groundwater to surface water

The development of groundwater CULs is described briefly below and in detail in Appendix J. CULs for groundwater IHSs are shown in Tables 29 through 33.

7.1.2.1 Indoor Industrial Worker CULs—Indirect Exposure to Volatile Chemicals in Groundwater

Site-specific groundwater CULs protective of indoor workers were developed for TCE and vinyl chloride, the two IHSs that are considered volatile chemicals. These CULs protective of indoor workers will also be protective of outdoor workers.

The method for estimating risk-based CULs for groundwater protective of indoor workers is very similar to the methods discussed above for volatiles in soil (Appendix J). The only difference is that a transfer factor simulating migration of a chemical in groundwater (not soil) to indoor air is used to estimate the groundwater CUL. The groundwater CULs for TCE and vinyl chloride are 10.8 μg/L and 71.5 μg/L, respectively (Table 31).

As mentioned above, a number of factors structure vapor migration from groundwater into a building, and the USEPA models used to simulate this process include a number of assumptions. Empirical indoor-air sample results are more appropriate for evaluating risks associated with exposure to volatile chemicals in indoor air than comparisons of groundwater sample results with model-derived CULs.

7.1.2.2 Excavation Worker CUL—Direct Contact with Groundwater

Neither CULs nor methods to calculate CULs for potential excavation workers who may directly contact chemicals in groundwater are included in MTCA WAC 173-340-700 through WAC 173-340-760. However, the DEQ has developed RBCs for this potential exposure scenario. The DEQ RBCs are calculated using conservative exposure assumptions and acceptable risk levels that are identical to those used for MTCA Method B groundwater CULs. Although excavation workers are expected to have short-term exposure durations (e.g., acute or subchronic), the DEQ's RBCs are calculated using chronic toxicity data and therefore overestimate potential risks. The DEQ assumes that excavation workers inhale volatile chemicals that migrate from groundwater to air in an excavation, and that workers have dermal contact with chemicals in groundwater. Equations and assumptions used to calculate the RBCs are described in Appendix B of the September 2003 DEQ *Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites* (DEQ, 2003). These DEQ RBCs were used as groundwater CULs protective of potential excavation workers (see Table 29).

No DEQ RBC is available for ORO. The DEQ RBC for DRO has been set at the solubility limit because maximum dissolved concentrations of DRO are not expected to pose unacceptable risks to excavation workers (DEQ, 2003). Concentrations of ORO are lower than concentrations of DRO, ORO is expected to be less soluble than DRO, and dissolved ORO is not expected to pose unacceptable risk to potential excavation workers. No free-phase petroleum product has been observed on groundwater at the site.

7.1.2.3 CULs Protective of Surface Water

Groundwater CULs at the property boundary that would be protective of surface water of the Duwamish River have been developed for all of the groundwater IHSs through the fate and transport modeling described in Section 6.3. Because fate and transport modeling shows that IHSs present at the site will not reach the Duwamish River, groundwater CULs that exceed surface-water CULs can be established consistent with WAC 173-340-720(6)(c)(i)(E). Appendix A provides the modeling output for the development of CULs. Groundwater CULs applicable at the eastern property boundary were developed by setting the target concentration at the point where groundwater discharges to the Duwamish River equal to surface-water screening levels, and accounting for attenuation that occurs between the property boundary and the Duwamish River. The most conservative Ecology or USEPA surface-water criteria (see Appendix A) were used as target concentrations. The CULs are provided in Tables 29 through 33.

It will likely be appropriate to establish the downgradient monitoring wells near the eastern property boundary, as a conditional point of compliance for the CULs for protection of surface water. In order for Ecology to approve this conditional point of compliance, Precision must demonstrate that it is not practicable to meet the CUL throughout the site within a reasonable restoration timeframe (see WAC 173-340-720(8)(c)).

7.1.3 Soil-Gas Preliminary CULs

Sub-slab soil-gas preliminary CULs were developed for TCE and vinyl chloride, a breakdown product of TCE. Both of these VOCs were detected in sub-slab soil-gas samples. These preliminary CULs were estimated by applying an attenuation factor to the MTCA Method C air CUL for each chemical. The attenuation factor was calculated using a USEPA model that simulates migration of vapors across a slab and into a building (Appendix J). The sub-slab soil-gas preliminary CULs for TCE and vinyl chloride are 8,150 $\mu g/m^3$ and 103,000 $\mu g/m^3$, respectively (Table 34).

7.1.4 Indoor-Air CULs

To aid interpretation of indoor-air sample results (Table 35), airborne chemical concentrations were compared to MTCA Method C air CULs (Ecology, 2006a).

7.2 Risk Results

Potential risks that IHSs in soil, groundwater, soil gas, and indoor air may pose to human health are evaluated below by comparing detected concentrations in these media with site-specific CULs. Tables 7-1, 7-2, and 7-3 and Figures 7-1 and 7-2, immediately following this page, show CUL exceedances. These exceedances are described in the sections below.

Table 7-1
IHS Exceedances in Soil
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Depth (ft. bgs)	Soil Chromium (Hexavalent) (mg/kg)	Arsenic (mg/kg)	Lead (mg/kg)	Trichloro-ethene (µg/kg)
MTCA Method A CULs for Unrestricted Land Use				19	20	NR	30
MTCA Method B CULs for Ingestion only				240	0.67	NR	2,500
MTCA Method C CULs for Ingestion Only				11,000	88	NR	330,000
Site-Specific CUL for Industrial Workers—Direct Contact				775	20[a]	1000[a]	6,780
CUL for Vapor Intrusion				NV	NV	NV	42
Preliminary Cleanup Level							
GP6	GP6-S-14.5	6/16/2005	14.5	--	--	--	**1,160**
GP11	GP11-S-2.0	6/17/2005	2	--	--	--	**87.2**
	GP11-S-6.5	6/17/2005	6.5	--	--	--	**281**
GP18	GP18-S-1.0	12/13/2005	1	**2,300 J**	--	--	--
GP32	GP32-S-1.0	12/14/2005	1	**3,500 J**	--	--	--
Off-Site Hand-Auger Sampling							
HA3	HA3-0.5	12/15/2005	0.5	--	**53.9**	--	--
HA4	HA4-0.5	12/15/2005	0.5	--	**44.3**	**1,710**	--
HA5	HA5-0.5	12/15/2005	0.5	--	**35.9**	**1,440**	--
HA22	HA22-S-0.5	1/10/2007	0.5	--	**53.5**	--	--

NOTES:
Bold indicates concentrations that exceed one or more of the relevant CULs.
-- = not detected at or above CULs.
CUL = cleanup level.
ft. bgs = feet below ground surface.
IHS = indicator hazardous substance.
J = estimated concentration.
mg/kg = milligrams per kilogram.
MTCA = Washington State Department of Ecology's Model Toxics Control Act.
µg/kg = micrograms per kilogram.
NR = MTCA reported the CUL as not researched.
NV = no value.
[a]MTCA Method A—Industrial Use.

Table 7-2
IHS Exceedances in Sub-Slab Vapor ($\mu g/m^3$)
Precision Engineering, Inc.
Seattle, Washington

Location	Date	Trichloroethene
PCUL for Vapor Intrusion		8150
A5	04/18/2006	**37,000**

NOTES:
Bold indicates concentrations that exceed one or more of the relevant CULs.
IHS = indicator hazardous substance.
$\mu g/m^3$ = micrograms per cubic meter.
PCUL = preliminary cleanup level.

Table 7-3
IHS Exceedances in Groundwater
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Chromium (Hexavalent) (mg/L)	Chromium (Trivalent) (mg/L)	Arsenic (µg/L)	Trichloro-ethene (µg/L)	Vinyl Chloride (µg/L)
MTCA Method A Groundwater CULs			NV	NR	5	5	0.2
MTCA Method B Groundwater CULs			0.048	NR	0.0583	0.109	0.0292
MTCA Method C Groundwater CULs			88	NR	0.0583	1.1	0.29
MTCA Method C Surface Water CULs			1.22	800[a]	2.46	37	92
AWQC—Human Health			NR	NR	0.018	2.5	0.025
Preliminary Cleanup Level			0.015	180	360	NR	NR
AWQC—Aquatic Life—Chronic			0.01	57	190	NR	NR
CUL for Vapor Intrusion			NV	NV	NV	309	71.5
Site-Specific Groundwater CUL for the Protection of Surface Water			0.085	950,000	0.06	600	4
Excavation Worker Direct Contact Groundwater CUL			>Max	190	5.8	130	1100
Monitoring Well Groundwater Data							
MW1	MW1-W-35.0	6/16/2005	**0.269**	NC	NA	NA	--
	MW1-122705	12/27/2005	--	--	**32.3**	--	--
	MW1-041806	04/18/2006	--	--	**33**	--	--
MW2	MW2-122805	12/28/2005	--	--	**5.63**	--	--
	MW2-041906	04/19/2006	--	--	**3.8**	--	--
MW3	MW3-122905	12/29/2005	--	--	**15.3**	--	--
	MW3-041706	04/17/2006	--	--	**13**	--	--
MW4	MW4-122705	12/27/2005	--	--	**15.1**	--	--
	MW4-041806	04/18/2006	--	--	**15**	--	--
MW5	MW5-122805	12/28/2005	**450**	--	**4.59**	--	--
	MW5-041906	04/19/2006	**350**	NC	**4.9**	--	--
MW6	MW6-122905	12/29/2005	--	--	**11.9**	--	--
	MW6-041906	04/19/2006	--	--	**24**	--	--
MW7	MW7-122805	12/28/2005	--	--	**6.62**	--	--
	MW7-041806	04/18/2006	--	--	**7.1**	--	--
MW8	MW8-122805	12/28/2005	--	--	**6.41**	--	--
	MW8-041806	04/18/2006	--	--	**4.8**	--	--
Reconnaissance Groundwater Data							
GP2	GP2-W-17-RECON	6/9/2005	**32.38**	--	NA	--	--
GP4	GP4-W-8.0	6/16/2005	**31**	**236**	NA	--	--
GP6	GP6-W-18.0	6/16/2005	**43**	**300**	NA	**1130**	--
GP8	GP8-W-10.0	6/16/2005	**61**	**294**	NA	--	--
GP-13	GP13-W-8.0	12/14/2005	--	--	--	--	**16.5**

NOTES:
Bold indicates concentrations that exceed one or more of the relevant CULs.
-- = not detected at or above CULs.
>Max = greater than 100,000.
ARAR = applicable or relevant and appropriate requirement.
AWQC = ambient water quality criteria.
CUL = cleanup level.
IHS = indicator hazardous substance.
mg/L = milligrams per liter.
MTCA = Washington State Department of Ecology's Model Toxics Control Act.
µg/L = micrograms per liter.
NA = not available.
NC = not calculated.
NR = MTCA reported the CUL as not researched.
NV = no value.
[a]Industrial preliminary remediation goal.

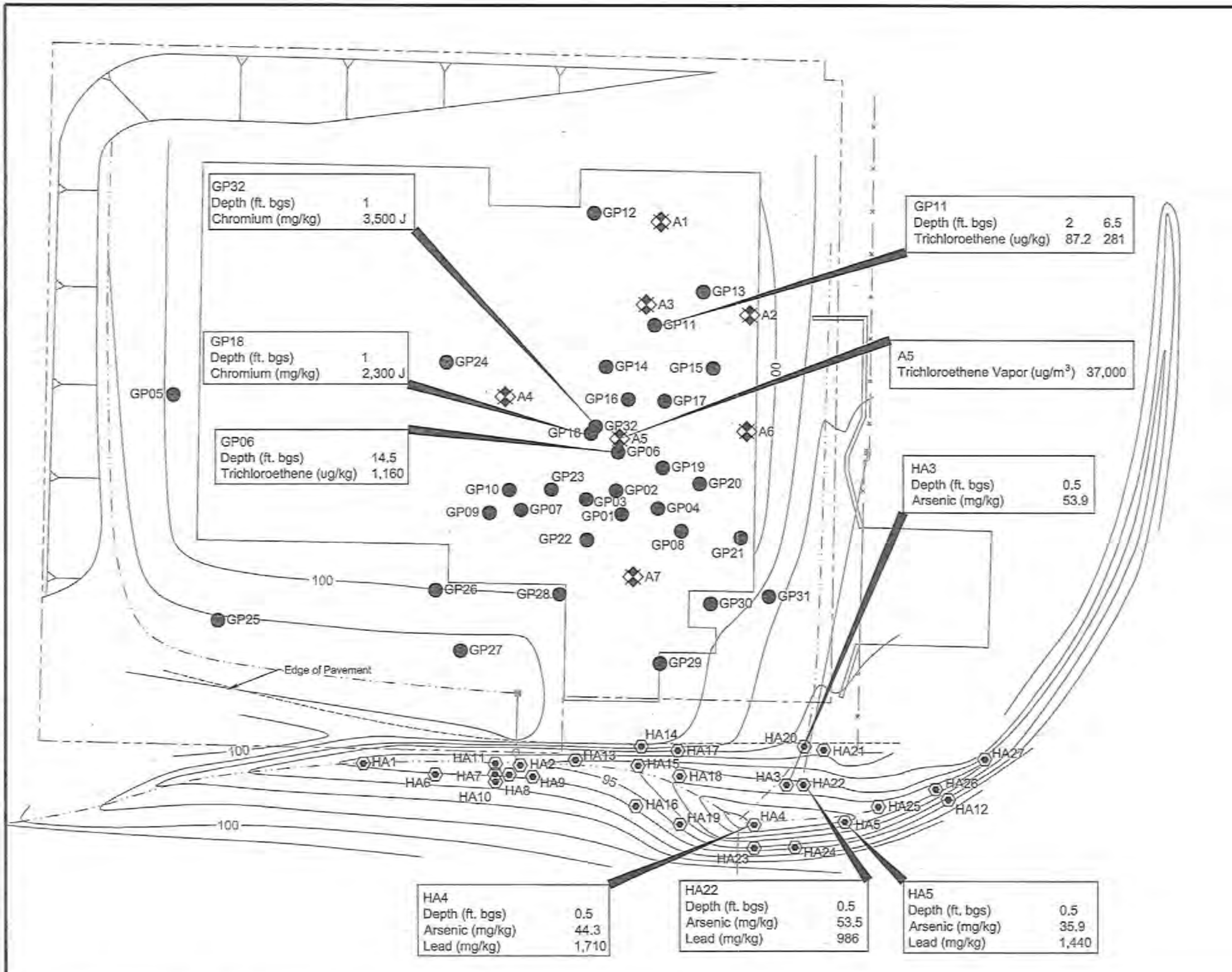


Figure 7-1
Exceedances in Soil Above Cleanup Levels

Precision Engineering, Inc.
Seattle, Washington

Legend:

- Property Boundary
- Fence
- Drainage Ditch
- Topographic Contour Interval
- 2-inch Asphalt Curbing
- Geoprobe Boring
- Hand Auger Boring
- Vapor Monitoring Sample

Notes:

1) Topography is based on an assumed vertical datum. Topography, storm sewer lines, fence line, and edge of pavement created from a 1969 survey by John R. Ewing and Associates.
2) Locations of property boundary, building corners, monitoring wells, Geoprobe borings, and hand augers HA1 through HA5 based on 2006 survey by Duncanson Company, Inc. Hand Augers HA13 to HA27 were recorded using Trimble GeoXT GPS Unit (accuracy ±3 feet), all other locations are approximate.
3) Exceedances in soil nomenclature: ft. bgs = feet below ground surface J = estimated concentration
4) Exceedances based on CULs including site-specific for vapor intrusion and for industrial workers - direct contact.

0 50 100
Feet

N

Maul Foster Alongi Inc.

Layout: 1 Project: 8006.08.04 Drawn By: J. Fisher Approved By: M. Gibson

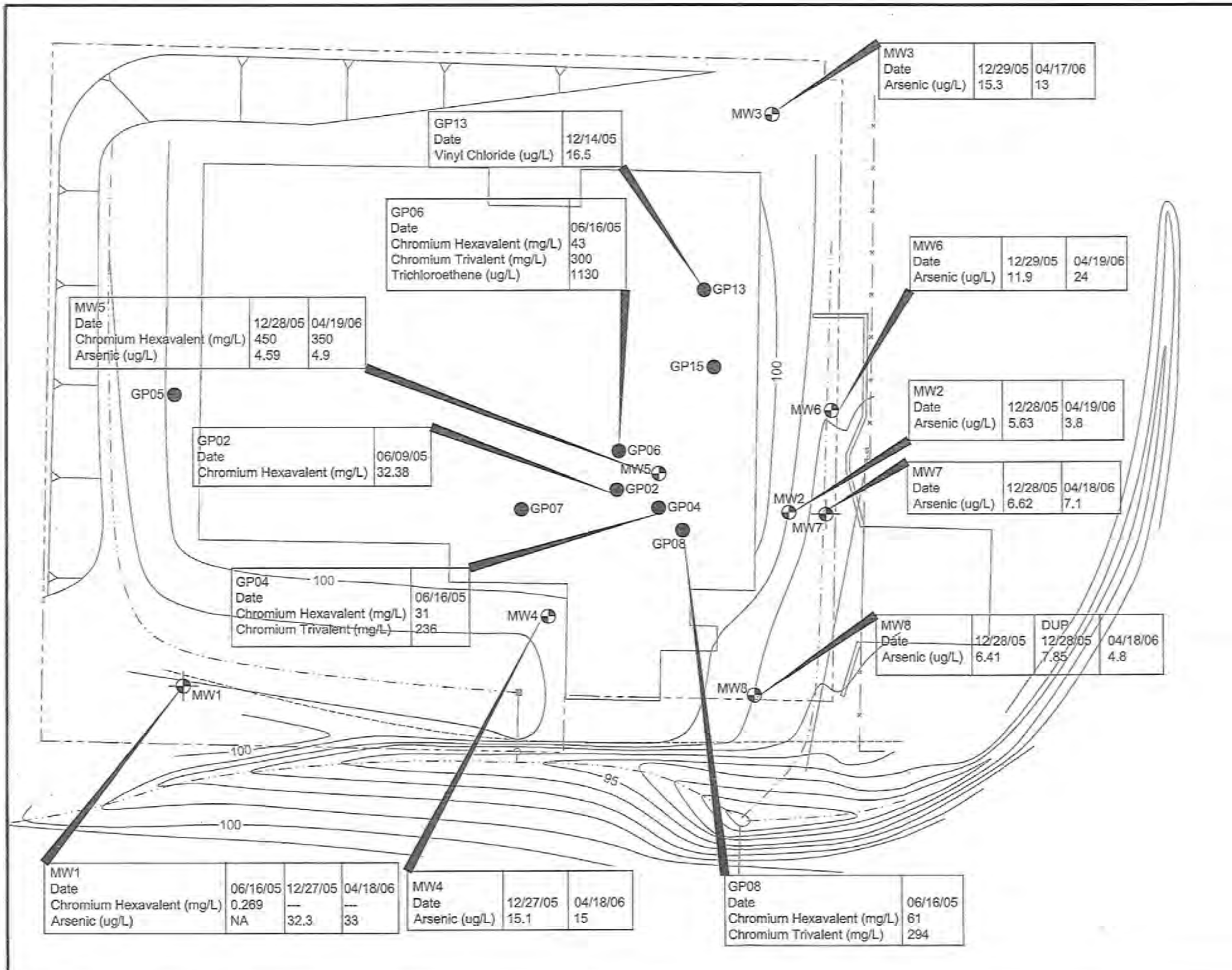


Figure 7-2
Exceedances in Groundwater Above Cleanup Levels

Precision Engineering, Inc.
Seattle, Washington

Notes:
1) Topography is based on an assumed vertical datum. Topography, storm sewer lines, fence line, and edge of pavement created from a 1989 survey by John R. Ewing and Associates.

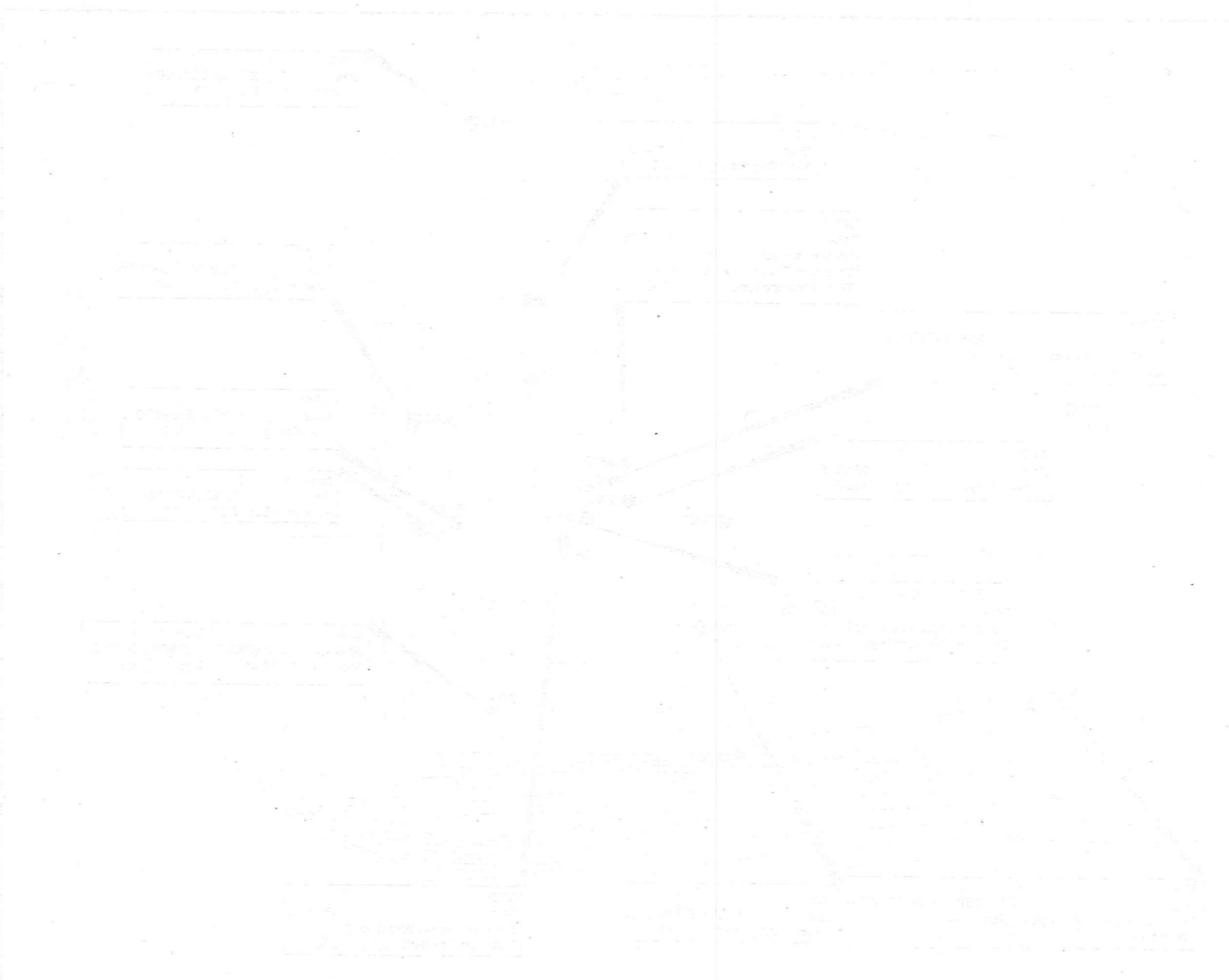
2) Locations of property boundary, building corners, monitoring wells, Geoprobe borings, and hand augers HA1 through HA5 based on 2006 survey by Duncanson Company, Inc. Hand Augers HA13 to HA27 were recorded using Trimble GeoXT GPS Unit (accuracy ±3 feet), all other locations are approximate.

3) Exceedances in soil nomenclature:
ft. bgs = feet below ground surface
--- = not detected above site Clean Up Levels (CULs)
NA = not analyzed

4) CULs include site-specific CULs for vapor intrusion and for the protection of surface water, and the preliminary CUL for excavation worker - direct contact.

MAUL FOSTER ALONGI INC.

Layout: 1 Project: 8005.08.04 Drawn By: J. Fisher Approved By: M. Gibson



7.2.1 Soil on Former Precision Property

Only two IHSs were detected in soil on the former Precision property at a concentration greater than a site-specific soil CUL: hexavalent chromium and TCE. The spatial extent of CUL exceedances for these IHS is discussed below. Because no CULs were developed for DRO and ORO, a risk evaluation of petroleum hydrocarbons is also discussed below. See Tables 25 through 28 for soil screening results. Note that Table 28 includes all seven cPAHs (even though chrysene was the only original IHS) along with a total cPAH value calculated by applying TEFs.

7.2.1.1 Hexavalent Chromium

Two soil samples collected beneath the building (GP18 and GP36) had concentrations of hexavalent chromium above the direct-contact CUL of 775 mg/kg for industrial workers. The concentration at GP18 was 2,300 mg/kg, and the concentration at GP32 was 3,500 mg/kg (Table 25). Both of the samples with hexavalent chromium concentrations above the CUL were collected at approximately 1 foot bgs (Table 25), and both were collected within approximately 5 feet of each other (Figure 6). Hexavalent chromium concentrations in several samples collected at multiple depths surrounding GP18 and GP32 were below the industrial-worker CUL. As a result, it appears that soil with hexavalent chromium concentrations above a CUL is limited to a relatively small and well-defined area immediately beneath the building slab.

At present, the building prevents workers from having direct contact with hexavalent chromium in soil, and there is no current unacceptable risk to human health, based on hexavalent chromium in soil. Unacceptable risk would occur only if the building was removed in the future, contaminated soil was left on the ground surface for an extended period of time, and humans were present in the contaminated area.

7.2.1.2 TCE

Soil samples collected at 14.5 feet bgs at GP6, and at 2 and 6.5 feet bgs at GP11, had concentrations of TCE above the vapor-intrusion CUL of 41.5 μg/kg (Table 27). The maximum detected concentration of TCE in soil was 1,160 μg/L at GP6. TCE was not detected in soil at concentrations exceeding a direct-contact CUL. As mentioned previously, risk estimates based on comparisons of soil analytical results with soil CULs for vapor intrusion are less reliable than those based on interpretations of indoor-air sample results. TCE was not detected in indoor air at concentrations that exceed the indoor-air CUL. Risks associated with potential exposure to TCE in indoor air are discussed in Section 7.2.5.

7.2.1.3 TPH

Concentrations of extractable petroleum hydrocarbons and other constituents for the soil sample with the highest petroleum-hydrocarbon concentrations (GP21 at 6.5 feet) were input into Ecology worksheets for evaluating petroleum hydrocarbons in soil. The result from the worksheet showed that this soil sample passed the calculated exposure pathways for industrial land use and Method B potable groundwater protection (see Appendix K), and that concentrations of petroleum hydrocarbons in soil do not pose a threat to human health or the environment.

7.2.1.4 Cumulative Risk for Soil on Former Precision Property

Chemical-specific direct-contact CULs for on-site soil do not require adjustment to account for exposure to multiple hazardous substances via multiple pathways (WAC 173-340-745(6)). Soil direct-contact CULs were calculated assuming multiple potential exposure pathways (e.g., ingestion, inhalation, dermal contact), and all significant alternative exposure routes were considered. Two IHSs were identified for on-site soil: hexavalent chromium and TCE. Total excess cancer and noncancer risk estimates associated with direct-contact exposures to on-site soil are shown in Table 36. Both cancer and noncancer risk estimates associated with exposure to the maximum concentration of TCE in on-site soil are orders of magnitude below the acceptable risk level. The noncancer CUL for hexavalent chromium is lower than the cancer CUL. Because risks associated with exposure to TCE are so low, the noncancer CUL for hexavalent chromium does not need to be adjusted downward in order to achieve acceptable risk levels associated with exposure to multiple chemicals.

7.2.2 Soil in Off-Property Drainage Ditch

The only IHSs that were detected in off-property drainage-ditch soil at a concentration greater than a site-specific soil CUL were lead and arsenic. The spatial extent of CUL exceedances for these IHSs is discussed below. Because no CULs were developed for DRO and ORO, a risk evaluation of petroleum hydrocarbons is also discussed below.

7.2.2.1 Arsenic

The concentrations of arsenic in four shallow soil samples collected from the drainage ditch south of the building (HA3, HA4, HA5, and HA22) were above the direct-contact CUL of 20 mg/kg (Table 26 and Figure 6). The maximum detected concentration was 53.9 mg/kg. All four samples are in locations that would receive runoff from a discharge pipe from the industrial property east of the former Precision property, especially HA22, which is located directly beneath where the outfall discharges (see Section 2.4.1 and Figure 6). As discussed in Section 1.2.2, data collected during this RI indicate that the arsenic in samples from the ditch likely originated from multiple sources.

7.2.2.2 Lead

The concentrations of lead in two shallow soil samples collected from the drainage ditch south of the building (HA4 and HA5) were above the direct contact CUL of 1,000 mg/kg (Table 26 and Figure 6). The maximum detected concentration was 1,710 mg/kg. As discussed in section 1.2.2, data collected during this RI indicate that the lead in samples from the ditch likely originated from multiple sources.

7.2.2.3 TPH

Concentrations of extractable petroleum hydrocarbons and other constituents for the soil sample with the highest petroleum hydrocarbon concentrations (HA4 at 0.5 feet bgs) and ditch-soil samples closer to the site (HA2 and HA3 at 0.5 feet bgs) were entered into Ecology worksheets for evaluating petroleum hydrocarbons in soil. The result from the worksheet showed that these soil samples passed the calculated exposure pathways for industrial land use and Method B potable groundwater protection (see Appendix K), and that concentrations of petroleum hydrocarbons in soil do not pose a threat to human health or the environment.

7.2.3 Groundwater

The only IHSs that were detected in groundwater at concentrations greater than a site-specific groundwater CUL were arsenic, trivalent and hexavalent chromium, and TCE. Concentrations of PAHs (Table 32), and TPH (Table 33) were below available excavation-worker CULs. Note that Table 32 shows all seven cPAHs along with a total cPAH value calculated by applying TEFs under the new MTCA amendment (Ecology, 2007b), however, the risk results remain unchanged. Risk associated with CUL exceedances for IHSs in groundwater is discussed below.

7.2.3.1 Metals

Concentrations of trivalent chromium in three reconnaissance groundwater samples (GP-4, GP-6, and GP-8) were above the excavation-worker CUL (Table 29). All three of these sample locations are under the southern portion of the building.

On-site groundwater concentrations of hexavalent chromium exceeded the CUL for the protection of surface water. All other IHSs and the modeled PAHs in groundwater were below their respective CULs. Hexavalent chromium concentrations that exceeded CULs for the protection of surface water were detected in groundwater samples collected from borings and MW5, located within the building footprint, and from one sample collected from MW1, which is a deep well assumed to be upgradient of the building. Concentrations of hexavalent chromium in wells located near the eastern property line were not detected above their method reporting limits and did not exceed CULs.

Most groundwater samples had concentrations of arsenic that were above the excavation-worker CUL (Table 30). As mentioned previously, arsenic is present at similar concentrations in groundwater throughout the site, and there is no indication that the former Precision property is a source of arsenic contamination. Arsenic in groundwater does not appear to be related to the site, and ambient levels of arsenic in groundwater are above the excavation-worker CUL.

7.2.3.2 TCE

The concentrations of TCE in reconnaissance groundwater samples GP-6 and GP-8 were above the groundwater CUL protective of indoor industrial workers who may have indirect exposure to chemicals that migrate from groundwater to indoor air (Table 31). Also, a sample from MW-5 in December 2005 had a concentration of TCE above the groundwater CUL. Risk estimates based on comparisons of groundwater analytical results with groundwater CULs are less reliable than those based on interpretations of indoor-air sample results. Based on empirical indoor-air sample results, TCE does not pose unacceptable risks to future workers (see Section 7.2.4). The reconnaissance groundwater sample collected at GP6 had a concentration of TCE that was above the excavation-worker CUL (Table 31).

7.2.4 Soil Gas

A sub-slab soil-gas sample collected at A5 had a concentration of TCE above the preliminary soil-gas CUL (Table 34). The concentrations of TCE and vinyl chloride in all other sub-slab soil-gas samples were below soil-gas CULs protective of indoor industrial workers. Based on empirical indoor-air sample results discussed in Section 7.2.5, TCE does not pose unacceptable risks to future workers.

7.2.5 Indoor Air

As shown in Table 35, TCE was detected both in indoor-air samples and in an outdoor-air sample collected south of the building. Breakdown products of TCE were not detected in indoor- or outdoor-air samples. The presence of TCE in the outdoor-air sample suggests that there are significant sources of TCE near the site that are unrelated to the former Precision facility. The concentrations of TCE in indoor-air samples were higher than the concentration in the outdoor-air sample. However, all TCE concentrations in indoor air were below the MTCA Method C air CUL.

The presence of TCE breakdown products (e.g., vinyl chloride) in groundwater downgradient of the source area indicates that in situ degradation of TCE is taking place. The TCE release must have occurred before the mid-1980s, when Precision stopped using TCE. TCE concentrations in soil and groundwater are expected to continue to decline over time because of natural degradation processes. Absent any new TCE releases, current conditions represent the worst-case conditions for the foreseeable future. TCE concentrations in indoor air are currently below MTCA Method C CULs, indicating that these concentrations do not pose an unacceptable risk to future workers in the building.

7.3 Risk Summary

7.3.1 Hexavalent and Trivalent Chromium

Hexavalent chromium concentrations are above CULs in a limited area of shallow soil immediately beneath the building slab. The building prevents workers from having direct contact with hexavalent chromium in soil. There is no current unacceptable risk to human health based on hexavalent chromium in soil. However, it is assumed that workers could contact soil if the building was removed in the future, if contaminated soil was left on the ground surface for an extended period of time, and if humans were present in the contaminated area.

Hexavalent chromium concentrations that exceeded CULs for the protection of surface water were detected in groundwater samples collected from borings and MW5, located within the building footprint, and from one sample collected from MW1, located upgradient of the building. Concentrations of hexavalent chromium in wells located near the eastern property line were not detected above their method reporting limits and did not exceed CULs. Concentrations of trivalent chromium in shallow groundwater beneath the building were above the excavation-worker CUL.

7.3.2 Lead and Arsenic

The concentrations of lead and arsenic in some shallow-soil samples collected from the drainage ditch south of the former Precision property are above direct-contact CULs. These samples are in locations that would receive runoff from the former Precision property, from properties east and west of the former Precision property, from 14th Avenue, and from the Highway 99/W Marginal Way S on-ramp. Data collected during this RI indicate that the lead and arsenic in samples from the ditch originated from sources other than the former Precision property. For example, neither lead nor arsenic was detected above CULs in the sample from HA2, near the discharge pipe from the western part of the former Precision property, and from the two samples collected just off of the paved area, directly in the path of sheet flow from the eastern portion of the site (HA20 and HA21). In addition, lead and arsenic concentrations detected on the north side of the ditch, near the site, were similar in magnitude to concentrations from the south side of the ditch, receiving sheet flow from a different source, the highway on-ramp. Data collected indicate that the arsenic and lead in samples from the ditch likely originated from multiple sources.

Despite evidence of multiple sources of contamination, Ecology indicated that Precision is at least partially responsible for the exceedances of CULs and did not accept Precision's previous proposal of taking no action in the off-property ditch. Therefore, as a cost-effective way to address the comments and concerns expressed by Ecology, Precision proposed to excavate all ditch soil containing IHSs at concentrations that exceed CULs. A separate work plan for removal of soil from the ditch (MFA, 2007) was approved by Ecology via electronic mail on August 2, 2007 (Ecology, 2007a).

Ditch excavation work and confirmation sampling were completed on October 24 and 25, 2007 (see Section 8). Approximately 100 cubic yards of soil were removed and properly disposed of off site. After excavation was complete, the entire area of soil disturbance was backfilled and stabilized with hydroseed. Because two perimeter confirmation samples exceeded CULs, additional sampling was conducted on November 19, 2007, to delineate any potential contamination surrounding the samples. The results of this additional sampling indicated that there is no widespread contamination outside of the area excavated.

As a precautionary measure, two additional small areas where chemical concentrations in confirmation samples were above conservative CULs were excavated on March 27, 2008. Approximately 4 cubic yards of soil was removed and properly disposed of off site. The excavated areas were backfilled with clean soil and stabilized with grass seed. Confirmation soil samples were collected from the bottom of the excavation. One confirmation sample had concentrations of arsenic and lead that exceeded CULs by 8 percent and 2 percent, respectively. Because these concentrations are only slightly above conservative CULs, residual soil impacts are both isolated and small in extent, and over a foot of clean fill material covers the sample location, no additional removal activities were warranted. All disturbed areas were stabilized with hydroseed, and contaminants are not expected to be mobile.

7.3.3 TCE

TCE was detected in soil, groundwater, and sub-slab soil-gas samples collected beneath the building at concentrations above model-derived CULs protective of indoor industrial workers. Concentrations of TCE in groundwater beneath the building were also above the CUL protective of excavation workers. Concentrations of TCE in indoor air of the building were below the applicable CUL, and TCE was present in outdoor air near the site, suggesting that there are sources in the region unrelated to the former Precision property. Given that TCE concentrations in indoor air were lower than model predictions, it can be reasoned that the transport models used to estimate soil, groundwater, and sub-slab soil-gas CULs overpredicted indoor-air concentrations of TCE. Based on empirical indoor-air sample results, site-related volatile chemicals do not appear to pose unacceptable risks to future workers.

Ecology has requested that Precision complete additional investigation of the indoor-air pathway. However, Precision has decided that the most cost-effective way to address this pathway is to proceed with the installation of a sub-slab vapor mitigation system to remediate any potential risks associated with the presence of sub-slab TCE concentrations (see Section 8).

8 CLEANUP ACTIONS

8.1 Off-Property Ditch

Despite evidence of multiple sources of contamination, Ecology did not accept Precision's previous proposal of taking no action in the off-property ditch because of the belief that Precision is at least partially responsible for the exceedances of soil CULs. Therefore, as a cost-effective way to address the comments and concerns expressed by Ecology, Precision proposed to excavate all ditch soil containing IHSs at concentrations that exceed CULs. A separate work plan for removal of soil from the ditch (MFA, 2007) was submitted to and subsequently approved by Ecology (Ecology, 2007a).

In October 2007, approximately 100 cubic yards of soil was removed and properly disposed of off site. After excavation was complete, the entire area of soil disturbance was backfilled and stabilized with hydroseed. Subsequent sampling and removal activities were also completed in November 2007 and March 2008, and are described below.

8.1.1 Procedures

General Environmental Management, Inc. completed the ditch excavation work on October 24 and 25, 2007. A silt fence was installed prior to the excavation work to prevent soil from being transported off the site and entering natural drainages. Consistent with the approved work plan, the area of excavation included approximately 2,685 square feet surrounding sample locations HA3, HA4, HA5, and HA22, where CUL exceedances had been documented (see Figure 10). The depth of excavation was approximately 1 foot, for an approximate excavation volume of 2,685 cubic feet or approximately 100 cubic yards. Based on the area delineated in the work plan for removal of soil from the ditch (MFA, 2007), the excavation area was measured out and flagged prior to digging.

Following the excavation, MFA collected confirmation samples from the bottom of the excavation (B1 through B13) and from the side walls/surface soil along the perimeter of the excavation (P1 through P9). Consistent with the approved work plan, all the samples were analyzed for arsenic and lead. In addition, sample B5 was analyzed for PAHs, GRO, DRO, ORO, and benzene, toluene, ethylbenzene, and xylenes (BTEX). Because of elevated concentrations of arsenic and lead in two perimeter confirmation samples, additional surface soil samples (SS1 through SS6) were collected on November 19, 2007, and analyzed for arsenic and lead.

Two composite soil samples were collected from the excavated soil and analyzed for eight Resource Conservation and Recovery Act metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver) by TCLP (toxicity characteristic leaching procedure) analysis for the purpose of characterization for disposal. No metals were detected through the TCLP analysis, so the soil was classified as nonhazardous for disposal.

Approximately 123 tons of soil was disposed of at Waste Management's Columbia Ridge facility in Arlington, Oregon. Following confirmation sampling, clean topsoil was backfilled in place of the excavated soil and graded to replicate the original contours. For erosion control, stabilization, and durability, the disturbed surface was hydroseeded with a fiber-bonded grass-seed mix. The fiber-bonding prevents erosion while the grass establishes a root system that will stabilize the soil.

8.1.2 Confirmation Sampling Results

Figure 10 and Tables 37 through 40 provide the locations and analytical results for the 31 initial confirmation samples that were analyzed. Confirmation sampling results indicated one duplicate sample (B13, duplicate of B12) from the bottom of the excavation and one sample (P1) on the perimeter of the excavation that had slight exceedances of the direct-contact CUL of 20 mg/kg for industrial workers for arsenic. Arsenic concentrations at B13 and P1 were 26.3 mg/kg and 22 mg/kg, respectively.

An additional sample on the north border of the excavation (P9) had detections of arsenic and lead (at 111 mg/kg and 2,410 mg/kg, respectively), which exceeded CULs for both arsenic (20 mg/kg) and lead (1,000 mg/kg). On November 19, 2007, additional sampling (SS-1 through SS-6) was conducted in the area surrounding P1 and P9, to delineate the extent of soil exceeding CULs. Analytical results are provided in Table 37. A sample from 1.5 feet bgs at SS-6 contained arsenic at a concentration of 23.7 mg/kg, which slightly exceeded the CUL for arsenic. All other samples contained arsenic and lead below CULs.

The results of this additional sampling indicated that there is no widespread contamination outside of the area excavated. Based on the spatial pattern in concentrations, the exceedances near the boundary of the excavation encompass a very small area.

8.1.3 Followup Excavation

General Environmental Management, Inc. completed additional excavation of the soil surrounding sample points P9, P1, and SS6 on March 27, 2008. An area of approximately

31 square feet was excavated around sample point P9 to a depth of 2 feet (see Figure 10). The 2 cubic yards of excavated material was disposed of as hazardous waste, based on the high concentration of lead detected in sample P9. An area of approximately 39 square feet was excavated around sample points P1 and SS6 to a depth of 1.5 feet. The 2 cubic yards of material excavated from this area was disposed of as nonhazardous waste. The excavated areas were backfilled with clean soil and stabilized with grass seed.

Following the excavation, MFA collected confirmation samples from the bottom of the excavation (C1 through C3). Perimeter samples were not needed, since the surrounding area had been investigated in previous efforts. The soil samples were analyzed for arsenic and lead. The concentrations of the chemicals of concern were below CULs in all of the samples except sample C3. Concentrations of arsenic and lead in sample C3 exceeded CULs by 8 percent and 2 percent, respectively. No additional removal actions were deemed warranted for several reasons: the concentrations are very close to soil CULs, residual soil impacts are both isolated and small in extent, and over a foot of clean fill material covers the sample location.

8.2 Indoor Air

Ecology has requested that Precision complete additional investigation of the indoor-air pathway. However, Precision has decided that the most cost-effective way to address this pathway is to proceed with the installation of a sub-slab vapor mitigation system to remediate any potential risks associated with the presence of sub-slab TCE concentrations. On February 13, 2008, Precision submitted a separate cleanup action plan to Ecology that described the proposed sub-slab vapor mitigation system (Pioneer, 2008).

LIMITATIONS

The services described in this report were performed consistent with generally accepted professional consulting principles and practices. No other warranty, express or implied, is made. These services were performed consistent with our agreement with our client. This report is solely for the use and information of our client unless otherwise noted. Any reliance on this report by a third party is at such party's sole risk.

Opinions and recommendations contained in this report apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, nor the use of segregated portions of this report.

REFERENCES

CA EPA, et al. 2003. Advisory—active soil gas investigations. California Environmental Protection Agency, California Department of Toxic Substances Control, and Los Angeles Regional Water Quality Control Board. http://www.dtsc.ca.gov/LawsRegsPolicies/Policies/SiteCleanup/upload/SMBR_ADV_activesoilgasinvst.pdf. January 28.

DEQ. 2003. Risk-based decision making for the remediation of petroleum-contaminated sites. App. B. Oregon Department of Environmental Quality. September.

Duwamish Coalition. 1997. Development of a three-dimensional, numerical groundwater flow model for the Duwamish River Basin. Prepared by J. Fabritz, J. Massmann, and D. Booth for City of Seattle Office of Economic Development and King County Office of Budget and Strategic Planning. August.

Duwamish Coalition. 1998a. Duwamish Basin groundwater pathways conceptual model report. Prepared by D. Booth, University of Washington, and L. Herman, Hart Crowser, Inc., with assistance from Floyd & Snyder, Inc.; Black & Veatch; Grambrell Urban, Inc.; and City of Seattle GIS Department. Prepared for City of Seattle Office of Economic Development and King County Office of Budget and Strategic Planning. April.

Duwamish Coalition. 1998b. Shallow groundwater use designation document. Prepared for City of Seattle Office of Economic Development and King County Office of Budget and Strategic Planning. April 16.

Ecology. 2006a. CLARC. Cleanup levels and risk calculations. https://fortress.wa.gov/ecy/clarc/CLARCHome.aspx (January 17, 2006).

Ecology. 2006b. Electronic mail (re model for Precision Engineering) to A. Clary, Maul Foster & Alongi, Inc. from M. Adams, Washington State Department of Ecology. March 27.

Ecology. 2006c. Letter (re opinion under WAC 173-340-515(5) on remedial action(s) for the following hazardous waste site: Name: Precision Engineering, Address: 1231 South Director Street, Seattle, WA 98108, Facility/Site No.: 2056, VCP No.: NW1511) to J. Okel, Precision Engineering, from M. Adams, Washington State Department of Ecology. March 27.

Ecology. 2007a. Electronic mail (re work plan for ditch excavation, former Precision Engineering site) to A. Clary, Maul Foster & Alongi, Inc. from M. Adams, Washington State Department of Ecology. August 2.

Ecology. 2007b. Evaluating the Toxicity and Assessing the Carcinogenic Risk of Environmental Mixtures Using Toxicity Equivalency Factors. October 12. https://fortress.wa.gov/ecy/clarc/FocusSheets/tef.pdf

Environmental Associates, Inc. 1992. Phase 1 environmental audit, industrial building, 1231 South Director Street, Seattle, Washington. Rev. 1. Prepared for Precision Engineering, Inc. Environmental Associates, Inc., Bellevue, Washington. October 12.

MDNR. 2005. Missouri risk-based corrective action (MRBCA) for petroleum storage tanks. Missouri Department of Natural Resources. http://dnr.missouri.gov/alpd/hwp/tanks/docs/soil-gas-protocol-2005-04-21.pdf. April 21.

MFA. 2005a. Preliminary soil and groundwater assessment report. Prepared for Precision Engineering, Inc. Maul Foster & Alongi, Inc., Vancouver, Washington. August 5.

MFA. 2005b. Work plan for soil and groundwater supplemental remedial investigation. Prepared for Precision Engineering, Inc. Maul Foster & Alongi, Inc., Vancouver, Washington. November 23.

MFA. 2006a. Supplemental remedial investigation, Precision Engineering, Seattle. Prepared for Stoel Rives, LLP. Maul Foster & Alongi, Inc., Vancouver, Washington. February 22.

MFA. 2006b. Remedial investigation and risk assessment, Precision Engineering, Seattle. Prepared for Stoel Rives, LLP. Maul Foster & Alongi, Inc., Vancouver, Washington. July 17.

MFA. 2007. Sediment removal work plan, Precision Engineering, Seattle. Prepared for M. Adams, Washington State Department of Ecology. Maul Foster & Alongi, Inc., Vancouver, Washington. July 30.

Neely, J. 2002. Personal interview by A. Clary, Maul Foster & Alongi, Inc., Vancouver, Washington, and P. Logan, Stoel Rives, LLP, Portland, Oregon. June 16.

NJDEP. 2005. Vapor intrusion guidance. New Jersey Department of Environmental Protection. http://www.nj.gov/dep/srp/guidance/vaporintrusion/vig_main.pdf. October.

Pioneer. 2008. Vapor intrusion mitigation system installation & long-term monitoring work plan. Pioneer Technologies Corporation. February.

Precision. 1993. Independent remedial action report. Final. Prepared for Washington State Department of Ecology. Precision Engineering, Inc., Seattle, Washington. July 21.

Sweet-Edwards/EMCON. 1990. Sediment sampling, Precision Engineering, Inc., Seattle, Washington. Prepared for Washington State Department of Ecology. Sweet-Edwards/EMCON, Inc., Bothell, Washington. February 26.

USEPA. 1989. Risk assessment guidance for Superfund. Vol. 1, human health evaluation manual (part A), interim final. EPA/540/1-89/002. U.S. Environmental Protection Agency, Office of Emergency and Remedial Response. December.

USEPA. 1996. Technical background document for soil screening guidance. Publication EPA/540/R-95/128. U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response. May.

USEPA. 2001. Supplemental guidance for developing soil screening levels for superfund sites. Peer review draft. U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response. March.

USEPA. 2002. Biochlor version 2.2, natural attenuation decision support system. U.S. Environmental Protection Agency. http://www.epa.gov/ada/csmos/models/biochlor.html. March.

USEPA. 2004a. User's guide for evaluating subsurface vapor intrusion into buildings. U.S. Environmental Protection Agency, Office of Emergency and Remedial Response. February 22.

USEPA. 2004b. Risk assessment guidance for Superfund. Vol. 1, human health evaluation manual (part E, supplemental guidance for dermal risk assessment). Final. EPA/540/R/99/005. U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, Washington, DC. July.

USEPA. Undated. Standard operating procedure for installation of sub-slab vapor probes and sampling using USEPA Method TO-15 to support vapor intrusion investigations. U.S. Environmental Protection Agency.

USGS. 2007. Real-time water data for USGS 12113350 Green River at Tukwila, WA. Water resources. National water information system: Web interface. http://waterdata.usgs.gov/wa/nwis/uv/?site_no=12113350&PARAmeter_cd=00060,00065.

TABLES

Table Notes
Precision Engineering, Inc.
Seattle, Washington

Bold indicates concentrations that exceed one or more of the relevant CULs.

= Criteria highlighted in gray are included in the tables, however are not applicable at the Property and are therefore not screened against.

-- = not analyzed.

ARAR = applicable or relevant and appropriate requirement.

AWQC = ambient water quality criteria.

bgs = below ground surface.

COPC = chemical of potential concern.

C_s = soil concentration.

CUL = cleanup level.

CUL_c = Cleanup level based on cancer effects.

CUL_{nc} = Cleanup level based on noncancer effects.

°C = degrees Celsius.

DET = detected using Northwest Total Petroleum Hydrocarbon identification scan.

ELCR = excess lifetime cancer risk ($ELCR = C_s*10^{-5}/CUL_c$).

ft = feet.

> Max = greater than 100,000.

>S = greater than saturation.

HQ = hazard quotient ($HQ=C_s/CUL_{nc}$).

IHS = indicator hazardous substance.

J = estimated concentration.

mg/kg = milligrams per kilogram.

mg/L = milligrams per liter.

MPE = measuring point elevation.

MTCA = Washington Department of Ecology's Model Toxics Control Act.

µg/kg = micrograms per kilogram.

µg/L = micrograms per liter.

µg/m^3 = micgrograms per cubic meter.

µS/cm = microsiemens per centimeter.

NA = not available.

NC = not calculated.

ND = not detected using Northwest Total Petroleum Hydrocarbon identification scan.

NGVD = National Geodetic Vertical Datum 1929.

NR = MTCA reported the CUL as not researched.

NTUs = nephelometric turbidity units.

NV = no value.

TEF = Toxixity Equivalency Factors

U = not detected at or above the method reporting limit.

[a]Trivalent chromium concentrations were calculated by subtracting the hexavalent chromium value from the total chromium value. If hexavalent chromium was not

Table 1
Water-Level Elevations
Precision Engineering, Inc.
Seattle, Washington

Location	Date	Measuring-Point Elevation (MPE) (ft NGVD)	Depth to Water (ft bgs)	Water-Level Elevation (ft NGVD)
MW-1	12/27/2005	23.16	2.03	21.13
	4/17/2006	23.16	0.61	22.55
	6/8/2006	23.16	1.57	21.59
MW-2	12/27/2005	18.86	4.82	14.04
	4/17/2006	18.86	4.65	14.21
	6/8/2006	18.86	4.64	14.22
MW-3	12/27/2005	19.51	5.48	14.03
	4/17/2006	19.51	5.79	13.72
	6/8/2006	19.51	5.93	14.61
MW-4	12/27/2005	20.54	5.77	14.77
	4/17/2006	20.54	5.55	14.99
	6/8/2006	20.54	5.61	14.93
MW-5	12/27/2005	19.86	5.52	14.34
	4/17/2006	19.86	5.32	14.54
	6/8/2006	19.86	5.29	14.57
MW-6	12/27/2005	17.99	4.70	13.29
	4/17/2006	17.99	4.27	13.72
	6/8/2006	17.99	4.10	13.89
MW-7	12/27/2005	17.84	5.77	12.07
	4/17/2006	17.84	4.64	13.20
	6/8/2006	17.84	5.17	12.67
MW-8	12/27/2005	17.35	3.32	14.03
	4/17/2006	17.35	3.12	14.23
	6/8/2006	17.35	3.33	14.02
Staff Gauge	12/27/2005	19.61 ft NGVD @ 8.00	Dry	Dry
	4/17/2006	19.61 ft NGVD @ 8.00	Dry	Dry
	6/8/2006	19.61 ft NGVD @ 8.00	0.02	19.63

Table 2
Indoor-Air Temperature and Pressure Readings
Precision Engineering, Inc.
Seattle, Washington

Sample	Initial Readings			Four-Hour Readings			Eight-Hour Readings		
	Time	Temperature (°C)	Atmospheric Pressure (inches of mercury)	Time	Temperature (°C)	Atmospheric Pressure (inches of mercury)	Time	Temperature (°C)	Atmospheric Pressure (inches of mercury)
IA1	7:46	20.8	30.03	11:43	21.7	30.00	15:46	23.8	30.00
IA2	7:49	20.9	30.03	11:42	21.7	30.00	15:49	23.9	30.00
IA3	7:50	20.9	30.03	11:44	22.0	30.00	15:50	24.0	30.00
IA4	7:53	21.0	30.03	11:48	22.2	30.00	15:53	24.0	30.00
IA5	7:57	21.1	30.03	11:49	22.3	30.00	15:57	23.8	30.00
IA6	7:55	21.1	30.03	11:51	22.5	30.00	15:55	23.9	30.00
IA7	7:42	20.4	30.03	11:37	21.3	30.00	15:45	22.9	30.00
IA8	7:53	21.0	30.03	11:48	22.2	30.00	15:53	24.0	30.00

Table 3
Chromium in Soil (mg/kg)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Depth (ft bgs)	Chromium	Chromium (Hexavalent)	Chromium (Trivalent)[a]
On-Site Geoprobe Sampling						
GP1	GP1-S-1.5	6/7/2005	1.5	205	152	53
	GP1-S-6.0	6/7/2005	6	147	31.8	115.2
	GP1-S-10.0	6/9/2005	10	73.5	14.4	59.1
GP2	GP2-S-1.0	6/7/2005	1	2680	523	2157
	GP2-S-10.0	6/9/2005	10	24.9	0.109 U	24.9
GP3	GP3-S-2.0	6/9/2005	2	915	27.7	887.3
	GP3-S-6.0	6/9/2005	6	1100	49.8	1050.2
	GP3-S-14	6/9/2005	14	941	34.4	906.6
GP4	GP4-S-1.5	6/16/2005	1.5	1230	53.4	1176.6
GP5	GP5-S-1.5	6/16/2005	1.5	18.9	0.111 U	18.9
	GP5-S-14.0	6/16/2005	14	20.1	0.115 U	20.1
GP6	GP6-S-1.0	6/16/2005	1	584	627	NC
	GP6-S-14.5	6/16/2005	14.5	259	0.181	258.819
GP7	GP7-S-2.0	6/16/2005	2	23.6	0.119	23.481
	GP7-S-8.0	6/16/2005	8	21	0.113 U	21
GP8	GP8-S-1.5	6/16/2005	1.5	22.2	0.661	21.539
GP9	GP9-S-2.0	6/17/2005	2	43.3	2.97	40.33
GP10	GP10-S-1.5	6/17/2005	1.5	21.8	0.142	21.658
	GP10-S-13.5	6/17/2005	13.5	24.1	0.106 U	24.1
GP11	GP11-S-2.0	6/17/2005	2	21.7	0.573	21.127
	GP11-S-6.5	6/17/2005	6.5	17.3	0.37	16.93
GP12	GP12-S-3.0	12/13/2005	3	24.3	1.1 UJ	24.3
	GP12-S-5.0	12/13/2005	5	25.2	1.0 UJ	25.2
GP13	GP13-S-1.0	12/14/2005	1	26.6	1.4 UJ	26.6
	GP13-S-6.0	12/14/2005	6	46.6	1.3 UJ	46.6
GP14	GP14-S-3.0	12/13/2005	3	24.8	2.0 UJ	24.8
	GP14-S-6.0	12/13/2005	6	31.4	1.2 J	30.2
GP15	GP15-S-3.0	12/13/2005	3	24.7	1.2 UJ	24.7
	GP15-S-6.0	12/13/2005	6	20.2	1.2 UJ	20.2
GP16	GP16-S-1.0	12/13/2005	1	30.0	2.1 UJ	30.0
	GP16-S-5.0	12/13/2005	5	26.2	2.1 UJ	26.2
GP17	GP17-S-1.0	12/13/2005	1	254	1.7 UJ	254
	GP17-S-6.0	12/13/2005	6	1660	60 J	1600
GP18	GP18-S-1.0	12/13/2005	1	4430	2300 J	2130
GP19	GP19-S-1.0	12/13/2005	1	22.0	2.5 UJ	22.0
	GP19-S-1.0-Dup	12/13/2005	1	24.8	2.0 UJ	24.8
	GP19-S-7.0	12/13/2005	7	27.1	2.7 UJ	27.1
GP20	GP20-S-1.0	12/14/2005	1	17.6	1.1 UJ	17.6
	GP20-S-6.0	12/14/2005	6	24.5	1.5 UJ	24.5
GP21	GP21-S-1.0	12/14/2005	1	25.6	1.0 UJ	25.6
	GP21-S-6.5	12/14/2005	6.5	23.0	1.3 UJ	23.0
GP22	GP22-S-1.0	12/13/2005	1	46.8	2.9 J	43.9
	GP22-S-10.0	12/13/2005	10	32.1	1.3 UJ	32.1
GP23	GP23-S-7.0	12/14/2005	7	23.3	1.1 UJ	23.3
	GP23-S-10.5	12/14/2005	10.5	979	1.2 UJ	979
GP24	GP24-S-3.0	12/14/2005	3	30.2	1.0 UJ	30.2
	GP24-S-3.0-Dup	12/14/2005	3	26.2	1.1 UJ	26.2
	GP24-S-6.5	12/14/2005	6.5	29.3	2.4 UJ	29.3

Table 3
Chromium in Soil (mg/kg)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Depth (ft bgs)	Chromium	Chromium (Hexavalent)	Chromium (Trivalent)[a]
On-Site Geoprobe Sampling						
GP25	GP25-S-1.0	12/12/2005	1	19.3	1.8 UJ	19.3
	GP25-S-7.0	12/12/2005	7	19.8	1.7 UJ	19.8
GP26	GP26-S-1.0	12/12/2005	1	23.7	2.2 UJ	23.7
	GP26-S-9.5	12/12/2005	9.5	24.0	2.1 UJ	24.0
GP27	GP27-S-1.0	12/12/2005	1	22.0	2.2 UJ	22.0
	GP27-S-13.0	12/12/2005	13	18.6	2.1 UJ	18.6
GP28	GP28-S-1.0	12/12/2005	1	20.5	2.2 UJ	20.5
	GP28-S-7.0	12/12/2005	7	22.4	1.8 UJ	22.4
GP29	GP29-S-1.0	12/12/2005	1	29.6	2.4 UJ	29.6
	GP29-S-6.0	12/12/2005	6	31.9	2.6 UJ	31.9
GP30	GP30-S-1.0	12/12/2005	1	27.2	2.1 UJ	27.2
	GP30-S-6.0	12/12/2005	6	32.7	2.4 UJ	32.7
GP31	GP31-S-1.0	12/12/2005	1	19.2	2.1 UJ	19.2
	GP31-S-6.0	12/12/2005	6	23.6	3.0 UJ	23.6
GP32	GP32-S-1.0	12/14/2005	1	6750	3500 J	3250
Off-Site Hand-Auger Sampling						
HA1	HA1-0.5	12/15/2005	0.5	34.3	2.9 UJ	34.3
	HA1-1.5	12/15/2005	1.5	110	6.5 J	103.5
	HA1-1.5-Dup	12/15/2005	1.5	84.5	2.8 UJ	84.5
HA2	HA2-0.5	12/15/2005	0.5	206	89 J	117
	HA2-1.5	12/15/2005	1.5	215	3.2 J	211.8
HA3	HA3-0.5	12/15/2005	0.5	1590	2.6 UJ	1590
	HA3-1.5	12/15/2005	1.5	55.2	2.4 UJ	55.2
HA4	HA4-0.5	12/15/2005	0.5	8480	7.2 UJ	8480
	HA4-1.5	12/15/2005	1.5	280	3.0 UJ	280
HA5	HA5-0.5	12/15/2005	0.5	155	5.8 UJ	155
	HA5-1.5	12/15/2005	1.5	32.7	2.9 UJ	32.7
HA6	HA6-0.5	04/18/2006	0.5	--	3.33 J	NC
HA7	HA7-0.5	04/18/2006	0.5	--	0.22 J	NC
HA8	HA8-0.5	04/18/2006	0.5	--	0.26 J	NC
HA9	HA9-0.5	04/19/2006	0.5	--	3.4 J	NC
HA10	HA10.05	04/19/2006	0.5	--	0.074 J	NC
HA11	HA11-0.5	04/19/2006	0.5	--	0.45 J	NC

Table 4
Metals in Soil (mg/kg)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Depth (ft bgs)	Antimony	Arsenic	Beryllium	Cadmium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
On-Site Geoprobe Sampling															
GP12	GP12-S-3.0	12/13/2005	3	1.77 U	2.79	0.591 U	0.591 U	17.6	2.45	0.131 U	25.6	0.591 U	0.591 U	0.591 U	32.9
GP13	GP13-S-1.0	12/14/2005	1	1.78 U	9.45	0.593 U	1.29	29.0	21.1	0.168 U	21.8	0.593 U	0.593 U	0.593 U	84.9
GP14	GP14-S-3.0	12/13/2005	3	1.83 U	3.00	0.609 U	0.609 U	14.4	2.20	0.120 U	32.9	0.609 U	0.609 U	0.609 U	38.4
GP15	GP15-S-3.0	12/13/2005	3	1.59 U	7.76	0.529 U	0.714	30.4	18.7	0.154 U	16.4	0.529 U	0.529 U	0.529 U	71.6
GP18	GP18-S-1.0	12/13/2005	1	1.84 U	3.55	0.615 U	0.615 U	113	26.3	1.10	23.1	0.615 U	0.615 U	0.615 U	40.9
GP20	GP20-S-1.0	12/14/2005	1	1.78 U	5.47	0.592 U	0.592 U	29.4	10.1	0.152 U	13.0	0.592 U	0.592 U	0.592 U	49.3
GP24	GP24-S-3.0	12/14/2005	3	1.63 U	3.06	0.542 U	0.542 U	16.5	3.09	0.115 U	28.5	0.542 U	0.542 U	0.542 U	44.3
	GP24-S-3.0-Dup	12/14/2005	3	1.60 U	3.64	0.532 U	0.532 U	14.3	3.33	0.107 U	25.3	0.532 U	0.532 U	0.532 U	50.4
GP28	GP28-S-1.0	12/12/2005	1	1.63 U	1.89	0.542 U	0.542 U	12.6	1.54	0.144 U	22.5	0.542 U	0.542 U	0.542 U	24.9
GP29	GP29-S-1.0	12/12/2005	1	1.73 U	5.91	0.577 U	0.577 U	15.6	18.0	0.876	27.0	0.577 U	0.577 U	0.577 U	36.9
GP31	GP31-S-1.0	12/12/2005	1	1.65 U	5.72	0.549 U	0.549 U	40.2	14.2	0.131 U	14.4	0.549 U	0.549 U	0.549 U	46.1
Off-Site Hand-Auger Sampling															
HA1	HA1-0.5	12/15/2005	0.5	1.73 U	3.81	0.576 U	0.576 U	32.8	34.6	0.132 U	21.3	0.576 U	0.576 U	0.576 U	140
	HA1-1.5	12/15/2005	1.5	1.65 U	2.88 J	0.550 U	0.550 U	16.2 J	15.3 J	0.328	24.7 J	0.550 U	0.550 U	0.550 U	70.8 J
	HA1-1.5-Dup	12/15/2005	1.5	2.12 U	8.35 J	0.707 U	0.707 U	68.4 J	95.3 J	0.364 U	108 J	0.707 U	0.707 U	0.707 U	293 J
HA2	HA2-0.5	12/15/2005	0.5	2.17 U	3.94	0.723 U	0.984	70.9	81.4	0.142 U	36.0	0.723 U	0.723 U	0.723 U	341
	HA2-1.5	12/15/2005	1.5	1.84 U	2.71	0.613 U	0.613 U	28.2	36.5	0.232	31.0	0.613 U	0.613 U	0.613 U	134
HA3	HA3-0.5	12/15/2005	0.5	1.94 U	53.9	0.648 U	2.53	528	545	2.65	98.4	0.648 U	0.648 U	0.648 U	433
	HA3-1.5	12/15/2005	1.5	1.76 U	6.96	0.585 U	0.585 U	16.4	8.41	0.109 U	30.8	0.585 U	0.585 U	0.585 U	46.2
HA4	HA4-0.5	12/15/2005	0.5	6.68	44.3	1.63 U	28.7	978	1710	2.28	99.7	1.63 U	1.63 U	1.63 U	2620
	HA4-1.5	12/15/2005	1.5	2.46 U	5.25	0.819 U	0.819 U	48.8	50.8	0.580 U	21.9	0.819 U	0.819 U	0.819 U	86.3
HA5	HA5-0.5	12/15/2005	0.5	3.56 U	35.9	1.19 U	3.13	129	1440	0.918	41.6	1.19 U	1.19 U	1.19 U	358
	HA5-1.5	12/15/2005	1.5	2.11 U	12.5	0.703 U	1.09	39.6	209	0.488 U	22.2	0.703 U	0.703 U	0.703 U	110
HA12	HA12-0.5	04/19/2006	0.5	--	9.0	--	0.48 J	39	220	--	--	--	--	--	--
HA17	HA17-S-0.5	1/9/2007	0.5	--	6.61	--	--	--	278	--	--	--	--	--	--
	HA17-S-1.5	1/9/2007	1.5	--	5.3	--	--	--	23.5	--	--	--	--	--	--
HA18	HA18-S-0.5	1/9/2007	0.5	--	5.03	--	--	--	61.5	--	--	--	--	--	--
	HA18-S-1.5	1/9/2007	1.5	--	2.12 U	--	--	--	2.12 U	--	--	--	--	--	--

Table 4
Metals in Soil (mg/kg)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Depth (ft bgs)	Antimony	Arsenic	Beryllium	Cadmium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
Off-Site Hand-Auger Sampling cont.															
HA19	HA19-S-0.5	1/9/2007	0.5	--	12.7	--	--	--	134	--	--	--	--	--	--
	HA19-S-1.5	1/9/2007	1.5	--	4.02	--	--	--	11.3	--	--	--	--	--	--
HA20	HA20-S-0.5	1/9/2007	0.5	--	2.02 U	--	--	--	27.9	--	--	--	--	--	--
	HA20-S-1.5	1/9/2007	1.5	--	1.81 U	--	--	--	8.91	--	--	--	--	--	--
HA21	HA21-S-0.5	1/10/2007	0.5	--	5.72	--	--	--	398	--	--	--	--	--	--
	HA21-S-1.5	1/10/2007	1.5	--	5.83	--	--	--	121	--	--	--	--	--	--
HA22	HA22-S-0.5	1/10/2007	0.5	--	53.5	--	--	--	986	--	--	--	--	--	--
	HA22-S-1.5	1/10/2007	1.5	--	10.3	--	--	--	32.4	--	--	--	--	--	--
HA23	HA23-S-0.5	1/10/2007	0.5	--	4.44	--	--	--	26.9	--	--	--	--	--	--
	HA23-S-1.5	1/10/2007	1.5	--	4.91	--	--	--	20.5	--	--	--	--	--	--
HA24	HA24-S-0.5	1/10/2007	0.5	--	4.9	--	--	--	63.9	--	--	--	--	--	--
	HA24-S-1.5	1/10/2007	1.5	--	5.23	--	--	--	24.3	--	--	--	--	--	--
HA25	HA25-S-0.5	1/10/2007	0.5	--	11.6	--	--	--	302	--	--	--	--	--	--
	HA25-S-1.5	1/10/2007	1.5	--	11.8	--	--	--	15.5	--	--	--	--	--	--

Table 5
Volatile Organic Compounds in Soil (µg/kg)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Depth (ft bgs)	1,1,1,2-Tetra-chloroethane	1,1,1-Trichloro-ethane	1,1,2,2-Tetra-chloroethane	1,1,2-Trichloro-ethane	1,1-Dichloro-ethane	1,1-Dichloro-ethene	1,1-Dichloro-propene
On-Site Geoprobe Sampling										
GP1	GP1-S-1.5	6/7/2005	1.5	0.839 U	0.839 U	0.839 U	0.839 U	0.839 U	0.839 U	0.839 U
	GP1-S-6.0	6/7/2005	6	1.12 U	1.12 U	1.12 U	1.12 U	1.12 U	1.12 U	1.12 U
	GP1-S-10.0	6/9/2005	10	38.2 U	7.65 U	7.65 U	38.2 U	38.2 U	7.65 U	38.2 U
GP2	GP2-S-1.0	6/7/2005	1	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U
	GP2-S-10.0	6/9/2005	10	44 U	8.81 U	8.81 U	44 U	44 U	8.81 U	44 U
GP3	GP3-S-2.0	6/9/2005	2	79.5 U	15.9 U	15.9 U	79.5 U	79.5 U	15.9 U	79.5 U
	GP3-S-6.0	6/9/2005	6	44.8 U	8.96 U	8.96 U	44.8 U	44.8 U	8.96 U	44.8 U
	GP3-S-14	6/9/2005	14	38.5 U	7.71 U	7.71 U	38.5 U	38.5 U	7.71 U	38.5 U
GP4	GP4-S-1.5	6/16/2005	1.5	51.7 U	10.3 U	10.3 U	51.7 U	51.7 U	10.3 U	51.7 U
GP5	GP5-S-1.5	6/16/2005	1.5	35.6 U	7.12 U	7.12 U	35.6 U	35.6 U	7.12 U	35.6 U
	GP5-S-8.0	6/16/2005	8	35.1 U	7.03 U	7.03 U	35.1 U	35.1 U	7.03 U	35.1 U
	GP5-S-14.0	6/16/2005	14	40.5 U	8.1 U	8.1 U	40.5 U	40.5 U	8.1 U	40.5 U
GP6	GP6-S-1.0	6/16/2005	1	42.5 U	8.5 U	8.5 U	42.5 U	42.5 U	8.5 U	42.5 U
	GP6-S-14.5	6/16/2005	14.5	41.4 U	8.28 U	8.28 U	41.4 U	41.4 U	8.28 U	41.4 U
GP7	GP7-S-2.0	6/16/2005	2	39 U	7.81 U	7.81 U	39 U	39 U	7.81 U	39 U
	GP7-S-8.0	6/16/2005	8	44.2 U	8.84 U	8.84 U	44.2 U	44.2 U	8.84 U	44.2 U
GP8	GP8-S-1.5	6/16/2005	1.5	49.3 U	9.86 U	9.86 U	49.3 U	49.3 U	9.86 U	49.3 U
GP9	GP9-S-2.0	6/17/2005	2	37.1 U	7.42 U	7.42 U	37.1 U	37.1 U	7.42 U	37.1 U
GP10	GP10-S-1.5	6/17/2005	1.5	55.8 U	11.2 U	11.2 U	55.8 U	55.8 U	23.7	55.8 U
	GP10-S-13.5	6/17/2005	13.5	39.8 U	7.96 U	7.96 U	39.8 U	39.8 U	7.96 U	39.8 U
GP11	GP11-S-2.0	6/17/2005	2	41.9 U	8.37 U	8.37 U	41.9 U	41.9 U	8.37 U	41.9 U
	GP11-S-6.5	6/17/2005	6.5	43 U	8.61 U	8.61 U	43 U	43 U	8.61 U	43 U
GP12	GP12-S-3.0	12/13/2005	3	--	--	--	--	--	--	--
	GP12-S-5.0	12/13/2005	5	--	--	--	--	--	--	--
GP13	GP13-S-1.0	12/14/2005	1	--	--	--	--	--	--	--
	GP13-S-6.0	12/14/2005	6	--	--	--	--	--	--	--
GP14	GP14-S-3.0	12/13/2005	3	--	--	--	--	--	--	--
	GP14-S-6.0	12/13/2005	6	--	--	--	--	--	--	--
GP15	GP15-S-3.0	12/13/2005	3	--	--	--	--	--	--	--
	GP15-S-6.0	12/13/2005	6	--	--	--	--	--	--	--

Table 5
Volatile Organic Compounds in Soil (µg/kg)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Depth (ft bgs)	1,1,1,2-Tetra-chloroethane	1,1,1-Trichloro-ethane	1,1,2,2-Tetra-chloroethane	1,1,2-Trichloro-ethane	1,1-Dichloro-ethane	1,1-Dichloro-ethene	1,1-Dichloro-propene
On-Site Geoprobe Sampling										
GP16	GP16-S-1.0	12/13/2005	1	--	--	--	--	--	--	--
	GP16-S-5.0	12/13/2005	5	--	--	--	--	--	--	--
GP17	GP17-S-1.0	12/13/2005	1	--	--	--	--	--	--	--
	GP17-S-6.0	12/13/2005	6	--	--	--	--	--	--	--
GP18	GP18-S-1.0	12/13/2005	1	--	--	--	--	--	--	--
GP19	GP19-S-1.0	12/13/2005	1	--	--	--	--	--	--	--
	GP19-S-1.0-Dup	12/13/2005	1	--	--	--	--	--	--	--
	GP19-S-7.0	12/13/2005	7	--	--	--	--	--	--	--
GP20	GP20-S-1.0	12/14/2005	1	--	--	--	--	--	--	--
	GP20-S-6.0	12/14/2005	6	--	--	--	--	--	--	--
GP21	GP21-S-1.0	12/14/2005	1	--	--	--	--	--	--	--
	GP21-S-6.5	12/14/2005	6.5	--	--	--	--	--	--	--
GP22	GP22-S-1.0	12/13/2005	1	--	--	--	--	--	--	--
	GP22-S-10.0	12/13/2005	10	--	--	--	--	--	--	--
GP23	GP23-S-7.0	12/14/2005	7	--	--	--	--	--	--	--
	GP23-S-10.5	12/14/2005	10.5	--	--	--	--	--	--	--
GP24	GP24-S-3.0	12/14/2005	3	--	--	--	--	--	--	--
	GP24-S-3.0-Dup	12/14/2005	3	--	--	--	--	--	--	--
	GP24-S-6.5	12/14/2005	6.5	--	--	--	--	--	--	--
GP25	GP25-S-1.0	12/12/2005	1	--	--	--	--	--	--	--
	GP25-S-7.0	12/12/2005	7	--	--	--	--	--	--	--
GP26	GP26-S-1.0	12/12/2005	1	--	--	--	--	--	--	--
	GP26-S-9.5	12/12/2005	9.5	--	--	--	--	--	--	--
GP27	GP27-S-1.0	12/12/2005	1	--	--	--	--	--	--	--
	GP27-S-13.0	12/12/2005	13	--	--	--	--	--	--	--
GP28	GP28-S-1.0	12/12/2005	1	--	--	--	--	--	--	--
	GP28-S-7.0	12/12/2005	7	--	--	--	--	--	--	--
GP29	GP29-S-1.0	12/12/2005	1	--	--	--	--	--	--	--
	GP29-S-6.0	12/12/2005	6	--	--	--	--	--	--	--

Table 5
Volatile Organic Compounds in Soil (µg/kg)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Depth (ft bgs)	1,1,1,2-Tetra-chloroethane	1,1,1-Trichloro-ethane	1,1,2,2-Tetra-chloroethane	1,1,2-Trichloro-ethane	1,1-Dichloro-ethane	1,1-Dichloro-ethene	1,1-Dichloro-propene
On-Site Geoprobe Sampling										
GP30	GP30-S-1.0	12/12/2005	1	--	--	--	--	--	--	--
	GP30-S-6.0	12/12/2005	6	--	--	--	--	--	--	--
GP31	GP31-S-1.0	12/12/2005	1	--	--	--	--	--	--	--
	GP31-S-6.0	12/12/2005	6	--	--	--	--	--	--	--
GP32	GP32-S-1.0	12/14/2005	1	--	--	--	--	--	--	--
Off-Site Hand-Auger Sampling										
HA1	HA1-0.5	12/15/2005	0.5	5.73 U	2.87 U	5.73 U	1.43 U	2.29 U	3.44 U	5.73 U
	HA1-1.5	12/15/2005	1.5	6.91 U	3.46 U	6.91 U	1.73 U	2.77 U	4.15 U	6.91 U
	HA1-1.5-Dup	12/15/2005	1.5	26.4 U	13.2 U	26.4 U	6.60 U	10.6 U	15.8 U	26.4 U
HA2	HA2-0.5	12/15/2005	0.5	7.30 U	3.65 U	7.30 U	1.83 U	2.92 U	4.38 U	7.30 U
	HA2-1.5	12/15/2005	1.5	4.61 U	2.30 U	4.61 U	1.15 U	1.84 U	2.77 U	4.61 U
HA3	HA3-0.5	12/15/2005	0.5	93.8 U	93.8 U	93.8 U	93.8 U	93.8 U	93.8 U	93.8 U
	HA3-1.5	12/15/2005	1.5	5.02 U	2.51 U	5.02 U	1.26 U	2.01 U	3.01 U	5.02 U
HA4	HA4-0.5	12/15/2005	0.5	73.9 U	37.0 U	73.9 U	18.5 U	29.6 U	44.4 U	73.9 U
	HA4-1.5	12/15/2005	1.5	6.12 U	3.06 U	6.12 U	1.53 U	2.45 U	3.67 U	6.12 U
HA5	HA5-0.5	12/15/2005	0.5	169 U	169 U	169 U	169 U	169 U	169 U	169 U
	HA5-1.5	12/15/2005	1.5	7.49 U	3.74 U	7.49 U	1.87 U	2.99 U	4.49 U	7.49 U

Table 5
Volatile Organic Compounds in Soil (µg/kg)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Depth (ft bgs)	1,2,3-Trichloro-benzene	1,2,3-Trichloro-propane	1,2,4-Tri-chlorobenzene	1,2,4-Tri-methylbenzene	1,2-Dibromo-3-chloropropane	1,2-Dibromo-ethane	1,2-Dichloro-benzene
On-Site Geoprobe Sampling										
GP1	GP1-S-1.5	6/7/2005	1.5	0.839 U	0.839 U	0.839 U	0.839 U	0.839 U	0.839 U	0.839 U
	GP1-S-6.0	6/7/2005	6	1.12 U	1.12 U	1.12 U	1.12 U	1.12 U	1.12 U	1.12 U
	GP1-S-10.0	6/9/2005	10	38.2 U	7.65 U	38.2 U	38.2 U	38.2 U	1.4 U	38.2 U
GP2	GP2-S-1.0	6/7/2005	1	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U
	GP2-S-10.0	6/9/2005	10	44 U	8.81 U	44 U	44 U	44 U	1.61 U	44 U
GP3	GP3-S-2.0	6/9/2005	2	79.5 U	15.9 U	79.5 U	79.5 U	79.5 U	2.91 U	79.5 U
	GP3-S-6.0	6/9/2005	6	44.8 U	8.96 U	44.8 U	44.8 U	44.8 U	1.64 U	44.8 U
	GP3-S-14	6/9/2005	14	38.5 U	7.71 U	38.5 U	38.5 U	38.5 U	1.41 U	38.5 U
GP4	GP4-S-1.5	6/16/2005	1.5	51.7 U	10.3 U	51.7 U	51.7 U	51.7 U	1.89 U	51.7 U
GP5	GP5-S-1.5	6/16/2005	1.5	35.6 U	7.12 U	35.6 U	35.6 U	35.6 U	1.3 U	35.6 U
	GP5-S-8.0	6/16/2005	8	35.1 U	7.03 U	35.1 U	35.1 U	35.1 U	1.29 U	35.1 U
	GP5-S-14.0	6/16/2005	14	40.5 U	8.1 U	40.5 U	40.5 U	40.5 U	1.48 U	40.5 U
GP6	GP6-S-1.0	6/16/2005	1	42.5 U	8.5 U	42.5 U	42.5 U	42.5 U	1.56 U	42.5 U
	GP6-S-14.5	6/16/2005	14.5	41.4 U	8.28 U	41.4 U	41.4 U	41.4 U	1.51 U	41.4 U
GP7	GP7-S-2.0	6/16/2005	2	39 U	7.81 U	39 U	39 U	39 U	1.43 U	39 U
	GP7-S-8.0	6/16/2005	8	44.2 U	8.84 U	44.2 U	44.2 U	44.2 U	1.62 U	44.2 U
GP8	GP8-S-1.5	6/16/2005	1.5	49.3 U	9.86 U	49.3 U	49.3 U	49.3 U	1.8 U	49.3 U
GP9	GP9-S-2.0	6/17/2005	2	37.1 U	7.42 U	37.1 U	37.1 U	37.1 U	1.36 U	37.1 U
GP10	GP10-S-1.5	6/17/2005	1.5	55.8 U	11.2 U	55.8 U	55.8 U	55.8 U	2.04 U	55.8 U
	GP10-S-13.5	6/17/2005	13.5	39.8 U	7.96 U	39.8 U	39.8 U	39.8 U	1.46 U	39.8 U
GP11	GP11-S-2.0	6/17/2005	2	41.9 U	8.37 U	41.9 U	41.9 U	41.9 U	1.53 U	41.9 U
	GP11-S-6.5	6/17/2005	6.5	43 U	8.61 U	43 U	43 U	43 U	1.58 U	43 U
GP12	GP12-S-3.0	12/13/2005	3	--	--	--	--	--	--	--
	GP12-S-5.0	12/13/2005	5	--	--	--	--	--	--	--
GP13	GP13-S-1.0	12/14/2005	1	--	--	--	--	--	--	--
	GP13-S-6.0	12/14/2005	6	--	--	--	--	--	--	--
GP14	GP14-S-3.0	12/13/2005	3	--	--	--	--	--	--	--
	GP14-S-6.0	12/13/2005	6	--	--	--	--	--	--	--
GP15	GP15-S-3.0	12/13/2005	3	--	--	--	--	--	--	--
	GP15-S-6.0	12/13/2005	6	--	--	--	--	--	--	--

Table 5
Volatile Organic Compounds in Soil (µg/kg)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Depth (ft bgs)	1,2,3-Trichloro-benzene	1,2,3-Trichloro-propane	1,2,4-Tri-chlorobenzene	1,2,4-Tri-methylbenzene	1,2-Dibromo-3-chloropropane	1,2-Dibromo-ethane	1,2-Dichloro-benzene
On-Site Geoprobe Sampling										
GP16	GP16-S-1.0	12/13/2005	1	--	--	--	--	--	--	--
	GP16-S-5.0	12/13/2005	5	--	--	--	--	--	--	--
GP17	GP17-S-1.0	12/13/2005	1	--	--	--	--	--	--	--
	GP17-S-6.0	12/13/2005	6	--	--	--	--	--	--	--
GP18	GP18-S-1.0	12/13/2005	1	--	--	--	--	--	--	--
GP19	GP19-S-1.0	12/13/2005	1	--	--	--	--	--	--	--
	GP19-S-1.0-Dup	12/13/2005	1	--	--	--	--	--	--	--
	GP19-S-7.0	12/13/2005	7	--	--	--	--	--	--	--
GP20	GP20-S-1.0	12/14/2005	1	--	--	--	--	--	--	--
	GP20-S-6.0	12/14/2005	6	--	--	--	--	--	--	--
GP21	GP21-S-1.0	12/14/2005	1	--	--	--	--	--	--	--
	GP21-S-6.5	12/14/2005	6.5	--	--	--	--	--	--	--
GP22	GP22-S-1.0	12/13/2005	1	--	--	--	--	--	--	--
	GP22-S-10.0	12/13/2005	10	--	--	--	--	--	--	--
GP23	GP23-S-7.0	12/14/2005	7	--	--	--	--	--	--	--
	GP23-S-10.5	12/14/2005	10.5		--	--	--	--	--	--
GP24	GP24-S-3.0	12/14/2005	3	--	--	--	--	--	--	--
	GP24-S-3.0-Dup	12/14/2005	3	--	--	--	--	--	--	--
	GP24-S-6.5	12/14/2005	6.5	--	--	--	--	--	--	--
GP25	GP25-S-1.0	12/12/2005	1	--	--	--	--	--	--	--
	GP25-S-7.0	12/12/2005	7	--	--	--	--	--	--	--
GP26	GP26-S-1.0	12/12/2005	1	--	--	--	--	--	--	--
	GP26-S-9.5	12/12/2005	9.5	--	--	--	--	--	--	--
GP27	GP27-S-1.0	12/12/2005	1	--	--	--	--	--	--	--
	GP27-S-13.0	12/12/2005	13	--	--	--	--	--	--	--
GP28	GP28-S-1.0	12/12/2005	1	--	--	--	--	--	--	--
	GP28-S-7.0	12/12/2005	7	--	--	--	--	--	--	--
GP29	GP29-S-1.0	12/12/2005	1	--	--	--	--	--	--	--
	GP29-S-6.0	12/12/2005	6	--	--	--	--	--	--	--

Table 5
Volatile Organic Compounds in Soil (µg/kg)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Depth (ft bgs)	1,2,3-Trichloro-benzene	1,2,3-Trichloro-propane	1,2,4-Tri-chlorobenzene	1,2,4-Tri-methylbenzene	1,2-Dibromo-3-chloropropane	1,2-Dibromo-ethane	1,2-Dichloro-benzene
On-Site Geoprobe Sampling										
GP30	GP30-S-1.0	12/12/2005	1	--	--	--	--	--	--	--
	GP30-S-6.0	12/12/2005	6	--	--	--	--	--	--	--
GP31	GP31-S-1.0	12/12/2005	1	--	--	--	--	--	--	--
	GP31-S-6.0	12/12/2005	6	--	--	--	--	--	--	--
GP32	GP32-S-1.0	12/14/2005	1	--	--	--	--	--	--	--
Off-Site Hand-Auger Sampling										
HA1	HA1-0.5	12/15/2005	0.5	5.73 U	5.73 U	5.73 U	5.73 U	11.5 U	5.73 U	5.73 U
	HA1-1.5	12/15/2005	1.5	6.91 U	6.91 U	6.91 U	6.91 U	13.8 U	6.91 U	6.91 U
	HA1-1.5-Dup	12/15/2005	1.5	26.4 U	26.4 U	26.4 U	26.4 U	52.8 U	26.4 U	26.4 U
HA2	HA2-0.5	12/15/2005	0.5	7.30 U	7.30 U	7.30 U	7.30 U	14.6 U	7.30 U	7.30 U
	HA2-1.5	12/15/2005	1.5	4.61 U	4.61 U	4.61 U	4.61 U	9.22 U	4.61 U	4.61 U
HA3	HA3-0.5	12/15/2005	0.5	93.8 U	93.8 U	93.8 U	93.8 U	469 U	93.8 U	93.8 U
	HA3-1.5	12/15/2005	1.5	5.02 U	5.02 U	5.02 U	5.02 U	10.0 U	5.02 U	5.02 U
HA4	HA4-0.5	12/15/2005	0.5	73.9 U	73.9 U	73.9 U	73.9 U	148 U	73.9 U	73.9 U
	HA4-1.5	12/15/2005	1.5	6.12 U	6.12 U	6.12 U	6.12 U	12.2 U	6.12 U	6.12 U
HA5	HA5-0.5	12/15/2005	0.5	169 U	169 U	169 U	169 U	844 U	169 U	169 U
	HA5-1.5	12/15/2005	1.5	7.49 U	7.49 U	7.49 U	7.49 U	15.0 U	7.49 U	7.49 U

Table 5
Volatile Organic Compounds in Soil (µg/kg)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Depth (ft bgs)	1,2-Dichloro-ethane	1,2-Dichloro-propane	1,3,5-Trimethyl-benzene	1,3-Dichloro-benzene	1,3-Dichloro-propane	1,4-Dichloro-benzene	2,2-Dichloro-propane
On-Site Geoprobe Sampling										
GP1	GP1-S-1.5	6/7/2005	1.5	0.839 U	0.839 U	0.839 U	0.839 U	0.839 U	0.839 U	0.839 U
	GP1-S-6.0	6/7/2005	6	1.12 U	1.12 U	1.12 U	1.12 U	1.12 U	1.12 U	1.12 U
	GP1-S-10.0	6/9/2005	10	7.65 U	7.65 U	7.65 U	38.2 U	7.65 U	38.2 U	38.2 U
GP2	GP2-S-1.0	6/7/2005	1	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U
	GP2-S-10.0	6/9/2005	10	8.81 U	8.81 U	8.81 U	44 U	8.81 U	44 U	44 U
GP3	GP3-S-2.0	6/9/2005	2	15.9 U	15.9 U	15.9 U	79.5 U	15.9 U	79.5 U	79.5 U
	GP3-S-6.0	6/9/2005	6	8.96 U	8.96 U	8.96 U	44.8 U	8.96 U	44.8 U	44.8 U
	GP3-S-14	6/9/2005	14	7.71 U	7.71 U	7.71 U	38.5 U	7.71 U	38.5 U	38.5 U
GP4	GP4-S-1.5	6/16/2005	1.5	10.3 U	10.3 U	10.3 U	51.7 U	10.3 U	51.7 U	51.7 U
GP5	GP5-S-1.5	6/16/2005	1.5	7.12 U	7.12 U	7.12 U	35.6 U	7.12 U	35.6 U	35.6 U
	GP5-S-8.0	6/16/2005	8	7.03 U	7.03 U	7.03 U	35.1 U	7.03 U	35.1 U	35.1 U
	GP5-S-14.0	6/16/2005	14	8.1 U	8.1 U	8.1 U	40.5 U	8.1 U	40.5 U	40.5 U
GP6	GP6-S-1.0	6/16/2005	1	8.5 U	8.5 U	8.5 U	42.5 U	8.5 U	42.5 U	42.5 U
	GP6-S-14.5	6/16/2005	14.5	8.28 U	8.28 U	8.28 U	41.4 U	8.28 U	41.4 U	41.4 U
GP7	GP7-S-2.0	6/16/2005	2	7.81 U	7.81 U	7.81 U	39 U	7.81 U	39 U	39 U
	GP7-S-8.0	6/16/2005	8	8.84 U	8.84 U	8.84 U	44.2 U	8.84 U	44.2 U	44.2 U
GP8	GP8-S-1.5	6/16/2005	1.5	9.86 U	9.86 U	9.86 U	49.3 U	9.86 U	49.3 U	49.3 U
GP9	GP9-S-2.0	6/17/2005	2	7.42 U	7.42 U	7.42 U	37.1 U	7.42 U	37.1 U	37.1 U
GP10	GP10-S-1.5	6/17/2005	1.5	11.2 U	11.2 U	11.2 U	55.8 U	11.2 U	55.8 U	55.8 U
	GP10-S-13.5	6/17/2005	13.5	7.96 U	7.96 U	7.96 U	39.8 U	7.96 U	39.8 U	39.8 U
GP11	GP11-S-2.0	6/17/2005	2	8.37 U	8.37 U	8.37 U	41.9 U	8.37 U	41.9 U	41.9 U
	GP11-S-6.5	6/17/2005	6.5	8.61 U	8.61 U	8.61 U	43 U	8.61 U	43 U	43 U
GP12	GP12-S-3.0	12/13/2005	3	--	--	--	--	--	--	--
	GP12-S-5.0	12/13/2005	5	--	--	--	--	--	--	--
GP13	GP13-S-1.0	12/14/2005	1	--	--	--	--	--	--	--
	GP13-S-6.0	12/14/2005	6	--	--	--	--	--	--	--
GP14	GP14-S-3.0	12/13/2005	3	--	--	--	--	--	--	--
	GP14-S-6.0	12/13/2005	6	--	--	--	--	--	--	--
GP15	GP15-S-3.0	12/13/2005	3	--	--	--	--	--	--	--
	GP15-S-6.0	12/13/2005	6	--	--	--	--	--	--	--

Table 5
Volatile Organic Compounds in Soil (µg/kg)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Depth (ft bgs)	1,2-Dichloro-ethane	1,2-Dichloro-propane	1,3,5-Trimethyl-benzene	1,3-Dichloro-benzene	1,3-Dichloro-propane	1,4-Dichloro-benzene	2,2-Dichloro-propane
On-Site Geoprobe Sampling										
GP16	GP16-S-1.0	12/13/2005	1	--	--	--	--	--	--	--
	GP16-S-5.0	12/13/2005	5	--	--	--	--	--	--	--
GP17	GP17-S-1.0	12/13/2005	1	--	--	--	--	--	--	--
	GP17-S-6.0	12/13/2005	6	--	--	--	--	--	--	--
GP18	GP18-S-1.0	12/13/2005	1	--	--	--	--	--	--	--
GP19	GP19-S-1.0	12/13/2005	1	--	--	--	--	--	--	--
	GP19-S-1.0-Dup	12/13/2005	1	--	--	--	--	--	--	--
	GP19-S-7.0	12/13/2005	7	--	--	--	--	--	--	--
GP20	GP20-S-1.0	12/14/2005	1	--	--	--	--	--	--	--
	GP20-S-6.0	12/14/2005	6	--	--	--	--	--	--	--
GP21	GP21-S-1.0	12/14/2005	1	--	--	--	--	--	--	--
	GP21-S-6.5	12/14/2005	6.5	--	--	--	--	--	--	--
GP22	GP22-S-1.0	12/13/2005	1	--	--	--	--	--	--	--
	GP22-S-10.0	12/13/2005	10	--	--	--	--	--	--	--
GP23	GP23-S-7.0	12/14/2005	7	--	--	--	--	--	--	--
	GP23-S-10.5	12/14/2005	10.5	--	--	--	--	--	--	--
GP24	GP24-S-3.0	12/14/2005	3	--	--	--	--	--	--	--
	GP24-S-3.0-Dup	12/14/2005	3	--	--	--	--	--	--	--
	GP24-S-6.5	12/14/2005	6.5	--	--	--	--	--	--	--
GP25	GP25-S-1.0	12/12/2005	1	--	--	--	--	--	--	--
	GP25-S-7.0	12/12/2005	7	--	--	--	--	--	--	--
GP26	GP26-S-1.0	12/12/2005	1	--	--	--	--	--	--	--
	GP26-S-9.5	12/12/2005	9.5	--	--	--	--	--	--	--
GP27	GP27-S-1.0	12/12/2005	1	--	--	--	--	--	--	--
	GP27-S-13.0	12/12/2005	13	--	--	--	--	--	--	--
GP28	GP28-S-1.0	12/12/2005	1	--	--	--	--	--	--	--
	GP28-S-7.0	12/12/2005	7	--	--	--	--	--	--	--
GP29	GP29-S-1.0	12/12/2005	1	--	--	--	--	--	--	--
	GP29-S-6.0	12/12/2005	6	--	--	--	--	--	--	--

Table 5
Volatile Organic Compounds in Soil (µg/kg)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Depth (ft bgs)	1,2-Dichloro-ethane	1,2-Dichloro-propane	1,3,5-Trimethyl-benzene	1,3-Dichloro-benzene	1,3-Dichloro-propane	1,4-Dichloro-benzene	2,2-Dichloro-propane
On-Site Geoprobe Sampling										
GP30	GP30-S-1.0	12/12/2005	1	--	--	--	--	--	--	--
	GP30-S-6.0	12/12/2005	6	--	--	--	--	--	--	--
GP31	GP31-S-1.0	12/12/2005	1	--	--	--	--	--	--	--
	GP31-S-6.0	12/12/2005	6	--	--	--	--	--	--	--
GP32	GP32-S-1.0	12/14/2005	1	--	--	--	--	--	--	--
Off-Site Hand-Auger Sampling										
HA1	HA1-0.5	12/15/2005	0.5	1.43 U	5.73 U	5.73 U	5.73 U	5.73 U	5.73 U	11.5 U
	HA1-1.5	12/15/2005	1.5	1.73 U	6.91 U	6.91 U	6.91 U	6.91 U	6.91 U	13.8 U
	HA1-1.5-Dup	12/15/2005	1.5	6.60 U	26.4 U	26.4 U	26.4 U	26.4 U	26.4 U	52.8 U
HA2	HA2-0.5	12/15/2005	0.5	1.83 U	7.30 U	7.30 U	7.30 U	7.30 U	7.30 U	14.6 U
	HA2-1.5	12/15/2005	1.5	1.15 U	4.61 U	4.61 U	4.61 U	4.61 U	4.61 U	9.22 U
HA3	HA3-0.5	12/15/2005	0.5	93.8 U	93.8 U	93.8 U	93.8 U	93.8 U	93.8 U	93.8 U
	HA3-1.5	12/15/2005	1.5	1.26 U	5.02 U	5.02 U	5.02 U	5.02 U	5.02 U	10.0 U
HA4	HA4-0.5	12/15/2005	0.5	18.5 U	73.9 U	73.9 U	73.9 U	73.9 U	73.9 U	148 U
	HA4-1.5	12/15/2005	1.5	1.53 U	6.12 U	6.12 U	6.12 U	6.12 U	6.12 U	12.2 U
HA5	HA5-0.5	12/15/2005	0.5	169 U	169 U	169 U	169 U	169 U	169 U	169 U
	HA5-1.5	12/15/2005	1.5	1.87 U	7.49 U	7.49 U	7.49 U	7.49 U	7.49 U	15.0 U

Table 5
Volatile Organic Compounds in Soil (µg/kg)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Depth (ft bgs)	2-Butanone	2-Chloro-toluene	4-Chloro-toluene	4-Isopropyl-toluene	4-Methyl-2-pentanone	Acetone	Benzene
On-Site Geoprobe Sampling										
GP1	GP1-S-1.5	6/7/2005	1.5	4.2 U	0.839 U	0.839 U	0.839 U	4.2 U	17.6	0.839 U
	GP1-S-6.0	6/7/2005	6	5.6 U	1.12 U	1.12 U	1.12 U	5.6 U	29.1	2.55
	GP1-S-10.0	6/9/2005	10	191 U	38.2 U	38.2 U	38.2 U	191 U	191 U	7.65 U
GP2	GP2-S-1.0	6/7/2005	1	4.8 U	0.96 U	0.96 U	0.96 U	4.8 U	13.4	0.96 U
	GP2-S-10.0	6/9/2005	10	220 U	44 U	44 U	44 U	220 U	220 U	8.81 U
GP3	GP3-S-2.0	6/9/2005	2	397 U	79.5 U	79.5 U	79.5 U	397 U	397 U	15.9 U
	GP3-S-6.0	6/9/2005	6	224 U	44.8 U	44.8 U	44.8 U	224 U	224 U	8.96 U
	GP3-S-14	6/9/2005	14	193 U	38.5 U	38.5 U	38.5 U	193 U	193 U	7.71 U
GP4	GP4-S-1.5	6/16/2005	1.5	259 U	51.7 U	51.7 U	51.7 U	259 U	259 U	10.3 U
GP5	GP5-S-1.5	6/16/2005	1.5	178 U	35.6 U	35.6 U	35.6 U	178 U	178 U	7.12 U
	GP5-S-8.0	6/16/2005	8	176 U	35.1 U	35.1 U	35.1 U	176 U	176 U	7.03 U
	GP5-S-14.0	6/16/2005	14	202 U	40.5 U	40.5 U	40.5 U	202 U	202 U	8.1 U
GP6	GP6-S-1.0	6/16/2005	1	213 U	42.5 U	42.5 U	42.5 U	213 U	213 U	8.5 U
	GP6-S-14.5	6/16/2005	14.5	207 U	41.4 U	41.4 U	41.4 U	207 U	207 U	8.28 U
GP7	GP7-S-2.0	6/16/2005	2	195 U	39 U	39 U	39 U	195 U	195 U	7.81 U
	GP7-S-8.0	6/16/2005	8	221 U	44.2 U	44.2 U	44.2 U	221 U	221 U	8.84 U
GP8	GP8-S-1.5	6/16/2005	1.5	246 U	49.3 U	49.3 U	49.3 U	246 U	246 U	9.86 U
GP9	GP9-S-2.0	6/17/2005	2	185 U	37.1 U	37.1 U	37.1 U	185 U	185 U	7.42 U
GP10	GP10-S-1.5	6/17/2005	1.5	279 U	55.8 U	55.8 U	55.8 U	279 U	279 U	11.2 U
	GP10-S-13.5	6/17/2005	13.5	199 U	39.8 U	39.8 U	39.8 U	199 U	199 U	7.96 U
GP11	GP11-S-2.0	6/17/2005	2	209 U	41.9 U	41.9 U	41.9 U	209 U	209 U	8.37 U
	GP11-S-6.5	6/17/2005	6.5	215 U	43 U	43 U	43 U	215 U	215 U	8.61 U
GP12	GP12-S-3.0	12/13/2005	3	14.3 U	--	--	--	--	--	--
	GP12-S-5.0	12/13/2005	5	13.6 U	--	--	--	--	--	--
GP13	GP13-S-1.0	12/14/2005	1	215	--	--	--	--	--	--
	GP13-S-6.0	12/14/2005	6	47.6	--	--	--	--	--	--
GP14	GP14-S-3.0	12/13/2005	3	14.7 U	--	--	--	--	--	--
	GP14-S-6.0	12/13/2005	6	15.7 U	--	--	--	--	--	--
GP15	GP15-S-3.0	12/13/2005	3	123	--	--	--	--	--	--
	GP15-S-6.0	12/13/2005	6	63.0 U	--	--	--	--	--	--

Table 5
Volatile Organic Compounds in Soil (µg/kg)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Depth (ft bgs)	2-Butanone	2-Chloro-toluene	4-Chloro-toluene	4-Isopropyl-toluene	4-Methyl-2-pentanone	Acetone	Benzene
On-Site Geoprobe Sampling										
GP16	GP16-S-1.0	12/13/2005	1	11.1 U	--	--	--	--	--	--
	GP16-S-5.0	12/13/2005	5	12.7 U	--	--	--	--	--	--
GP17	GP17-S-1.0	12/13/2005	1	29.5	--	--	--	--	--	--
	GP17-S-6.0	12/13/2005	6	22.3	--	--	--	--	--	--
GP18	GP18-S-1.0	12/13/2005	1	14.2 U	--	--	--	--	--	--
GP19	GP19-S-1.0	12/13/2005	1	60.1	--	--	--	--	--	--
	GP19-S-1.0-Dup	12/13/2005	1	37.5	--	--	--	--	--	--
	GP19-S-7.0	12/13/2005	7	16.3 U	--	--	--	--	--	--
GP20	GP20-S-1.0	12/14/2005	1	21.7	--	--	--	--	--	--
	GP20-S-6.0	12/14/2005	6	66.3	--	--	--	--	--	--
GP21	GP21-S-1.0	12/14/2005	1	13.1 U	--	--	--	--	--	--
	GP21-S-6.5	12/14/2005	6.5	66.7	--	--	--	--	--	--
GP22	GP22-S-1.0	12/13/2005	1	13.6 U	--	--	--	--	--	--
	GP22-S-10.0	12/13/2005	10	12.8	--	--	--	--	--	--
GP23	GP23-S-7.0	12/14/2005	7	10.8 U	--	--	--	--	--	--
	GP23-S-10.5	12/14/2005	10.5	13.6 U	--	--	--	--	--	--
GP24	GP24-S-3.0	12/14/2005	3	15.5 U	--	--	--	--	--	--
	GP24-S-3.0-Dup	12/14/2005	3	15.0 U	--	--	--	--	--	--
	GP24-S-6.5	12/14/2005	6.5	17.0 U	--	--	--	--	--	--
GP25	GP25-S-1.0	12/12/2005	1	12.8 U	--	--	--	--	--	--
	GP25-S-7.0	12/12/2005	7	14.8 U	--	--	--	--	--	--
GP26	GP26-S-1.0	12/12/2005	1	12.1 U	--	--	--	--	--	--
	GP26-S-9.5	12/12/2005	9.5	15.9 U	--	--	--	--	--	--
GP27	GP27-S-1.0	12/12/2005	1	13.2 U	--	--	--	--	--	--
	GP27-S-13.0	12/12/2005	13	12.3 U	--	--	--	--	--	--
GP28	GP28-S-1.0	12/12/2005	1	11.2 U	--	--	--	--	--	--
	GP28-S-7.0	12/12/2005	7	13.0 U	--	--	--	--	--	--
GP29	GP29-S-1.0	12/12/2005	1	14.8 U	--	--	--	--	--	--
	GP29-S-6.0	12/12/2005	6	14.6 U	--	--	--	--	--	--

Table 5
Volatile Organic Compounds in Soil (µg/kg)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Depth (ft bgs)	2-Butanone	2-Chloro-toluene	4-Chloro-toluene	4-Isopropyl-toluene	4-Methyl-2-pentanone	Acetone	Benzene
On-Site Geoprobe Sampling										
GP30	GP30-S-1.0	12/12/2005	1	16.9	--	--	--	--	--	--
	GP30-S-6.0	12/12/2005	6	52.6	--	--	--	--	--	--
GP31	GP31-S-1.0	12/12/2005	1	12.1 U	--	--	--	--	--	--
	GP31-S-6.0	12/12/2005	6	56.8	--	--	--	--	--	--
GP32	GP32-S-1.0	12/14/2005	1	14.2 U	--	--	--	--	--	--
Off-Site Hand-Auger Sampling										
HA1	HA1-0.5	12/15/2005	0.5	17.2 U	5.73 U	5.73 U	5.73 U	22.9 U	34.4 U	1.72 U
	HA1-1.5	12/15/2005	1.5	20.7 U	6.91 U	6.91 U	6.91 U	27.7 U	41.5 U	2.07 U
	HA1-1.5-Dup	12/15/2005	1.5	79.2 U	26.4 U	26.4 U	26.4 U	106 U	158 U	7.92 U
HA2	HA2-0.5	12/15/2005	0.5	21.9 U	7.30 U	7.30 U	7.30 U	29.2 U	43.8 U	2.19 U
	HA2-1.5	12/15/2005	1.5	13.8 U	4.61 U	4.61 U	4.61 U	18.4 U	27.7 U	1.38 U
HA3	HA3-0.5	12/15/2005	0.5	938 U	93.8 U	93.8 U	93.8 U	938 U	938 U	93.8 U
	HA3-1.5	12/15/2005	1.5	15.1 U	5.02 U	5.02 U	5.02 U	20.1 U	30.1 U	1.51 U
HA4	HA4-0.5	12/15/2005	0.5	222 U	73.9 U	73.9 U	73.9 U	296 U	444 U	22.2 U
	HA4-1.5	12/15/2005	1.5	18.4 U	6.12 U	6.12 U	6.12 U	24.5 U	36.7 U	1.84 U
HA5	HA5-0.5	12/15/2005	0.5	1690 U	169 U	169 U	169 U	1690 U	1690 U	169 U
	HA5-1.5	12/15/2005	1.5	27.2	7.49 U	7.49 U	7.49 U	29.9 U	80.3	2.25 U

Table 5
Volatile Organic Compounds in Soil (µg/kg)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Depth (ft bgs)	Bromo-benzene	Bromodichloro-methane	Bromo-form	Bromo-methane	Carbon Tetrachloride	Chloro-benzene	Chlorobromo-methane
On-Site Geoprobe Sampling										
GP1	GP1-S-1.5	6/7/2005	1.5	0.839 U	0.839 U	0.839 U	0.839 U	0.839 U	0.839 U	0.839 U
	GP1-S-6.0	6/7/2005	6	1.12 U	1.12 U	1.12 U	1.12 U	1.12 U	1.12 U	1.12 U
	GP1-S-10.0	6/9/2005	10	38.2 U	38.2 U	38.2 U	38.2 U	7.65 U	38.2 U	38.2 U
GP2	GP2-S-1.0	6/7/2005	1	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U
	GP2-S-10.0	6/9/2005	10	44 U	44 U	44 U	44 U	8.81 U	44 U	44 U
GP3	GP3-S-2.0	6/9/2005	2	79.5 U	79.5 U	79.5 U	79.5 U	15.9 U	79.5 U	79.5 U
	GP3-S-6.0	6/9/2005	6	44.8 U	44.8 U	44.8 U	44.8 U	8.96 U	44.8 U	44.8 U
	GP3-S-14	6/9/2005	14	38.5 U	38.5 U	38.5 U	38.5 U	7.71 U	38.5 U	38.5 U
GP4	GP4-S-1.5	6/16/2005	1.5	51.7 U	51.7 U	51.7 U	51.7 U	10.3 U	51.7 U	51.7 U
GP5	GP5-S-1.5	6/16/2005	1.5	35.6 U	35.6 U	35.6 U	35.6 U	7.12 U	35.6 U	35.6 U
	GP5-S-8.0	6/16/2005	8	35.1 U	35.1 U	35.1 U	35.1 U	7.03 U	35.1 U	35.1 U
	GP5-S-14.0	6/16/2005	14	40.5 U	40.5 U	40.5 U	40.5 U	8.1 U	40.5 U	40.5 U
GP6	GP6-S-1.0	6/16/2005	1	42.5 U	42.5 U	42.5 U	42.5 U	8.5 U	42.5 U	42.5 U
	GP6-S-14.5	6/16/2005	14.5	41.4 U	41.4 U	41.4 U	41.4 U	8.28 U	41.4 U	41.4 U
GP7	GP7-S-2.0	6/16/2005	2	39 U	39 U	39 U	39 U	7.81 U	39 U	39 U
	GP7-S-8.0	6/16/2005	8	44.2 U	44.2 U	44.2 U	44.2 U	8.84 U	44.2 U	44.2 U
GP8	GP8-S-1.5	6/16/2005	1.5	49.3 U	49.3 U	49.3 U	49.3 U	9.86 U	49.3 U	49.3 U
GP9	GP9-S-2.0	6/17/2005	2	37.1 U	37.1 U	37.1 U	37.1 U	7.42 U	37.1 U	37.1 U
GP10	GP10-S-1.5	6/17/2005	1.5	55.8 U	55.8 U	55.8 U	55.8 U	11.2 U	55.8 U	55.8 U
	GP10-S-13.5	6/17/2005	13.5	39.8 U	39.8 U	39.8 U	39.8 U	7.96 U	39.8 U	39.8 U
GP11	GP11-S-2.0	6/17/2005	2	41.9 U	41.9 U	41.9 U	41.9 U	8.37 U	41.9 U	41.9 U
	GP11-S-6.5	6/17/2005	6.5	43 U	43 U	43 U	43 U	8.61 U	43 U	43 U
GP12	GP12-S-3.0	12/13/2005	3	--	--	--	--	--	--	--
	GP12-S-5.0	12/13/2005	5	--	--	--	--	--	--	--
GP13	GP13-S-1.0	12/14/2005	1	--	--	--	--	--	--	--
	GP13-S-6.0	12/14/2005	6	--	--	--	--	--	--	--
GP14	GP14-S-3.0	12/13/2005	3	--	--	--	--	--	--	--
	GP14-S-6.0	12/13/2005	6	--	--	--	--	--	--	--
GP15	GP15-S-3.0	12/13/2005	3	--	--	--	--	--	--	--
	GP15-S-6.0	12/13/2005	6	--	--	--	--	--	--	--

Table 5
Volatile Organic Compounds in Soil (µg/kg)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Depth (ft bgs)	Bromo-benzene	Bromodichloro-methane	Bromo-form	Bromo-methane	Carbon Tetrachloride	Chloro-benzene	Chlorobromo-methane
On-Site Geoprobe Sampling										
GP16	GP16-S-1.0	12/13/2005	1	--	--	--	--	--	--	--
	GP16-S-5.0	12/13/2005	5	--	--	--	--	--	--	--
GP17	GP17-S-1.0	12/13/2005	1	--	--	--	--	--	--	--
	GP17-S-6.0	12/13/2005	6	--	--	--	--	--	--	--
GP18	GP18-S-1.0	12/13/2005	1	--	--	--	--	--	--	--
GP19	GP19-S-1.0	12/13/2005	1	--	--	--	--	--	--	--
	GP19-S-1.0-Dup	12/13/2005	1	--	--	--	--	--	--	--
	GP19-S-7.0	12/13/2005	7	--	--	--	--	--	--	--
GP20	GP20-S-1.0	12/14/2005	1	--	--	--	--	--	--	--
	GP20-S-6.0	12/14/2005	6	--	--	--	--	--	--	--
GP21	GP21-S-1.0	12/14/2005	1	--	--	--	--	--	--	--
	GP21-S-6.5	12/14/2005	6.5	--	--	--	--	--	--	--
GP22	GP22-S-1.0	12/13/2005	1	--	--	--	--	--	--	--
	GP22-S-10.0	12/13/2005	10	--	--	--	--	--	--	--
GP23	GP23-S-7.0	12/14/2005	7	--	--	--	--	--	--	--
	GP23-S-10.5	12/14/2005	10.5	--	--	--	--	--	--	--
GP24	GP24-S-3.0	12/14/2005	3	--	--	--	--	--	--	--
	GP24-S-3.0-Dup	12/14/2005	3	--	--	--	--	--	--	--
	GP24-S-6.5	12/14/2005	6.5	--	--	--	--	--	--	--
GP25	GP25-S-1.0	12/12/2005	1	--	--	--	--	--	--	--
	GP25-S-7.0	12/12/2005	7	--	--	--	--	--	--	--
GP26	GP26-S-1.0	12/12/2005	1	--	--	--	--	--	--	--
	GP26-S-9.5	12/12/2005	9.5	--	--	--	--	--	--	--
GP27	GP27-S-1.0	12/12/2005	1	--	--	--	--	--	--	--
	GP27-S-13.0	12/12/2005	13	--	--	--	--	--	--	--
GP28	GP28-S-1.0	12/12/2005	1	--	--	--	--	--	--	--
	GP28-S-7.0	12/12/2005	7	--	--	--	--	--	--	--
GP29	GP29-S-1.0	12/12/2005	1	--	--	--	--	--	--	--
	GP29-S-6.0	12/12/2005	6	--	--	--	--	--	--	--

Table 5
Volatile Organic Compounds in Soil (µg/kg)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Depth (ft bgs)	Bromo-benzene	Bromodichloro-methane	Bromo-form	Bromo-methane	Carbon Tetrachloride	Chloro-benzene	Chlorobromo-methane
On-Site Geoprobe Sampling										
GP30	GP30-S-1.0	12/12/2005	1	--	--	--	--	--	--	--
	GP30-S-6.0	12/12/2005	6	--	--	--	--	--	--	--
GP31	GP31-S-1.0	12/12/2005	1	--	--	--	--	--	--	--
	GP31-S-6.0	12/12/2005	6	--	--	--	--	--	--	--
GP32	GP32-S-1.0	12/14/2005	1	--	--	--	--	--	--	--
Off-Site Hand-Auger Sampling										
HA1	HA1-0.5	12/15/2005	0.5	5.73 U	5.73 U	5.73 U	11.5 U	5.73 U	2.29 U	5.73 U
	HA1-1.5	12/15/2005	1.5	6.91 U	6.91 U	6.91 U	13.8 U	6.91 U	2.77 U	6.91 U
	HA1-1.5-Dup	12/15/2005	1.5	26.4 U	26.4 U	26.4 U	52.8 U	26.4 U	10.6 U	26.4 U
HA2	HA2-0.5	12/15/2005	0.5	7.30 U	7.30 U	7.30 U	14.6 U	7.30 U	2.92 U	7.30 U
	HA2-1.5	12/15/2005	1.5	4.61 U	4.61 U	4.61 U	9.22 U	4.61 U	1.84 U	4.61 U
HA3	HA3-0.5	12/15/2005	0.5	93.8 U	93.8 U	93.8 U	93.8 U	93.8 U	93.8 U	93.8 U
	HA3-1.5	12/15/2005	1.5	5.02 U	5.02 U	5.02 U	10.0 U	5.02 U	2.01 U	5.02 U
HA4	HA4-0.5	12/15/2005	0.5	73.9 U	73.9 U	73.9 U	148 U	73.9 U	29.6 U	73.9 U
	HA4-1.5	12/15/2005	1.5	6.12 U	6.12 U	6.12 U	12.2 U	6.12 U	2.45 U	6.12 U
HA5	HA5-0.5	12/15/2005	0.5	169 U	169 U	169 U	169 U	169 U	169 U	169 U
	HA5-1.5	12/15/2005	1.5	7.49 U	7.49 U	7.49 U	15.0 U	7.49 U	2.99 U	7.49 U

Table 5
Volatile Organic Compounds in Soil (µg/kg)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Depth (ft bgs)	Chloro-ethane	Chloroform	Chloro-methane	cis-1,2-Dichloroethene	cis-1,3-Dichloro-propene	Dibromo-chloromethane	Dibromo-methane
On-Site Geoprobe Sampling										
GP1	GP1-S-1.5	6/7/2005	1.5	0.839 U	0.839 U	0.839 U	0.839 U	0.839 U	0.839 U	0.839 U
	GP1-S-6.0	6/7/2005	6	1.12 U	1.12 U	1.12 U	1.12 U	1.12 U	1.12 U	1.12 U
	GP1-S-10.0	6/9/2005	10	76.5 U	38.2 U	38.2 U	38.2 U	38.2 U	38.2 U	38.2 U
GP2	GP2-S-1.0	6/7/2005	1	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U
	GP2-S-10.0	6/9/2005	10	88.1 U	44 U	44 U	44 U	44 U	44 U	44 U
GP3	GP3-S-2.0	6/9/2005	2	159 U	79.5 U	79.5 U	79.5 U	79.5 U	79.5 U	79.5 U
	GP3-S-6.0	6/9/2005	6	89.6 U	44.8 U	44.8 U	44.8 U	44.8 U	44.8 U	44.8 U
	GP3-S-14	6/9/2005	14	77.1 U	38.5 U	38.5 U	38.5 U	38.5 U	38.5 U	38.5 U
GP4	GP4-S-1.5	6/16/2005	1.5	103 U	51.7 U	51.7 U	51.7 U	51.7 U	51.7 U	51.7 U
GP5	GP5-S-1.5	6/16/2005	1.5	71.2 U	35.6 U	35.6 U	35.6 U	35.6 U	35.6 U	35.6 U
	GP5-S-8.0	6/16/2005	8	70.3 U	35.1 U	35.1 U	35.1 U	35.1 U	35.1 U	35.1 U
	GP5-S-14.0	6/16/2005	14	81 U	40.5 U	40.5 U	40.5 U	40.5 U	40.5 U	40.5 U
GP6	GP6-S-1.0	6/16/2005	1	85 U	42.5 U	42.5 U	42.5 U	42.5 U	42.5 U	42.5 U
	GP6-S-14.5	6/16/2005	14.5	82.8 U	41.4 U	41.4 U	149	41.4 U	41.4 U	41.4 U
GP7	GP7-S-2.0	6/16/2005	2	78.1 U	39 U	39 U	39 U	39 U	39 U	39 U
	GP7-S-8.0	6/16/2005	8	88.4 U	44.2 U	44.2 U	44.2 U	44.2 U	44.2 U	44.2 U
GP8	GP8-S-1.5	6/16/2005	1.5	98.6 U	49.3 U	49.3 U	49.3 U	49.3 U	49.3 U	49.3 U
GP9	GP9-S-2.0	6/17/2005	2	74.2 U	37.1 U	37.1 U	37.1 U	37.1 U	37.1 U	37.1 U
GP10	GP10-S-1.5	6/17/2005	1.5	112 U	55.8 U	55.8 U	55.8 U	55.8 U	55.8 U	55.8 U
	GP10-S-13.5	6/17/2005	13.5	79.6 U	39.8 U	39.8 U	39.8 U	39.8 U	39.8 U	39.8 U
GP11	GP11-S-2.0	6/17/2005	2	83.7 U	41.9 U	41.9 U	41.9 U	41.9 U	41.9 U	41.9 U
	GP11-S-6.5	6/17/2005	6.5	86.1 U	43 U	43 U	78.8	43 U	43 U	43 U
GP12	GP12-S-3.0	12/13/2005	3	--	--	--	2.86 U	--	--	--
	GP12-S-5.0	12/13/2005	5	--	--	--	2.73 U	--	--	--
GP13	GP13-S-1.0	12/14/2005	1	--	--	--	11.9 U	--	--	--
	GP13-S-6.0	12/14/2005	6	--	--	--	3.47 U	--	--	--
GP14	GP14-S-3.0	12/13/2005	3	--	--	--	2.93 U	--	--	--
	GP14-S-6.0	12/13/2005	6	--	--	--	3.15 U	--	--	--
GP15	GP15-S-3.0	12/13/2005	3	--	--	--	3.26 U	--	--	--
	GP15-S-6.0	12/13/2005	6	--	--	--	12.6 U	--	--	--

Table 5
Volatile Organic Compounds in Soil (µg/kg)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Depth (ft bgs)	Chloro-ethane	Chloroform	Chloro-methane	cis-1,2-Dichloroethene	cis-1,3-Dichloro-propene	Dibromo-chloromethane	Dibromo-methane
On-Site Geoprobe Sampling										
GP16	GP16-S-1.0	12/13/2005	1	--	--	--	2.22 U	--	--	--
	GP16-S-5.0	12/13/2005	5	--	--	--	2.55 U	--	--	--
GP17	GP17-S-1.0	12/13/2005	1	--	--	--	2.51 U	--	--	--
	GP17-S-6.0	12/13/2005	6	--	--	--	2.72 U	--	--	--
GP18	GP18-S-1.0	12/13/2005	1	--	--	--	2.83 U	--	--	--
GP19	GP19-S-1.0	12/13/2005	1	--	--	--	3.20 U	--	--	--
	GP19-S-1.0-Dup	12/13/2005	1	--	--	--	2.88 U	--	--	--
	GP19-S-7.0	12/13/2005	7	--	--	--	3.26 U	--	--	--
GP20	GP20-S-1.0	12/14/2005	1	--	--	--	3.15 U	--	--	--
	GP20-S-6.0	12/14/2005	6	--	--	--	5.42 U	--	--	--
GP21	GP21-S-1.0	12/14/2005	1	--	--	--	2.61 U	--	--	--
	GP21-S-6.5	12/14/2005	6.5	--	--	--	3.35 U	--	--	--
GP22	GP22-S-1.0	12/13/2005	1	--	--	--	2.72 U	--	--	--
	GP22-S-10.0	12/13/2005	10	--	--	--	2.27 U	--	--	--
GP23	GP23-S-7.0	12/14/2005	7	--	--	--	2.16 U	--	--	--
	GP23-S-10.5	12/14/2005	10.5	--	--	--	2.72 U	--	--	--
GP24	GP24-S-3.0	12/14/2005	3	--	--	--	3.09 U	--	--	--
	GP24-S-3.0-Dup	12/14/2005	3	--	--	--	3.00 U	--	--	--
	GP24-S-6.5	12/14/2005	6.5	--	--	--	3.40 U	--	--	--
GP25	GP25-S-1.0	12/12/2005	1	--	--	--	2.56 U	--	--	--
	GP25-S-7.0	12/12/2005	7	--	--	--	2.97 U	--	--	--
GP26	GP26-S-1.0	12/12/2005	1	--	--	--	2.41 U	--	--	--
	GP26-S-9.5	12/12/2005	9.5	--	--	--	3.18 U	--	--	--
GP27	GP27-S-1.0	12/12/2005	1	--	--	--	2.63 U	--	--	--
	GP27-S-13.0	12/12/2005	13	--	--	--	2.45 U	--	--	--
GP28	GP28-S-1.0	12/12/2005	1	--	--	--	2.24 U	--	--	--
	GP28-S-7.0	12/12/2005	7	--	--	--	2.61 U	--	--	--
GP29	GP29-S-1.0	12/12/2005	1	--	--	--	4.94	--	--	--
	GP29-S-6.0	12/12/2005	6	--	--	--	9.96	--	--	--

Table 5
Volatile Organic Compounds in Soil (µg/kg)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Depth (ft bgs)	Chloro-ethane	Chloroform	Chloro-methane	cis-1,2-Dichloroethene	cis-1,3-Dichloro-propene	Dibromo-chloromethane	Dibromo-methane
On-Site Geoprobe Sampling										
GP30	GP30-S-1.0	12/12/2005	1	--	--	--	2.87 U	--	--	--
	GP30-S-6.0	12/12/2005	6	--	--	--	3.99 U	--	--	--
GP31	GP31-S-1.0	12/12/2005	1	--	--	--	2.42 U	--	--	--
	GP31-S-6.0	12/12/2005	6	--	--	--	4.09 U	--	--	--
GP32	GP32-S-1.0	12/14/2005	1	--	--	--	2.84 U	--	--	--
Off-Site Hand-Auger Sampling										
HA1	HA1-0.5	12/15/2005	0.5	5.73 U	2.87 U	11.5 U	3.44 U	5.73 U	5.73 U	5.73 U
	HA1-1.5	12/15/2005	1.5	6.91 U	3.46 U	13.8 U	4.15 U	6.91 U	6.91 U	6.91 U
	HA1-1.5-Dup	12/15/2005	1.5	26.4 U	13.2 U	52.8 U	15.8 U	26.4 U	26.4 U	26.4 U
HA2	HA2-0.5	12/15/2005	0.5	7.30 U	3.65 U	14.6 U	4.38 U	7.30 U	7.30 U	7.30 U
	HA2-1.5	12/15/2005	1.5	4.61 U	2.30 U	9.22 U	2.77 U	4.61 U	4.61 U	4.61 U
HA3	HA3-0.5	12/15/2005	0.5	93.8 U	93.8 U	469 U	93.8 U	93.8 U	93.8 U	93.8 U
	HA3-1.5	12/15/2005	1.5	5.02 U	2.51 U	10.0 U	3.01 U	5.02 U	5.02 U	5.02 U
HA4	HA4-0.5	12/15/2005	0.5	73.9 U	37.0 U	148 U	44.4 U	73.9 U	73.9 U	73.9 U
	HA4-1.5	12/15/2005	1.5	6.12 U	3.06 U	12.2 U	3.67 U	6.12 U	6.12 U	6.12 U
HA5	HA5-0.5	12/15/2005	0.5	169 U	169 U	844 U	169 U	169 U	169 U	169 U
	HA5-1.5	12/15/2005	1.5	7.49 U	3.74 U	15.0 U	4.49 U	7.49 U	7.49 U	7.49 U

Table 5
Volatile Organic Compounds in Soil (µg/kg)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Depth (ft bgs)	Dichloro-difluoromethane	Ethyl-benzene	Hexachloro-butadiene	Isopropyl-benzene	m,p-Xylene	Methylene chloride	Naphthalene
On-Site Geoprobe Sampling										
GP1	GP1-S-1.5	6/7/2005	1.5	0.839 U	0.839 U	0.839 U	0.839 U	1.68 U	0.839 U	0.839 U
	GP1-S-6.0	6/7/2005	6	1.12 U	1.12 U	1.12 U	1.12 U	2.24 U	1.12 U	1.12 U
	GP1-S-10.0	6/9/2005	10	38.2 U	38.2 U	38.2 U	38.2 U	76.5 U	7.65 U	38.2 U
GP2	GP2-S-1.0	6/7/2005	1	0.96 U	0.96 U	0.96 U	0.96 U	1.92 U	0.96 U	0.96 U
	GP2-S-10.0	6/9/2005	10	44 U	44 U	44 U	44 U	88.1 U	8.81 U	44 U
GP3	GP3-S-2.0	6/9/2005	2	79.5 U	79.5 U	79.5 U	79.5 U	159 U	15.9 U	79.5 U
	GP3-S-6.0	6/9/2005	6	44.8 U	44.8 U	44.8 U	44.8 U	89.6 U	8.96 U	44.8 U
	GP3-S-14	6/9/2005	14	38.5 U	38.5 U	38.5 U	38.5 U	77.1 U	7.71 U	38.5 U
GP4	GP4-S-1.5	6/16/2005	1.5	51.7 U	51.7 U	51.7 U	51.7 U	103 U	10.3 U	51.7 U
GP5	GP5-S-1.5	6/16/2005	1.5	35.6 U	35.6 U	35.6 U	35.6 U	71.2 U	7.12 U	35.6 U
	GP5-S-8.0	6/16/2005	8	35.1 U	35.1 U	35.1 U	35.1 U	70.3 U	7.03 U	35.1 U
	GP5-S-14.0	6/16/2005	14	40.5 U	40.5 U	40.5 U	40.5 U	81 U	8.1 U	40.5 U
GP6	GP6-S-1.0	6/16/2005	1	42.5 U	42.5 U	42.5 U	42.5 U	85 U	8.5 U	42.5 U
	GP6-S-14.5	6/16/2005	14.5	41.4 U	41.4 U	41.4 U	41.4 U	82.8 U	8.28 U	41.4 U
GP7	GP7-S-2.0	6/16/2005	2	39 U	39 U	39 U	39 U	78.1 U	7.81 U	39 U
	GP7-S-8.0	6/16/2005	8	44.2 U	44.2 U	44.2 U	44.2 U	88.4 U	8.84 U	44.2 U
GP8	GP8-S-1.5	6/16/2005	1.5	49.3 U	49.3 U	49.3 U	49.3 U	98.6 U	9.86 U	49.3 U
GP9	GP9-S-2.0	6/17/2005	2	37.1 U	37.1 U	37.1 U	37.1 U	74.2 U	7.42 U	37.1 U
GP10	GP10-S-1.5	6/17/2005	1.5	55.8 U	55.8 U	55.8 U	55.8 U	112 U	17.9	55.8 U
	GP10-S-13.5	6/17/2005	13.5	39.8 U	39.8 U	39.8 U	39.8 U	79.6 U	7.96 U	39.8 U
GP11	GP11-S-2.0	6/17/2005	2	41.9 U	41.9 U	41.9 U	41.9 U	83.7 U	8.37 U	41.9 U
	GP11-S-6.5	6/17/2005	6.5	43 U	43 U	43 U	43 U	86.1 U	8.61 U	43 U
GP12	GP12-S-3.0	12/13/2005	3	--	--	--	--	--	--	--
	GP12-S-5.0	12/13/2005	5	--	--	--	--	--	--	--
GP13	GP13-S-1.0	12/14/2005	1	--	--	--	--	--	--	--
	GP13-S-6.0	12/14/2005	6	--	--	--	--	--	--	--
GP14	GP14-S-3.0	12/13/2005	3	--	--	--	--	--	--	--
	GP14-S-6.0	12/13/2005	6	--	--	--	--	--	--	--
GP15	GP15-S-3.0	12/13/2005	3	--	--	--	--	--	--	--
	GP15-S-6.0	12/13/2005	6	--	--	--	--	--	--	--

Table 5
Volatile Organic Compounds in Soil (µg/kg)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Depth (ft bgs)	Dichloro-difluoromethane	Ethyl-benzene	Hexachloro-butadiene	Isopropyl-benzene	m,p-Xylene	Methylene chloride	Naphthalene
On-Site Geoprobe Sampling										
GP16	GP16-S-1.0	12/13/2005	1	--	--	--	--	--	--	--
	GP16-S-5.0	12/13/2005	5	--	--	--	--	--	--	--
GP17	GP17-S-1.0	12/13/2005	1	--	--	--	--	--	--	--
	GP17-S-6.0	12/13/2005	6	--	--	--	--	--	--	--
GP18	GP18-S-1.0	12/13/2005	1	--	--	--	--	--	--	--
GP19	GP19-S-1.0	12/13/2005	1	--	--	--	--	--	--	--
	GP19-S-1.0-Dup	12/13/2005	1	--	--	--	--	--	--	--
	GP19-S-7.0	12/13/2005	7	--	--	--	--	--	--	--
GP20	GP20-S-1.0	12/14/2005	1	--	--	--	--	--	--	--
	GP20-S-6.0	12/14/2005	6	--	--	--	--	--	--	--
GP21	GP21-S-1.0	12/14/2005	1	--	--	--	--	--	--	--
	GP21-S-6.5	12/14/2005	6.5	--	--	--	--	--	--	--
GP22	GP22-S-1.0	12/13/2005	1	--	--	--	--	--	--	--
	GP22-S-10.0	12/13/2005	10	--	--	--	--	--	--	--
GP23	GP23-S-7.0	12/14/2005	7	--	--	--	--	--	--	--
	GP23-S-10.5	12/14/2005	10.5	--	--	--	--	--	--	--
GP24	GP24-S-3.0	12/14/2005	3	--	--	--	--	--	--	--
	GP24-S-3.0-Dup	12/14/2005	3	--	--	--	--	--	--	--
	GP24-S-6.5	12/14/2005	6.5	--	--	--	--	--	--	--
GP25	GP25-S-1.0	12/12/2005	1	--	--	--	--	--	--	--
	GP25-S-7.0	12/12/2005	7	--	--	--	--	--	--	--
GP26	GP26-S-1.0	12/12/2005	1	--	--	--	--	--	--	--
	GP26-S-9.5	12/12/2005	9.5	--	--	--	--	--	--	--
GP27	GP27-S-1.0	12/12/2005	1	--	--	--	--	--	--	--
	GP27-S-13.0	12/12/2005	13	--	--	--	--	--	--	--
GP28	GP28-S-1.0	12/12/2005	1	--	--	--	--	--	--	--
	GP28-S-7.0	12/12/2005	7	--	--	--	--	--	--	--
GP29	GP29-S-1.0	12/12/2005	1	--	--	--	--	--	--	--
	GP29-S-6.0	12/12/2005	6	--	--	--	--	--	--	--

Table 5
Volatile Organic Compounds in Soil (µg/kg)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Depth (ft bgs)	Dichloro-difluoromethane	Ethyl-benzene	Hexachloro-butadiene	Isopropyl-benzene	m,p-Xylene	Methylene chloride	Naphthalene
On-Site Geoprobe Sampling										
GP30	GP30-S-1.0	12/12/2005	1	--	--	--	--	--	--	--
	GP30-S-6.0	12/12/2005	6	--	--	--	--	--	--	--
GP31	GP31-S-1.0	12/12/2005	1	--	--	--	--	--	--	--
	GP31-S-6.0	12/12/2005	6	--	--	--	--	--	--	--
GP32	GP32-S-1.0	12/14/2005	1	--	--	--	--	--	--	--
Off-Site Hand-Auger Sampling										
HA1	HA1-0.5	12/15/2005	0.5	5.73 U	4.58 U	5.73 U	5.73 U	--	4.01 U	5.73 U
	HA1-1.5	12/15/2005	1.5	6.91 U	5.53 U	6.91 U	6.91 U	--	4.84 U	6.91 U
	HA1-1.5-Dup	12/15/2005	1.5	26.4 U	21.1 U	26.4 U	26.4 U	--	18.5 U	26.4 U
HA2	HA2-0.5	12/15/2005	0.5	7.30 U	5.84 U	7.30 U	7.30 U	--	5.11 U	7.30 U
	HA2-1.5	12/15/2005	1.5	4.61 U	3.69 U	4.61 U	4.61 U	--	3.23 U	4.61 U
HA3	HA3-0.5	12/15/2005	0.5	93.8 U	93.8 U	93.8 U	93.8 U	--	938 U	93.8 U
	HA3-1.5	12/15/2005	1.5	5.02 U	4.02 U	5.02 U	5.02 U	--	3.51 U	5.02 U
HA4	HA4-0.5	12/15/2005	0.5	73.9 U	59.1 U	73.9 U	73.9 U	--	51.8 U	73.9 U
	HA4-1.5	12/15/2005	1.5	6.12 U	4.89 U	6.12 U	6.12 U	--	4.28 U	6.12 U
HA5	HA5-0.5	12/15/2005	0.5	169 U	169 U	169 U	169 U	--	1690 U	169 U
	HA5-1.5	12/15/2005	1.5	7.49 U	5.99 U	7.49 U	7.49 U	--	5.24 U	7.49 U

Table 5
Volatile Organic Compounds in Soil (µg/kg)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Depth (ft bgs)	n-Butyl-benzene	n-Propyl-benzene	o-Xylene	sec-Butyl-benzene	Styrene	tert-Butyl-benzene	Tetra-chloroethene
On-Site Geoprobe Sampling										
GP1	GP1-S-1.5	6/7/2005	1.5	0.839 U	0.839 U	0.839 U	0.839 U	0.839 U	0.839 U	0.839 U
	GP1-S-6.0	6/7/2005	6	1.12 U	1.12 U	1.12 U	1.12 U	1.12 U	1.12 U	1.12 U
	GP1-S-10.0	6/9/2005	10	38.2 U	38.2 U	38.2 U	38.2 U	38.2 U	38.2 U	7.65 U
GP2	GP2-S-1.0	6/7/2005	1	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U
	GP2-S-10.0	6/9/2005	10	44 U	44 U	44 U	44 U	44 U	44 U	8.81 U
GP3	GP3-S-2.0	6/9/2005	2	79.5 U	79.5 U	79.5 U	79.5 U	79.5 U	79.5 U	15.9 U
	GP3-S-6.0	6/9/2005	6	44.8 U	44.8 U	44.8 U	44.8 U	44.8 U	44.8 U	8.96 U
	GP3-S-14	6/9/2005	14	38.5 U	38.5 U	38.5 U	38.5 U	38.5 U	38.5 U	7.71 U
GP4	GP4-S-1.5	6/16/2005	1.5	51.7 U	51.7 U	51.7 U	51.7 U	51.7 U	51.7 U	10.3 U
GP5	GP5-S-1.5	6/16/2005	1.5	35.6 U	35.6 U	35.6 U	35.6 U	35.6 U	35.6 U	7.12 U
	GP5-S-8.0	6/16/2005	8	35.1 U	35.1 U	35.1 U	35.1 U	35.1 U	35.1 U	7.03 U
	GP5-S-14.0	6/16/2005	14	40.5 U	40.5 U	40.5 U	40.5 U	40.5 U	40.5 U	8.1 U
GP6	GP6-S-1.0	6/16/2005	1	42.5 U	42.5 U	42.5 U	42.5 U	42.5 U	42.5 U	8.5 U
	GP6-S-14.5	6/16/2005	14.5	41.4 U	41.4 U	41.4 U	41.4 U	41.4 U	41.4 U	8.28 U
GP7	GP7-S-2.0	6/16/2005	2	39 U	39 U	39 U	39 U	39 U	39 U	7.81 U
	GP7-S-8.0	6/16/2005	8	44.2 U	44.2 U	44.2 U	44.2 U	44.2 U	44.2 U	8.84 U
GP8	GP8-S-1.5	6/16/2005	1.5	49.3 U	49.3 U	49.3 U	49.3 U	49.3 U	49.3 U	9.86 U
GP9	GP9-S-2.0	6/17/2005	2	37.1 U	37.1 U	37.1 U	37.1 U	37.1 U	37.1 U	7.42 U
GP10	GP10-S-1.5	6/17/2005	1.5	55.8 U	55.8 U	55.8 U	55.8 U	55.8 U	55.8 U	11.2 U
	GP10-S-13.5	6/17/2005	13.5	39.8 U	39.8 U	39.8 U	39.8 U	39.8 U	39.8 U	7.96 U
GP11	GP11-S-2.0	6/17/2005	2	41.9 U	41.9 U	41.9 U	41.9 U	41.9 U	41.9 U	8.37 U
	GP11-S-6.5	6/17/2005	6.5	43 U	43 U	43 U	43 U	43 U	43 U	8.61 U
GP12	GP12-S-3.0	12/13/2005	3	--	--	--	--	--	--	--
	GP12-S-5.0	12/13/2005	5	--	--	--	--	--	--	--
GP13	GP13-S-1.0	12/14/2005	1	--	--	--	--	--	--	--
	GP13-S-6.0	12/14/2005	6	--	--	--	--	--	--	--
GP14	GP14-S-3.0	12/13/2005	3	--	--	--	--	--	--	--
	GP14-S-6.0	12/13/2005	6	--	--	--	--	--	--	--
GP15	GP15-S-3.0	12/13/2005	3	--	--	--	--	--	--	--
	GP15-S-6.0	12/13/2005	6	--	--	--	--	--	--	--

Table 5
Volatile Organic Compounds in Soil (µg/kg)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Depth (ft bgs)	n-Butyl-benzene	n-Propyl-benzene	o-Xylene	sec-Butyl-benzene	Styrene	tert-Butyl-benzene	Tetra-chloroethene
On-Site Geoprobe Sampling										
GP16	GP16-S-1.0	12/13/2005	1	--	--	--	--	--	--	--
	GP16-S-5.0	12/13/2005	5	--	--	--	--	--	--	--
GP17	GP17-S-1.0	12/13/2005	1	--	--	--	--	--	--	--
	GP17-S-6.0	12/13/2005	6	--	--	--	--	--	--	--
GP18	GP18-S-1.0	12/13/2005	1	--	--	--	--	--	--	--
GP19	GP19-S-1.0	12/13/2005	1	--	--	--	--	--	--	--
	GP19-S-1.0-Dup	12/13/2005	1	--	--	--	--	--	--	--
	GP19-S-7.0	12/13/2005	7	--	--	--	--	--	--	--
GP20	GP20-S-1.0	12/14/2005	1	--	--	--	--	--	--	--
	GP20-S-6.0	12/14/2005	6	--	--	--	--	--	--	--
GP21	GP21-S-1.0	12/14/2005	1	--	--	--	--	--	--	--
	GP21-S-6.5	12/14/2005	6.5	--	--	--	--	--	--	--
GP22	GP22-S-1.0	12/13/2005	1	--	--	--	--	--	--	--
	GP22-S-10.0	12/13/2005	10	--	--	--	--	--	--	--
GP23	GP23-S-7.0	12/14/2005	7	--	--	--	--	--	--	--
	GP23-S-10.5	12/14/2005	10.5	--	--	--	--	--	--	--
GP24	GP24-S-3.0	12/14/2005	3	--	--	--	--	--	--	--
	GP24-S-3.0-Dup	12/14/2005	3	--	--	--	--	--	--	--
	GP24-S-6.5	12/14/2005	6.5	--	--	--	--	--	--	--
GP25	GP25-S-1.0	12/12/2005	1	--	--	--	--	--	--	--
	GP25-S-7.0	12/12/2005	7	--	--	--	--	--	--	--
GP26	GP26-S-1.0	12/12/2005	1	--	--	--	--	--	--	--
	GP26-S-9.5	12/12/2005	9.5	--	--	--	--	--	--	--
GP27	GP27-S-1.0	12/12/2005	1	--	--	--	--	--	--	--
	GP27-S-13.0	12/12/2005	13	--	--	--	--	--	--	--
GP28	GP28-S-1.0	12/12/2005	1	--	--	--	--	--	--	--
	GP28-S-7.0	12/12/2005	7	--	--	--	--	--	--	--
GP29	GP29-S-1.0	12/12/2005	1	--	--	--	--	--	--	--
	GP29-S-6.0	12/12/2005	6	--	--	--	--	--	--	--

Table 5
Volatile Organic Compounds in Soil (µg/kg)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Depth (ft bgs)	n-Butyl-benzene	n-Propyl-benzene	o-Xylene	sec-Butyl-benzene	Styrene	tert-Butyl-benzene	Tetra-chloroethene
On-Site Geoprobe Sampling										
GP30	GP30-S-1.0	12/12/2005	1	--	--	--	--	--	--	--
	GP30-S-6.0	12/12/2005	6	--	--	--	--	--	--	--
GP31	GP31-S-1.0	12/12/2005	1	--	--	--	--	--	--	--
	GP31-S-6.0	12/12/2005	6	--	--	--	--	--	--	--
GP32	GP32-S-1.0	12/14/2005	1	--	--	--	--	--	--	--
Off-Site Hand-Auger Sampling										
HA1	HA1-0.5	12/15/2005	0.5	5.73 U	5.73 U	--	5.73 U	1.15 U	5.73 U	2.29 U
	HA1-1.5	12/15/2005	1.5	6.91 U	6.91 U	--	6.91 U	1.38 U	6.91 U	2.77 U
	HA1-1.5-Dup	12/15/2005	1.5	26.4 U	26.4 U	--	26.4 U	5.28 U	26.4 U	10.6 U
HA2	HA2-0.5	12/15/2005	0.5	7.30 U	7.30 U	--	7.30 U	1.46 U	7.30 U	2.92 U
	HA2-1.5	12/15/2005	1.5	4.61 U	4.61 U	--	4.61 U	0.922 U	4.61 U	1.84 U
HA3	HA3-0.5	12/15/2005	0.5	93.8 U	93.8 U	--	93.8 U	93.8 U	93.8 U	93.8 U
	HA3-1.5	12/15/2005	1.5	5.02 U	5.02 U	--	5.02 U	1.00 U	5.02 U	2.01 U
HA4	HA4-0.5	12/15/2005	0.5	73.9 U	73.9 U	--	73.9 U	14.8 U	73.9 U	29.6 U
	HA4-1.5	12/15/2005	1.5	6.12 U	6.12 U	--	6.12 U	1.22 U	6.12 U	2.45 U
HA5	HA5-0.5	12/15/2005	0.5	169 U	169 U	--	169 U	169 U	169 U	169 U
	HA5-1.5	12/15/2005	1.5	7.49 U	7.49 U	--	7.49 U	1.50 U	7.49 U	2.99 U

Table 5
Volatile Organic Compounds in Soil (µg/kg)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Depth (ft bgs)	Toluene	trans-1,2-Dichloroethene	trans-1,3-Dichloropropene	Trichloro-ethene	Trichloro-fluoromethane	Vinyl chloride	Xylenes, Total
On-Site Geoprobe Sampling										
GP1	GP1-S-1.5	6/7/2005	1.5	0.839 U	0.839 U	0.839 U	0.839 U	0.839 U	0.839 U	--
	GP1-S-6.0	6/7/2005	6	1.62	1.12 U	1.12 U	1.12 U	1.12 U	1.12 U	--
	GP1-S-10.0	6/9/2005	10	38.2 U	38.2 U	38.2 U	7.65 U	38.2 U	7.65 U	--
GP2	GP2-S-1.0	6/7/2005	1	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	--
	GP2-S-10.0	6/9/2005	10	44 U	44 U	44 U	8.81 U	44 U	8.81 U	--
GP3	GP3-S-2.0	6/9/2005	2	79.5 U	79.5 U	79.5 U	15.9 U	79.5 U	15.9 U	--
	GP3-S-6.0	6/9/2005	6	44.8 U	44.8 U	44.8 U	8.96 U	44.8 U	8.96 U	--
	GP3-S-14	6/9/2005	14	38.5 U	38.5 U	38.5 U	7.71 U	38.5 U	7.71 U	--
GP4	GP4-S-1.5	6/16/2005	1.5	51.7 U	51.7 U	51.7 U	10.3 U	51.7 U	10.3 U	--
GP5	GP5-S-1.5	6/16/2005	1.5	35.6 U	35.6 U	35.6 U	7.12 U	35.6 U	7.12 U	--
	GP5-S-8.0	6/16/2005	8	35.1 U	35.1 U	35.1 U	7.03 U	35.1 U	7.03 U	--
	GP5-S-14.0	6/16/2005	14	40.5 U	40.5 U	40.5 U	8.1 U	40.5 U	8.1 U	--
GP6	GP6-S-1.0	6/16/2005	1	42.5 U	42.5 U	42.5 U	**40.5**	42.5 U	8.5 U	--
	GP6-S-14.5	6/16/2005	14.5	41.4 U	41.4 U	41.4 U	**1160**	41.4 U	8.28 U	--
GP7	GP7-S-2.0	6/16/2005	2	39 U	39 U	39 U	7.81 U	39 U	7.81 U	--
	GP7-S-8.0	6/16/2005	8	44.2 U	44.2 U	44.2 U	8.84 U	44.2 U	8.84 U	--
GP8	GP8-S-1.5	6/16/2005	1.5	49.3 U	49.3 U	49.3 U	9.86 U	49.3 U	9.86 U	--
GP9	GP9-S-2.0	6/17/2005	2	37.1 U	37.1 U	37.1 U	7.42 U	37.1 U	7.42 U	--
GP10	GP10-S-1.5	6/17/2005	1.5	55.8 U	55.8 U	55.8 U	11.2 U	55.8 U	11.2 U	--
	GP10-S-13.5	6/17/2005	13.5	39.8 U	39.8 U	39.8 U	7.96 U	39.8 U	7.96 U	--
GP11	GP11-S-2.0	6/17/2005	2	41.9 U	41.9 U	41.9 U	87.2	41.9 U	8.37 U	--
	GP11-S-6.5	6/17/2005	6.5	43 U	43 U	43 U	281	43 U	8.61 U	--
GP12	GP12-S-3.0	12/13/2005	3	--	2.39 U	--	2.39 U	--	2.39 U	--
	GP12-S-5.0	12/13/2005	5	--	2.27 U	--	2.27 U	--	2.27 U	--
GP13	GP13-S-1.0	12/14/2005	1	--	9.89 U	--	9.89 U	--	9.89 U	--
	GP13-S-6.0	12/14/2005	6	--	2.89 U	--	2.89 U	--	2.89 U	--
GP14	GP14-S-3.0	12/13/2005	3	--	2.44 U	--	4.49	--	2.44 U	--
	GP14-S-6.0	12/13/2005	6	--	2.62 U	--	2.62 U	--	2.62 U	--
GP15	GP15-S-3.0	12/13/2005	3	--	2.72 U	--	2.72 U	--	2.72 U	--
	GP15-S-6.0	12/13/2005	6	--	10.5 U	--	10.5 U	--	10.5 U	--

Table 5
Volatile Organic Compounds in Soil (µg/kg)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Depth (ft bgs)	Toluene	trans-1,2-Dichloroethene	trans-1,3-Dichloropropene	Trichloro-ethene	Trichloro-fluoromethane	Vinyl chloride	Xylenes, Total
On-Site Geoprobe Sampling										
GP16	GP16-S-1.0	12/13/2005	1	--	1.85 U	--	3.63	--	1.85 U	--
	GP16-S-5.0	12/13/2005	5	--	2.12 U	--	2.12 U	--	2.12 U	--
GP17	GP17-S-1.0	12/13/2005	1	--	2.09 U	--	2.09 U	--	2.09 U	--
	GP17-S-6.0	12/13/2005	6	--	2.27 U	--	2.27 U	--	2.27 U	--
GP18	GP18-S-1.0	12/13/2005	1	--	2.36 U	--	3.43	--	2.36 U	--
GP19	GP19-S-1.0	12/13/2005	1	--	2.67 U	--	2.67 U	--	2.67 U	--
	GP19-S-1.0-Dup	12/13/2005	1	--	2.40 U	--	2.40 U	--	2.40 U	--
	GP19-S-7.0	12/13/2005	7	--	2.72 U	--	2.72 U	--	2.72 U	--
GP20	GP20-S-1.0	12/14/2005	1	--	2.62 U	--	2.62 U	--	2.62 U	--
	GP20-S-6.0	12/14/2005	6	--	4.52 U	--	4.52 U	--	4.52 U	--
GP21	GP21-S-1.0	12/14/2005	1	--	2.18 U	--	2.18 U	--	2.18 U	--
	GP21-S-6.5	12/14/2005	6.5	--	2.79 U	--	2.79 U	--	2.79 U	--
GP22	GP22-S-1.0	12/13/2005	1	--	2.26 U	--	2.26 U	--	2.26 U	--
	GP22-S-10.0	12/13/2005	10	--	1.89 U	--	1.89 U	--	1.89 U	--
GP23	GP23-S-7.0	12/14/2005	7	--	1.80 U	--	1.80 U	--	1.80 U	--
	GP23-S-10.5	12/14/2005	10.5	--	2.27 U	--	2.27 U	--	2.27 U	--
GP24	GP24-S-3.0	12/14/2005	3	--	2.58 U	--	2.58 U	--	2.58 U	--
	GP24-S-3.0-Dup	12/14/2005	3	--	2.50 U	--	2.50 U	--	2.50 U	--
	GP24-S-6.5	12/14/2005	6.5	--	2.83 U	--	2.83 U	--	2.83 U	--
GP25	GP25-S-1.0	12/12/2005	1	--	2.13 U	--	2.13 U	--	2.13 U	--
	GP25-S-7.0	12/12/2005	7	--	2.47 U	--	2.47 U	--	2.47 U	--
GP26	GP26-S-1.0	12/12/2005	1	--	2.01 U	--	2.01 U	--	2.01 U	--
	GP26-S-9.5	12/12/2005	9.5	--	2.65 U	--	2.65 U	--	2.65 U	--
GP27	GP27-S-1.0	12/12/2005	1	--	2.19 U	--	2.19 U	--	2.19 U	--
	GP27-S-13.0	12/12/2005	13	--	2.05 U	--	2.05 U	--	2.05 U	--
GP28	GP28-S-1.0	12/12/2005	1	--	1.87 U	--	1.87 U	--	1.87 U	--
	GP28-S-7.0	12/12/2005	7	--	2.17 U	--	2.17 U	--	2.17 U	--
GP29	GP29-S-1.0	12/12/2005	1	--	2.47 U	--	2.47 U	--	2.47 U	--
	GP29-S-6.0	12/12/2005	6	--	2.43 U	--	2.43 U	--	2.43 U	--

Table 5
Volatile Organic Compounds in Soil (µg/kg)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Depth (ft bgs)	Toluene	trans-1,2-Dichloroethene	trans-1,3-Dichloropropene	Trichloro-ethene	Trichloro-fluoromethane	Vinyl chloride	Xylenes, Total
On-Site Geoprobe Sampling										
GP30	GP30-S-1.0	12/12/2005	1	--	2.39 U	--	2.39 U	--	2.39 U	--
	GP30-S-6.0	12/12/2005	6	--	3.32 U	--	3.32 U	--	3.32 U	--
GP31	GP31-S-1.0	12/12/2005	1	--	2.02 U	--	2.02 U	--	2.02 U	--
	GP31-S-6.0	12/12/2005	6	--	3.41 U	--	3.41 U	--	3.41 U	--
GP32	GP32-S-1.0	12/14/2005	1	--	2.37 U	--	2.37 U	--	2.37 U	--
Off-Site Hand-Auger Sampling										
HA1	HA1-0.5	12/15/2005	0.5	1.72 U	2.87 U	1.43 U	2.87 U	5.73 U	2.87 U	11.5 U
	HA1-1.5	12/15/2005	1.5	2.07 U	3.46 U	1.73 U	3.46 U	6.91 U	3.46 U	13.8 U
	HA1-1.5-Dup	12/15/2005	1.5	7.92 U	13.2 U	6.60 U	13.2 U	26.4 U	13.2 U	52.8 U
HA2	HA2-0.5	12/15/2005	0.5	2.19 U	3.65 U	1.83 U	3.65 U	7.30 U	3.65 U	14.6 U
	HA2-1.5	12/15/2005	1.5	1.38 U	2.30 U	1.15 U	2.30 U	4.61 U	2.30 U	9.22 U
HA3	HA3-0.5	12/15/2005	0.5	93.8 U	93.8 U	93.8 U	93.8 U	93.8 U	93.8 U	281 U
	HA3-1.5	12/15/2005	1.5	1.51 U	2.51 U	1.26 U	2.51 U	5.02 U	2.51 U	10.0 U
HA4	HA4-0.5	12/15/2005	0.5	22.2 U	37.0 U	18.5 U	37.0 U	73.9 U	37.0 U	148 U
	HA4-1.5	12/15/2005	1.5	1.84 U	3.06 U	1.53 U	3.06 U	6.12 U	3.06 U	12.2 U
HA5	HA5-0.5	12/15/2005	0.5	169 U	169 U	169 U	169 U	169 U	169 U	506 U
	HA5-1.5	12/15/2005	1.5	2.25 U	3.74 U	1.87 U	3.74 U	7.49 U	3.74 U	15.0 U

Table 6
Petroleum Hydrocarbon Identification in Soil
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Depth (ft bgs)	Gasoline-Range Organics	Diesel-Range Organics	Oil-Range Organics
On-Site Geoprobe Sampling						
GP1	GP1-S-1.5	6/7/2005	1.5	ND	ND	ND
	GP1-S-6.0	6/7/2005	6	ND	ND	ND
	GP1-S-10.0	6/9/2005	10	ND	ND	ND
GP2	GP2-S-1.0	6/7/2005	1	ND	ND	ND
	GP2-S-10.0	6/9/2005	10	ND	ND	ND
GP3	GP3-S-2.0	6/9/2005	2	ND	ND	ND
	GP3-S-6.0	6/9/2005	6	ND	ND	ND
	GP3-S-14	6/9/2005	14	ND	ND	ND
GP4	GP4-S-1.5	6/16/2005	1.5	ND	ND	ND
GP5	GP5-S-1.5	6/16/2005	1.5	ND	ND	ND
	GP5-S-14.0	6/16/2005	14	ND	ND	ND
GP6	GP6-S-1.0	6/16/2005	1	ND	ND	ND
	GP6-S-14.5	6/16/2005	14.5	ND	ND	ND
GP7	GP7-S-2.0	6/16/2005	2	ND	ND	ND
	GP7-S-8.0	6/16/2005	8	ND	ND	ND
GP8	GP8-S-1.5	6/16/2005	1.5	ND	ND	ND
GP9	GP9-S-2.0	6/17/2005	2	ND	ND	ND
GP10	GP10-S-1.5	6/17/2005	1.5	ND	ND	ND
	GP10-S-13.5	6/17/2005	13.5	ND	ND	ND
GP11	GP11-S-2.0	6/17/2005	2	ND	ND	ND
	GP11-S-6.5	6/17/2005	6.5	ND	ND	ND

Table 7
Petroleum Hydrocarbons in Soil (mg/kg)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Depth (ft bgs)	Gasoline-Range Organics	Diesel-Range Organics	Oil-Range Organics
On-Site Geoprobe Sampling						
GP12	GP12-S-3.0	12/13/2005	3	--	10.7 U	26.6 U
GP13	GP13-S-6.0	12/14/2005	6	--	12.8 U	56.1
GP14	GP14-S-6.0	12/13/2005	6	--	10.8 U	26.9 U
GP15	GP15-S-3.0	12/13/2005	3	--	17.7	59.1
GP16	GP16-S-5.0	12/13/2005	5	--	11.2 U	28.0 U
GP17	GP17-S-1.0	12/13/2005	1	--	11.6	63.1
GP18	GP18-S-1.0	12/13/2005	1	--	156	742
GP19	GP19-S-1.0	12/13/2005	1	--	52.8	172
GP19	GP19-S-1.0-Dup	12/13/2005	1	--	18.2	43.8
GP19	GP19-S-7.0	12/13/2005	7	--	14.5 U	56.7
GP20	GP20-S-1.0	12/14/2005	1	--	198	301
GP20	GP20-S-6.0	12/14/2005	6	--	75.9	294
GP21	GP21-S-1.0	12/14/2005	1	--	11.2 U	28.0 U
GP21	GP21-S-6.5	12/14/2005	6.5	--	5270	19900
GP22	GP22-S-10.0	12/13/2005	10	--	11.3 U	28.2 U
GP23	GP23-S-7.0	12/14/2005	7	--	10.8 U	26.9 U
GP24	GP24-S-3.0	12/14/2005	3	--	11.1 U	27.8 U
GP25	GP25-S-7.0	12/12/2005	7	--	10.6 U	26.6 U
GP26	GP26-S-1.0	12/12/2005	1	--	36.4	121
GP26	GP26-S-9.5	12/12/2005	9.5	--	10.8 U	27.1 U
GP27	GP27-S-13.0	12/12/2005	13	--	10.9 U	27.2 U
GP28	GP28-S-1.0	12/12/2005	1	--	10.8 U	27.0 U
GP28	GP28-S-7.0	12/12/2005	7	--	10.4 U	26.0 U
GP29	GP29-S-1.0	12/12/2005	1	--	80.4	249
GP29	GP29-S-6.0	12/12/2005	6	--	12.8 U	32.0 U
GP30	GP30-S-1.0	12/12/2005	1	--	14.9	90.5
GP30	GP30-S-6.0	12/12/2005	6	--	39.6	165
GP31	GP31-S-1.0	12/12/2005	1	--	145	1300
GP31	GP31-S-6.0	12/12/2005	6	--	58.9	157
GP32	GP32-S-1.0	12/14/2005	1	--	11.3 U	28.3 U
Off-Site Hand-Auger Sampling						
HA1	HA1-0.5	12/15/2005	0.5	11.4	210	1170
HA1	HA1-1.5	12/15/2005	1.5	6.57 U	37.6	182
HA1	HA1-1.5-Dup	12/15/2005	1.5	7.00 U	67.0	328
HA2	HA2-0.5	12/15/2005	0.5	8.20 U	636	3170
HA2	HA2-1.5	12/15/2005	1.5	4.79 U	73.8	409
HA3	HA3-0.5	12/15/2005	0.5	7.58 U	278	2470
HA3	HA3-1.5	12/15/2005	1.5	5.65 U	11.7 U	30.1
HA4	HA4-0.5	12/15/2005	0.5	22.1 U	35900	106000
HA4	HA4-1.5	12/15/2005	1.5	10.2 U	1350	3550
HA5	HA5-0.5	12/15/2005	0.5	21.3 U	1130	7330
HA5	HA5-1.5	12/15/2005	1.5	8.11 U	61.8	347

Table 8
Polycyclic Aromatic Hydrocarbons in Soil (mg/kg)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Depth (ft. bgs)	1-Methyl-naphthalene	2-Methyl-naphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a) anthracene
On-Site Geoprobe Sampling									
GP18	GP18-S-1.0	12/13/2005	1	0.0167	0.0202	0.0111 U	0.0111 U	0.0111 U	0.0235
GP19	GP19-S-1.0	12/13/2005	1	0.0124 U	0.0124 U	0.0124 U	0.0124 U	0.0124 U	0.0124 U
GP20	GP20-S-1.0	12/14/2005	1	0.0120 U	0.0120 U	0.0120 U	0.0120 U	0.0120 U	0.0120 U
GP20	GP20-S-6.0	12/14/2005	6	0.0139 U	0.0139 U	0.0139 U	0.0139 U	0.0139 U	0.0139 U
GP21	GP21-S-6.5	12/14/2005	6.5	0.0129 U	0.0129 U	0.0129 U	0.0129 U	0.0129 U	0.0129 U
GP29	GP29-S-1.0	12/12/2005	1	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0137	0.0750
GP30	GP30-S-6.0	12/12/2005	6	0.0146 U	0.0146 U	0.0146 U	0.0146 U	0.0146 U	0.0154
GP31	GP31-S-1.0	12/12/2005	1	0.0117 U	0.0117 U	0.0117 U	0.0117 U	0.0117 U	0.0117 U
GP31	GP31-S-6.0	12/12/2005	6	0.0134 U	0.0134 U	0.0134 U	0.0134 U	0.0134 U	0.0211
Off-Site Hand-Auger Sampling									
HA1	HA1-0.5	12/15/2005	0.5	0.0151 U	0.0151 U	0.0151 U	0.0151 U	0.0151 U	0.0151 U
HA1	HA1-1.5	12/15/2005	1.5	0.0129 U	0.0129 U	0.0129 U	0.0129 U	0.0129 U	0.0129 U
HA1	HA1-1.5-Dup	12/15/2005	1.5	0.0152 U	0.0152 U	0.0152 U	0.0152 U	0.0152 U	0.0288
HA2	HA2-0.5	12/15/2005	0.5	0.0176 U	0.0176 U	0.0176 U	0.0176 U	0.0176 U	0.0176 U
HA2	HA2-1.5	12/15/2005	1.5	0.0125 U	0.0125 U	0.0125 U	0.0125 U	0.0125 U	0.0125 U
HA3	HA3-0.5	12/15/2005	0.5	0.0133 U	0.0133 U	0.0133 U	0.0133 U	0.0133 U	0.0340
HA3	HA3-1.5	12/15/2005	1.5	0.0118 U	0.0118 U	0.0118 U	0.0118 U	0.0118 U	0.0118 U
HA4	HA4-0.5	12/15/2005	0.5	0.340 U	0.340 U	0.340 U	0.340 U	0.340 U	0.554
HA4	HA4-1.5	12/15/2005	1.5	0.0159 U	0.0159 U	0.0159 U	0.0159 U	0.0159 U	0.0159 U
HA5	HA5-0.5	12/15/2005	0.5	0.267 U	0.267 U	0.267 U	0.267 U	0.267 U	0.862
HA5	HA5-1.5	12/15/2005	1.5	0.0153 U	0.0153 U	0.0153 U	0.0153 U	0.0153 U	0.0153 U

Table 8
Polycyclic Aromatic Hydrocarbons in Soil (mg/kg)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Depth (ft. bgs)	Benzo(a) pyrene	Benzo(b) fluoranthene	Benzo(ghi) perylene	Benzo(k) fluoranthene	Chrysene	Dibenzo(a,h) anthracene
On-Site Geoprobe Sampling									
GP18	GP18-S-1.0	12/13/2005	1	0.0111 U	0.0746	0.0111 U	0.0560	0.0717	0.0111 U
GP19	GP19-S-1.0	12/13/2005	1	0.0124 U	0.0124 U	0.0124 U	0.0124 U	0.0127	0.0124 U
GP20	GP20-S-1.0	12/14/2005	1	0.0120 U	0.0120 U	0.0120 U	0.0120 U	0.0120 U	0.0120 U
GP20	GP20-S-6.0	12/14/2005	6	0.0139 U	0.0139 U	0.0139 U	0.0139 U	0.0139 U	0.0139 U
GP21	GP21-S-6.5	12/14/2005	6.5	0.0129 U	0.0129 U	0.0129 U	0.0129 U	0.0129 U	0.0129 U
GP29	GP29-S-1.0	12/12/2005	1	0.0571	0.0611	0.0249	0.0703	0.122	0.0162
GP30	GP30-S-6.0	12/12/2005	6	0.0146 U	0.0146 U	0.0146 U	0.0146 U	0.0334	0.0146 U
GP31	GP31-S-1.0	12/12/2005	1	0.0117 U	0.0117 U	0.0117 U	0.0117 U	0.0340	0.0117 U
GP31	GP31-S-6.0	12/12/2005	6	0.0176	0.0261	0.0134 U	0.0178	0.0449	0.0134 U
Off-Site Hand-Auger Sampling									
HA1	HA1-0.5	12/15/2005	0.5	0.0151 U	0.0151 U	0.0151 U	0.0151 U	0.0151 U	0.0151 U
HA1	HA1-1.5	12/15/2005	1.5	0.0129 U	0.0129 U	0.0129 U	0.0129 U	0.0129 U	0.0129 U
HA1	HA1-1.5-Dup	12/15/2005	1.5	0.0500	0.0769	0.0243	0.0581	0.0612	0.0152 U
HA2	HA2-0.5	12/15/2005	0.5	0.0176 U	0.0222	0.0176 U	0.0205	0.0276	0.0176 U
HA2	HA2-1.5	12/15/2005	1.5	0.0125 U	0.0204	0.0125 U	0.0151	0.0179	0.0125 U
HA3	HA3-0.5	12/15/2005	0.5	0.0525	0.0982	0.0532	0.0706	0.0804	0.0133 U
HA3	HA3-1.5	12/15/2005	1.5	0.0118 U	0.0118 U	0.0118 U	0.0118 U	0.0118 U	0.0118 U
HA4	HA4-0.5	12/15/2005	0.5	0.694	0.771	0.352	0.749	0.899	0.340 U
HA4	HA4-1.5	12/15/2005	1.5	0.0159 U	0.0159 U	0.0159 U	0.0159 U	0.0159	0.0159 U
HA5	HA5-0.5	12/15/2005	0.5	1.45	1.62	1.19	1.82	1.54	0.435
HA5	HA5-1.5	12/15/2005	1.5	0.0153 U	0.0153 U	0.0153 U	0.0153 U	0.0153 U	0.0153 U

Table 8
Polycyclic Aromatic Hydrocarbons in Soil (mg/kg)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Depth (ft. bgs)	Fluoranthene	Fluorene	Indeno(1,2,3-cd) pyrene	Naphthalene	Phenanthrene	Pyrene
On-Site Geoprobe Sampling									
GP18	GP18-S-1.0	12/13/2005	1	0.195	0.0111 U	0.0111 U	0.0179	0.109	0.0884
GP19	GP19-S-1.0	12/13/2005	1	0.0245	0.0124 U	0.0124 U	0.0124 U	0.0161	0.0203
GP20	GP20-S-1.0	12/14/2005	1	0.0120 U	0.0120 U	0.0120 U	0.0120 U	0.0120 U	0.0120 U
GP20	GP20-S-6.0	12/14/2005	6	0.0139 U	0.0139 U	0.0139 U	0.0139 U	0.0139 U	0.0139 U
GP21	GP21-S-6.5	12/14/2005	6.5	0.0129 U	0.0129 U	0.0129 U	0.0129 U	0.0129 U	0.0129 U
GP29	GP29-S-1.0	12/12/2005	1	0.149	0.0119 U	0.0260	0.0119 U	0.0382	0.156
GP30	GP30-S-6.0	12/12/2005	6	0.0467	0.0146 U	0.0146 U	0.0146 U	0.0258	0.0531
GP31	GP31-S-1.0	12/12/2005	1	0.0253	0.0117 U	0.0117 U	0.0117 U	0.0153	0.0254
GP31	GP31-S-6.0	12/12/2005	6	0.0517	0.0134 U	0.0134 U	0.0134 U	0.0287	0.0500
Off-Site Hand-Auger Sampling									
HA1	HA1-0.5	12/15/2005	0.5	0.0196	0.0151 U	0.0151 U	0.0151 U	0.0151 U	0.0151 U
HA1	HA1-1.5	12/15/2005	1.5	0.0129 U	0.0129 U	0.0129 U	0.0129 U	0.0129 U	0.0129 U
HA1	HA1-1.5-Dup	12/15/2005	1.5	0.0951	0.0152 U	0.0201	0.0152 U	0.0382	0.0657
HA2	HA2-0.5	12/15/2005	0.5	0.0455	0.0176 U	0.0176 U	0.0176 U	0.0180	0.0334
HA2	HA2-1.5	12/15/2005	1.5	0.0329	0.0125 U	0.0125 U	0.0125 U	0.0125 U	0.0240
HA3	HA3-0.5	12/15/2005	0.5	0.120	0.0133 U	0.0385	0.0133 U	0.0826	0.134
HA3	HA3-1.5	12/15/2005	1.5	0.0118 U	0.0118 U	0.0118 U	0.0118 U	0.0118 U	0.0118 U
HA4	HA4-0.5	12/15/2005	0.5	1.30	0.340 U	0.340 U	0.340 U	0.340 U	1.52
HA4	HA4-1.5	12/15/2005	1.5	0.0191	0.0159 U	0.0159 U	0.0159 U	0.0159 U	0.0218
HA5	HA5-0.5	12/15/2005	0.5	2.38	0.267 U	1.02	0.267 U	0.930	2.15
HA5	HA5-1.5	12/15/2005	1.5	0.0153 U	0.0153 U	0.0153 U	0.0153 U	0.0153 U	0.0153 U

Table 9
Metals in Reconnaissance Groundwater (mg/L)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Dissolved Chromium	Chromium (Hexavalent)	Dissolved Chromium (Trivalent)[a]	Lead
GP2	GP2-W-17-RECON	6/9/2005	37.1	4.72	32.38	15 U
GP4	GP4-W-8.0	6/16/2005	267	236	31	--
GP5	GP5-W-18.0	6/16/2005	0.02 U	0.0897	NC	--
GP6	GP6-W-18.0	6/16/2005	343	300	43	--
GP7	GP7-W-14.0	6/16/2005	0.02 U	0.101	NC	--
GP8	GP8-W-10.0	6/16/2005	355	294	61	--

Table 10
Volatile Organic Compounds in Reconnaissance Groundwater (µg/L)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	1,1,1,2-Tetra-chloroethane	1,1,1-Trichloro-ethane	1,1,2,2-Tetra-chloroethane	1,1,2-Trichloro-ethane	1,1-Dichloro-ethane	1,1-Dichloro-ethene	1,1-Dichloro-propene	1,2,3-Trichloro-benzene
GP2	GP2-W-17-RECON	6/9/2005	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
GP4	GP4-W-8.0	6/16/2005	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
GP5	GP5-W-18.0	6/16/2005	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
GP6	GP6-W-18.0	6/16/2005	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
GP7	GP7-W-14.0	6/16/2005	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
GP8	GP8-W-10.0	6/16/2005	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
GP-13	GP13-W-8.0	12/14/2005	--	--	--	--	--	--	--	--
GP-15	GP15-W-8.0	12/14/2005	--	--	--	--	--	--	--	--

Table 10
Volatile Organic Compounds in Reconnaissance Groundwater (µg/L)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	1,2,3-Trichloro-propane	1,2,4-Trichloro-benzene	1,2,4-Trimethyl-benzene	1,2-Dibromo-3-chloropropane	1,2-Dibromo-ethane	1,2-Dichloro-benzene	1,2-Dichloro-ethane	1,2-Dichloro-propane
GP2	GP2-W-17-RECON	6/9/2005	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
GP4	GP4-W-8.0	6/16/2005	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
GP5	GP5-W-18.0	6/16/2005	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
GP6	GP6-W-18.0	6/16/2005	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
GP7	GP7-W-14.0	6/16/2005	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
GP8	GP8-W-10.0	6/16/2005	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
GP-13	GP13-W-8.0	12/14/2005	--	--	--	--	--	--	--	--
GP-15	GP15-W-8.0	12/14/2005	--	--	--	--	--	--	--	--

Table 10
Volatile Organic Compounds in Reconnaissance Groundwater (µg/L)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	1,3,5-Trimethyl-benzene	1,3-Dichloro-benzene	1,3-Dichloro-propane	1,4-Dichloro-benzene	2,2-Dichloro-propane	2-Butanone	2-Chlorotoluene	4-Chlorotoluene
GP2	GP2-W-17-RECON	6/9/2005	5 U	5 U	5 U	5 U	5 U	729	5 U	5 U
GP4	GP4-W-8.0	6/16/2005	1 U	1 U	1 U	1 U	1 U	5 U	1 U	1 U
GP5	GP5-W-18.0	6/16/2005	1 U	1 U	1 U	1 U	1 U	5 U	1 U	1 U
GP6	GP6-W-18.0	6/16/2005	20 U	20 U	20 U	20 U	20 U	100 U	20 U	20 U
GP7	GP7-W-14.0	6/16/2005	1 U	1 U	1 U	1 U	1 U	5 U	1 U	1 U
GP8	GP8-W-10.0	6/16/2005	1 U	1 U	1 U	1 U	1 U	10.3	1 U	1 U
GP-13	GP13-W-8.0	12/14/2005	–	–	–	–	–	2 U	–	–
GP-15	GP15-W-8.0	12/14/2005	–	–	–	–	–	2.07	–	–

Table 10
Volatile Organic Compounds in Reconnaissance Groundwater (µg/L)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	4-Isopropyl-toluene	4-Methyl-2-pentanone	Acetone	Benzene	Bromobenzene	Bromodichloro-methane	Bromoform	Bromomethane	Carbon Tetrachloride
GP2	GP2-W-17-RECON	6/9/2005	5 U	25 U	295	5 U	5 U	5 U	5 U	5 U	5 U
GP4	GP4-W-8.0	6/16/2005	1 U	5 U	40.5	1 U	1 U	1 U	1 U	1 U	1 U
GP5	GP5-W-18.0	6/16/2005	1 U	5 U	7.2	1 U	1 U	1 U	1 U	1 U	1 U
GP6	GP6-W-18.0	6/16/2005	20 U	100 U	100 U	20 U	20 U	20 U	20 U	20 U	20 U
GP7	GP7-W-14.0	6/16/2005	1 U	5 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U
GP8	GP8-W-10.0	6/16/2005	1 U	5 U	75.8	1 U	1 U	1 U	1 U	1 U	1 U
GP-13	GP13-W-8.0	12/14/2005	--	--	--	--	--	--	--	--	--
GP-15	GP15-W-8.0	12/14/2005	--	--	--	--	--	--	--	--	--

Table 10
Volatile Organic Compounds in Reconnaissance Groundwater (µg/L)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Chlorobenzene	Chlorobromomethane	Chloroethane	Chloroform	Chloromethane	cis-1,2-Dichloroethene	cis-1,3-Dichloro-propene
GP2	GP2-W-17-RECON	6/9/2005	5 U	5 U	5 U	5 U	5 U	5 U	5 U
GP4	GP4-W-8.0	6/16/2005	1 U	1 U	1 U	1 U	1 U	1 U	1 U
GP5	GP5-W-18.0	6/16/2005	1 U	1 U	1 U	1 U	1 U	1 U	1 U
GP6	GP6-W-18.0	6/16/2005	20 U	20 U	20 U	20 U	20 U	144	20 U
GP7	GP7-W-14.0	6/16/2005	1 U	1 U	1 U	1 U	1 U	1 U	1 U
GP8	GP8-W-10.0	6/16/2005	1 U	1 U	1 U	1 U	1 U	2.26	1 U
GP-13	GP13-W-8.0	12/14/2005	--	--	--	--	--	6.03	--
GP-15	GP15-W-8.0	12/14/2005	--	--	--	--	--	0.2 U	--

Table 10
Volatile Organic Compounds in Reconnaissance Groundwater (µg/L)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Dibromo-chloromethane	Dibromo-methane	Dichloro-difluoromethane	Ethylbenzene	Hexachloro-butadiene	Isopropyl-benzene	m,p-Xylene	Methyl tert-butyl ether
GP2	GP2-W-17-RECON	6/9/2005	5 U	5 U	5 U	5 U	5 U	5 U	1 U0	5 U
GP4	GP4-W-8.0	6/16/2005	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U
GP5	GP5-W-18.0	6/16/2005	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U
GP6	GP6-W-18.0	6/16/2005	20 U	20 U	20 U	20 U	20 U	20 U	40 U	20 U
GP7	GP7-W-14.0	6/16/2005	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U
GP8	GP8-W-10.0	6/16/2005	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U
GP-13	GP13-W-8.0	12/14/2005	--	--	--	--	--	--	--	--
GP-15	GP15-W-8.0	12/14/2005	--	--	--	--	--	--	--	--

Table 10
Volatile Organic Compounds in Reconnaissance Groundwater (µg/L)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Methylene chloride	Naphthalene	n-Butyl-benzene	n-Propyl-benzene	o-Xylene	sec-Butyl-benzene	Styrene	tert-Butyl-benzene
GP2	GP2-W-17-RECON	6/9/2005	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
GP4	GP4-W-8.0	6/16/2005	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
GP5	GP5-W-18.0	6/16/2005	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
GP6	GP6-W-18.0	6/16/2005	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
GP7	GP7-W-14.0	6/16/2005	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
GP8	GP8-W-10.0	6/16/2005	1 U	87	1 U	1 U	1 U	1 U	1 U	1 U
GP-13	GP13-W-8.0	12/14/2005	--	--	--	--	--	--	--	--
GP-15	GP15-W-8.0	12/14/2005	--	--	--	--	--	--	--	--

Table 10
Volatile Organic Compounds in Reconnaissance Groundwater (µg/L)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Tetra-chloroethene	Toluene	trans-1,2-Dichloroethene	trans-1,3-Dichloro-propene	Trichloro-ethene	Trichloro-fluoromethane	Vinyl chloride
GP2	GP2-W-17-RECON	6/9/2005	5 U	5 U	5 U	5 U	5 U	5 U	5 U
GP4	GP4-W-8.0	6/16/2005	1 U	1 U	1 U	1 U	1 U	1 U	1 U
GP5	GP5-W-18.0	6/16/2005	1 U	1 U	1 U	1 U	1 U	1 U	1 U
GP6	GP6-W-18.0	6/16/2005	20 U	20 U	20 U	20 U	1130	20 U	20 U
GP7	GP7-W-14.0	6/16/2005	1 U	1 U	1 U	1 U	1 U	1 U	1 U
GP8	GP8-W-10.0	6/16/2005	1 U	1 U	1 U	1 U	16.8	1 U	1 U
GP-13	GP13-W-8.0	12/14/2005	--	--	1.01	--	0.220	--	16.5
GP-15	GP15-W-8.0	12/14/2005	--	--	0.2 U	--	0.2 U	--	0.2 U

Table 11
Petroleum Hydrocarbon Identification in Reconnaissance Groundwater
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Gasoline-Range Organics	Diesel-Range Organics	Oil-Range Organics
GP2	GP2-W-17-RECON	6/9/2005	DET	ND	ND
GP4	GP4-W-8.0	6/16/2005	ND	DET	ND
GP5	GP5-W-18.0	6/16/2005	ND	ND	ND
GP6	GP6-W-18.0	6/16/2005	ND	ND	ND
GP7	GP7-W-14.0	6/16/2005	ND	ND	ND
GP8	GP8-W-10.0	6/16/2005	DET	DET	DET

Table 12
Petroleum Hydrocarbons in Reconnaissance Groundwater (mg/L)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Gasoline-Range Organics	Diesel-Range Organics	Oil-Range Organics
GP2	GP2-W-17-RECON	6/9/2005	0.1 U	--	--
GP4	GP4-W-8.0	6/16/2005	--	0.325	0.478 U
GP8	GP8-W-10.0	6/16/2005	0.155	0.814	0.479 U

Table 13
Polycyclic Aromatic Hydrocarbons in Reconnaissance Groundwater (µg/L)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	2-Chloro-naphthalene	2-Methyl-naphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a) anthracene	Benzo(a) pyrene	Benzo(b+k) fluoranthene
GP4	GP4-W-8.0	6/16/2005	0.191 U	0.477 U	0.191 U	0.191 U	0.191 U	0.191 U	0.191 U	0.954 U
GP8	GP8-W-10.0	6/16/2005	0.194 U	8.56	0.328	0.194 U	0.194 U	0.194 U	0.194 U	0.97 U

Table 13
Polycyclic Aromatic Hydrocarbons in Reconnaissance Groundwater (µg/L)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Benzo(ghi) perylene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd) pyrene	Naphthalene	Phenanthrene	Pyrene
GP4	GP4-W-8.0	6/16/2005	0.191 U	0.191 U	0.191 U	0.191 U	0.191 U	0.191 U	0.477 U	0.191 U	0.191 U
GP8	GP8-W-10.0	6/16/2005	0.194 U	0.194 U	0.194 U	0.194 U	0.298	0.194 U	26.5	5.54	0.194 U

Table 14
Polychlorinated Biphenyls in Reconnaissance Groundwater (µg/L)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260
GP8	GP8-W-10.0	6/16/2005	0.0958 U	0.0958 U	0.0958 U	0.0958 U	0.0958 U	0.0958 U	0.0958 U

Table 15
Dissolved Chromium in Groundwater (mg/L)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Dissolved Chromium	Chromium (Hexavalent)	Dissolved Chromium (Trivalent)[a]
MW1	MW1-W-35.0	6/16/2005	0.02 U	0.269	NC
	MW1-122705	12/27/2005	0.001 U	0.00625 U	NC
	MW1-041806	4/18/2006	0.00014 U	0.00063 U	NC
MW2	MW2-W-0605	6/17/2005	0.02 U	0.01 U	NC
	MW2-122805	12/28/2005	0.00879	0.00625 U	0.00879
	MW2-041906	4/19/2006	0.021	0.00063 U	0.021
MW3	MW3-0605	6/7/2005	0.02 U	0.01 U	NC
	MW3-122905	12/29/2005	0.00215	0.00625 U	0.00215
	MW3-041706	4/17/2006	0.0078	0.00063 U	0.0078
MW4	MW4-0605	6/9/2005	0.02 U	0.01 U	NC
	MW4-0605-Dup	6/9/2005	0.02 U	0.01 U	NC
	MW4-122705	12/27/2005	0.001 U	0.00625 U	NC
	MW4-041806	4/18/2006	0.0020	0.023	NC
MW5	MW5-122805	12/28/2005	497	450	47
	MW5-041906	4/19/2006	32	350	NC
MW6	MW6-122905	12/29/2005	0.0187	0.00625 U	0.0187
	MW6-041906	4/19/2006	0.047	0.00063 U	0.047
MW7	MW7-122805	12/28/2005	0.0106	0.00738	0.0106
	MW7-041806	4/18/2006	0.013	0.00063 U	0.013
	MW7-041806-Dup	4/18/2006	0.013	0.00063 U	0.013
MW8	MW8-122805	12/28/2005	0.00755	0.00625 U	0.00755
	MWDup-122805	12/28/2005	0.00849	0.00625 U	0.00849
	MW8-041806	4/18/2006	0.021	0.00063 UJ	0.021

Table 16
Dissolved Metals in Groundwater (µg/L)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Antimony	Arsenic	Beryllium	Cadmium	Copper	Lead
MW1	MW1-122705	12/27/2005	3.00 U	32.3	1.00 U	1.00 U	1.01	1.00 U
	MW1-041806	4/18/2006	--	33	--	--	0.075 U	0.016 U
MW2	MW2-122805	12/28/2005	3.00 U	5.63	1.00 U	1.00 U	1.17	1.00 U
	MW2-041906	4/19/2006	--	3.8	--	--	2.5	0.016 U
MW3	MW3-122905	12/29/2005	3.00 U	15.3	1.00 U	1.00 U	1.00 U	1.00 U
	MW3-041706	4/17/2006	--	13	--	--	0.075 U	0.016 U
MW4	MW4-122705	12/27/2005	3.00 U	15.1	1.00 U	1.00 U	1.00 U	1.00 U
	MW4-041806	4/18/2006	--	15	--	--	0.075 U	0.016 U
MW5	MW5-122805	12/28/2005	3.00 U	4.59	1.00 U	1.00 U	3.67	1.00 U
	MW5-041906	4/19/2006	--	4.9	--	--	0.075 U	0.016 U
MW6	MW6-122905	12/29/2005	3.00 U	11.9	1.00 U	1.00 U	4.02	1.00 U
	MW6-041906	4/19/2006	--	24	--	--	5.1	0.016 U
MW7	MW7-122805	12/28/2005	3.00 U	6.62	1.00 U	1.00 U	2.12	1.00 U
	MW7-041806	4/18/2006	--	7.1	--	--	2.4	0.016 U
	MW7-041806-Dup	4/18/2006	--	7.3	--	--	3.3	0.016 U
MW8	MW8-122805	12/28/2005	3.00 U	6.41	1.00 U	1.00 U	1.00 U	1.00 U
	MWDup-122805	12/28/2005	3.00 U	7.85	1.00 U	1.00 U	1.03	1.00 U
	MW8-041806	4/18/2006	--	4.8	--	--	0.075 U	0.016 U

Table 16
Dissolved Metals in Groundwater (µg/L)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
MW1	MW1-122705	12/27/2005	0.200 U	1.00 U	1.00 U	1.00 U	1.00 U	10.0 U
	MW1-041806	4/18/2006	--	--	1.1 U	--	--	--
MW2	MW2-122805	12/28/2005	0.200 U	2.51	6.28	1.00 U	1.00 U	10.0 U
	MW2-041906	4/19/2006	--	--	10	--	--	--
MW3	MW3-122905	12/29/2005	0.200 U	1.70	1.00 U	1.00 U	1.00 U	10.0 U
	MW3-041706	4/17/2006	--	--	1.1 U	--	--	--
MW4	MW4-122705	12/27/2005	0.200 U	1.33	1.00 U	1.00 U	1.00 U	10.0 U
	MW4-041806	4/18/2006	--	--	1.1 U	--	--	--
MW5	MW5-122805	12/28/2005	0.200 U	32.2	1000 U	1.00 U	1.00 U	14.0
	MW5-041906	4/19/2006	--	--	1.1 U	--	--	--
MW6	MW6-122905	12/29/2005	0.200 U	16.3	12.3	1.00 U	1.00 U	10.0 U
	MW6-041906	4/19/2006	--	--	19	--	--	--
MW7	MW7-122805	12/28/2005	0.200 U	11.8	2.77	1.00 U	1.00 U	10.8
	MW7-041806	4/18/2006	--	--	5.0	--	--	--
	MW7-041806-Dup	4/18/2006	--	--	4.6	--	--	--
MW8	MW8-122805	12/28/2005	0.200 U	2.91	4.11	1.00 U	1.00 U	10.0 U
	MWDup-122805	12/28/2005	0.200 U	3.14	4.27	1.00 U	1.00 U	10.0 U
	MW8-041806	4/18/2006	--	--	3.6	--	--	--

Table 17
Volatile Organic Compounds in Groundwater (µg/L)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	1,1,1,2-Tetra-chloroethane	1,1,1-Trichloro-ethane	1,1,2,2-Tetra-chloroethane	1,1,2-Trichloro-ethane	1,1-Dichloro-ethane	1,1-Dichloro-ethene	1,1-Dichloro-propene	1,2,3-Trichloro-benzene
MW1	MW1-W-35.0	6/16/2005	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	MW1-122705	12/27/2005	--	--	--	--	--	--	--	--
	MW1-041806	04/18/2006	--	--	--	--	--	--	--	--
MW2	MW2-W-0605	6/17/2005	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	MW2-122805	12/28/2005	--	--	--	--	--	--	--	--
	MW2-041906	04/19/2006	--	--	--	--	--	--	--	--
MW3	MW3-0605	6/7/2005	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	MW3-122905	12/29/2005	--	--	--	--	--	--	--	--
	MW3-041706	04/17/2006	--	--	--	--	--	--	--	--
MW4	MW4-0605	6/9/2005	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	MW4-0605-Dup	6/9/2005	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	MW4-122705	12/27/2005	--	--	--	--	--	--	--	--
	MW4-041806	04/18/2006	--	--	--	--	--	--	--	--
MW5	MW5-122805	12/28/2005	--	--	--	--	--	--	--	--
	MW5-041906	04/19/2006	--	--	--	--	--	--	--	--
MW6	MW6-122905	12/29/2005	--	--	--	--	--	--	--	--
	MW6-041906	04/19/2006	--	--	--	--	--	--	--	--
MW7	MW7-122805	12/28/2005	--	--	--	--	--	--	--	--
	MW7-041806	04/18/2006	--	--	--	--	--	--	--	--
	MW7-041806-Dup	04/18/2006	--	--	--	--	--	--	--	--
MW8	MW8-122805	12/28/2005	--	--	--	--	--	--	--	--
	MWDUP-122805	12/28/2005	--	--	--	--	--	--	--	--
	MW8-041806	04/18/2006	--	--	--	--	--	--	--	--

Table 17
Volatile Organic Compounds in Groundwater (µg/L)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	1,2,3-Trichloro-propane	1,2,4-Trichloro-benzene	1,2,4-Trimethyl-benzene	1,2-Dibromo-3-chloropropane	1,2-Dibromo-ethane	1,2-Dichloro-benzene	1,2-Dichloro-ethane	1,2-Dichloro-propane
MW1	MW1-W-35.0	6/16/2005	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	MW1-122705	12/27/2005	--	--	--	--	--	--	--	--
	MW1-041806	04/18/2006	--	--	--	--	--	--	--	--
MW2	MW2-W-0605	6/17/2005	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	MW2-122805	12/28/2005	--	--	--	--	--	--	--	--
	MW2-041906	04/19/2006	--	--	--	--	--	--	--	--
MW3	MW3-0605	6/7/2005	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	MW3-122905	12/29/2005	--	--	--	--	--	--	--	--
	MW3-041706	04/17/2006	--	--	--	--	--	--	--	--
MW4	MW4-0605	6/9/2005	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	MW4-0605-Dup	6/9/2005	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	MW4-122705	12/27/2005	--	--	--	--	--	--	--	--
	MW4-041806	04/18/2006	--	--	--	--	--	--	--	--
MW5	MW5-122805	12/28/2005	--	--	--	--	--	--	--	--
	MW5-041906	04/19/2006	--	--	--	--	--	--	--	--
MW6	MW6-122905	12/29/2005	--	--	--	--	--	--	--	--
	MW6-041906	04/19/2006	--	--	--	--	--	--	--	--
MW7	MW7-122805	12/28/2005	--	--	--	--	--	--	--	--
	MW7-041806	04/18/2006	--	--	--	--	--	--	--	--
	MW7-041806-Dup	04/18/2006	--	--	--	--	--	--	--	--
MW8	MW8-122805	12/28/2005	--	--	--	--	--	--	--	--
	MWDUP-122805	12/28/2005	--	--	--	--	--	--	--	--
	MW8-041806	04/18/2006	--	--	--	--	--	--	--	--

Table 17
Volatile Organic Compounds in Groundwater (µg/L)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	1,3,5-Trimethyl-benzene	1,3-Dichloro-benzene	1,3-Dichloro-propane	1,4-Dichloro-benzene	2,2-Dichloro-propane	2-Butanone	2-Chlorotoluene	4-Chlorotoluene
MW1	MW1-W-35.0	6/16/2005	1 U	1 U	1 U	1 U	1 U	5 U	1 U	1 U
	MW1-122705	12/27/2005	--	--	--	--	--	2 U	--	--
	MW1-041806	04/18/2006	--	--	--	--	--	--	--	--
MW2	MW2-W-0605	6/17/2005	1 U	1 U	1 U	1 U	1 U	5.43	1 U	1 U
	MW2-122805	12/28/2005	--	--	--	--	--	2 U	--	--
	MW2-041906	04/19/2006	--	--	--	--	--	--	--	--
MW3	MW3-0605	6/7/2005	1 U	1 U	1 U	1 U	1 U	5 U	1 U	1 U
	MW3-122905	12/29/2005	--	--	--	--	--	2 U	--	--
	MW3-041706	04/17/2006	--	--	--	--	--	--	--	--
MW4	MW4-0605	6/9/2005	1 U	1 U	1 U	1 U	1 U	5 U	1 U	1 U
	MW4-0605-Dup	6/9/2005	1 U	1 U	1 U	1 U	1 U	5 U	1 U	1 U
	MW4-122705	12/27/2005	--	--	--	--	--	2 U	--	--
	MW4-041806	04/18/2006	--	--	--	--	--	--	--	--
MW5	MW5-122805	12/28/2005	--	--	--	--	--	34	--	--
	MW5-041906	04/19/2006	--	--	--	--	--	--	--	--
MW6	MW6-122905	12/29/2005	--	--	--	--	--	10.7	--	--
	MW6-041906	04/19/2006	--	--	--	--	--	--	--	--
MW7	MW7-122805	12/28/2005	--	--	--	--	--	2 U	--	--
	MW7-041806	04/18/2006	--	--	--	--	--	--	--	--
	MW7-041806-Dup	04/18/2006	--	--	--	--	--	--	--	--
MW8	MW8-122805	12/28/2005	--	--	--	--	--	17	--	--
	MWDUP-122805	12/28/2005	--	--	--	--	--	15.5	--	--
	MW8-041806	04/18/2006	--	--	--	--	--	--	--	--

Table 17
Volatile Organic Compounds in Groundwater (µg/L)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	4-Isopropyl-toluene	4-Methyl-2-pentanone	Acetone	Benzene	Bromobenzene	Bromodichloro-methane	Bromoform	Bromomethane
MW1	MW1-W-35.0	6/16/2005	1 U	5 U	5 U	1 U	1 U	1 U	1 U	1 U
	MW1-122705	12/27/2005	--	--	--	--	--	--	--	--
	MW1-041806	04/18/2006	--	--	--	--	--	--	--	--
MW2	MW2-W-0605	6/17/2005	1 U	5 U	17.1	1 U	1 U	1 U	1 U	1 U
	MW2-122805	12/28/2005	--	--	--	--	--	--	--	--
	MW2-041906	04/19/2006	--	--	--	--	--	--	--	--
MW3	MW3-0605	6/7/2005	1 U	5 U	5 U	1 U	1 U	1 U	1 U	1 U
	MW3-122905	12/29/2005	--	--	--	--	--	--	--	--
	MW3-041706	04/17/2006	--	--	--	--	--	--	--	--
MW4	MW4-0605	6/9/2005	1 U	5 U	5 U	1 U	1 U	1 U	1 U	1 U
	MW4-0605-Dup	6/9/2005	1 U	5 U	5 U	1 U	1 U	1 U	1 U	1 U
	MW4-122705	12/27/2005	--	--	--	--	--	--	--	--
	MW4-041806	04/18/2006	--	--	--	--	--	--	--	--
MW5	MW5-122805	12/28/2005	--	--	--	--	--	--	--	--
	MW5-041906	04/19/2006	--	--	--	--	--	--	--	--
MW6	MW6-122905	12/29/2005	--	--	--	--	--	--	--	--
	MW6-041906	04/19/2006	--	--	--	--	--	--	--	--
MW7	MW7-122805	12/28/2005	--	--	--	--	--	--	--	--
	MW7-041806	04/18/2006	--	--	--	--	--	--	--	--
	MW7-041806-Dup	04/18/2006	--	--	--	--	--	--	--	--
MW8	MW8-122805	12/28/2005	--	--	--	--	--	--	--	--
	MWDUP-122805	12/28/2005	--	--	--	--	--	--	--	--
	MW8-041806	04/18/2006	--	--	--	--	--	--	--	--

Table 17
Volatile Organic Compounds in Groundwater (µg/L)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Carbon Tetrachloride	Chlorobenzene	Chlorobromo-methane	Chloroethane	Chloroform	Chloromethane	cis-1,2-Dichloroethene	cis-1,3-Dichloro-propene
MW1	MW1-W-35.0	6/16/2005	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	MW1-122705	12/27/2005	--	--	--	--	--	--	0.200 U	--
	MW1-041806	04/18/2006	--	--	--	--	--	--	0.062 U	--
MW2	MW2-W-0605	6/17/2005	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	MW2-122805	12/28/2005	--	--	--	--	--	--	0.200 U	--
	MW2-041906	04/19/2006	--	--	--	--	--	--	0.062 U	--
MW3	MW3-0605	6/7/2005	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	MW3-122905	12/29/2005	--	--	--	--	--	--	0.200	--
	MW3-041706	04/17/2006	--	--	--	--	--	--	0.062 U	--
MW4	MW4-0605	6/9/2005	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	MW4-0605-Dup	6/9/2005	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	MW4-122705	12/27/2005	--	--	--	--	--	--	0.200 U	--
	MW4-041806	04/18/2006	--	--	--	--	--	--	0.062 U	--
MW5	MW5-122805	12/28/2005	--	--	--	--	--	--	2.42	--
	MW5-041906	04/19/2006	--	--	--	--	--	--	1.1	--
MW6	MW6-122905	12/29/2005	--	--	--	--	--	--	1.00 U	--
	MW6-041906	04/19/2006	--	--	--	--	--	--	0.062 U	--
MW7	MW7-122805	12/28/2005	--	--	--	--	--	--	0.200 U	--
	MW7-041806	04/18/2006	--	--	--	--	--	--	0.062 U	--
	MW7-041806-Dup	04/18/2006	--	--	--	--	--	--	0.062 U	--
MW8	MW8-122805	12/28/2005	--	--	--	--	--	--	1.03	--
	MWDUP-122805	12/28/2005	--	--	--	--	--	--	0.920	--
	MW8-041806	04/18/2006	--	--	--	--	--	--	1.5	--

Table 17
Volatile Organic Compounds in Groundwater (µg/L)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Dibromo-chloromethane	Dibromo-methane	Dichloro-difluoromethane	Ethylbenzene	Hexachloro-butadiene	Isopropyl-benzene	m,p-Xylene	Methyl tert-butyl ether
MW1	MW1-W-35.0	6/16/2005	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U
	MW1-122705	12/27/2005	--	--	--	--	--	--	--	--
	MW1-041806	04/18/2006	--	--	--	--	--	--	--	--
MW2	MW2-W-0605	6/17/2005	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U
	MW2-122805	12/28/2005	--	--	--	--	--	--	--	--
	MW2-041906	04/19/2006	--	--	--	--	--	--	--	--
MW3	MW3-0605	6/7/2005	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U
	MW3-122905	12/29/2005	--	--	--	--	--	--	--	--
	MW3-041706	04/17/2006	--	--	--	--	--	--	--	--
MW4	MW4-0605	6/9/2005	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U
	MW4-0605-Dup	6/9/2005	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U
	MW4-122705	12/27/2005	--	--	--	--	--	--	--	--
	MW4-041806	04/18/2006	--	--	--	--	--	--	--	--
MW5	MW5-122805	12/28/2005	--	--	--	--	--	--	--	--
	MW5-041906	04/19/2006	--	--	--	--	--	--	--	--
MW6	MW6-122905	12/29/2005	--	--	--	--	--	--	--	--
	MW6-041906	04/19/2006	--	--	--	--	--	--	--	--
MW7	MW7-122805	12/28/2005	--	--	--	--	--	--	--	--
	MW7-041806	04/18/2006	--	--	--	--	--	--	--	--
	MW7-041806-Dup	04/18/2006	--	--	--	--	--	--	--	--
MW8	MW8-122805	12/28/2005	--	--	--	--	--	--	--	--
	MWDUP-122805	12/28/2005	--	--	--	--	--	--	--	--
	MW8-041806	04/18/2006	--	--	--	--	--	--	--	--

Table 17
Volatile Organic Compounds in Groundwater (µg/L)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Methylene chloride	Naphthalene	n-Butyl-benzene	n-Propyl-benzene	o-Xylene	sec-Butyl-benzene	Styrene	tert-Butyl-benzene
MW1	MW1-W-35.0	6/16/2005	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	MW1-122705	12/27/2005	--	--	--	--	--	--	--	--
	MW1-041806	04/18/2006	--	--	--	--	--	--	--	--
MW2	MW2-W-0605	6/17/2005	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	MW2-122805	12/28/2005	--	--	--	--	--	--	--	--
	MW2-041906	04/19/2006	--	--	--	--	--	--	--	--
MW3	MW3-0605	6/7/2005	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	MW3-122905	12/29/2005	--	--	--	--	--	--	--	--
	MW3-041706	04/17/2006	--	--	--	--	--	--	--	--
MW4	MW4-0605	6/9/2005	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	MW4-0605-Dup	6/9/2005	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	MW4-122705	12/27/2005	--	--	--	--	--	--	--	--
	MW4-041806	04/18/2006	--	--	--	--	--	--	--	--
MW5	MW5-122805	12/28/2005	--	--	--	--	--	--	--	--
	MW5-041906	04/19/2006	--	--	--	--	--	--	--	--
MW6	MW6-122905	12/29/2005	--	--	--	--	--	--	--	--
	MW6-041906	04/19/2006	--	--	--	--	--	--	--	--
MW7	MW7-122805	12/28/2005	--	--	--	--	--	--	--	--
	MW7-041806	04/18/2006	--	--	--	--	--	--	--	--
	MW7-041806-Dup	04/18/2006	--	--	--	--	--	--	--	--
MW8	MW8-122805	12/28/2005	--	--	--	--	--	--	--	--
	MWDUP-122805	12/28/2005	--	--	--	--	--	--	--	--
	MW8-041806	04/18/2006	--	--	--	--	--	--	--	--

Table 17
Volatile Organic Compounds in Groundwater (µg/L)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Tetra-chloroethene	Toluene	trans-1,2-Dichloroethene	trans-1,3-Dichloro-propene	Trichloro-ethene	Trichloro-fluoromethane	Vinyl chloride
MW1	MW1-W-35.0	6/16/2005	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	MW1-122705	12/27/2005	--	--	0.200 U	--	0.200 U	--	0.200 U
	MW1-041806	04/18/2006	--	--	0.091 U	--	0.055 U	--	0.14 U
MW2	MW2-W-0605	6/17/2005	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	MW2-122805	12/28/2005	--	--	0.200 U	--	0.200 U	--	0.200 U
	MW2-041906	04/19/2006	--	--	0.091 U	--	0.055 U	--	0.14 U
MW3	MW3-0605	6/7/2005	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	MW3-122905	12/29/2005	--	--	0.200 U	--	0.200 U	--	0.200 U
	MW3-041706	04/17/2006	--	--	0.091 U	--	0.055 U	--	0.14 U
MW4	MW4-0605	6/9/2005	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	MW4-0605-Dup	6/9/2005	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	MW4-122705	12/27/2005	--	--	0.200 U	--	0.200 U	--	0.200 U
	MW4-041806	04/18/2006	--	--	0.091 U	--	0.055 U	--	0.14 U
MW5	MW5-122805	12/28/2005	--	--	0.260	--	22.1	--	0.200 U
	MW5-041906	04/19/2006	--	--	0.091 U	--	7.9	--	0.14 U
MW6	MW6-122905	12/29/2005	--	--	1.00 U	--	1.00 U	--	1.00 U
	MW6-041906	04/19/2006	--	--	0.091 U	--	0.055 U	--	0.14 U
MW7	MW7-122805	12/28/2005	--	--	0.200 U	--	0.200 U	--	0.200 U
	MW7-041806	04/18/2006	--	--	0.091 U	--	0.055 U	--	0.14 U
	MW7-041806-Dup	04/18/2006	--	--	0.091 U	--	0.055 U	--	0.14 U
MW8	MW8-122805	12/28/2005	--	--	0.200 U	--	0.200 U	--	0.560
	MWDUP-122805	12/28/2005	--	--	0.200 U	--	0.200 U	--	0.400
	MW8-041806	04/18/2006	--	--	0.091 U	--	0.055 U	--	0.80 J

Table 18
Petroleum Hydrocarbon Identification in Groundwater
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Gasoline-Range Organics	Diesel-Range Organics	Oil-Range Organics
MW2	MW2-W-0605	6/17/2005	ND	DET	DET

Table 19
Petroleum Hydrocarbons in Groundwater (mg/L)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Gasoline-Range Organics	Diesel-Range Organics	Oil-Range Organics
MW1	MW1-122705	12/27/2005	--	0.248 U	0.495 U
	MW1-041806	4/18/2006	--	0.26 U	0.52 U
MW2	MW2-W-0605	6/17/2005	0.1 U	0.438	0.512
	MW2-122805	12/28/2005	--	1.19	1.04
	MW2-041906	4/19/2006	--	0.41	0.58 U
MW3	MW3-122905	12/29/2005	--	0.312	0.505 U
	MW3-041706	4/17/2006	--	0.28 U	0.57 U
MW4	MW4-122705	12/27/2005	--	0.248 U	0.495 U
	MW4-041806	4/18/2006	--	0.27 U	0.54 U
MW5	MW5-122805	12/28/2005	--	0.831	0.495 U
	MW5-041906	4/19/2006	--	0.26 U	0.51 U
MW6	MW6-122905	12/29/2005	--	2.64	1.32
	MW6-041906	4/19/2006	--	0.76	1.2
MW7	MW7-122805	12/28/2005	--	0.248 U	0.495 U
	MW7-041806	4/18/2006	--	0.26 U	0.51 U
	MW7-041806-Dup	4/18/2006	--	0.26 U	0.51 U
MW8	MW8-122805	12/28/2005	--	1.71	1.00
	MWDup-122805	12/28/2005	--	1.79	1.21
	MW8-041806	4/18/2006	--	0.45	0.58 U

Table 20
Polycyclic Aromatic Hydrocarbons in Groundwater (µg/L)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	2-Chloro-naphthalene	1-Methyl-naphthalene	2-Methyl-naphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a) anthracene
MW1	MW1-122705	12/27/2005	--	0.114 U	0.114 U	0.114 U	0.114 U	0.114 U	0.107
	MW1-041806	04/18/2006	--	0.030 U	0.0086 U	0.0038 J	0.020 J	0.030 J	0.029 J
MW2	MW2-W-0605	6/17/2005	0.192 U	--	0.481 U	0.192 U	0.192 U	0.192 U	0.192 U
	MW2-122805	12/28/2005	--	0.0990 U	0.0990 U	0.0990 U	0.0990 U	0.0990 U	0.00990 U
	MW2-041906	04/19/2006	--	0.035 U	0.0098 U	0.015 J	0.0044 U	0.035 J	0.031 J
MW3	MW3-122905	12/29/2005	--	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.0100 U
	MW3-041706	04/17/2006	--	0.034 U	0.0095 U	0.0032 U	0.0042 U	0.0084 U	0.0095 U
MW4	MW4-122705	12/27/2005	--	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.0100 U
	MW4-041806	04/18/2006	--	0.033 U	0.0092 U	0.0031 U	0.019 J	0.0082 U	0.0092 U
MW5	MW5-122805	12/28/2005	--	0.0990 U	0.0990 U	0.0990 U	0.0990 U	0.0990 U	0.00990 U
	MW5-041906	04/19/2006	--	0.030 U	0.017 J	0.0061 J	0.020 J	0.033 J	0.0086 U
MW6	MW6-122905	12/29/2005	--	0.0990 U	0.0990 U	0.0990 U	0.0990 U	0.0990 U	0.00990 U
	MW6-041906	04/19/2006	--	0.033 U	0.012 J	0.0031 U	0.0041 U	0.039 J	0.0093 U
MW7	MW7-122805	12/28/2005	--	0.0990 U	0.0990 U	0.0990 U	0.0990 U	0.0990 U	0.00990 U
	MW7-041806	04/18/2006	--	0.032 U	0.014 J	0.011 J	0.028 J	0.037 J	0.035 J
	MW7-041806-Dup	04/18/2006	--	0.032 U	0.0091 U	0.0043 J	0.0041 U	0.029 J	0.0091 U
MW8	MW8-122805	12/28/2005	--	0.106	0.100 U	0.100 U	0.100 U	0.100 U	0.0100 U
	MWDup-122805	12/28/2005	--	0.103	0.0990 U	0.0990 U	0.0990 U	0.0990 U	0.0990 U
	MW8-041806	04/18/2006	--	0.040 U	0.011 U	0.0038 U	0.0050 U	0.010 U	0.011 U

Table 20
Polycyclic Aromatic Hydrocarbons in Groundwater (µg/L)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Benzo(a) pyrene	Benzo(b) fluoranthene	Benzo(k) fluoranthene	Benzo(b+k) fluoranthene	Benzo(ghi) perylene	Chrysene	Dibenzo(a,h) anthracene
MW1	MW1-122705	12/27/2005	0.0114 U	0.104	0.108	--	0.114 U	0.132	0.0114 U
	MW1-041806	04/18/2006	0.057 U	--	--	0.030 U	0.017 U	0.014 J	0.011 U
MW2	MW2-W-0605	6/17/2005	0.192 U	--	--	0.962 U	0.192 U	0.192 U	0.192 U
	MW2-122805	12/28/2005	0.00990 U	0.00990 U	0.00990 U	--	0.0990 U	0.00990 U	0.00990 U
	MW2-041906	04/19/2006	0.066 U	--	--	0.034 U	0.020 U	0.0098 U	0.013 U
MW3	MW3-122905	12/29/2005	0.0100 U	0.0100 U	0.0100 U	--	0.100 U	0.0100 U	0.0100 U
	MW3-041706	04/17/2006	0.063 U	--	--	0.033 U	0.019 U	0.0095 U	0.013 U
MW4	MW4-122705	12/27/2005	0.0100 U	0.0100 U	0.0100 U	--	0.100 U	0.0100 U	0.0100 U
	MW4-041806	04/18/2006	0.061 U	--	--	0.032 U	0.018 U	0.0092 U	0.012 U
MW5	MW5-122805	12/28/2005	0.00990 U	0.00990 U	0.00990 U	--	0.0990 U	0.00990 U	0.00990 U
	MW5-041906	04/19/2006	0.057 U	--	--	0.030 U	0.017 U	0.0086 U	0.011 U
MW6	MW6-122905	12/29/2005	0.00990 U	0.00990 U	0.00990 U	--	0.0990 U	0.00990 U	0.00990 U
	MW6-041906	04/19/2006	0.062 U	--	--	0.032 U	0.019 U	0.0093 U	0.012 U
MW7	MW7-122805	12/28/2005	0.00990 U	0.00990 U	0.00990 U	--	0.0990 U	0.00990 U	0.00990 U
	MW7-041806	04/18/2006	0.061 U	--	--	0.031 U	0.018 U	0.013 J	0.038 J
	MW7-041806-Dup	04/18/2006	0.061 U	--	--	0.031 U	0.018 U	0.0091 U	0.012 U
MW8	MW8-122805	12/28/2005	0.0100 U	0.0100 U	0.0100 U	--	0.100 U	0.0100 U	0.0100 U
	MWDup-122805	12/28/2005	0.00990 U	0.00990 U	0.00990 U	--	0.0990 U	0.00990 U	0.00990 U
	MW8-041806	04/18/2006	0.075 U	--	--	0.039 U	0.023 U	0.011 U	0.015 U

Table 20
Polycyclic Aromatic Hydrocarbons in Groundwater (µg/L)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Fluoranthene	Fluorene	Indeno(1,2,3-cd) pyrene	Naphthalene	Phenanthrene	Pyrene
MW1	MW1-122705	12/27/2005	0.384	0.114 U	0.0114 U	0.114 U	0.159	0.310
	MW1-041806	04/18/2006	0.053 J	0.0076 U	0.034 J	0.011 J	0.024 J	0.043 U
MW2	MW2-W-0605	6/17/2005	0.192 U	0.192 U	0.192 U	0.854	0.192 U	0.192 U
	MW2-122805	12/28/2005	0.0990 U	0.0990 U	0.00990 U	0.271	0.0990 U	0.0990 U
	MW2-041906	04/19/2006	0.032 J	0.0087 U	0.016 U	0.93	0.0052 U	0.014 U
MW3	MW3-122905	12/29/2005	0.100 U	0.100 U	0.0100 U	0.100 U	0.100 U	0.100 U
	MW3-041706	04/17/2006	0.0095 U	0.0084 U	0.016 U	0.0063 U	0.0032 U	0.014 U
MW4	MW4-122705	12/27/2005	0.100 U	0.100 U	0.0100 U	0.100 U	0.100 U	0.100 U
	MW4-041806	04/18/2006	0.029 J	0.0082 U	0.015 U	0.011 J	0.0064 U	0.030 U
MW5	MW5-122805	12/28/2005	0.0990 U	0.0990 U	0.00990 U	0.457	0.0990 U	0.0990 U
	MW5-041906	04/19/2006	0.032 J	0.0076 U	0.014 U	0.13	0.014 U	0.032 U
MW6	MW6-122905	12/29/2005	0.0990 U	0.0990 U	0.00990 U	0.0990 U	0.0990 U	0.0990 U
	MW6-041906	04/19/2006	0.033 J	0.0083 U	0.016 U	0.013 J	0.011 U	0.034 U
MW7	MW7-122805	12/28/2005	0.0990 U	0.0990 U	0.00990 U	0.0990 U	0.0990 U	0.0990 U
	MW7-041806	04/18/2006	0.036 J	0.013 J	0.039 J	0.023 J	0.022 J	0.037 U
	MW7-041806-Dup	04/18/2006	0.0091 U	0.0081 U	0.015 U	0.019 J	0.0081 U	0.013 U
MW8	MW8-122805	12/28/2005	0.100 U	0.100 U	0.0100 U	0.100 U	0.100 U	0.100 U
	MWDup-122805	12/28/2005	0.0990 U	0.0990 U	0.00990 U	0.0990 U	0.0990 U	0.0990 U
	MW8-041806	04/18/2006	0.011 U	0.010 U	0.019 U	0.0075 U	0.0038 U	0.016 U

Table 21
Summary of Field Parameters in Groundwater
Precision Engineering, Inc.
Seattle, Washington

Location	Date Collected	pH (Standard Units)	Temperature (°C)	Conductivity (µS/cm)	Turbidity (NTUs)
MW1	12/27/2005	8.09	12.0	232	10.2
	4/18/2006	8.42	12.7	219	2.13
MW2	12/28/2005	6.30	14.5	1484	78.2
	4/19/2006	6.71	15.9	1260	46.4
MW3	12/29/2005	6.13	14.4	397	11.9
	4/17/2006	6.63	13.8	371	1.14
MW4	12/27/2005	7.53	16.3	403	4.16
	4/18/2006	8.15	15.6	391	2.70
MW5	12/28/2005	5.97	16.5	1020	1.46
	4/19/2006	6.50	15.4	693	1.56
MW6	12/29/2005	6.29	14.9	2620	16.88
	4/19/2006	6.63	14.4	1691	24.9
MW7	12/28/2005	6.82	14.3	1115	3.00
	4/18/2006	7.28	16.3	996	5.33
MW8	12/28/2005	6.43	14.5	--	388
	4/18/2006	6.84	14.2	920	135.2

Table 22
Volatile Organic Compounds in Sub-Slab Vapor (µg/m³)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Trichloro-ethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Vinyl chloride	Isobutane	Butane
A1	A1-042806	04/18/2006	4.0 U	3.0 U	3.0 U	1.9 U	5800 J	73
A2	A2-042806	04/18/2006	4.9 U	3.6 U	3.6 U	2.3 U	5500 J	160
A3	A3-042806	04/18/2006	6100	470	13 U	8.4 U	2600 J	31 U
A4	A4-042806	04/18/2006	NA	NA	NA	NA	NA	NA
A5	A5-042806	04/18/2006	37000	1700	100 U	420	620 U	250 U
A6	A6-042806	04/18/2006	3.5 U	2.6 U	2.6 U	1.7 U	>11000 J	350
A7	A7-042806	04/18/2006	3.5 U	2.6 U	2.6 U	1.7 U	>13000 J	330

Table 23
Volatile Organic Compounds in Air (µg/m^3)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Trichloro-ethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethane	1,1-Dichloroethene	Vinyl chloride
IA1	IA1	06/13/2006	0.2	0.12 U	0.63 U	0.13 U	0.063 U	0.040 U
IA2	IA2	06/13/2006	0.083	0.13 U	0.65 U	0.13 U	0.065 U	0.042 U
IA3	IA3	06/13/2006	0.11	0.15 U	0.74 U	0.15 U	0.074 U	0.048 U
IA4	IA4	06/13/2006	0.14	0.14 U	0.69 U	0.14 U	0.069 U	0.045 U
IA5	IA5	06/13/2006	0.16	0.16 U	0.80 U	0.16 U	0.080 U	0.051 U
IA6	IA6	06/13/2006	0.15	0.12 U	0.60 U	0.12 U	0.060 U	0.039 U
IA6	IA6 Duplicate	06/13/2006	0.15	0.12 U	0.60 U	0.12 U	0.060 U	0.039 U
IA7	IA7	06/13/2006	0.046	0.13 U	0.65 U	0.13 U	0.065 U	0.042 U
IA8	IA8	06/13/2006	0.15	0.13 U	0.65 U	0.13 U	0.065 U	0.042 U

Table 24
Exposure Scenarios
Precision Engineering, Inc.
Seattle, Washington

Medium	Exposure Pathway	Receptors	Selected Pathway	Reason for Selection or Exclusion
Soil (0 to 15 feet bgs)	Ingestion, Inhalation, and Dermal Absorption	Outdoor Industrial Workers	Yes	Future industrial workers may have contact with soil if the building and pavement are removed.
Vadose-Zone Soil (0 to15 feet bgs)	Volatilization to Indoor Air	Indoor Industrial Workers	Yes	Volatile chemicals in vadose-zone soil may penetrate an on-site building and enter indoor air.
Soil	Leaching to Groundwater	Industrial Workers	Yes	IHSs in soil may leach to groundwater.
Groundwater	Ingestion, Inhalation, and Dermal Absorption	Residents and Industrial Workers	No	Groundwater in the area is not used for drinking.
Groundwater	Volatilization to Indoor Air	Indoor Industrial Workers	Yes	Volatile chemicals in groundwater may penetrate an on-site building and enter indoor air.
Groundwater	Volatilization to Outdoor Air	Industrial Workers	No	Volatile chemicals in groundwater may migrate to outdoor air. However, CULs protective of indoor industrial workers are more stringent than those protective of outdoor workers.
Surface Water	Fish Ingestion	Recreational Fishers	No	Impacted groundwater does not extend to the Duwamish River.
Surface Water	Gill Uptake	Aquatic/Benthic Biota	No	Impacted groundwater does not extend to the Duwamish River.

Table 25
Risk Screening
Hexavalent Chromium in Soil (mg/kg)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Lab Code	Date	Depth (ft bgs)	Chromium (Hexavalent)	Chromium (Trivalent)[a]
MTCA Method A CULs for Unrestricted Land Use					19	2000
MTCA Method B CULs for Ingestion only					240	NV
MTCA Method C CULs for Ingestion Only					11,000	NV
CUL for Industrial Workers—Direct Contact					775	390,000
On-Site Geoprobe Sampling						
GP1	GP1-S-1.5	128268-01	6/7/2005	1.5	152	53
	GP1-S-6.0	128268-02	6/7/2005	6	31.8	115.2
	GP1-S-10.0	128318-02	6/9/2005	10	14.4	59.1
GP2	GP2-S-1.0	128268-03	6/7/2005	1	523	2157
	GP2-S-10.0	128318-01	6/9/2005	10	0.109 U	24.9
GP3	GP3-S-2.0	128318-03	6/9/2005	2	27.7	887.3
	GP3-S-6.0	128318-04	6/9/2005	6	49.8	1050.2
	GP3-S-14	128318-05	6/9/2005	14	34.4	906.6
GP4	GP4-S-1.5	128457-01	6/16/2005	1.5	53.4	1176.6
GP5	GP5-S-1.5	128457-02	6/16/2005	1.5	0.111 U	18.9
	GP5-S-14.0	128457-04	6/16/2005	14	0.115 U	20.1
GP6	GP6-S-1.0	128457-05	6/16/2005	1	627	NC
	GP6-S-14.5	128457-07	6/16/2005	14.5	0.181	258.819
GP7	GP7-S-2.0	128457-08	6/16/2005	2	0.119	23.481
	GP7-S-8.0	128457-09	6/16/2005	8	0.113 U	21
GP8	GP8-S-1.5	128457-10	6/16/2005	1.5	0.661	21.539
GP9	GP9-S-2.0	128457-11	6/17/2005	2	2.97	40.33
GP10	GP10-S-1.5	128457-12	6/17/2005	1.5	0.142	21.658
	GP10-S-13.5	128457-14	6/17/2005	13.5	0.106 U	24.1
GP11	GP11-S-2.0	128457-15	6/17/2005	2	0.573	21.127
	GP11-S-6.5	128457-16	6/17/2005	6.5	0.37	16.93
GP12	GP12-S-3.0	B5L0339-30	12/13/2005	3	1.1 UJ	24.3
	GP12-S-5.0	B5L0339-31	12/13/2005	5	1.0 UJ	25.2
GP13	GP13-S-1.0	B5L0418-01	12/14/2005	1	1.4 UJ	26.6
	GP13-S-6.0	B5L0418-02	12/14/2005	6	1.3 UJ	46.6
GP14	GP14-S-3.0	B5L0339-24	12/13/2005	3	2.0 UJ	24.8
	GP14-S-6.0	B5L0339-25	12/13/2005	6	1.2 J	30.2
GP15	GP15-S-3.0	B5L0339-32	12/13/2005	3	1.2 UJ	24.7
	GP15-S-6.0	B5L0339-33	12/13/2005	6	1.2 UJ	20.2
GP16	GP16-S-1.0	B5L0339-22	12/13/2005	1	2.1 UJ	30.0
	GP16-S-5.0	B5L0339-23	12/13/2005	5	2.1 UJ	26.2
GP17	GP17-S-1.0	B5L0339-17	12/13/2005	1	1.7 UJ	254
	GP17-S-6.0	B5L0339-18	12/13/2005	6	60 J	1600
GP18	GP18-S-1.0	B5L0339-26	12/13/2005	1	**2300 J**	2130
GP19	GP19-S-1.0	B5L0339-19	12/13/2005	1	2.5 UJ	22.0
	GP19-S-1.0-Dup	B5L0339-19	12/13/2005	1	2.0 UJ	24.8
	GP19-S-7.0	B5L0339-21	12/13/2005	7	2.7 UJ	27.1
GP20	GP20-S-1.0	B5L0418-05	12/14/2005	1	1.1 UJ	17.6
	GP20-S-6.0	B5L0418-06	12/14/2005	6	1.5 UJ	24.5
GP21	GP21-S-1.0	B5L0418-03	12/14/2005	1	1.0 UJ	25.6
	GP21-S-6.5	B5L0418-04	12/14/2005	6.5	1.3 UJ	23.0

Table 25
Risk Screening
Hexavalent Chromium in Soil (mg/kg)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Lab Code	Date	Depth (ft bgs)	Chromium (Hexavalent)	Chromium (Trivalent)[a]
MTCA Method A CULs for Unrestricted Land Use					19	2000
MTCA Method B CULs for Ingestion only					240	NV
MTCA Method C CULs for Ingestion Only					11,000	NV
CUL for Industrial Workers—Direct Contact					775	390,000
On-Site Geoprobe Sampling cont.						
GP22	GP22-S-1.0	B5L0339-27	12/13/2005	1	2.9 J	43.9
	GP22-S-10.0	B5L0339-29	12/13/2005	10	1.3 UJ	32.1
GP23	GP23-S-7.0	B5L0418-10	12/14/2005	7	1.1 UJ	23.3
	GP23-S-10.5	B5L0418-11	12/14/2005	10.5	1.2 UJ	979
GP24	GP24-S-3.0	B5L0418-12	12/14/2005	3	1.0 UJ	30.2
	GP24-S-3.0-Dup	B5L0418-12	12/14/2005	3	1.1 UJ	26.2
	GP24-S-6.5	B5L0418-14	12/14/2005	6.5	2.4 UJ	29.3
GP25	GP25-S-1.0	B5L0339-01	12/12/2005	1	1.8 UJ	19.3
	GP25-S-7.0	B5L0339-02	12/12/2005	7	1.7 UJ	19.8
GP26	GP26-S-1.0	B5L0339-03	12/12/2005	1	2.2 UJ	23.7
	GP26-S-9.5	B5L0339-05	12/12/2005	9.5	2.1 UJ	24.0
GP27	GP27-S-1.0	B5L0339-06	12/12/2005	1	2.2 UJ	22.0
	GP27-S-13.0	B5L0339-08	12/12/2005	13	2.1 UJ	18.6
GP28	GP28-S-1.0	B5L0339-09	12/12/2005	1	2.2 UJ	20.5
	GP28-S-7.0	B5L0339-10	12/12/2005	7	1.8 UJ	22.4
GP29	GP29-S-1.0	B5L0339-11	12/12/2005	1	2.4 UJ	29.6
	GP29-S-6.0	B5L0339-12	12/12/2005	6	2.6 UJ	31.9
GP30	GP30-S-1.0	B5L0339-13	12/12/2005	1	2.1 UJ	27.2
	GP30-S-6.0	B5L0339-14	12/12/2005	6	2.4 UJ	32.7
GP31	GP31-S-1.0	B5L0339-15	12/12/2005	1	2.1 UJ	19.2
	GP31-S-6.0	B5L0339-16	12/12/2005	6	3.0 UJ	23.6
GP32	GP32-S-1.0	B5L0418-08	12/14/2005	1	**3500 J**	3250
Off-Site Hand-Auger Sampling						
HA1	HA1-0.5	B5L0418-17	12/15/2005	0.5	2.9 UJ	34.3
	HA1-1.5	B5L0418-18	12/15/2005	1.5	6.5 J	103.5
	HA1-1.5-Dup	B5L0418-18	12/15/2005	1.5	2.8 UJ	84.5
HA2	HA2-0.5	B5L0418-19	12/15/2005	0.5	89 J	117
	HA2-1.5	B5L0418-20	12/15/2005	1.5	3.2 J	211.8
HA3	HA3-0.5	B5L0418-21	12/15/2005	0.5	2.6 UJ	1590
	HA3-1.5	B5L0418-22	12/15/2005	1.5	2.4 UJ	55.2
HA4	HA4-0.5	B5L0418-23	12/15/2005	0.5	7.2 UJ	8480
	HA4-1.5	B5L0418-24	12/15/2005	1.5	3.0 UJ	280
HA5	HA5-0.5	B5L0418-25	12/15/2005	0.5	5.8 UJ	155
	HA5-1.5	B5L0418-26	12/15/2005	1.5	2.9 UJ	32.7
HA6	HA6-0.5	580-2284-4	04/18/2006	0.5	3.33 J	NC
HA7	HA7-0.5	580-2284-6	04/18/2006	0.5	0.22 J	NC
HA8	HA8-0.5	580-2284-8	04/18/2006	0.5	0.26 J	NC
HA9	HA9-0.5	580-2284-13	04/19/2006	0.5	3.4 J	NC
HA10	HA10.05	580-2284-15	04/19/2006	0.5	0.074 J	NC
HA11	HA11-0.5	580-2284-17	04/19/2006	0.5	0.45 J	NC

Table 26
Risk Screening
Metal IHSs in Soil (mg/kg)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Depth (ft bgs)	Arsenic	Cadmium	Copper	Lead
MTCA Method A CULs for Unrestricted Land Use				20	2	NV	250
MTCA Method B CULs for Ingestion only				0.67	80	3000	NV
MTCA Method C CULs for Ingestion only				88	3,500	130,000	NV
CUL for Industrial Workers—Direct Contact				20*	2,350	53,300	1,000*
Off-Site Hand-Auger Sampling							
HA1	HA1-0.5	12/15/2005	0.5	3.81	0.576 U	32.8	34.6
	HA1-1.5	12/15/2005	1.5	2.88 J	0.550 U	16.2 J	15.3 J
	HA1-1.5-Dup	12/15/2005	1.5	8.35 J	0.707 U	68.4 J	95.3 J
HA2	HA2-0.5	12/15/2005	0.5	3.94	0.984	70.9	81.4
	HA2-1.5	12/15/2005	1.5	2.71	0.613 U	28.2	36.5
HA3	HA3-0.5	12/15/2005	0.5	**53.9**	2.53	528	545
	HA3-1.5	12/15/2005	1.5	6.96	0.585 U	16.4	8.41
HA4	HA4-0.5	12/15/2005	0.5	**44.3**	28.7	978	**1710**
	HA4-1.5	12/15/2005	1.5	5.25	0.819 U	48.8	50.8
HA5	HA5-0.5	12/15/2005	0.5	**35.9**	3.13	129	**1440**
	HA5-1.5	12/15/2005	1.5	12.5	1.09	39.6	209
HA12	HA12-0.5	4/19/2006	0.5	9.0	0.48 J	39	220
HA17	HA17-S-0.5	1/9/2007	0.5	6.61	--	--	278
	HA17-S-1.5	1/9/2007	1.5	5.3	--	--	23.5
HA18	HA18-S-0.5	1/9/2007	0.5	5.03	--	--	61.5
	HA18-S-1.5	1/9/2007	1.5	2.12 U	--	--	2.12 U
HA19	HA19-S-0.5	1/9/2007	0.5	12.7	--	--	134
	HA19-S-1.5	1/9/2007	1.5	4.02	--	--	11.3
HA20	HA20-S-0.5	1/9/2007	0.5	2.02 U	--	--	27.9
	HA20-S-1.5	1/9/2007	1.5	1.81 U	--	--	8.91
HA21	HA21-S-0.5	1/10/2007	0.5	5.72	--	--	398
	HA21-S-1.5	1/10/2007	1.5	5.83	--	--	121
HA22	HA22-S-0.5	1/10/2007	0.5	**53.5**	--	--	986
	HA22-S-1.5	1/10/2007	1.5	10.3	--	--	32.4
HA23	HA23-S-0.5	1/10/2007	0.5	4.44	--	--	26.9
	HA23-S-1.5	1/10/2007	1.5	4.91	--	--	20.5
HA24	HA24-S-0.5	1/10/2007	0.5	4.9	--	--	63.9
	HA24-S-1.5	1/10/2007	1.5	5.23	--	--	24.3
HA25	HA25-S-0.5	1/10/2007	0.5	11.6	--	--	302
	HA25-S-1.5	1/10/2007	1.5	11.8	--	--	15.5

*MTCA Method A - Industrial Use

Table 27
Risk Screening
Volatile Organic Compound IHSs in Soil (µg/kg)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Depth (ft bgs)	Trichloro-ethene	Vinyl chloride
MTCA Method A CULs for Unrestricted Land Use				30	NA
MTCA Method B CULs for Ingestion only				2500	667
MTCA Method C CULs for Ingestion Only				330,000	88,000
CUL for Industrial Workers—Direct Contact				6780	NA
CUL for Vapor Intrusion				41.5	NA
On-Site Geoprobe Sampling					
GP1	GP1-S-1.5	6/7/2005	1.5	0.839 U	0.839 U
	GP1-S-6.0	6/7/2005	6	1.12 U	1.12 U
	GP1-S-10.0	6/9/2005	10	7.65 U	7.65 U
GP2	GP2-S-1.0	6/7/2005	1	0.96 U	0.96 U
	GP2-S-10.0	6/9/2005	10	8.81 U	8.81 U
GP3	GP3-S-2.0	6/9/2005	2	15.9 U	15.9 U
	GP3-S-6.0	6/9/2005	6	8.96 U	8.96 U
	GP3-S-14	6/9/2005	14	7.71 U	7.71 U
GP4	GP4-S-1.5	6/16/2005	1.5	10.3 U	10.3 U
GP5	GP5-S-1.5	6/16/2005	1.5	7.12 U	7.12 U
	GP5-S-8.0	6/16/2005	8	7.03 U	7.03 U
	GP5-S-14.0	6/16/2005	14	8.1 U	8.1 U
GP6	GP6-S-1.0	6/16/2005	1	40.5	8.5 U
	GP6-S-14.5	6/16/2005	14.5	**1160**	8.28 U
GP7	GP7-S-2.0	6/16/2005	2	7.81 U	7.81 U
	GP7-S-8.0	6/16/2005	8	8.84 U	8.84 U
GP8	GP8-S-1.5	6/16/2005	1.5	9.86 U	9.86 U
GP9	GP9-S-2.0	6/17/2005	2	7.42 U	7.42 U
GP10	GP10-S-1.5	6/17/2005	1.5	11.2 U	11.2 U
	GP10-S-13.5	6/17/2005	13.5	7.96 U	7.96 U
GP11	GP11-S-2.0	6/17/2005	2	**87.2**	8.37 U
	GP11-S-6.5	6/17/2005	6.5	**281**	8.61 U
GP12	GP12-S-3.0	12/13/2005	3	2.39 U	2.39 U
	GP12-S-5.0	12/13/2005	5	2.27 U	2.27 U
GP13	GP13-S-1.0	12/14/2005	1	9.89 U	9.89 U
	GP13-S-6.0	12/14/2005	6	2.89 U	2.89 U
GP14	GP14-S-3.0	12/13/2005	3	4.49	2.44 U
	GP14-S-6.0	12/13/2005	6	2.62 U	2.62 U
GP15	GP15-S-3.0	12/13/2005	3	2.72 U	2.72 U
	GP15-S-6.0	12/13/2005	6	10.5 U	10.5 U
GP16	GP16-S-1.0	12/13/2005	1	3.63	1.85 U
	GP16-S-5.0	12/13/2005	5	2.12 U	2.12 U
GP17	GP17-S-1.0	12/13/2005	1	2.09 U	2.09 U
	GP17-S-6.0	12/13/2005	6	2.27 U	2.27 U
GP18	GP18-S-1.0	12/13/2005	1	3.43	2.36 U
GP19	GP19-S-1.0	12/13/2005	1	2.67 U	2.67 U
	GP19-S-1.0-Dup	12/13/2005	1	2.40 U	2.40 U
	GP19-S-7.0	12/13/2005	7	2.72 U	2.72 U

Table 27
Risk Screening
Volatile Organic Compound IHSs in Soil (µg/kg)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Depth (ft bgs)	Trichloro-ethene	Vinyl chloride
MTCA Method A CULs for Unrestricted Land Use				30	NA
MTCA Method B CULs for Ingestion only				2500	667
MTCA Method C CULs for Ingestion Only				330,000	88,000
CUL for Industrial Workers—Direct Contact				6780	NA
CUL for Vapor Intrusion				41.5	NA
On-Site Geoprobe Sampling cont.					
GP20	GP20-S-1.0	12/14/2005	1	2.62 U	2.62 U
	GP20-S-6.0	12/14/2005	6	4.52 U	4.52 U
GP21	GP21-S-1.0	12/14/2005	1	2.18 U	2.18 U
	GP21-S-6.5	12/14/2005	6.5	2.79 U	2.79 U
GP22	GP22-S-1.0	12/13/2005	1	2.26 U	2.26 U
	GP22-S-10.0	12/13/2005	10	1.89 U	1.89 U
GP23	GP23-S-7.0	12/14/2005	7	1.80 U	1.80 U
	GP23-S-10.5	12/14/2005	10.5	2.27 U	2.27 U
GP24	GP24-S-3.0	12/14/2005	3	2.58 U	2.58 U
	GP24-S-3.0-Dup	12/14/2005	3	2.50 U	2.50 U
	GP24-S-6.5	12/14/2005	6.5	2.83 U	2.83 U
GP25	GP25-S-1.0	12/12/2005	1	2.13 U	2.13 U
	GP25-S-7.0	12/12/2005	7	2.47 U	2.47 U
GP26	GP26-S-1.0	12/12/2005	1	2.01 U	2.01 U
	GP26-S-9.5	12/12/2005	9.5	2.65 U	2.65 U
GP27	GP27-S-1.0	12/12/2005	1	2.19 U	2.19 U
	GP27-S-13.0	12/12/2005	13	2.05 U	2.05 U
GP28	GP28-S-1.0	12/12/2005	1	1.87 U	1.87 U
	GP28-S-7.0	12/12/2005	7	2.17 U	2.17 U
GP29	GP29-S-1.0	12/12/2005	1	2.47 U	2.47 U
	GP29-S-6.0	12/12/2005	6	2.43 U	2.43 U
GP30	GP30-S-1.0	12/12/2005	1	2.39 U	2.39 U
	GP30-S-6.0	12/12/2005	6	3.32 U	3.32 U
GP31	GP31-S-1.0	12/12/2005	1	2.02 U	2.02 U
	GP31-S-6.0	12/12/2005	6	3.41 U	3.41 U
GP32	GP32-S-1.0	12/14/2005	1	2.37 U	2.37 U

Table 28
Risk Screening
Polycyclic Aromatic Hydrocarbon IHSs in Soil (mg/kg)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Depth (ft bgs)	Benzo(a) anthracene*	Benzo(a) pyrene*	Benzo(b) fluoranthene*	Benzo(k) fluoranthene*
MTCA Method A CULs for Unrestricted Land Use				NV	0.1	NV	NV
MTCA Method B CULs for Ingestion only				0.14	0.14	0.14	0.14
MTCA Method C CULs for Ingestion only				18	18	18	18
CUL for Industrial Workers—Direct Contact				NC	NC	NC	NC
Off-Site Hand-Auger Sampling							
HA1	HA1-0.5	12/15/2005	0.5	0.0151 U	0.0151 U	0.0151 U	0.0151 U
	HA1-1.5	12/15/2005	1.5	0.0129 U	0.0129 U	0.0129 U	0.0129 U
	HA1-1.5-Dup	12/15/2005	1.5	0.0288	0.0500	0.0769	0.0581
HA2	HA2-0.5	12/15/2005	0.5	0.0176 U	0.0176 U	0.0222	0.0205
	HA2-1.5	12/15/2005	1.5	0.0125 U	0.0125 U	0.0204	0.0151
HA3	HA3-0.5	12/15/2005	0.5	0.0340	0.0525	0.0982	0.0706
	HA3-1.5	12/15/2005	1.5	0.0118 U	0.0118 U	0.0118 U	0.0118 U
HA4	HA4-0.5	12/15/2005	0.5	0.554	0.694	0.771	0.749
	HA4-1.5	12/15/2005	1.5	0.0159 U	0.0159 U	0.0159 U	0.0159 U
HA5	HA5-0.5	12/15/2005	0.5	0.862	1.45	1.62	1.82
	HA5-1.5	12/15/2005	1.5	0.0153 U	0.0153 U	0.0153 U	0.0153 U

*Criteria shown for MTCA values pre October 2007.
**Criteria shown is for benzo(a)pyrene for MTCA cPAH screening post October 2007.

Table 28
Risk Screening
Polycyclic Aromatic Hydrocarbon IHSs in Soil (mg/kg)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Depth (ft bgs)	Chrysene*	Dibenzo(a,h) anthracene*	Indeno(1,2,3-cd) pyrene*	Total cPAHs including TEFs**
MTCA Method A CULs for Unrestricted Land Use				NV	NV	NV	0.1
MTCA Method B CULs for Ingestion only				0.14	0.14	0.14	0.14
MTCA Method C CULs for Ingestion only				18	18	18	18
CUL for Industrial Workers—Direct Contact				3420	NC	NC	NC
Off-Site Hand-Auger Sampling							
HA1	HA1-0.5	12/15/2005	0.5	0.0151 U	0.0151 U	0.0151 U	0.011
	HA1-1.5	12/15/2005	1.5	0.0129 U	0.0129 U	0.0129 U	0.010
	HA1-1.5-Dup	12/15/2005	1.5	0.0612	0.0152 U	0.0201	0.070
HA2	HA2-0.5	12/15/2005	0.5	0.0276	0.0176 U	0.0176 U	0.016
	HA2-1.5	12/15/2005	1.5	0.0179	0.0125 U	0.0125 U	0.012
HA3	HA3-0.5	12/15/2005	0.5	0.0804	0.0133 U	0.0385	0.078
	HA3-1.5	12/15/2005	1.5	0.0118 U	0.0118 U	0.0118 U	0.009
HA4	HA4-0.5	12/15/2005	0.5	0.899	0.34 U	0.34 U	0.944
	HA4-1.5	12/15/2005	1.5	0.0159	0.0159 U	0.0159 U	0.012
HA5	HA5-0.5	12/15/2005	0.5	1.54	0.435	1.02	2.041
	HA5-1.5	12/15/2005	1.5	0.0153 U	0.0153 U	0.0153 U	0.012

*Criteria shown for MTCA values pre October 2007.
**Criteria shown is for benzo(a)pyrene for MTCA cPAH scre

Table 29
Risk Screening
Hexavalent Chromium in Groundwater (mg/L)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Chromium (Hexavalent)	Dissolved Chromium (Trivalent)[a]
MTCA Method A Groundwater CULs			NV	NV
MTCA Method B Groundwater CULs			0.048	24
MTCA Method C Groundwater CULs			0.11	53
MTCA Method C Surface-Water CULs			1.20	610
AWQC—Human Health			NR	NR
Surface-Water ARAR—Aquatic Life—Acute			0.015	1.8
AWQC—Aquatic Life—Chronic			0.01	0.057
Site-Specific Groundwater CUL for the Protection of Surface Water			0.15	2,800,000,000
Excavation Worker Direct-Contact			>Max	190
Monitoring Well Groundwater Data				
MW1	MW1-W-35.0	6/16/2005	**0.269**	NC
	MW1-122705	12/27/2005	0.00625 U	NC
	MW1-041806	04/18/2006	0.02 U	NC
MW2	MW2-W-0605	6/17/2005	0.01 U	NC
	MW2-122805	12/28/2005	0.00625 U	0.00879
	MW2-041906	04/19/2006	0.02 U	0.021
MW3	MW3-0605	6/7/2005	0.01 U	NC
	MW3-122905	12/29/2005	0.00625 U	0.00215
	MW3-041706	04/17/2006	0.02 U	0.0078
MW4	MW4-0605	6/9/2005	0.01 U	NC
	MW4-0605-Dup	6/9/2005	0.01 U	NC
	MW4-122705	12/27/2005	0.00625 U	NC
	MW4-041806	04/18/2006	0.023	NC
MW5	MW5-122805	12/28/2005	**450**	47
	MW5-041906	04/19/2006	**350**	NC
MW6	MW6-122905	12/29/2005	0.00625 U	0.0187
	MW6-041906	04/19/2006	0.02 U	0.047
MW7	MW7-122805	12/28/2005	0.00738	0.0106
	MW7-041806	04/18/2006	0.02U	0.013
	MW7-041806-Dup	04/18/2006	0.02 U	NC
MW8	MW8-122805	12/28/2005	0.00625 U	0.00755
	MWDUP-122805	12/28/2005	0.02 U	0.00849
	MW8-041806	04/18/2006	0.02 UJ	0.021
Reconnaissance Groundwater Data				
GP2	GP2-W-17-RECON	6/9/2005	**32.38**	4.72
GP4	GP4-W-8.0	6/16/2005	**31**	236
GP5	GP5-W-18.0	6/16/2005	NC	0.0897
GP6	GP6-W-18.0	6/16/2005	**43**	300
GP7	GP7-W-14.0	6/16/2005	NC	0.101
GP8	GP8-W-10.0	6/16/2005	**61**	294
GP-13	GP13-W-8.0	12/14/2005	NC	NA
GP-15	GP15-W-8.0	12/14/2005	NC	NA

Table 30
Risk Screening
Dissolved Metal IHSs in Groundwater (µg/L)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Arsenic	Copper	Selenium
MTCA Method A Groundwater CULs			5	NV	NV
MTCA Method B Groundwater CULs			0.0583	592	80
MTCA Method C Groundwater CULs			0.0583	1,300	175
MTCA Method C Surface-Water CULs			2.46	6,660	6,750
AWQC—Human Health			0.018	NR	170
Surface-Water ARAR—Aquatic Life—Acute			360	4.6	20
AWQC—Aquatic Life—Chronic			190	3.5	5
Site-Specific Groundwater CUL for the Protection of Surface Water			NV	22	NV
Excavation Worker Direct-Contact Groundwater CUL			5.8	5000	NV
Monitoring Well Groundwater Data					
MW1	MW1-W-35.0	6/16/2005	NA	NA	NA
	MW1-122705	12/27/2005	**32.3**	1.01	1.00 U
	MW1-041806	04/18/2006	**33**	2.0 U	2.0 U
MW2	MW2-W-0605	6/17/2005	NA	NA	NA
	MW2-122805	12/28/2005	5.63	1.17	6.28
	MW2-041906	04/19/2006	3.8	2.5	10
MW3	MW3-0605	6/7/2005	NA	NA	NA
	MW3-122905	12/29/2005	**15.3**	1.00 U	1.00 U
	MW3-041706	04/17/2006	**13**	2.0 U	2.0 U
MW4	MW4-0605	6/9/2005	NA	NA	NA
	MW4-0605-Dup	6/9/2005	NA	NA	NA
	MW4-122705	12/27/2005	**15.1**	1.00 U	1.00 U
	MW4-041806	04/18/2006	**15**	2.0 U	2.0 U
MW5	MW5-122805	12/28/2005	4.59	3.67	1000 U
	MW5-041906	04/19/2006	4.9	2.0 U	2.0 U
MW6	MW6-122905	12/29/2005	**11.9**	4.02	12.3
	MW6-041906	04/19/2006	**24**	5.1	19
MW7	MW7-122805	12/28/2005	**6.62**	2.12	2.77
	MW7-041806	04/18/2006	**7.1**	2.4	5
	MW7-041806-Dup	04/18/2006	NA	NA	NA
MW8	MW8-122805	12/28/2005	**6.41**	1.00 U	4.11
	MWDUP-122805	12/28/2005	**7.85**	1.03	4.27
	MW8-041806	04/18/2006	4.8	2.0 U	3.6
Reconnaissance Groundwater Data					
GP2	GP2-W-17-RECON	6/9/2005	NA	NA	NA
GP4	GP4-W-8.0	6/16/2005	NA	NA	NA
GP5	GP5-W-18.0	6/16/2005	NA	NA	NA
GP6	GP6-W-18.0	6/16/2005	NA	NA	NA
GP7	GP7-W-14.0	6/16/2005	NA	NA	NA
GP8	GP8-W-10.0	6/16/2005	NA	NA	NA
GP-13	GP13-W-8.0	12/14/2005	NA	NA	NA
GP-15	GP15-W-8.0	12/14/2005	NA	NA	NA

Table 31
Risk Screening
Volatile Organic Compound IHSs in Groundwater (µg/L)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Trichloro-ethene	Vinyl chloride
MTCA Method A Groundwater CULs			5	0.2
MTCA Method B Groundwater CULs			0.109	0.0292
MTCA Method C Groundwater CULs			1.1	0.29
MTCA Method C Surface-Water CULs			37	92
AWQC—Human Health			2.5	0.025
Surface-Water ARAR—Aquatic Life—Acute			NR	NR
AWQC—Aquatic Life—Chronic			NR	NR
CUL for Vapor Intrusion			10.8	71.5
Site-Specific Groundwater CUL for the Protection of Surface Water			1,630	52
Excavation Worker Direct-Contact Groundwater CUL			130	1100
Monitoring Well Groundwater Data				
MW1	MW1-W-35.0	6/16/2005	1 U	1 U
	MW1-122705	12/27/2005	0.200 U	0.200 U
	MW1-041806	04/18/2006	0.055 U	0.14 U
MW2	MW2-W-0605	6/17/2005	1 U	1 U
	MW2-122805	12/28/2005	0.200 U	0.200 U
	MW2-041906	04/19/2006	0.055 U	0.14 U
MW3	MW3-0605	6/7/2005	1 U	1 U
	MW3-122905	12/29/2005	0.200 U	0.200 U
	MW3-041706	04/17/2006	0.055 U	0.14 U
MW4	MW4-0605	6/9/2005	1 U	1 U
	MW4-0605-Dup	6/9/2005	1 U	1 U
	MW4-122705	12/27/2005	0.200 U	0.200 U
	MW4-041806	04/18/2006	0.055 U	0.14 U
MW5	MW5-122805	12/28/2005	**22.1**	0.200 U
	MW5-041906	04/19/2006	7.9	0.14 U
MW6	MW6-122905	12/29/2005	1.00 U	1.00 U
	MW6-041906	04/19/2006	0.055 U	0.14 U
MW7	MW7-122805	12/28/2005	0.200 U	0.200 U
	MW7-041806	04/18/2006	0.055 U	0.14 U
	MW7-041806-Dup	04/18/2006	0.055 U	0.14 U
MW8	MW8-122805	12/28/2005	0.200 U	0.560
	MWDUP-122805	12/28/2005	0.200 U	0.400
	MW8-041806	04/18/2006	0.055 U	0.80 J
Reconnaissance Groundwater Data				
GP2	GP2-W-17-RECON	6/9/2005	5 U	5 U
GP4	GP4-W-8.0	6/16/2005	1 U	1 U
GP5	GP5-W-18.0	6/16/2005	1 U	1 U
GP6	GP6-W-18.0	6/16/2005	**1130**	20 U
GP7	GP7-W-14.0	6/16/2005	1 U	1 U
GP8	GP8-W-10.0	6/16/2005	**16.8**	1 U
GP-13	GP13-W-8.0	12/14/2005	0.220	16.5
GP-15	GP15-W-8.0	12/14/2005	0.2 U	0.2 U

Table 32
Risk Screening
Polycyclic Aromatic Hydrocarbons in Groundwater (µg/L)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Benzo(a) anthracene*	Benzo(a) pyrene*	Benzo(b) fluoranthene*	Benzo(k) fluoranthene*	Benzo(b+k) fluoranthene*	Chrysene*	Dibenzo(a,h) anthracene*	Indeno (1,2,3-cd) pyrene*	Total cPAHs including TEFs**
MTCA Method A Groundwater CULs			NV	0.1	NV	NV	NV	NV	NV	NV	0.1
MTCA Method B Groundwater CULs			0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012
MTCA Method C Groundwater CULs			0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
MTCA Method C Surface-Water CULs			0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
AWQC—Human Health			0.0038	0.0038	0.0038	0.0038	NR	0.0038	0.0038	0.0038	0.0038
Surface-Water ARAR—Aquatic Life—Acute			NR	NR	NR	NR	NR	NR	NR	NR	NR
AWQC—Aquatic Life—Chronic			NR	NR	NR	NR	NR	NR	NR	NR	NR
Site-Specific Groundwater CUL for the Protection of Surface Water			145,000,000	NC	108,000,000	38,000,000	NC	95,000,000	100,000,000	97,000,000	NC
Excavation Worker Direct-Contact Groundwater CUL			9.1	NC	5.2	49	NC	910	0.21	2.9	NC
Monitoring Well Groundwater Data											
MW1	MW1-W-35.0	6/16/2005	NA	NA	NA	NA	NA	NA	NA	NA	NA
	MW1-122705	12/27/2005	0.107	0.011 U	0.104	0.108	NA	0.132	0.0114 U	0.0114 U	0.040
	MW1-041806	04/18/2006	0.029 J	0.057 U	NA	NA	0.03 U	0.014 J	0.095 U	0.034 J	0.041
MW2	MW2-W-0605	6/17/2005	0.192 U	0.192 U	NA	NA	0.962 U	0.192 U	0.192 U	0.192 U	0.174
	MW2-122805	12/28/2005	0.0099 U	0.01 U	0.0099 U	0.0099 U	NA	0.0099 U	0.0099 U	0.0099 U	0.007
	MW2-041906	04/19/2006	0.031 J	0.066 U	NA	NA	0.034 U	0.11 U	0.11 U	0.11 U	0.049
MW3	MW3-0605	6/7/2005	NA	NA	NA	NA	NA	NA	NA	NA	NA
	MW3-122905	12/29/2005	0.01 U	0.01 U	0.01 U	0.01 U	NA	0.01 U	0.01 U	0.01 U	0.008
	MW3-041706	04/17/2006	0.11 U	0.063 U	NA	NA	0.033 U	0.11 U	0.11 U	0.11 U	0.050
MW4	MW4-0605	6/9/2005	NA	NA	NA	NA	NA	NA	NA	NA	NA
	MW4-0605-Dup	6/9/2005	NA	NA	NA	NA	NA	NA	NA	NA	NA
	MW4-122705	12/27/2005	0.01 U	0.01 U	0.01 U	0.01 U	NA	0.01 U	0.01 U	0.01 U	0.008
	MW4-041806	04/18/2006	0.1 U	0.061 U	NA	NA	0.032 U	0.1 U	0.1 U	0.1 U	0.048
MW5	MW5-122805	12/28/2005	0.0099 U	0.01 U	0.0099 U	0.0099 U	NA	0.0099 U	0.0099 U	0.0099 U	0.007
	MW5-041906	04/19/2006	0.095 U	0.057 U	NA	NA	0.03 U	0.095 U	0.095 U	0.095 U	0.045
MW6	MW6-122905	12/29/2005	0.0099 U	0.01 U	0.0099 U	0.0099 U	NA	0.0099 U	0.0099 U	0.0099 U	0.007
	MW6-041906	04/19/2006	0.1 U	0.062 U	NA	NA	0.032 U	0.1 U	0.1 U	0.1 U	0.048

Table 32
Risk Screening
Polycyclic Aromatic Hydrocarbons in Groundwater (µg/L)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Benzo(a) anthracene*	Benzo(a) pyrene*	Benzo(b) fluoranthene*	Benzo(k) fluoranthene*	Benzo(b+k) fluoranthene*	Chrysene*	Dibenzo(a,h) anthracene*	Indeno (1,2,3-cd) pyrene*	Total cPAHs including TEFs**
MTCA Method A Groundwater CULs			NV	0.1	NV	NV	NV	NV	NV	NV	0.1
MTCA Method B Groundwater CULs			0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012
MTCA Method C Groundwater CULs			0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
MTCA Method C Surface-Water CULs			0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
AWQC—Human Health			0.0038	0.0038	0.0038	0.0038	NR	0.0038	0.0038	0.0038	0.0038
Surface-Water ARAR—Aquatic Life—Acute			NR	NR	NR	NR	NR	NR	NR	NR	NR
AWQC—Aquatic Life—Chronic			NR	NR	NR	NR	NR	NR	NR	NR	NR
Site-Specific Groundwater CUL for the Protection of Surface Water			145,000,000	NC	108,000,000	38,000,000	NC	95,000,000	100,000,000	97,000,000	NC
Excavation Worker Direct-Contact Groundwater CUL			9.1	NC	5.2	49	NC	910	0.21	2.9	NC
MW7	MW7-122805	12/28/2005	0.0099 U	0.01 U	0.0099 U	0.0099 U	NA	0.0099 U	0.0099 U	0.0099 U	0.007
	MW7-041806	04/18/2006	0.035 J	0.061 U	NA	NA	0.031 U	0.013 J	0.038 J	0.039 J	0.043
	MW7-041806-Dup	04/18/2006	0.1 U	0.061 U	NA	NA	0.031 U	0.1 U	0.1 U	0.1 U	0.048
MW8	MW8-122805	12/28/2005	0.01 U	0.01 U	0.01 U	0.01 U	NA	0.01 U	0.01 U	0.01 U	0.008
	MWDUP-122805	12/28/2005	0.099 U	0.01 U	0.0099 U	0.0099 U	NA	0.0099 U	0.0099 U	0.0099 U	0.012
	MW8-041806	04/18/2006	0.13 U	0.075 U	NA	NA	0.039 U	0.13 U	0.13 U	0.13 U	0.060
Reconnaissance Groundwater Data											
GP2	GP2-W-17-RECON	6/9/2005	NA	NA	NA	NA	NA	NA	NA	NA	NA
GP4	GP4-W-8.0	6/16/2005	0.191 U	0.191 U	NA	NA	0.954 U	0.191 U	0.191 U	0.191 U	0.173
GP5	GP5-W-18.0	6/16/2005	NA	NA	NA	NA	NA	NA	NA	NA	NA
GP6	GP6-W-18.0	6/16/2005	NA	NA	NA	NA	NA	NA	NA	NA	NA
GP7	GP7-W-14.0	6/16/2005	0.194 U	0.194 U	NA	NA	0.97 U	0.194 U	0.194 U	0.194 U	0.176
GP8	GP8-W-10.0	6/16/2005	NA	NA	NA	NA	NA	NA	NA	NA	NA
GP-13	GP13-W-8.0	12/14/2005	NA	NA	NA	NA	NA	NA	NA	NA	NA
GP-15	GP15-W-8.0	12/14/2005	NA	NA	NA	NA	NA	NA	NA	NA	NA

*Criteria shown for MTCA values pre October 2007.

**Criteria shown is for benzo(a)pyrene for MTCA cPAH screening post October 2007.

Table 33
Risk Screening
Petroleum Hydrocarbon IHSs in Groundwater (mg/L)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Diesel-Range Organics	Oil-Range Organics
MTCA Method A Groundwater CULs			500	500
MTCA Method B Groundwater CULs			NV	NV
MTCA Method C Groundwater CULs			NV	NV
MTCA Method C Surface-Water CULs			NV	NV
AWQC—Human Health			NV	NV
Surface-Water ARAR—Aquatic Life—Acute			NV	NV
AWQC—Aquatic Life—Chronic			NV	NV
CUL for Vapor Intrusion			NV	NV
Site-Specific Groundwater CUL for the Protection of Surface Water			NV	NV
Excavation Worker Direct-Contact Groundwater CUL			>S	NV
Monitoring Well Groundwater Data				
MW1	MW1-W-35.0	6/16/2005	NA	NA
	MW1-122705	12/27/2005	0.248 U	0.495 U
	MW1-041806	04/18/2006	0.26 U	0.52 U
MW2	MW2-W-0605	6/17/2005	0.438	0.512
	MW2-122805	12/28/2005	1.19	1.04
	MW2-041906	04/19/2006	0.41	0.58 U
MW3	MW3-0605	6/7/2005	NA	NA
	MW3-122905	12/29/2005	0.312	0.505 U
	MW3-041706	04/17/2006	0.28 U	0.57 U
MW4	MW4-0605	6/9/2005	NA	NA
	MW4-0605-Dup	6/9/2005	NA	NA
	MW4-122705	12/27/2005	0.248 U	0.495 U
	MW4-041806	04/18/2006	0.27 U	0.54 U
MW5	MW5-122805	12/28/2005	0.831	0.495 U
	MW5-041906	04/19/2006	0.26 U	0.51 U
MW6	MW6-122905	12/29/2005	2.64	1.32
	MW6-041906	04/19/2006	0.76	1.2
MW7	MW7-122805	12/28/2005	0.248 U	0.495 U
	MW7-041806	04/18/2006	0.26 U	0.51 U
	MW7-041806-Dup	04/18/2006	0.26 U	0.51 U
MW8	MW8-122805	12/28/2005	1.71	1.00
	MWDUP-122805	12/28/2005	1.79	1.21
	MW8-041806	04/18/2006	0.45	0.58 U
Reconnaissance Groundwater Data				
GP2	GP2-W-17-RECON	6/9/2005	NA	NA
GP4	GP4-W-8.0	6/16/2005	0.325	0.478 U
GP5	GP5-W-18.0	6/16/2005	NA	NA
GP6	GP6-W-18.0	6/16/2005	NA	NA
GP7	GP7-W-14.0	6/16/2005	NA	NA
GP8	GP8-W-10.0	6/16/2005	0.814	0.479 U
GP-13	GP13-W-8.0	12/14/2005	NA	NA
GP-15	GP15-W-8.0	12/14/2005	NA	NA

Table 34
Risk Screening
Volatile Organic Compounds in Sub-Slab Vapor (µg/m^3)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Trichloro-ethene	Vinyl chloride
CUL for Vapor Intrusion			8150	103,000
A1	A1-042806	04/18/2006	4.0 U	1.9 U
A2	A2-042806	04/18/2006	4.9 U	2.3 U
A3	A3-042806	04/18/2006	6100	8.4 U
A4	A4-042806	04/18/2006	NA	NA
A5	A5-042806	04/18/2006	**37000**	420
A6	A6-042806	04/18/2006	3.5 U	1.7 U
A7	A7-042806	04/18/2006	3.5 U	1.7 U

Table 35
Risk Screening
Volatile Organic Compounds in Air (μg/m^3)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample ID	Date	Trichloroethene
CUL for Air			0.22
IA1	IA1	06/13/2006	0.2
IA2	IA2	06/13/2006	0.083
IA3	IA3	06/13/2006	0.11
IA4	IA4	06/13/2006	0.14
IA5	IA5	06/13/2006	0.16
IA6	IA6	06/13/2006	0.15
IA6	IA6 Duplicate	06/13/2006	0.15
IA7	IA7	06/13/2006	0.046
IA8	IA8	06/13/2006	0.15

Table 36
Cumulative Risk for On-Site Soil
Precision Engineering, Inc.
Seattle, Washington

COPC	Maximum Detected Concentration	Industrial Worker Direct-Contact Scenario			
	C_s	CUL_c	ELCR	CUL_{nc}	HQ
	mg/kg	mg/kg	Unitless	mg/kg	Unitless
Hexavalent chromium	3.50E+03	2.2E+03	1.6E-05	1.4E+03	2.5E+00
Trichloroethene	1.16E+00	6.8E+00	1.7E-06	3.6E+02	3.2E-03
Cumulative Risk	NC	NC	1.8E-05	NC	2.5E+00

Table 37
Total Metals in Soil from
Ditch Removal Confirmation Samples (mg/kg)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample	Depth (ft bgs)	Date Collected	Arsenic	Lead
MTCA Method A CULs for Unrestricted Land Use				20	NR
MTCA Method B CULs for Ingestion only				0.67	NR
MTCA Method C CULs for Ingestion Only				88	NR
Site-Specific CUL for Industrial Workers—Direct Contact				20	1000[a]
B1	B1	1.5	10/24/2007	16.2	11.2
B2	B2	1.5	10/24/2007	13.9	36.7
B3	B3	1.5	10/24/2007	10.7	29.7
B4	B4	1.5	10/24/2007	3.79	3.6
B5	B5	1.5	10/24/2007	3.07	5.19
B6	B6	1.5	10/24/2007	2.76	3.5
B7	B7	1.5	10/24/2007	7.21	22.2
B8	B8	1.5	10/24/2007	10	40.4
B9	B9	1.5	10/24/2007	8	19.5
B10	B10	1.5	10/24/2007	16.1	37.2
B11	B11	1.5	10/24/2007	8.26	16
B12	B12	1.5	10/24/2007	11.3	108
B13	B13	1.5	10/24/2007	**26.3**	55.5
P1	P1	0.5	10/24/2007	**22**	653
P2	P2	0.5	10/24/2007	15.7	200
P3	P3	0.5	10/24/2007	13.3	202
P4	P4	0.5	10/24/2007	11.6	103
P5	P5	0.5	10/24/2007	9.54	64.6
P6	P6	0.5	10/24/2007	9.05	108
P7	P7	0.5	10/24/2007	19.9	196
P8	P8	0.5	10/24/2007	13.8	76.8
P9	P9	0.5	10/25/2007	**111**	**2410**
P10	P10	0.5	10/25/2007	15.6	365
SS-1	SS1-6	0.5	11/19/2007	2.64	120
SS-2	SS2-6	0.5	11/19/2007	4.82	75.2
SS-3	SS3-6	0.5	11/19/2007	**37**	668
SS-3	SS3-18	1.5	11/19/2007	6.79	230
SS-4	SS4-6	0.5	11/19/2007	3.58	18.5
SS-5	SS5-6	0.5	11/19/2007	4.43	44
SS-6	SS6-6	0.5	11/19/2007	16.8	838
SS-6	SS6-18	1.5	11/19/2007	**23.7**	526
C-1	C-1	2	3/27/2008	9.91	470
C-2	C-2	1.5	3/27/2008	**21.6**	**1020**
C-3	C-3	1.5	3/27/2008	13.2	213

Table 38
Polycyclic Aromatic Hydrocarbons in Soil from Ditch Removal Confirmation Samples (mg/kg)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample	Depth (ft bgs)	Date Collected	1-Methyl-naphthalene	2-Methyl-naphthalene	Acenaph-thene	Acenaph-thylene	Anthracene	Benzo(a) anthracene
B5	B5	1.5	10/24/2007	0.0130 U	0.0130 U	0.0130 U	0.0130 U	0.0130 U	0.0130 U

Table 38
Polycyclic Aromatic Hydrocarbons in Soil from Ditch Removal Confirmation Samples (mg/kg)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample	Depth (ft bgs)	Date Collected	Benzo(a) pyrene	Benzo(b) fluoranthene	Benzo(ghi) perylene	Benzo(k) fluoranthene	Chrysene	Dibenzo(a,h) anthracene
B5	B5	1.5	10/24/2007	0.0130 U	0.0130 U	0.0130 U	0.0130 U	0.0130 U	0.0130 U

Table 38
Polycyclic Aromatic Hydrocarbons in Soil from Ditch Removal Confirmation Samples (mg/kg)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample	Depth (ft bgs)	Date Collected	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene
B5	B5	1.5	10/24/2007	0.0130 U	0.0130 U	0.0130 U	0.0130 U	0.0130 U	0.0130 U

Table 39
Total Petroleum Hydrocarbons in Soil from Ditch Removal Confirmation Samples (mg/kg)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample	Depth (ft bgs)	Date Collected	Gasoline-Range Hydrocarbons	Diesel	Lube-Oil-Range Hydrocarbons
B5	B5	1.5	10/24/2007	5.30 U	13.0 U	32.5 U

Table 40
BTEX Compounds in Soil from Ditch Removal Confirmation Samples (mg/kg)
Precision Engineering, Inc.
Seattle, Washington

Location	Sample	Depth (ft bgs)	Date Collected	Benzene	Ethylbenzene	Toluene	Total Xylenes
B5	B5	1.5	10/24/2007	0.0318 U	0.0530 U	0.0530 U	0.106 U

FIGURES

MAUL FOSTER ALONGI INC.
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0 800 1600 FEET

N

Figure 1
Site Location

Precision Engineering, Inc.
Seattle, Washington

Source: Base map prepared from Microsoft Street & Trips 2000
Site Address: 1231 S. Director Street, Seattle, Washington
Section: 32 Township: 24N Range: 4E Of Willamette Meridian

File: G:\8006.08 STOEL RIVES-PRECISION EQUIPMENT\04_RI RA-SEATTLE\FIG01_SITE LOCATION2.DWG Last edited: JUN. 23, 2006 @ 09:32 a.m. by: jfisher Xrefs: none black/white

Layout: 1 Project: 8006.08.04 Drawn By: D. Glaus Approved By: A. Hughes

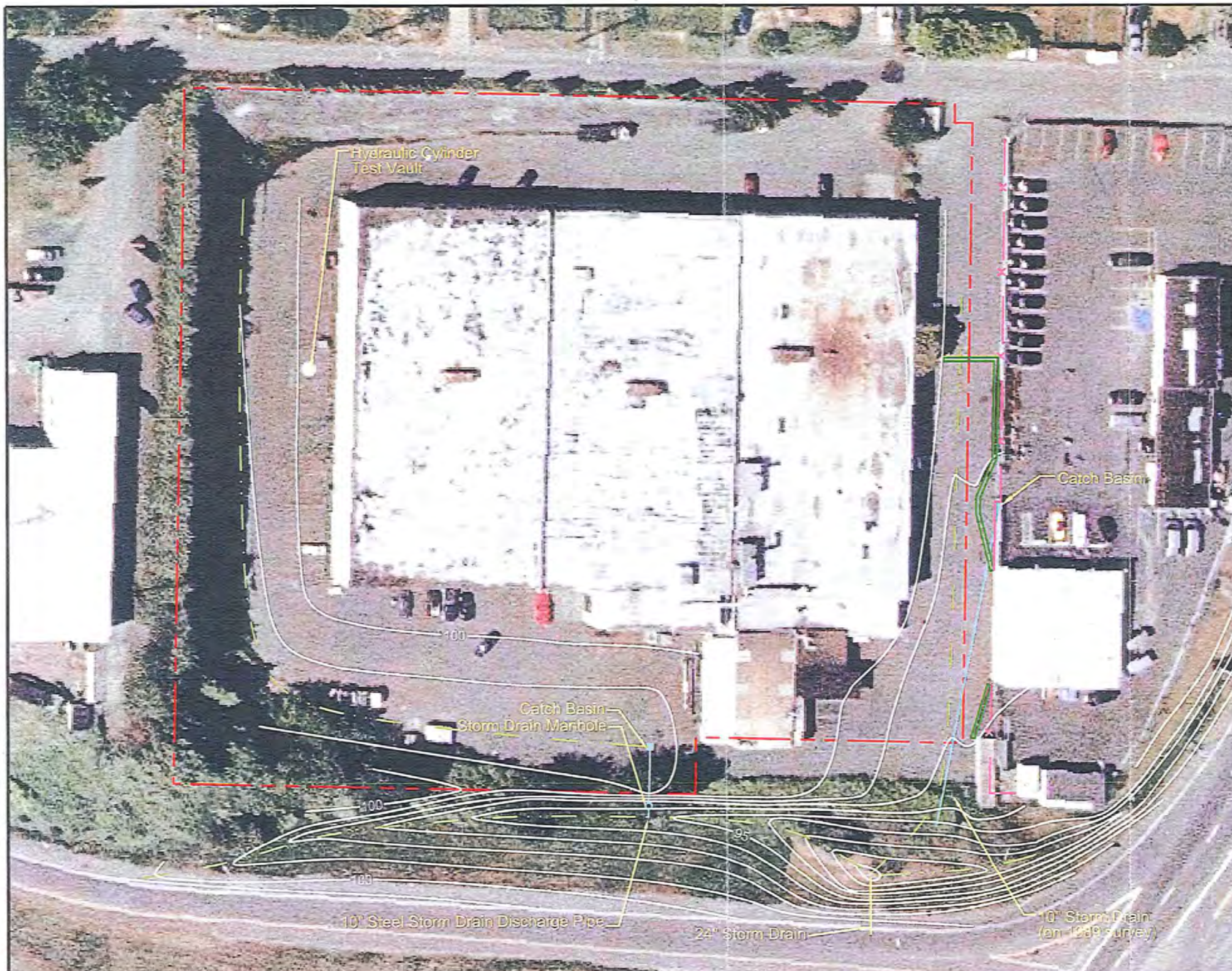

Figure 2
Outside Features

Precision Engineering, Inc.
Seattle, Washington

Legend:
- Property Boundary
- Asphalt Curbing
- Fence
- Drainage Ditch
- Topographic Contour Interval
- Storm Drain

Notes:
1) Topography is based on an assumed vertical datum. Topography, storm sewer lines, and fence line created from a 1989 survey by John R. Ewing and Associates.
2) Locations of property boundary based on 2006 survey by Duncanson Company, Inc. All other locations are approximate.

N

0 50 100
FEET

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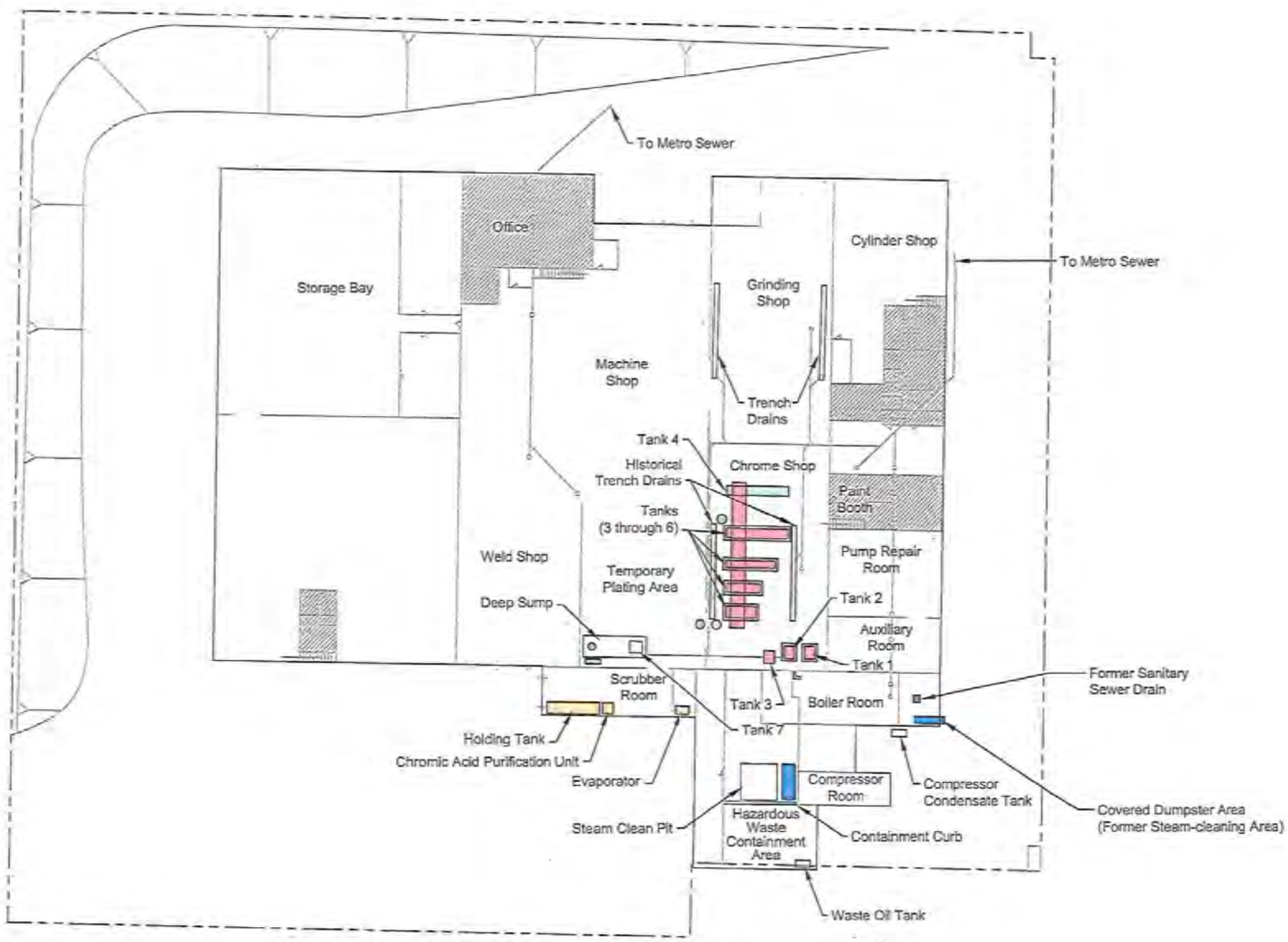
Layout: 1 Project: 8006.08.04 Drawn By: J. Fisher Approved By: A. Clary

Figure 3
Former Building Features

Precision Engineering, Inc.
Seattle, Washington



Legend:
- Property Boundary
- Former Sanitary Sewer Piping (from July 1986 Drawing by Precision Engineering, Inc.)
- Building Second Floor Present
- 1990 and 1992 Excavation Areas

Former Tanks:
- Chromic Acid Plating Tank
- Other Tanks Containing Chromic Acid
- Sodium Hydroxide Tank
- Sodium Carbonate Tank
- Hydrochloric Acid Tank
- TCE Tank

Note:
Locations of property boundary and building corners based on 2006 survey by Duncanson Company, Inc. All other locations are approximate.

0 50 100
Feet

N

Maul Foster Alongi Inc.

Layout: 1 Project: 8006.08.04 Drawn By: J. Fisher Approved By: A. Hughes

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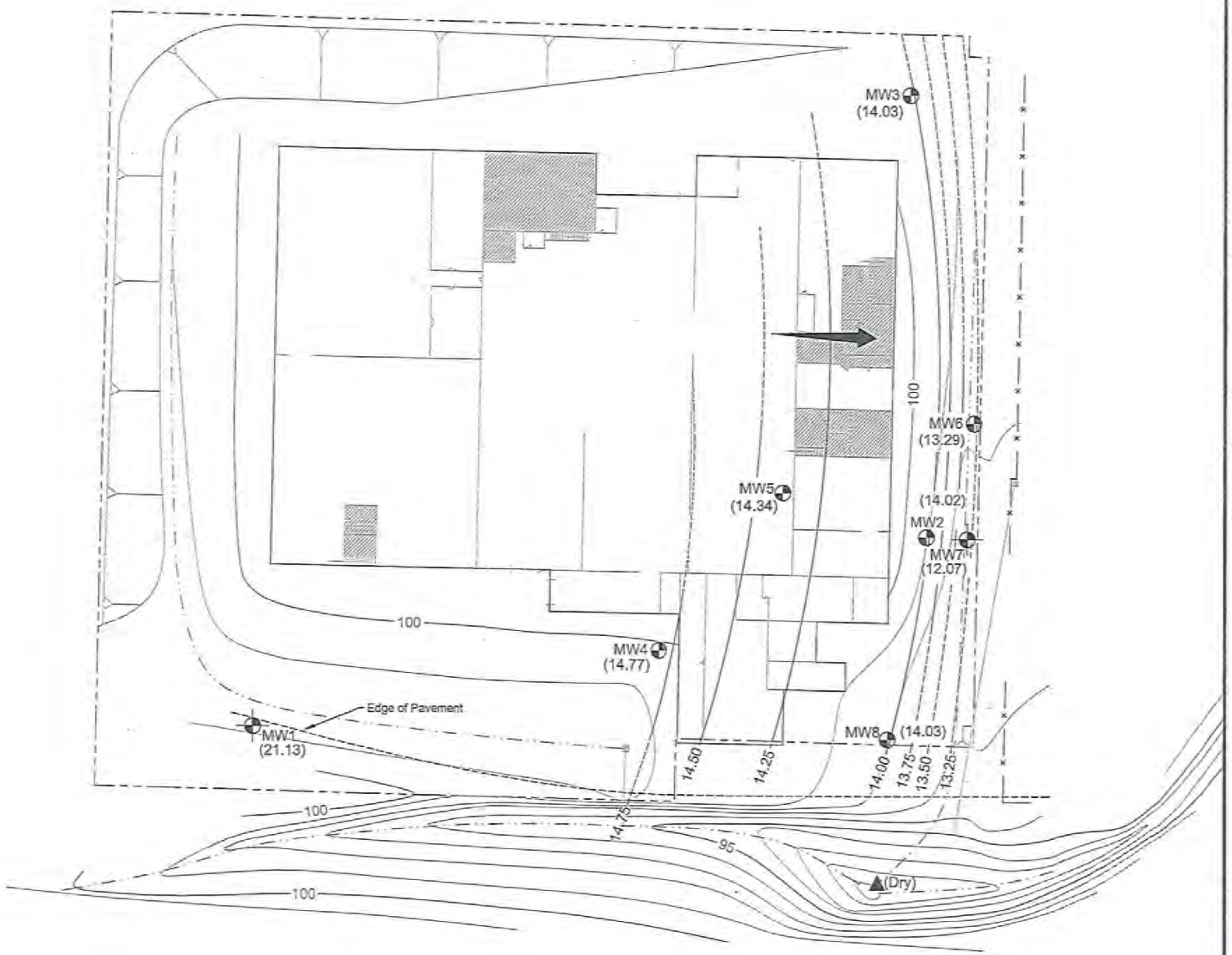

Figure 4
Potentiometric Surface for the Shallow Water-Bearing Zone, December 2005

Precision Engineering, Inc.
Seattle, Washington

Legend:
- Property Boundary
- Fence
- Drainage Ditch
- Topographic Contour Interval (assumed datum)
- Shallow Monitoring Well
- Deep Monitoring Well
- Staff Gauge
- Groundwater Contour (0.25-Foot Interval)
- Inferred Groundwater Contour
- Flow Direction
- (13.29) Water Level Elevation (in Feet NGVD 1929)
- (Dry) No Measurable Water

Notes:
1) Topography is based on an assumed vertical datum. Topography, storm sewer lines, fence line, and edge of pavement created from a 1989 survey by John R. Ewing and Associates.
2) MW1 & MW7 monitoring well water level elevations are shown but are not used to create the potentiometric surface. They are screened in the deeper advanced outwash aquifer (confined sand and gravel water-bearing zone).
3) Locations of property boundary, building corners and monitoring wells based on 2006 survey by Duncanson Company, Inc. All other locations are approximate.

0 50 100
Feet

N

MAUL FOSTER ALONGI INC.
ENVIRONMENTAL & ENGINEERING CONSULTANTS

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Layout: 1 Project: 8006.08.04 Drawn By: J. Fisher Approved By: A. Hughes

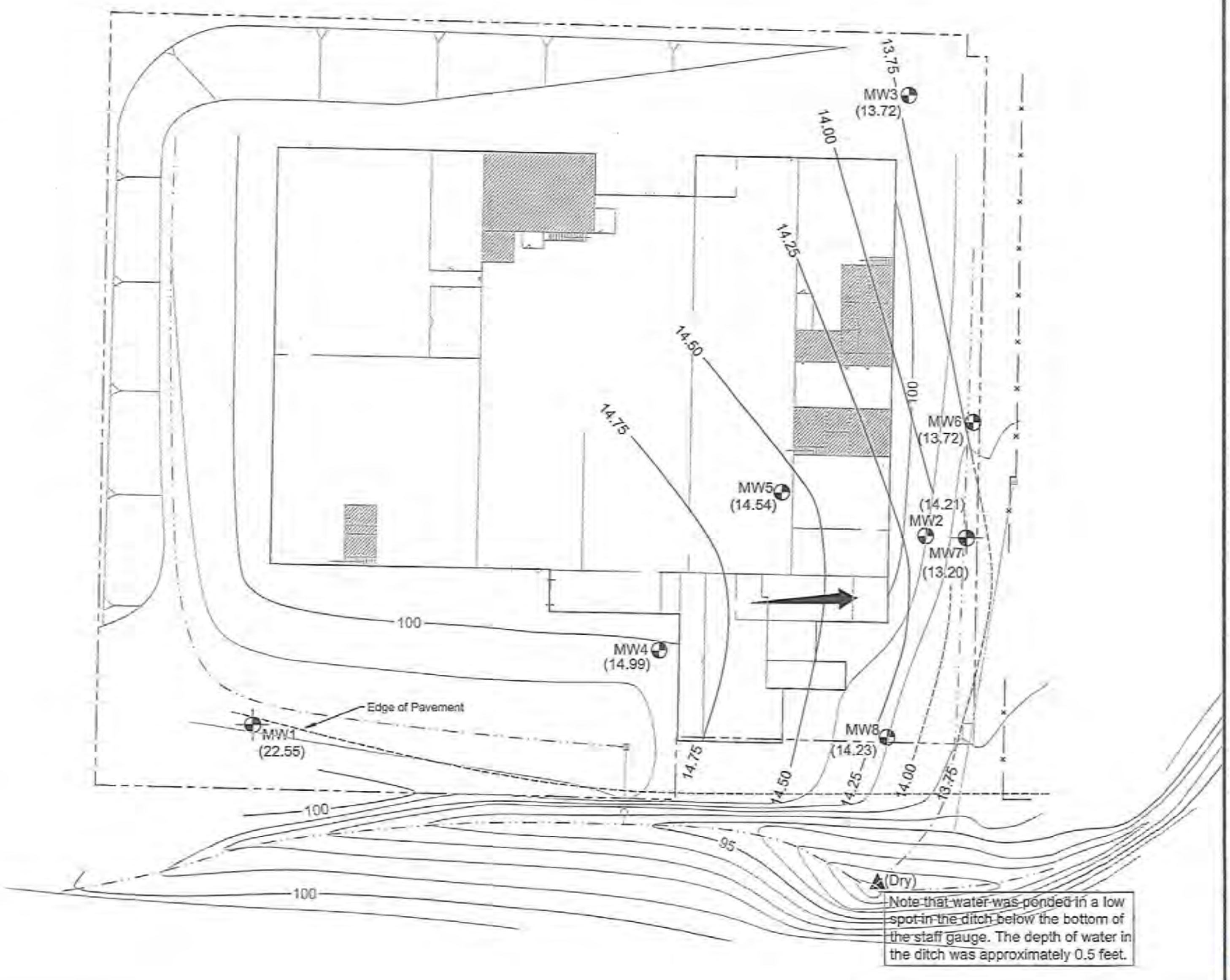

Figure 5
Potentiometric Surface for the Shallow Water-Bearing Zone, April 2006

Precision Engineering, Inc.
Seattle, Washington

Legend:
- Property Boundary
- Fence
- Drainage Ditch
- Topographic Contour Interval (assumed datum)
- Shallow Monitoring Well
- Deep Monitoring Well
- Staff Gauge
- Groundwater Contour (0.25-Foot Interval)
- Inferred Groundwater Contour
- Flow Direction
- (14.23) Water Level Elevation (in Feet NGVD 1929)
- (Dry) No Measurable Water

Notes:
1) Topography is based on an assumed vertical datum. Topography, storm sewer lines, fence line, and edge of pavement created from a 1989 survey by John R. Ewing and Associates.
2) MW1 & MW7 monitoring well water level elevations are shown but are not used to create the potentiometric surface. They are screened in the deeper advanced outwash aquifor (confined sand and gravel water-bearing zone).
3) Locations of property boundary, building corners and monitoring wells based on 2006 survey by Duncanson Company, Inc. All other locations are approximate.

0 50 100
Feet

N

Maul Foster Alongi inc.
Environmental & Engineering Consultants

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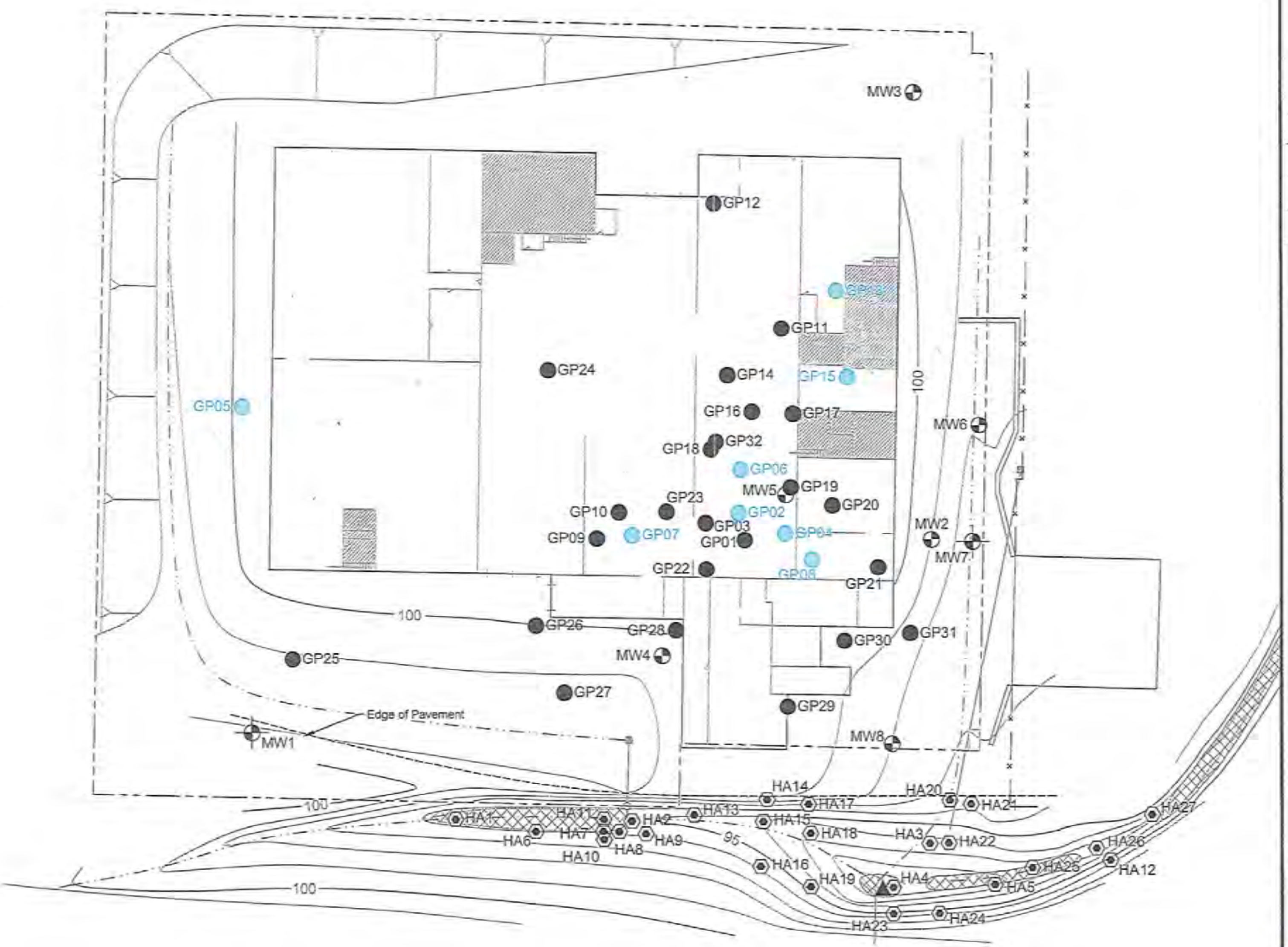

Figure 6
Soil and Groundwater Sample Locations

Precision Engineering, Inc. Seattle, Washington

Legend:
- Property Boundary
- Fence
- Drainage Ditch
- Topographic Contour Interval
- 2-inch Asphalt Curbing
- Shallow Monitoring Well
- Deep Monitoring Well
- Staff Gauge
- Geoprobe Boring
- Hand Auger Boring
- Reconnaissance Groundwater Sample
- Building Second Floor Present
- Ponded Water (observed April 19, 2006)

Notes:
1) Topography is based on an assumed vertical datum. Topography, storm sewer lines, fence line, and edge of pavement created from a 1989 survey by John R. Ewing and Associates.
2) Locations of property boundary, building corners, monitoring wells, Geoprobe borings, and hand augers HA1 through HA5 based on 2006 survey by Duncanson Company, Inc. Hand Augers HA13 to HA27 were recorded using Trimble GeoXT GPS Unit (accuracy ±3 feet), all other locations are approximate.

N

0 50 100

Feet

Maul Foster Alongi inc.

Layout: 1 Project: 8006.08.04 Drawn By: A. Young Approved By: A. Hughes

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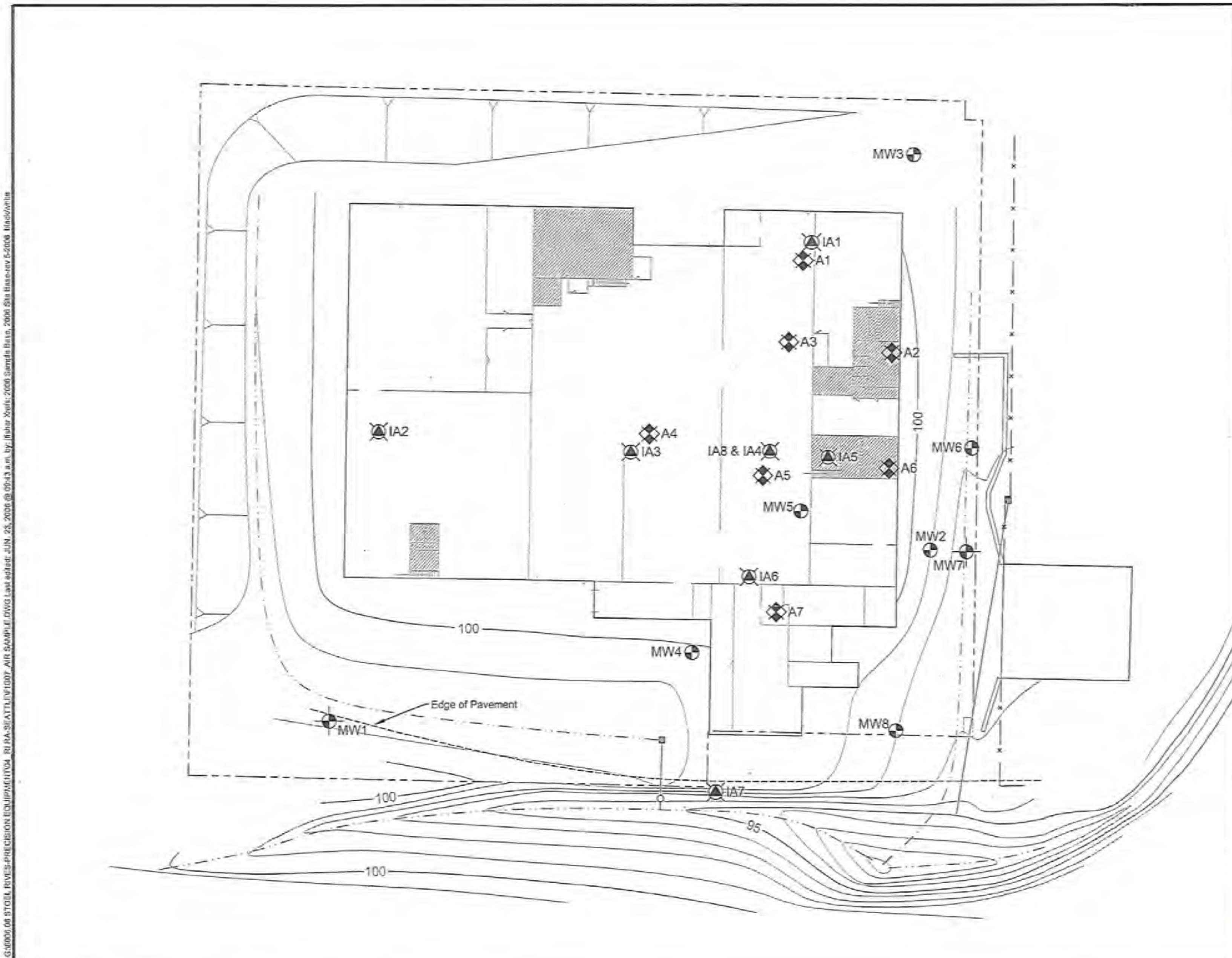
Figure 7
Sub-slab Vapor and Indoor Air Sample Locations

Precision Engineering, Inc.
Seattle, Washington



Legend:
- Property Boundary
- Fence
- Drainage Ditch
- Topographic Contour Interval
- 2-inch Asphalt Curbing
- Shallow Monitoring Well
- Deep Monitoring Well
- Subsurface Vapor Monitoring Point
- Air Sample Point
- Building Second Floor Present

Notes:
1) Topography is based on an assumed vertical datum. Topography, storm sewer lines, fence line, and edge of pavement created from a 1989 survey by John R. Ewing and Associates.

2) Locations of property boundary, building corners and monitoring wells based on 2006 survey by Duncanson Company, Inc. All other locations are approximate.

0 50 100
Feet

N

Maul Foster Alongi Inc.
Environmental & Engineering Consultants

Layout: 1 Project: 8006.08.04 Drawn By: J. Fisher Approved By: A. Clary

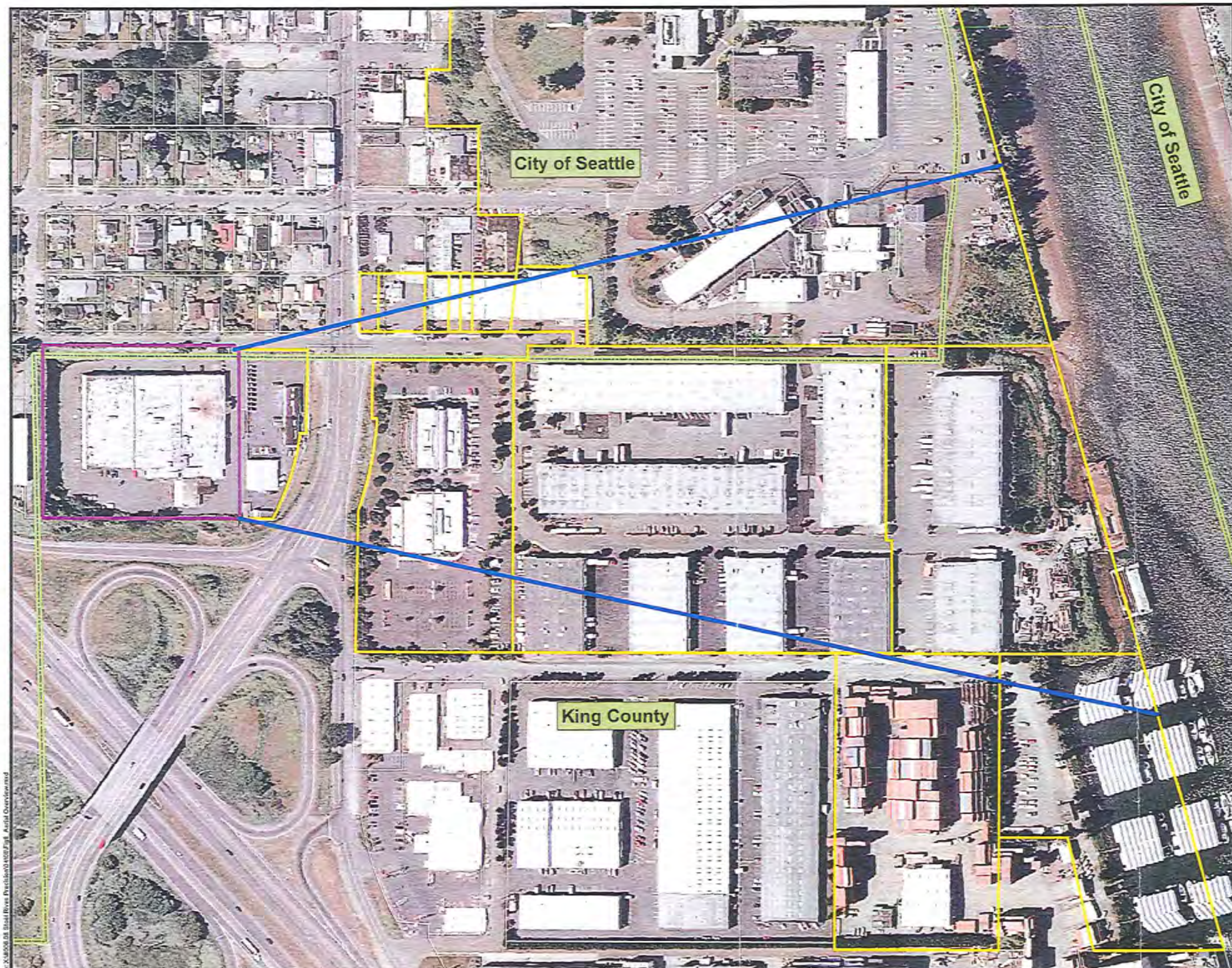


Figure 8
Aerial Overview

Precision Engineering, Inc.
Seattle, Washington

Legend

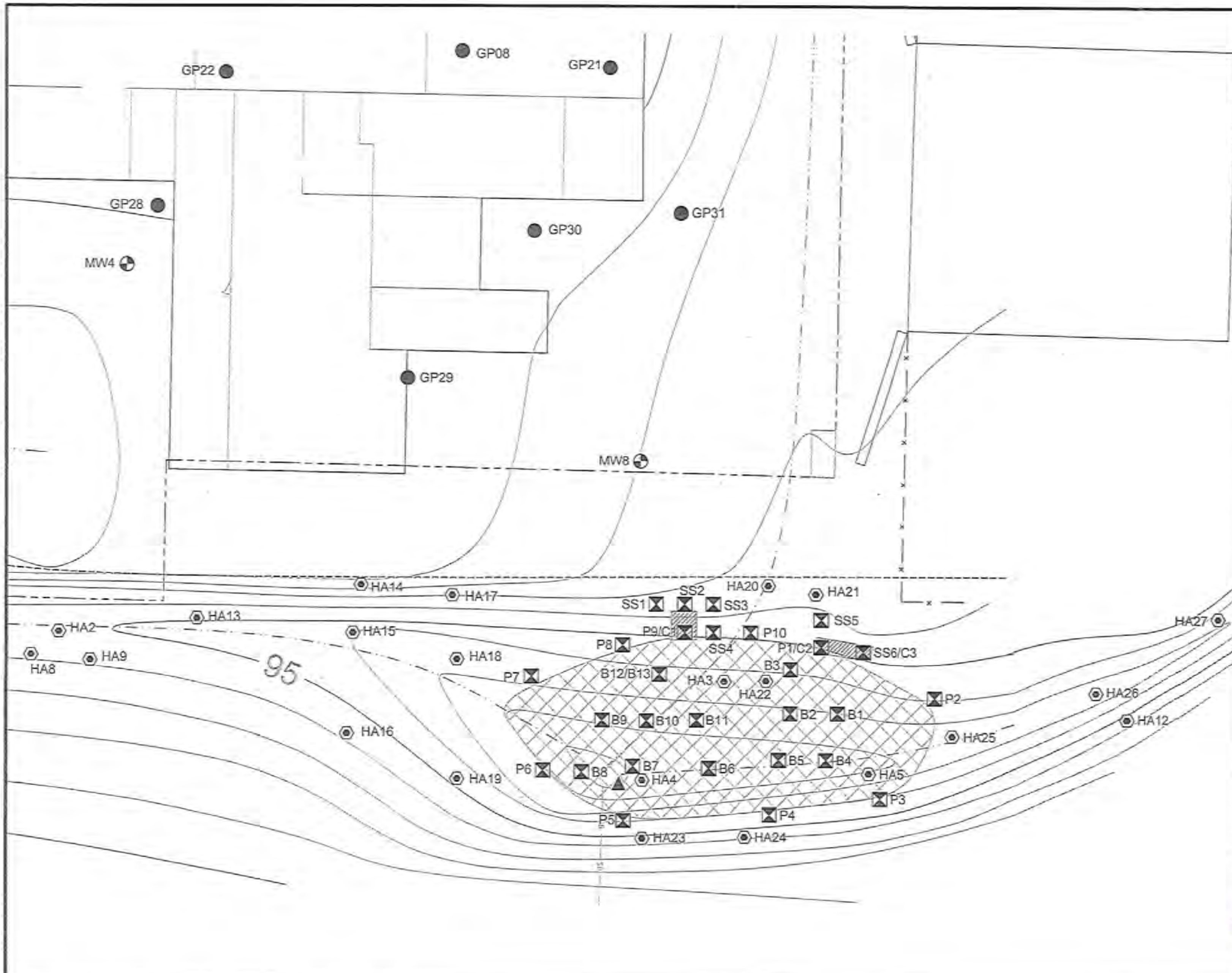
- Groundwater Plume Extent
- Tax Lots
- Tax Lots - Study Area
- Precision Equipment
- City of Seattle - King County Border

Source: Aerial Photograph (2002) obtained from USGS Seamless Server

MAUL FOSTER ALONGI INC.
ENVIRONMENTAL & ENGINEERING CONSULTANTS

Figure 10
Soil Excavation Area and Sample Locations

Precision Engineering, Inc.
Seattle, Washington



Legend:
- Property Boundary
- Fence
- Drainage Ditch
- Topographic Contour Interval
- 2-inch Asphalt Curbing
- Shallow Monitoring Well
- Deep Monitoring Well
- Staff Gauge
- Hand Auger Boring
- Confirmation Grab Sample
- Area Excavated in October 2007
- Area Excavated in March 2008

Notes:
1) Topography is based on an assumed vertical datum. Topography, storm sewer lines, fence line, and edge of pavement created from a 1989 survey by John R. Ewing and Associates.

2) Locations of property boundary, building corners, monitoring wells, geoprobe borings, and hand augers HA1 through HA5 based on 2006 survey by Duncanson Company, Inc. Hand Auger HA13 to HA27 were recorded using Trimble GeoXT GPS Unit (accuracy ±3 feet), all other locations are approximate.

N

0 20 40
Feet

MAUL FOSTER ALONGI INC.
ENVIRONMENTAL & ENGINEERING CONSULTANTS
Vancouver, WA | Portland, OR | www.MFAinc.org

Layout: Site Project: 8006.08.04 Drawn By: J. Fisher Approved By: M. Stringer

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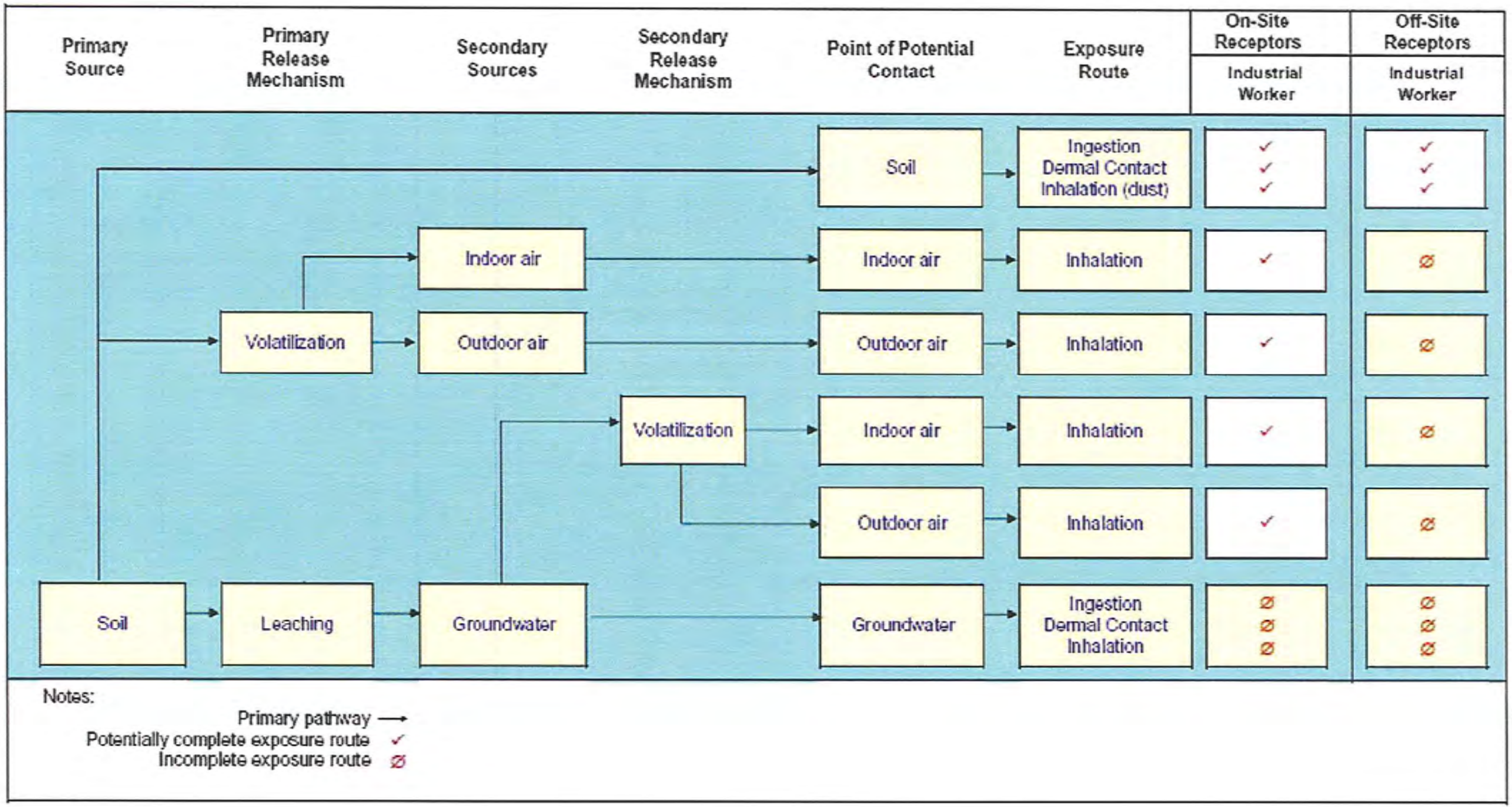

Figure 9
Conceptual Site Model of Potential Human Exposure Pathways

Precision Engineering, Inc.
Seattle, Washington

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Vancouver, WA | Portland, OR | www.MFAinc.org

Layout: 1 Project: 8006.08.01 Drawn By: J. Fisher Approved By: A. Clary

APPENDIX A

GROUNDWATER FATE AND TRANSPORT MODELING

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MEMORANDUM

TO: Mark Adams, Ecology

DATE: February 25, 2008

FROM: Matthew Hickey and James Peale

PROJECT: No. 8006.08.04

RE: Groundwater Cleanup Levels for the Protection of Surface Water and Groundwater Fate and Transport Modeling for the Former Precision Engineering Site, VCP ID Number NW 1511

Maul Foster & Alongi, Inc. (MFA) has prepared this memorandum to describe groundwater fate and transport modeling for the Precision Engineering, Inc. (Precision) site located at 1231 S Director Street in Seattle, Washington. This memorandum also addresses a request by the Washington State Department of Ecology (Ecology) to develop groundwater cleanup levels (CULs) for the protection of surface water. Because the modeling shows that indicator hazardous substances (IHSs) present at the site will not reach the Duwamish River, groundwater CULs that exceed surface-water CULs can be established consistent with WAC 173-340-720(6)(c)(i)(E).

MFA used the groundwater model to derive groundwater CULs for site IHSs that, if exceeded at the eastern property boundary, are predicted to result in exceedances of surface-water criteria at the point where groundwater discharges to the Duwamish River. The following discussion includes a description of the groundwater model used, model inputs, assumptions, and results.

Model Description

MFA performed the groundwater modeling using U.S. Environmental Protection Agency's (USEPA's) BIOCHLOR model (USEPA, 2002). BIOCHLOR is based on the Domenico analytical solute transport model and has the ability to simulate 1-D advection, 3-D dispersion, linear adsorption, and biotransformation or degradation. BIOCHLOR includes three different model types:

- Type I: Solute transport without decay
- Type II: Solute transport with biotransformation or degradation modeled as a sequential first-order decay process
- Type III: Solute transport with biotransformation or degradation modeled as a sequential first-order decay process with two different reaction zones (i.e., each zone has a different set of rate coefficient values)

All compounds were modeled using the Type I or II models Type II was used for all compounds except metals. Type I was used for metals, which do not decay. Type I and Type II were used for trichloroethene (TCE) and vinyl chloride, to accommodate a request by Ecology, as explained further below.

Model Inputs, Assumptions, and Output

The model required the following data inputs:

- Source concentrations
- Source dimensions (lateral and vertical)
- Groundwater velocity (either entered directly or calculated using gradient, hydraulic conductivity, and porosity)
- Retardation factors (either entered directly or calculated using default partition coefficients and organic carbon data for soil)
- Degradation rates based on half-life data (a half-life x factor of 2 was used for TCE and VC)
- Model domain size and duration

These parameters are summarized on Table A1 and discussed further (along with the assumptions) in the following sections. The output of the model is the concentration at a designated distance downgradient of the source.

Compounds Modeled

MFA modeled the fate and transport of the following IHSs:

- Copper
- Trivalent and hexavalent chromium
- Trichloroethene (TCE)
- Vinyl chloride

Diesel- and oil-range organics are also IHSs in site groundwater, but the chemical properties necessary to run the model are not available for diesel or oil. Instead, selected polycyclic aromatic hydrocarbons (PAHs) (which are constituents of diesel- and oil-range organics) that were detected in site groundwater at a concentration above the Ecology or USEPA surface-water criteria were modeled. Benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene were modeled as surrogates.

Arsenic and selenium, which are IHSs at the site, were not modeled because based on the data collected, Precision does not appear to be a source of these IHSs. The spatial distribution of arsenic concentrations in groundwater is not consistent with what would be expected if the former Precision site was the source. The arsenic detections are representative of naturally occurring background concentrations. For example, the highest concentration of arsenic detected at the site (32.3 μg/L) was in a sample from monitoring well MW1, located upgradient of the facility. Arsenic is ubiquitous in groundwater throughout the site at concentrations that appear to be consistent with naturally occurring background levels and there is no indication that Precision is a source of the arsenic in groundwater. Selenium is detected in some of the downgradient monitoring wells at the site; however, selenium was not detected in soil and is no link between selenium and Precision.

It was not necessary to model benzo(b)fluoranthene and benzo(k)fluoranthene to demonstrate that these constituents would not reach the river reach the Duwamish River as it was already shown that they were not detected in monitoring locations at or near the property boundary nor in borings where IHSs may not be detected in downgradient locations.

Source Concentrations, Downgradient Concentrations, and Surface-Water Criteria

The maximum detected concentrations in groundwater samples collected from monitoring wells at the eastern property boundary were used as the source concentration to demonstrate that constituents at the site will not reach the river (see Table A1). Although TCE and vinyl chloride were not detected in property boundary monitoring wells, concentrations from geoprobe groundwater reconnaissance sample GP-13, located approximately 75 feet upgradient of the property boundary were used. Data from GP-13 was used as the boring was in a location where Ecology had expressed concern that IHSs may not show up in downgradient wells.

To calculate the groundwater CUL, an iterative process was used whereby assumed source concentrations were input into the model until the calculated downgradient concentration matched the most conservative applicable surface-water criteria. The groundwater CUL for a given IHS is the source concentration that predicts groundwater concentrations equal to the surface-water criteria (see Table A2). Groundwater CULs for the volatile organic compounds (VOCs) TCE and vinyl chloride were calculated in three ways: using a degradation rate based on reference values (Howard, et. El., 1991), using the same reference value multiplied by a factor of two, and with no degradation occurring (i.e., Type I model).

Table A3 summarizes applicable surface-water criteria. The most conservative (lowest) criteria from Table A3 were used for the model. Water-quality criteria were obtained from the Cleanup Levels and Risk Calculations (CLARC) Web page (Ecology, 2007). Applicable surface-water criteria included Model Toxics Control Act (MTCA) Method B and Method C CULs for surface water, and Ecology and USEPA surface-water criteria for aquatic life and for human health in both freshwater and marine environments. Criteria for both freshwater and marine environments were used based on reports that the base of the Duwamish is saline, while approximately the top 10 feet is freshwater (Duwamish Coalition, 1998). Use of water-quality criteria for the consumption of organisms and water is overly conservative, as water in the Duwamish is brackish and is not used for drinking water.

Source Area Dimensions

Source dimensions were based on the areal extent of IHS detections at the site. The extent of the contaminants was estimated to be equal to the distance between a sample location in which the constituent was detected in groundwater and the nearest sample location in which the constituent was not detected. Data from both monitoring wells and reconnaissance borings were considered in estimating the source-area widths.

The source width for trivalent chromium, and all of the PAHs was 300 feet (based on detections near the north and south property boundaries). The source width for hexavalent chromium was 50 feet (based on detections in GP6 and MW4). Copper source width was 225 feet, based on detections in MW6, MW2, and MW8. The source width for vinyl chloride was 200 feet (based on the detection of vinyl chloride in GP-13 and MW-8). The source width for TCE was 40 feet (based on the detections of TCE in GP6, GP8, and GP-13). It is important to note that hexavalent chromium, TCE, and vinyl chloride were not detected at the property boundary (i.e., applying these concentrations at the property boundary is an overly conservative case).

The source-area thickness for all IHSs was estimated as 15 feet (based on the difference in elevation between the top of the water table and the top of the aquitard).

BIOCHLOR allows the user to specify either a constant concentration source or a variety of source decay scenarios. Using a decay scenario requires an estimate of the mass contained in the original release. MFA conservatively assumed a constant, nondegrading source. This assumption significantly overestimates the amount of mass in the subsurface, considering that TCE use at the property ended in the mid-1980s, that the outside steam-cleaning area was relocated before 1986, that the boiler UST was abandoned in place and filled with a slurry in 1992, that chrome-plating operations ceased in 2005, and the evidence that the organic compounds are degrading (the presence, for example, of the TCE degradation product vinyl chloride).

Groundwater Velocity

Groundwater models are typically sensitive to variations in groundwater velocity, which is dependent on the hydraulic conductivity (K) of the water-bearing zone (as well as the porosity [n] and the gradient [i]). A gradient of 0.003 was calculated using site groundwater-elevation data collected from MW6 (located at the property boundary) on April 17, 2006, and an average daily staff-gauge elevation for the Duwamish on the same day (USGS, 2007). A porosity of 0.3 was assumed based on typical estimates for the soil types at the site.

Values of K can range over orders of magnitude. The estimate of K from the document titled Development of a Three-Dimensional Numerical Groundwater Flow Model for the Duwamish River Basin (Duwamish Coalition, 1998) is 0.001 centimeters per second for the area near the former Precision site. MFA modeled the groundwater flow using a K value five times the Duwamish Coalition estimate (i.e. 0.005 centimeters per second). Applying this value to Darcy's law results in a linear velocity of 52 feet per year. The assumed K value is conservative compared to the value used by the Duwamish Coalition (i.e., overestimates groundwater velocity and consequently potential contaminant migration).

Retardation Factor

The velocity of organic constituents in the dissolved phase is usually less than (i.e., retarded relative to) the groundwater velocity due to sorption effects. Sorption of organic constituents occurs as dissolved-phase organic constituents partition to the organic carbon in soil. The rate of sorption depends on the amount of organic carbon in the soil and the distribution coefficients (K_{oc} values). The K_{oc} values for TCE, benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene were obtained from Ecology's CLARC Web page (Ecology, 2007). The CLARC Web page listed distribution coefficients for volatile organic compounds (VOCs) of 94 L/kg for TCE and 19 L/kg for vinyl chloride, indicating low tendency for sorption (and thus retardation). Distribution coefficients for PAHs were significantly larger (i.e., $3.6x10^5$ L/kg for benzo(a)anthracene, $1.2x10^6$ L/kg for benzo(b)fluoranthene and benzo(k)fluoranthene, $4.0x10^5$ L/kg for chrysene, $1.8x10^6$ L/kg for dibenzo(a,h)anthracene, and $3.5x10^6$ L/kg for indeno(1,2,3-cd)pyrene).

Sorption of dissolved inorganic constituents occurs primarily due to cation- or anion-exchange processes. The amount of solute that is adsorbed to the aquifer matrix is also described by a distribution coefficient (K_d). Distribution coefficients for arsenic, copper, trivalent chromium, hexavalent chromium, and selenium were also obtained from the CLARC Web page. The CLARC Web page listed distribution coefficients for metals of 29 L/kg for arsenic, 22 L/kg for copper, 1,000 L/kg for trivalent chromium, 19 L/kg for hexavalent chromium, and 5 L/kg for selenium.

No organic carbon data are available for the former Precision site. MFA used the default value (0.0018) supplied by the BIOCHLOR model and the distribution coefficients to calculate retardation factors. Resulting retardation factors for the metals and VOCs were calculated and are shown on Tables A1 and A2.

Because of the high propensity of PAHs to adhere to soil, (reflected in the high partitioning coefficients for the PAHs), calculated retardation factors for PAHs were also high. Solutions to the advection-dispersion equations using the superposition approach used by BIOCHLOR for solving the Domenico analytical model are known to diverge from solutions obtained by more robust numerical models for contaminants with large retardation factors. MFA confirmed this when attempting to model the PAH contaminants; high retardation factors caused the model to produce unrealistic results. In order to make the model function correctly, while still maintaining a high level of model conservatism, MFA set the retardation factors for all PAHs to a value of 10. This is a highly conservative approach, and resulted in migration of these contaminants being overestimated. Therefore, the CULs for the PAHs developed using these lower retardation factors are much lower than CULs that would have been calculated had the model been able to use the higher retardation factors.

Degradation Rates and Dispersion

BIOCHLOR allows the application of half-life data for calculating a first-order decay scenario. Literature values for half-lives of the VOCs and PAHs are appropriate to use. At the request of Ecology, MFA modeled a range of degradation rates for both TCE and vinyl chloride. CULs were calculated for all IHS's using the average of literature values for the degradation rates. Additionally, CULS for TCE and VC were calculated based on half lives that are two times longer than the literature values as well as with no degradation. Degradation of TCE at the site has been confirmed by the presence of vinyl chloride (a degradation product); however, to be conservative, the final groundwater CULs for TCE and vinyl chloride are assumed to be those calculated using the half lives increased by a factor of two. Degradation of total petroleum hydrocarbon constituents in the subsurface has been widely documented and can be inferred at this site.

Dispersion occurs when groundwater encounters soil grains and the contaminant molecules are deflected or dispersed away from each other. Dispersion occurs in the longitudinal direction (i.e., along the groundwater plume axis in the direction of groundwater flow) and in the transverse planes (i.e., lateral or crossgradient to groundwater flow, in two dimensions). The amount of longitudinal and lateral dispersion is typically considered to be a function of plume length. For the purposes of this model, dispersion was calculated (using the internal BIOCHLOR algorithm) to be 180 feet, based on a hypothetical plume length of 1,800 feet.

Model Domain Size and Duration

The model domain was set at 800 feet wide and 3,600 feet long, well in excess of the width of the property and the distance to the Duwamish River. The models were run assuming a 35-year period, which is the estimated approximate length of time that it would take groundwater to travel 1,800 feet (i.e., the distance from the eastern property boundary to the Duwamish River), based on estimated groundwater seepage velocity at the site. Given that the primary sources of the contamination are no longer present, it is unlikely that impacts will continue for this length of time.

It is important to note that the assumptions of constant contaminant sources at maximum detected concentrations assumed at the eastern property edge are very conservative. Mass loading to the system is in fact finite due to the UST decommissioning and soil excavation conducted in the 1980's, and maximum concentrations in several cases were located an additional 50 to 130 feet west of the eastern property edge. The model was also set up to assume maximum concentrations throughout the source area. In reality, this would not be the case due to dispersive effects.

Results

Table A1 presents a summary of modeling results indicating that none of the IHSs at the site will reach the Duwamish River at concentrations at or above method detection limits. Figures A1 through A9 show concentration vs. distance with the assumed source area concentration at the eastern property boundary and the corresponding concentration at the river.[1]

Table A2 provides the modeling results to determine site specific CULs for the protection of surface water. Concentration vs. distance graphs showing the most stringent surface water CUL concentration at the Duwamish (i.e, at 1,800 feet, and the site specific CUL at the property boundary (0 feet), are included as Figures A10 through A20.

Table A4 compares the calculated CULs to concentrations of IHSs and PAHs detected in site groundwater samples. On-site groundwater concentrations of hexavalent chromium exceeded their respective CULs. All other IHSs and the modeled PAHs in groundwater are below their

[1] Note that the modeled concentrations shown on the graphs are expressed in milligrams per liter. Some modeled concentrations were converted to micrograms per liter (µg/L) in the tables for the ease of comparison, as site data and criteria are presented in µg/L for the constituents modeled.

respective CULs. Hexavalent chromium concentrations that exceeded CULs were detected in groundwater samples collected from borings and MW5, located within the building footprint, and from one sample collected from MW1, located upgradient of the building. Concentrations of hexavalent chromium in wells located near the eastern property line were not detected above their method reporting limits and did not exceed CULs.

Attachments

References
Tables A1 through A4
Figures A1 through A20

References

Duwamish Coalition. 1997. Development of a three-dimensional, numerical groundwater flow model for the Duwamish River Basin. Prepared by J. Fabritz, J. Massmann, and D. Booth for City of Seattle Office of Economic Development and King County Office of Budget and Strategic Planning. August.

Ecology. 2007. Cleanup levels and risk calculations. https://fortress.wa.gov/ecy/clarc/CLARCHome.aspx (November 12, 2007).

MFA. 2006. Remedial investigation and risk assessment. Prepared for Stoel Rives, LLP. Maul Foster & Alongi, Inc., Vancouver, Washington. July 17.

USEPA. 2002. Biochlor. Natural attenuation decision support system. Ver. 2.2. U.S. Environmental Protection Agency. http://www.epa.gov/ada/csmos/models/biochlor.html. March.

USGS. 2007. Real-time water data for USGS 12113350 Green River at Tukwila, WA. Water resources. National water information system: Web interface. http://waterdata.usgs.gov/wa/nwis/uv/?site_no=12113350&PARAmeter_cd=00060,00065.

TABLES

Appendix A Table Notes
Precision Engineering, Inc.
Seattle, Washington

Bold font indicates an exceedance of the CUL.

ARAR = applicable or relevant and appropriate requirement.
AWQC = ambient water quality criteria.
CUL = cleanup level.
J = estimated.
mg/L = milligrams per liter.
MTCA = Washington State Department of Ecology's Model Toxics Control Act.
µg/L = micrograms per liter.
NA = not analyzed.
NC = not calculated.
NR = not researched.
NV = no value.
U = not detected at or above the method reporting limit.

[a] Surface water of the Duwamish is brackish and is not used for drinking.
[b] Based on literature estimates from *Development of a Three-Dimensional Numerical Groundwater Flow Model for the Duwamish River Basin* ; University of Washington; August, 1998.
[c] Based on field data.
[d] Standard assumption.
[e] Calculated (v=(k*i)/n).
[f] Due to sorption; calculated (R=1+(rho/n)*Koc*foc).
[g] Actual calculated retardation factor or more conservative.
[h] Based on distance between sample locations with detections.
[i] Based on screen intervals/recon intervals.
[j] Groundwater Chemicals Desk Reference; Montgomery ed.; CRC Press, 1996.
[k] Concentration at a distance of 1,800 ft from eastern property boundary (distance to Duwamish River) was set equal to the surface-water criteria.

Table A1
Fate and Transport Model Inputs and Results Showing no Discharge of IHSs to the Duwamish
Precision Engineering, Inc.
Seattle, Washington

Model Parameters	Chromium, Trivalent	Chromium, Hexavalent	Copper	Trichloro-ethene	Vinyl Chloride
Hydraulic Conductivity (k, cm/sec)[b]	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03
Gradient (i)[c]	0.003	0.003	0.003	0.003	0.003
Porosity (n)[d]	0.3	0.3	0.3	0.3	0.3
Groundwater Velocity (v, ft/yr)[e]	52	52	52	52	52
Retardation Factor[f]	5334	102	118	1.90	1.18
Modeled Retardation[g]	10	10	10	1.90	1.18
Simulation Time (yrs)	35	35	35	35	35
Source Concentration (µg/L)	47	7.38	4.02	0.220	16.5
Source Width (ft)[h]	300	50	225	40	200
Source Thickness (ft)[i]	15	15	15	15	15
Modeled Half-life (days)[j]	NV	NV	NV	1751	832
Results					
Detection Limits (µg/L)	10	10	1	0.2	0.2
Concentration at Duwamish (ug/L)	<10	<10	<1	<0.01	<0.1

Table A1
Fate and Transport Model Inputs and Results Showing no Discharge of IHSs to the Duwamish
Precision Engineering, Inc.
Seattle, Washington

Model Parameters	Benzo(a) anthracene	Benzo(b) fluoranthene	Benzo(k) fluoranthene	Chrysene	Dibenzo(a,h) anthracene	Indeno(1,2,3-cd)pyrene
Hydraulic Conductivity (k, cm/sec)[b]	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03
Gradient (i)[c]	0.003	0.003	0.003	0.003	0.003	0.003
Porosity (n)[d]	0.3	0.3	0.3	0.3	0.3	0.3
Groundwater Velocity (v, ft/yr)[e]	52	52	52	52	52	52
Retardation Factor[f]	3,433	11,809	11,809	3,822	17,176	33,313
Modeled Retardation[g]	10	10	10	10	10	10
Simulation Time (yrs)	35	35	35	35	35	35
Source Concentration (µg/L)	0.035	ND	ND	0.013	0.038	0.039
Source Width (ft)[h]	300	300	300	300	300	300
Source Thickness (ft)[i]	15	15	15	15	15	15
Modeled Half-life (days)[j]	782	970	3,029	1,371	1,301	1,330
Results						
Detection Limits (µg/L)	0.01	0.01	0.01	0.01	0.01	0.01
Concentration at Duwamish (ug/L)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Table A2
Development of Site Specific Groundwater Clean-up Levels
Precision Engineering, Inc.
Seattle, Washington

Model Parameters	Chromium, Trivalent	Chromium, Hexavalent	Copper	Trichloro-ethene	Vinyl Chloride
Hydraulic Conductivity (k, cm/sec)[b]	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03
Gradient (i)[c]	0.003	0.003	0.003	0.003	0.003
Porosity (n)[d]	0.3	0.3	0.3	0.3	0.3
Groundwater Velocity (v, ft/yr)[e]	52	52	52	52	52
Retardation Factor[f]	5334	102	118	1.9	1.18
Modeled Retardation[g]	10	10	10	1.9	1.18
Simulation Time (yrs)	35	35	35	35	35
Source Width (ft)[h]	300	50	225	40	200
Source Thickness (ft)[i]	15	15	15	15	15
Half-life (days)[j]	NV	NV	NV	876	416
Concentration of groundwater discharge to surface water = Surface Water Criteria value (µg/L)[k]	74	11	3.1	1.5	0.025
Results (Source Area Concentration)					
Type I	3,600,000,000,000	160	22	188	18.70
Type II	NC	NC	NC	128,800	2,640
Type II with Half-life x factor of 2 for TCE and VC (µg/L)	NC	NC	NC	1,630	52

Table A2
Development of Site Specific Groundwater Clean-up Levels
Precision Engineering, Inc.
Seattle, Washington

Model Parameters	Benzo(a) anthracene	Benzo(b) fluoranthene	Benzo(k) fluoranthene	Chrysene	Dibenzo(a,h) anthracene	Indeno(1,2,3-cd)pyrene
Hydraulic Conductivity (k, cm/sec)[b]	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03
Gradient (i)[c]	0.003	0.003	0.003	0.003	0.003	0.003
Porosity (n)[d]	0.3	0.3	0.3	0.3	0.3	0.3
Groundwater Velocity (v, ft/yr)[e]	52	52	52	52	52	52
Retardation Factor[f]	3,433	11,809	11,809	3,822	17,176	33,313
Modeled Retardation[g]	10	10	10	10	10	10
Simulation Time (yrs)	35	35	35	35	35	35
Source Width (ft)[h]	300	300	300	300	300	300
Source Thickness (ft)[i]	15	15	15	15	15	15
Half-life (days)[j]	782	970	3,029	1,371	1,301	1,330
Concentration of groundwater discharge to surface water = Surface Water Criteria value (µg/L)[k]	0.0038	0.0038	0.0038	0.0038	0.0038	0.0038
Results (Source Area Concentration)						
Type I	NC	NC	NC	NC	NC	NC
Type II	200,000,000	165,000,000	55,000,000	130,000,000	135,000,000	132,000,000
Type II with Half-life x factor of 2 for TCE and VC (µg/L)	NC	NC	NC	NC	NC	NC

Table A3
Applicable Surface-Water Criteria
Precision Engineering, Inc.
Seattle, Washington

Surface-Water Criteria	Hexavalent Chromium (mg/L)	Dissolved Trivalent Chromium[a] (mg/L)	Copper (µg/L)	Trichloro-ethene (µg/L)	Vinyl chloride (µg/L)	Benzo(a) anthracene (µg/L)	Benzo(b) fluoranthene (µg/L)
MTCA Method B Surface Water CULs, carcinogen or non-carcinogen	0.490	240	2700	**1.5**	3.7	0.0300	0.0300
MTCA Method C Surface Water CULs, carcinogen or non-carcinogen	1.20	610	6,700	37	92	0.74	0.74
AWQC—Human Health	NR	NR	1,300	2.5	**0.025**	**0.0038**	**0.0038**
Surface Water ARAR—Aquatic Life—Freshwater/Acute	0.15	1.8	4.6	NR	NR	NR	NR
AWQC—Aquatic Life—Chronic	**0.011**	**0.074**	**3.1**	NR	NR	NR	NR

*Lowest CUL bolded

Table A3
Applicable Surface-Water Criteria
Precision Engineering, Inc.
Seattle, Washington

Surface-Water Criteria	Benzo(k) fluoranthene (µg/L)	Benzo(b+k) fluoranthene (µg/L)	Chrysene (µg/L)	Dibenzo(a,h) anthracene (µg/L)	Indeno(1,2,3-cd) pyrene (µg/L)	Diesel-Range Organics (mg/L)	Oil-Range Organics (mg/L)
MTCA Method B Surface Water CULs, carcinogen or non-carcinogen	0.0300	0.0300	0.0300	0.0300	0.0300	NV	NV
MTCA Method C Surface Water CULs, carcinogen or non-carcinogen	0.74	0.74	0.74	0.74	0.74	NV	NV
AWQC—Human Health	**0.0038**	NR	**0.0038**	**0.0038**	**0.0038**	NV	NV
Surface Water ARAR—Aquatic Life—Freshwater/Acute	NR	NR	NR	NR	NR	NV	NV
AWQC—Aquatic Life—Chronic	NR	NR	NR	NR	NR	NV	NV

*Lowest CUL bolded

Table A4
Risk Screening
Groundwater Protection of Surface Water
Precision Engineering, Inc.
Seattle, Washington

Location	Date	Dissolved Chromium (Trivalent)	Chromium (Hexavalent)	Copper	Selenium	Trichloro-ethene	Vinyl chloride	Diesel-Range Organics	Oil-Range Organics
		mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L
Site-Specific Groundwater CUL for the Protection of Surface Water		2,800,000,000	0.15	22	25	1,630	52	NV	NV
Monitoring Well Groundwater Data									
MW1	6/16/2005	NC	**0.269**	NA	NA	1 U	1 U	NA	NA
	12/27/2005	NC	0.00625 U	1.01	1.00 U	0.200 U	0.200 U	0.248 U	0.495 U
	04/18/2006	NC	0.02 U	2.0 U	2.0 U	1 U	1 U	0.26 U	0.52 U
MW2	6/17/2005	NC	0.01 U	NA	NA	1 U	1 U	0.438	0.512
	12/28/2005	0.00879	0.00625 U	1.17	6.28	0.200 U	0.200 U	1.19	1.04
	04/19/2006	0.021	0.02 U	2.5	10	1 U	1 U	0.41	0.58 U
MW3	6/7/2005	NC	0.01 U	NA	NA	1 U	1 U	NA	NA
	12/29/2005	0.00215	0.00625 U	1.00 U	1.00 U	0.200 U	0.200 U	0.312	0.505 U
	04/17/2006	0.0078	0.02 U	2.0 U	2.0 U	1 U	1 U	0.28 U	0.57 U
MW4	6/9/2005	NC	0.01 U	NA	NA	1 U	1 U	NA	NA
	6/9/2005	NC	0.01 U	NA	NA	1 U	1 U	NA	NA
	12/27/2005	NC	0.00625 U	1.00 U	1.00 U	0.200 U	0.200 U	0.248 U	0.495 U
	04/18/2006	NC	0.023	2.0 U	2.0 U	1 U	1 U	0.27 U	0.54 U
MW5	12/28/2005	47	**450**	3.67	1000 U	22.1	0.200 U	0.831	0.495 U
	04/19/2006	NC	**350**	2.0 U	2.0 U	7.9	0.14 U	0.26 U	0.51 U
MW6	12/29/2005	0.0187	0.00625 U	4.02	12.3	1 U	1 U	2.64	1.32
	04/19/2006	0.047	0.02 U	5.1	19	1 U	1 U	0.76	1.2
MW7	12/28/2005	0.0106	0.00738	2.12	2.77	0.200 U	0.200 U	0.248 U	0.495 U
	04/18/2006	0.013	0.02U	2.4	5	1 U	1 U	0.26 U	0.51 U
	04/18/2006	NC	0.02 U	NA	NA	1 U	1 U	0.26 U	0.51 U
MW8	12/28/2005	0.00755	0.00625 U	1.00 U	4.11	0.200 U	0.560	1.71	1.00
	12/28/2005	0.00849	0.02 U	1.03	4.27	0.200 U	0.400	1.79	1.21
	04/18/2006	0.021	0.02 UJ	2.0 U	3.6	1 U	0.80 J	0.45	0.58 U

Table A4
Risk Screening
Groundwater Protection of Surface Water
Precision Engineering, Inc.
Seattle, Washington

Location	Date	Dissolved Chromium (Trivalent)	Chromium (Hexavalent)	Copper	Selenium	Trichloro-ethene	Vinyl chloride	Diesel-Range Organics	Oil-Range Organics
		mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L
Site-Specific Groundwater CUL for the Protection of Surface Water		2,800,000,000	0.15	22	25	1,630	52	NV	NV
Reconnaissance Groundwater Data									
GP2	6/9/2005	32.38	**4.72**	NA	NA	5 U	5 U	NA	NA
GP4	6/16/2005	31	**236**	NA	NA	1 U	1 U	0.325	0.478 U
GP5	6/16/2005	NC	0.0897	NA	NA	1 U	1 U	NA	NA
GP6	6/16/2005	43	**300**	NA	NA	1,130	20 U	NA	NA
GP7	6/16/2005	NC	0.101	NA	NA	1 U	1 U	NA	NA
GP8	6/16/2005	61	**294**	NA	NA	16.8	1 U	0.814	0.479 U
GP-13	12/14/2005	NC	NA	NA	NA	0.220	16.5	NA	NA
GP-15	12/14/2005	NC	NA	NA	NA	0.2 U	0.2 U	NA	NA

Table A4
Risk Screening
Groundwater Protection of Surface Water
Precision Engineering, Inc.
Seattle, Washington

Location	Date	Benzo(a) anthracene	Benzo(b) fluoranthene	Benzo(k) fluoranthene	Benzo(b+k) fluoranthene	Chrysene	Dibenzo(a,h) anthracene	Indeno(1,2,3-cd) pyrene
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Site-Specific Groundwater CUL for the Protection of Surface Water		145,000,000	108,000,000	38,000,000	NV	95,000,000	100,000,000	97,000,000
Monitoring Well Groundwater Data								
MW1	6/16/2005	NA	NA	NA	NA	NA	NA	NA
	12/27/2005	0.107	0.104	0.108	NA	0.132	0.0114 U	0.0114 U
	04/18/2006	0.029 J	NA	NA	0.030 U	0.014 J	0.095 U	0.034 J
MW2	6/17/2005	0.192 U	NA	NA	0.962 U	0.192 U	0.192 U	0.192 U
	12/28/2005	0.00990 U	0.00990 U	0.00990 U	NA	0.00990 U	0.00990 U	0.00990 U
	04/19/2006	0.031 J	NA	NA	0.034 U	0.11 U	0.11 U	0.11 U
MW3	6/7/2005	NA	NA	NA	NA	NA	NA	NA
	12/29/2005	0.0100 U	0.0100 U	0.0100 U	NA	0.0100 U	0.0100 U	0.0100 U
	04/17/2006	0.11 U	NA	NA	0.033 U	0.11 U	0.11 U	0.11 U
MW4	6/9/2005	NA	NA	NA	NA	NA	NA	NA
	6/9/2005	NA	NA	NA	NA	NA	NA	NA
	12/27/2005	0.0100 U	0.0100 U	0.0100 U	NA	0.0100 U	0.0100 U	0.0100 U
	04/18/2006	0.10 U	NA	NA	0.032 U	0.10 U	0.10 U	0.10 U
MW5	12/28/2005	0.00990 U	0.00990 U	0.00990 U	NA	0.00990 U	0.00990 U	0.00990 U
	04/19/2006	0.095 U	NA	NA	0.030 U	0.095 U	0.095 U	0.095 U
MW6	12/29/2005	0.00990 U	0.00990 U	0.00990 U	NA	0.00990 U	0.00990 U	0.00990 U
	04/19/2006	0.10 U	NA	NA	0.032 U	0.10 U	0.10 U	0.10 U
MW7	12/28/2005	0.00990 U	0.00990 U	0.00990 U	NA	0.00990 U	0.00990 U	0.00990 U
	04/18/2006	0.035 J	NA	NA	0.031 U	0.013 J	0.038 J	0.039 J
	04/18/2006	0.10 U	NA	NA	0.031 U	0.10 U	0.10 U	0.10 U
MW8	12/28/2005	0.0100 U	0.0100 U	0.0100 U	NA	0.0100 U	0.0100 U	0.0100 U
	12/28/2005	0.0990 U	0.00990 U	0.00990 U	NA	0.00990 U	0.00990 U	0.00990 U
	04/18/2006	0.13 U	NA	NA	0.039 U	0.13 U	0.13U	0.13 U

Table A4
Risk Screening
Groundwater Protection of Surface Water
Precision Engineering, Inc.
Seattle, Washington

Location	Date	Benzo(a) anthracene	Benzo(b) fluoranthene	Benzo(k) fluoranthene	Benzo(b+k) fluoranthene	Chrysene	Dibenzo(a,h) anthracene	Indeno(1,2,3-cd) pyrene
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Site-Specific Groundwater CUL for the Protection of Surface Water		145,000,000	108,000,000	38,000,000	NV	95,000,000	100,000,000	97,000,000
Reconnaissance Groundwater Data								
GP2	6/9/2005	NA	NA	NA	NA	NA	NA	NA
GP4	6/16/2005	0.191 U	0.954 U	NA	NA	0.191 U	0.191 U	0.191 U
GP5	6/16/2005	NA	NA	NA	NA	NA	NA	NA
GP6	6/16/2005	NA	NA	NA	NA	NA	NA	NA
GP7	6/16/2005	NA	NA	NA	NA	NA	NA	NA
GP8	6/16/2005	0.194 U	0.97 U	NA	NA	0.194 U	0.194 U	0.194 U
GP-13	12/14/2005	NA	NA	NA	NA	NA	NA	NA
GP-15	12/14/2005	NA	NA	NA	NA	NA	NA	NA

FIGURES

Figure A1
Fate and Transport Modeling
Trivalent Chromium
Precision Engineering, Inc.
Seattle, Washington

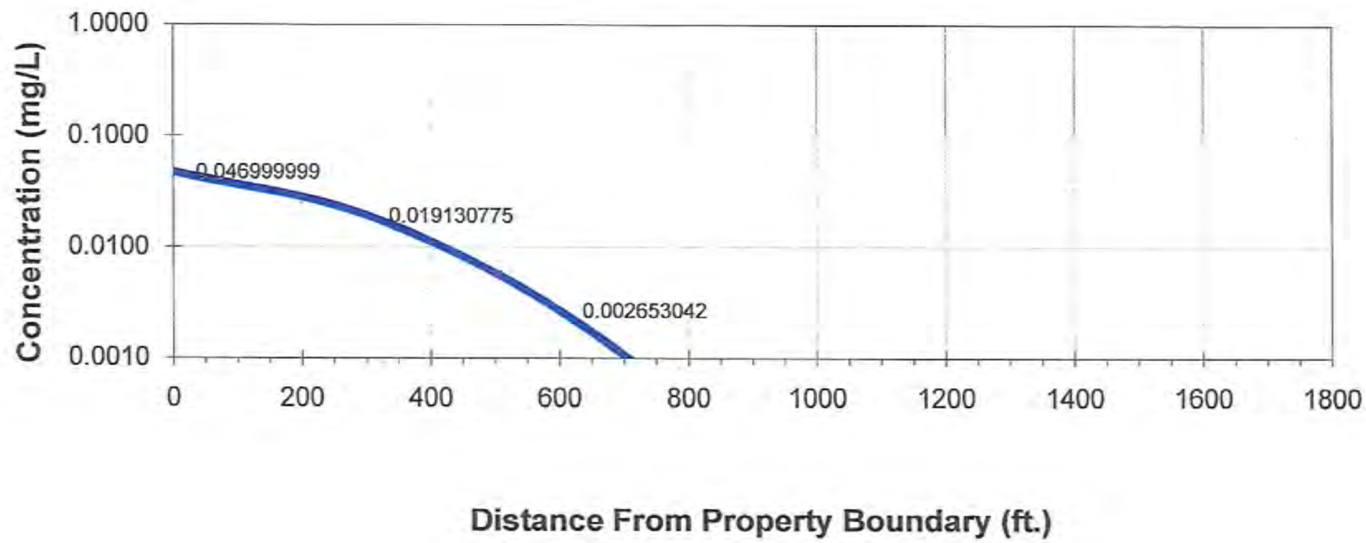


Figure A2
Fate and Transport Modeling
Hexavalent Chromium
Precision Engineering, Inc.
Seattle, Washington

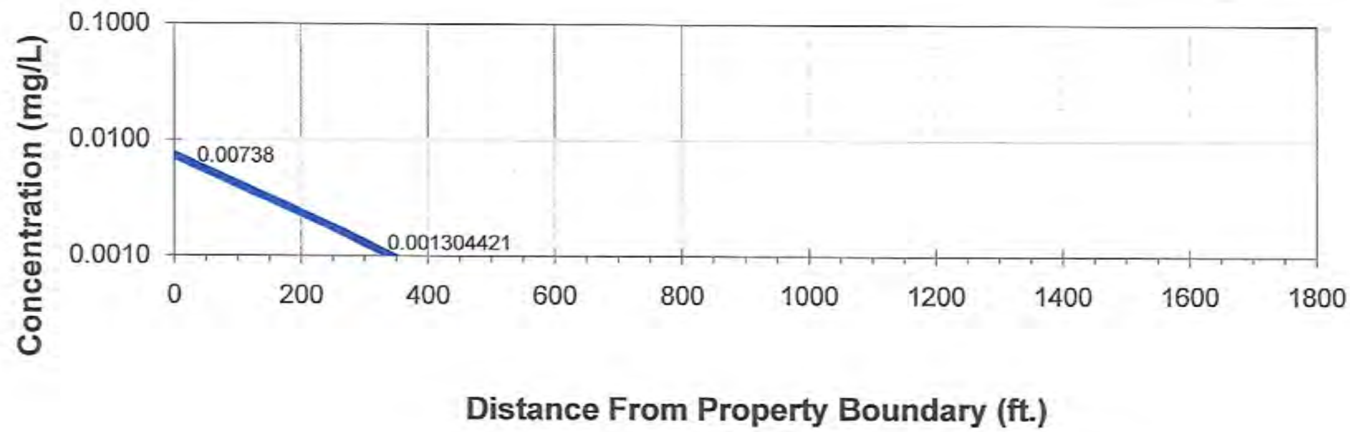


Figure A3
Fate and Transport Modeling
Copper
Precision Engineering, Inc.
Seattle, Washington

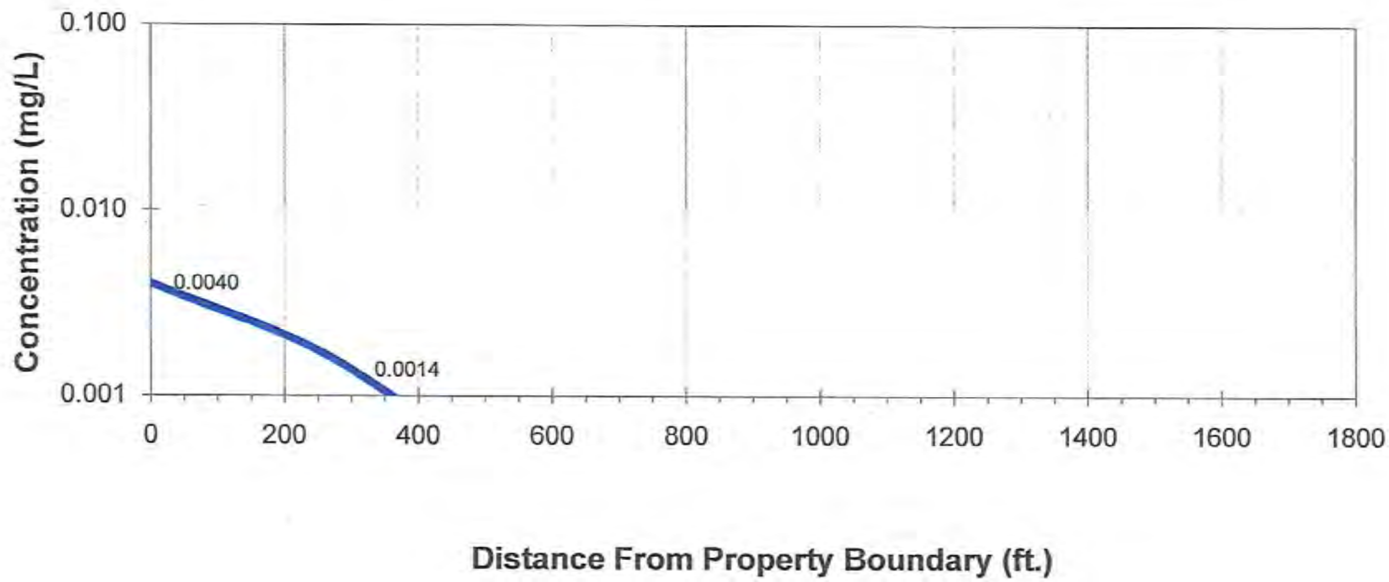


Figure A4
Fate and Transport Modeling
Trichloroethene
Precision Engineering, Inc.
Seattle, Washington

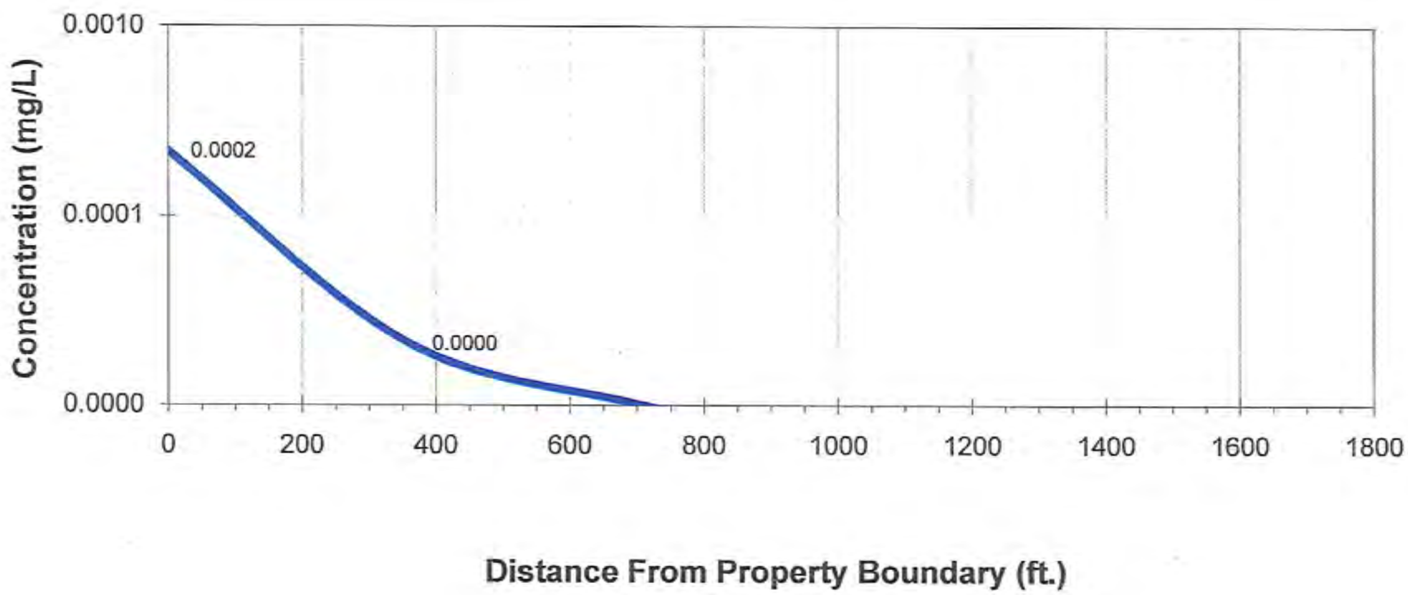


Figure A5
Fate and Transport Modeling
Vinyl Chloride
Precision Engineering, Inc.
Seattle, Washington

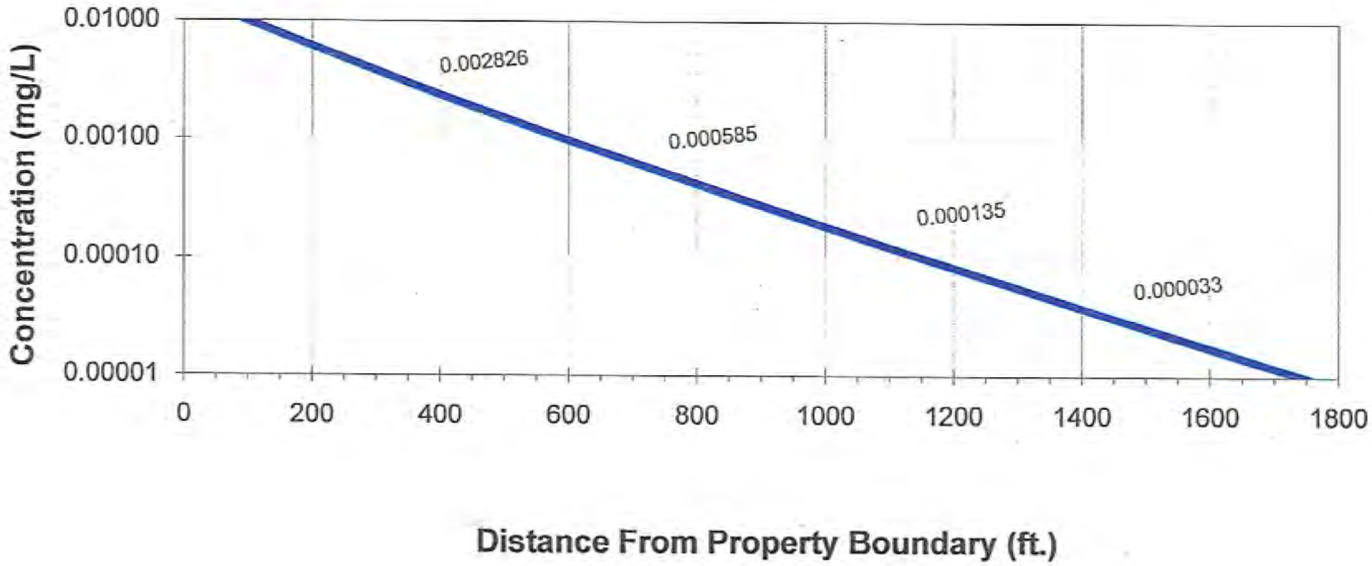


Figure A6
Fate and Transport Modeling
Benzo(a)anthracene
Precision Engineering, Inc.
Seattle, Washington

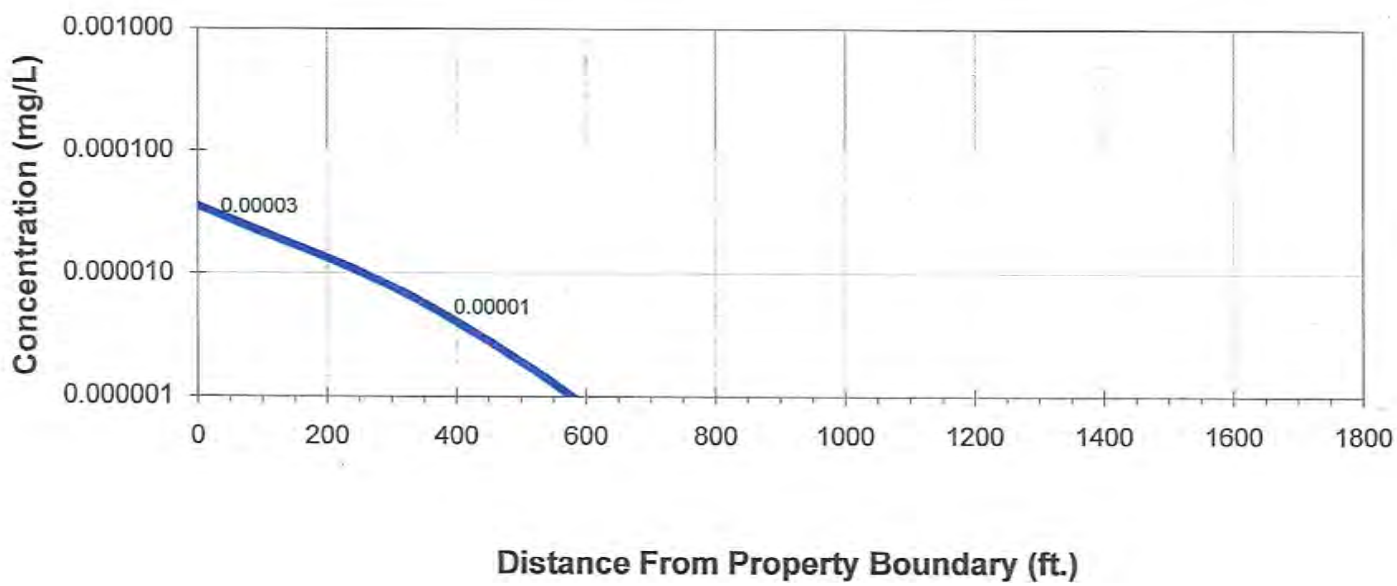


Figure A7
Fate and Transport Modeling
Chrysene
Precision Engineering, Inc.
Seattle, Washington

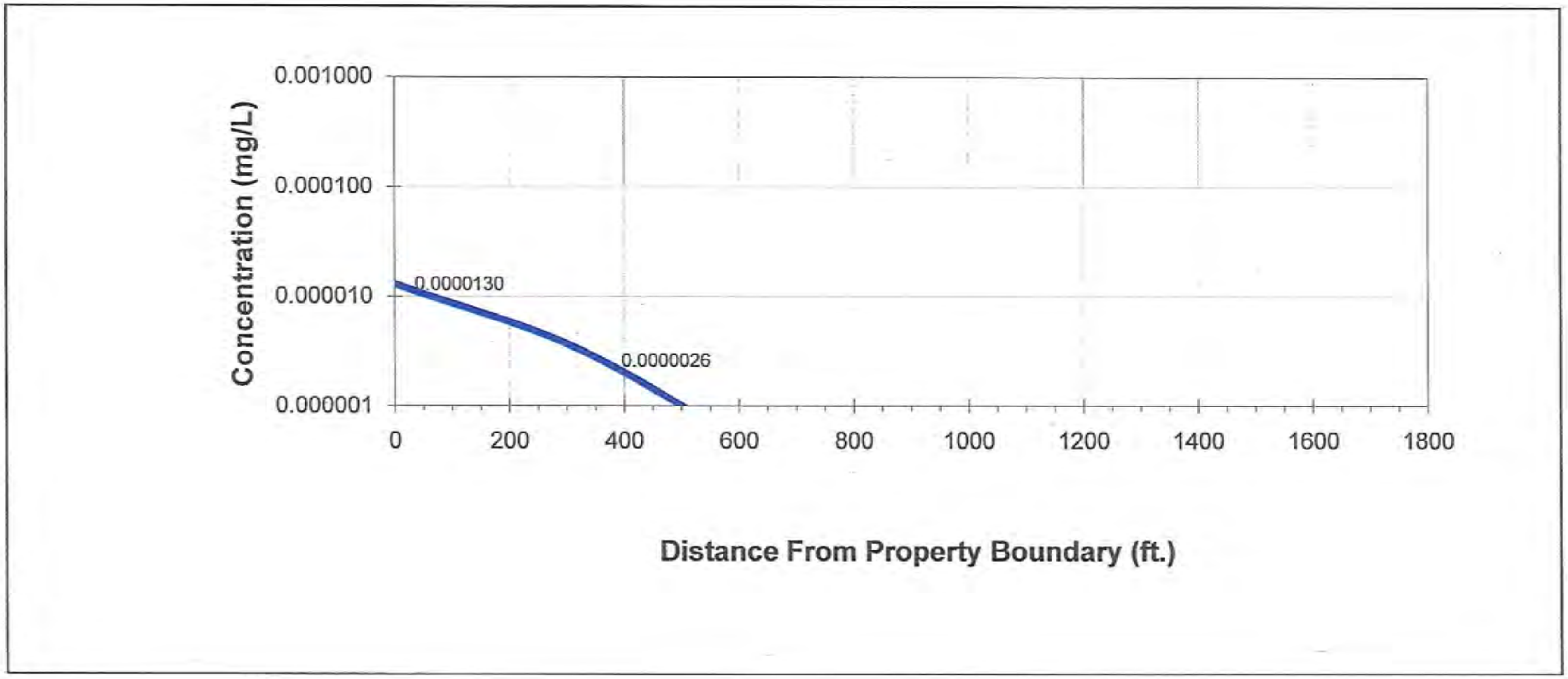


Figure A8
Fate and Transport Modeling
Dibenzo(a,h)anthracene
Precision Engineering, Inc.
Seattle, Washington

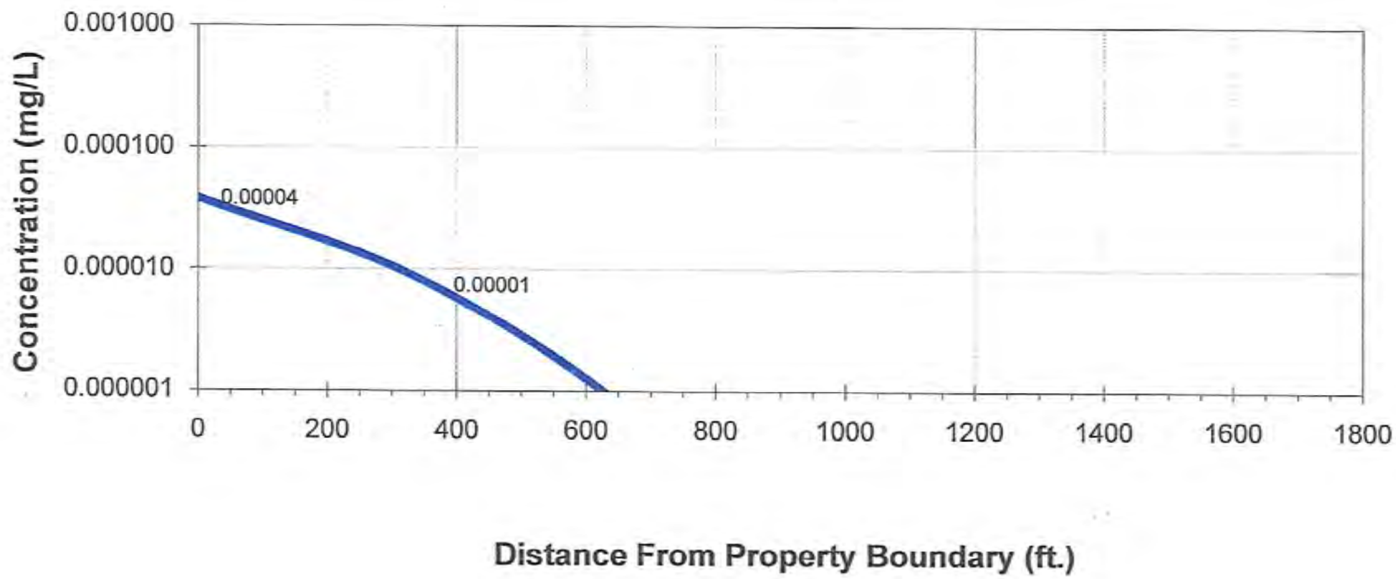


Figure A9
Fate and Transport Modeling
Indeno(1,2,3,-cd)pyrene
Precision Engineering, Inc.
Seattle, Washington

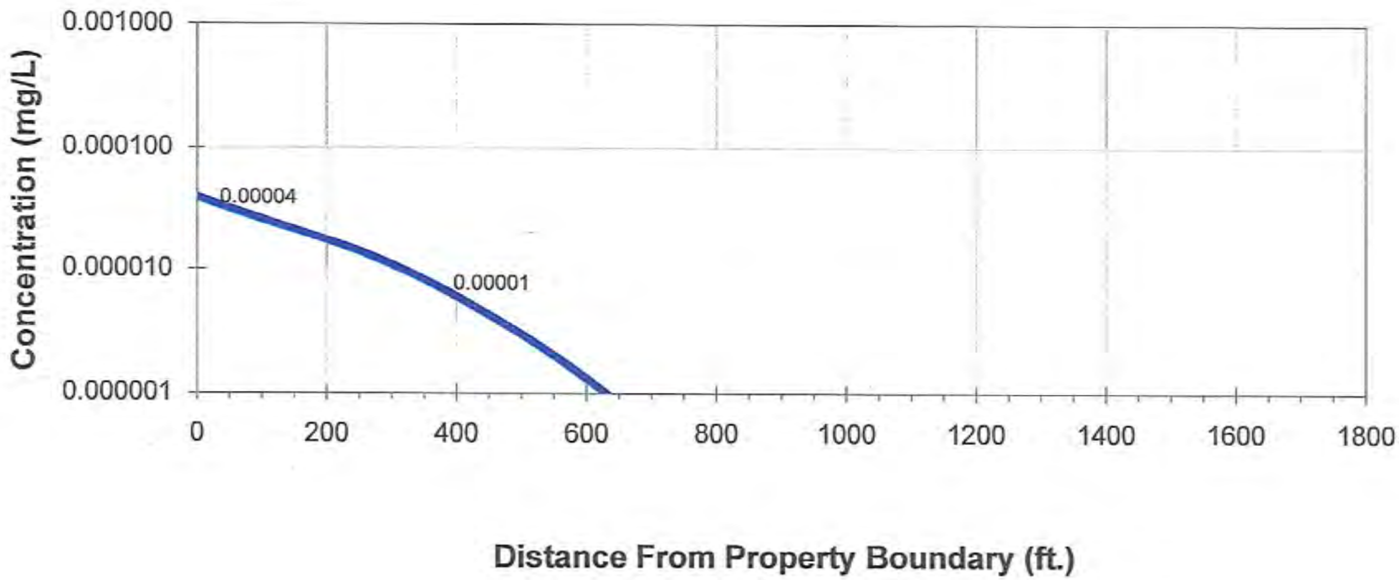


Figure A10
Fate and Transport Modeling for Site Specific CULs
Trivalent Chromium
Precision Engineering, Inc.
Seattle, Washington

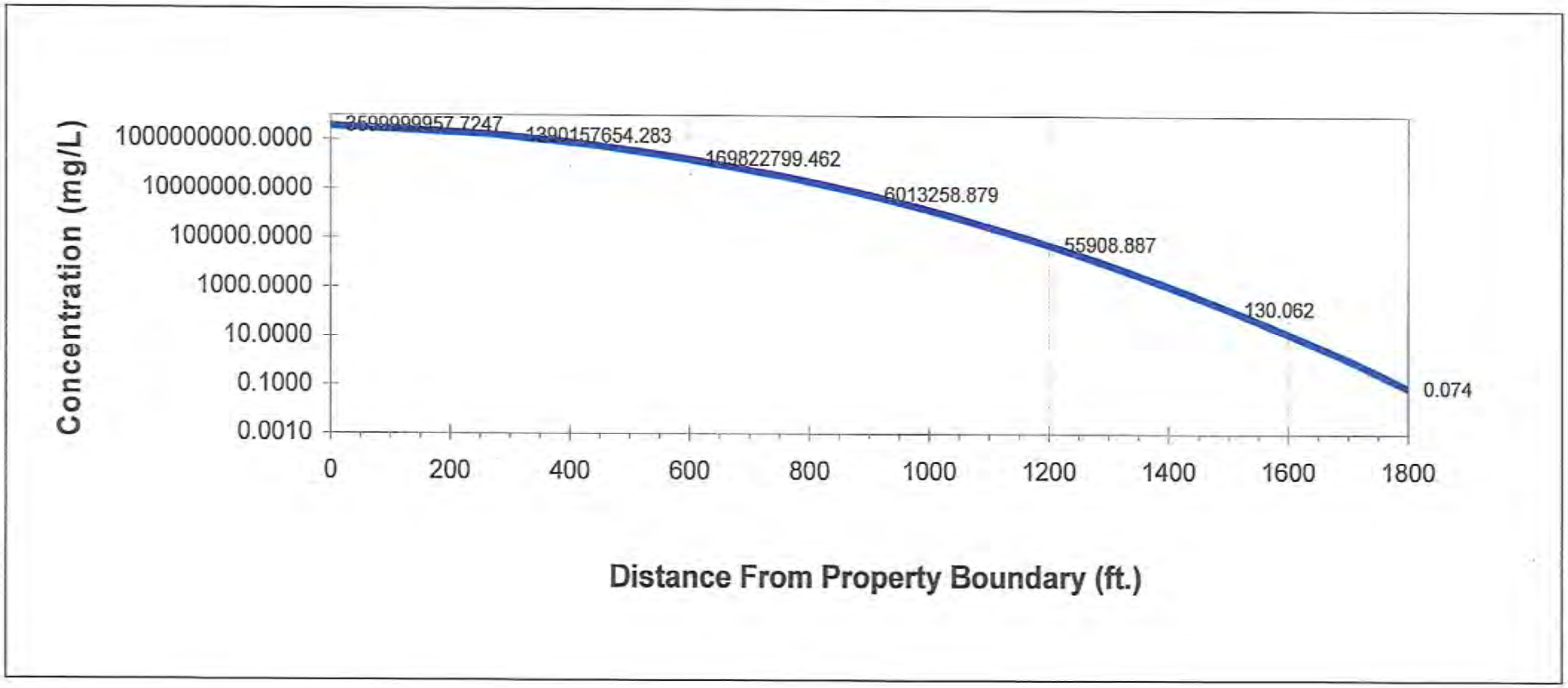


Figure A11
Fate and Transport Modeling for Site Specific CULs
Hexavalent Chromium
Precision Engineering, Inc.
Seattle, Washington

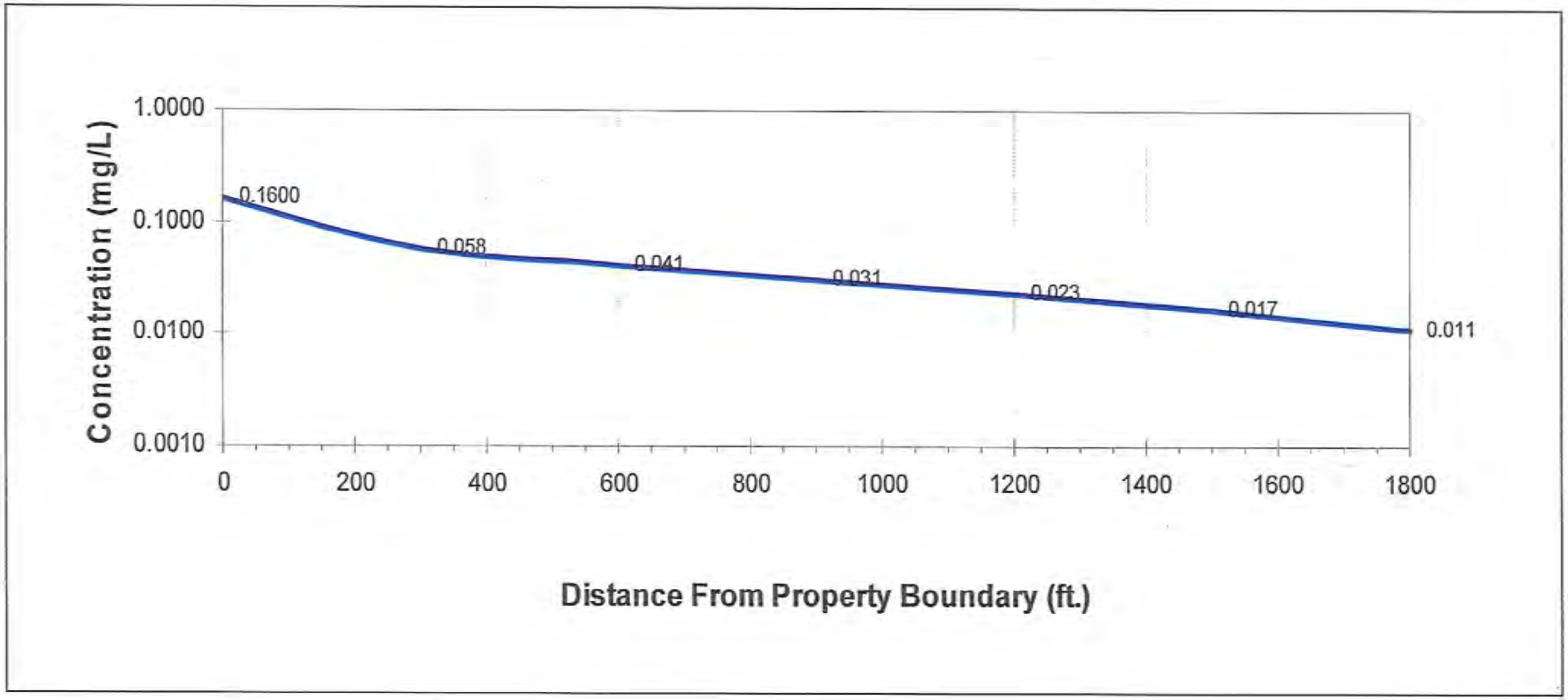


Figure A12
Fate and Transport Modeling for Site Specific CULs
Copper
Precision Engineering, Inc.
Seattle, Washington

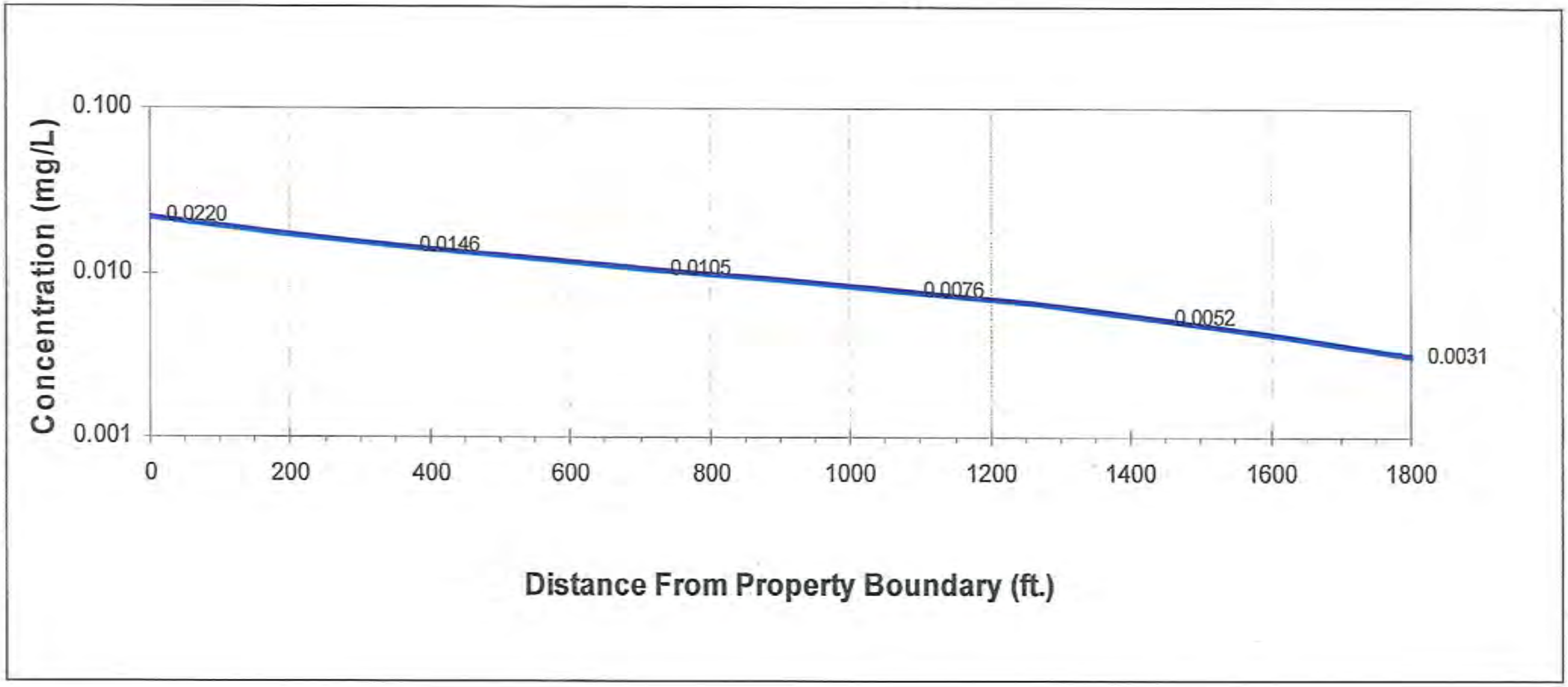


Figure A13
Fate and Transport Modeling for Site Specific CULs
TCE
Precision Engineering, Inc.
Seattle, Washington

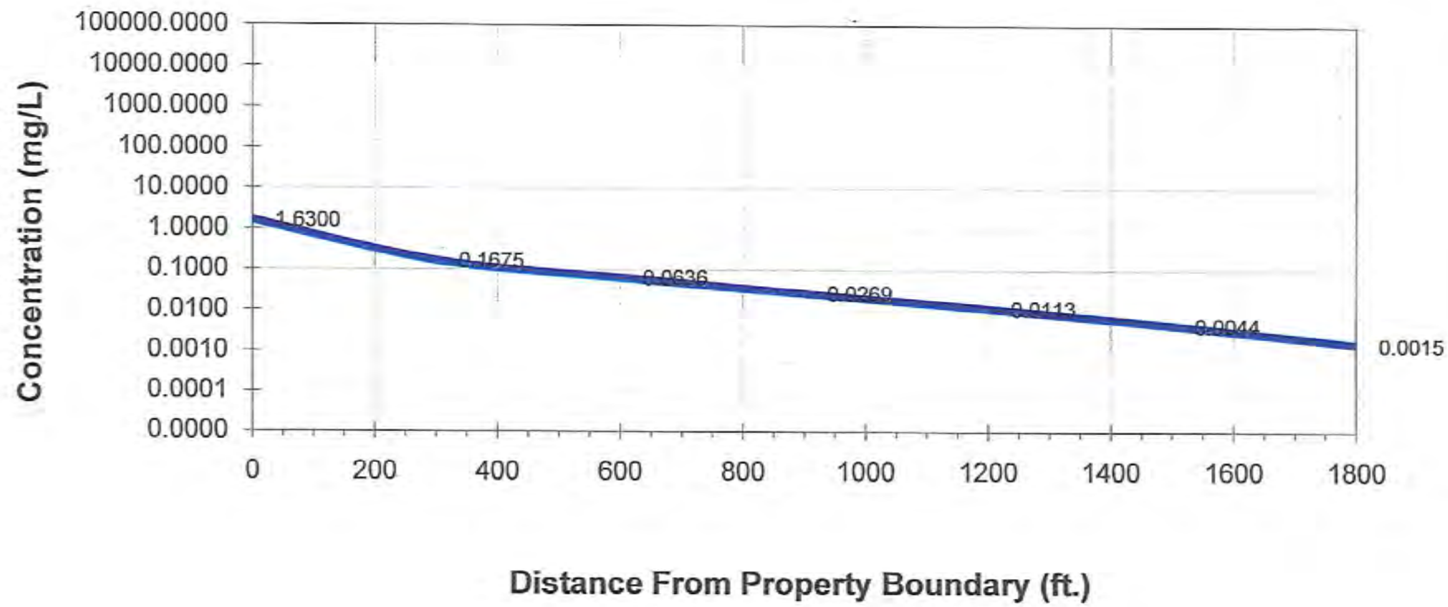


Figure A14
Fate and Transport Modeling for Site Specific CULs
Vinyl Chloride
Precision Engineering, Inc.
Seattle, Washington

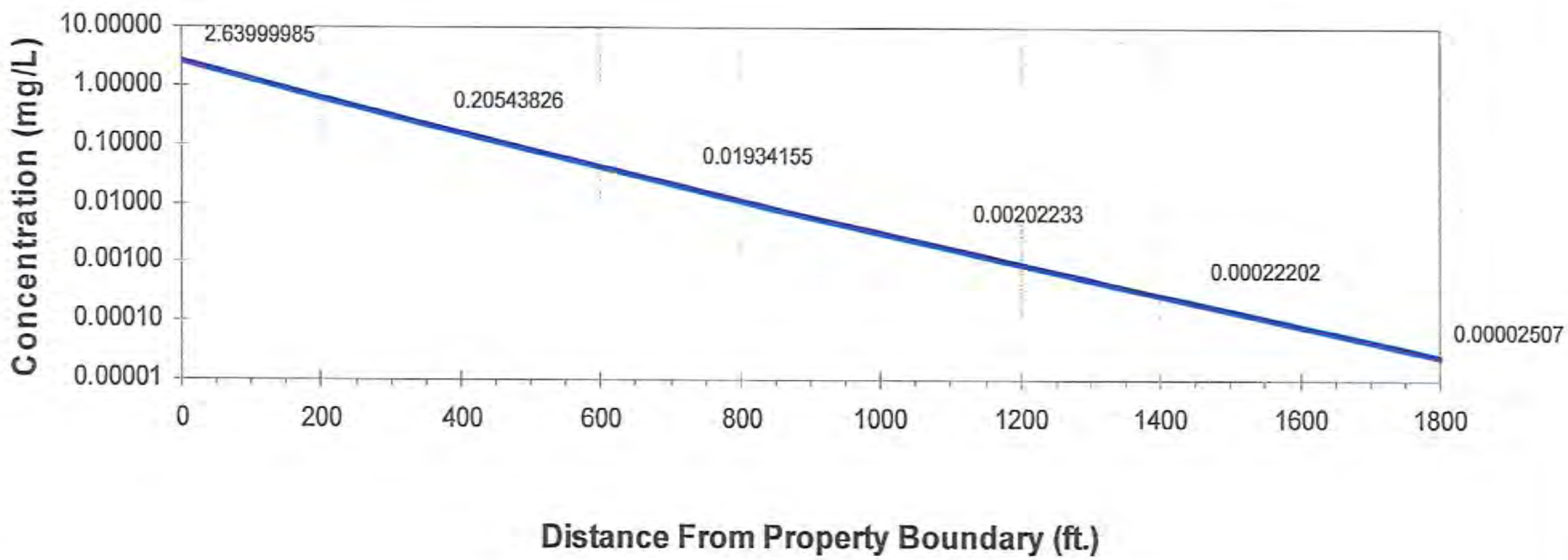


Figure A15
Fate and Transport Modeling for Site Specific CULs
Benzo(a)anthracene
Precision Engineering, Inc.
Seattle, Washington

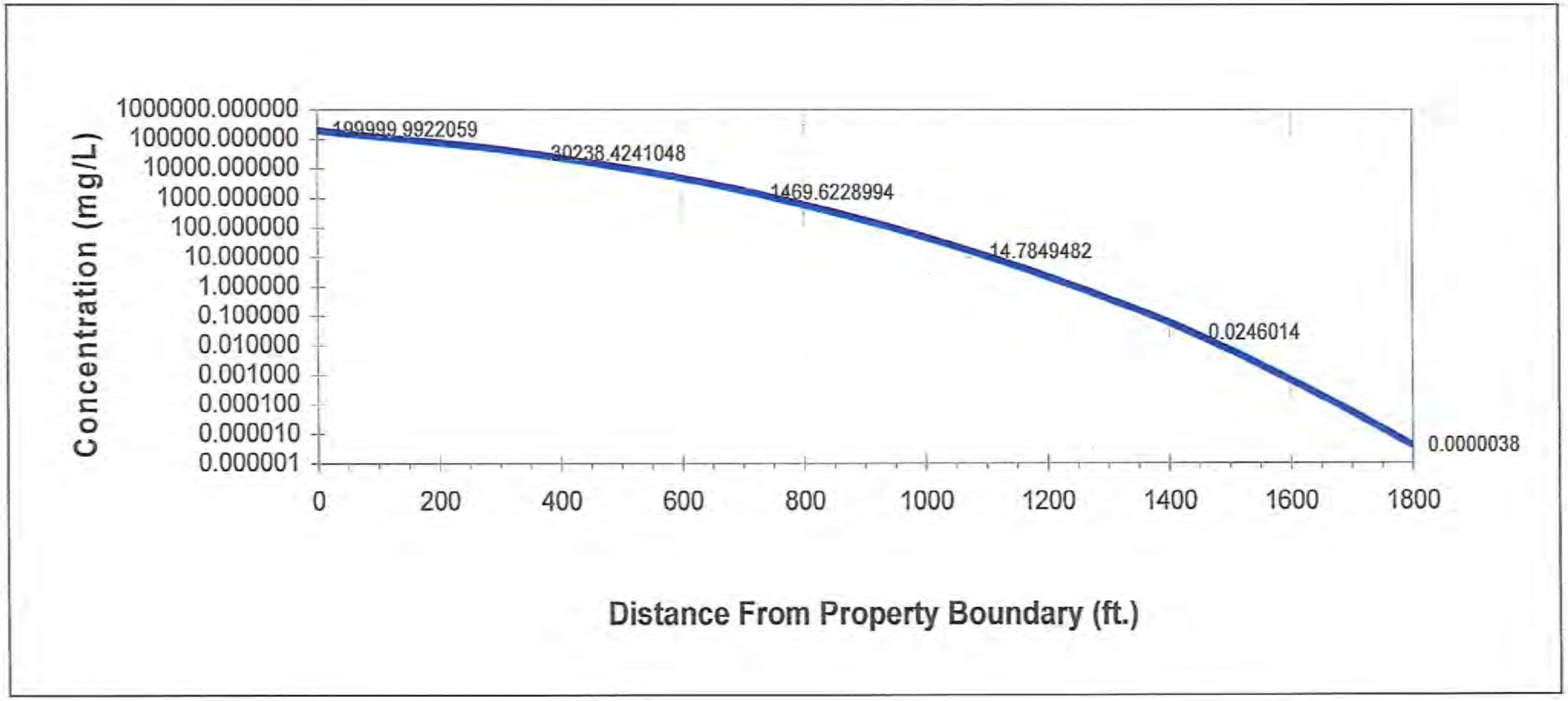


Figure A16
Fate and Transport Modeling for Site Specific CULs
Benzo(b)fluoranthene
Precision Engineering, Inc.
Seattle, Washington

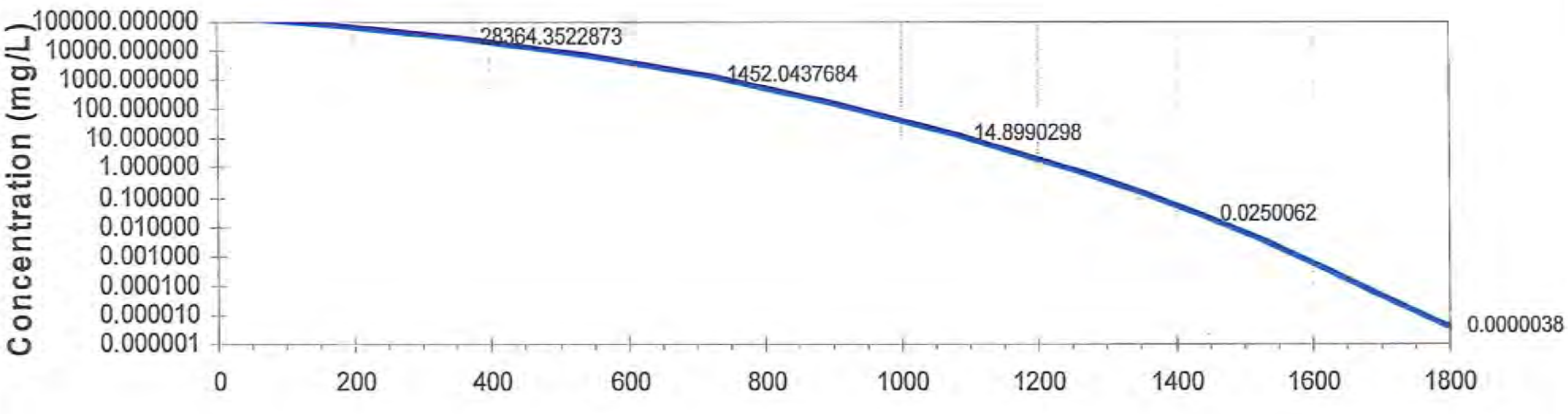


Figure A17
Fate and Transport Modeling for Site Specific CULs
Benzo(k)fluoranthene
Precision Engineering, Inc.
Seattle, Washington

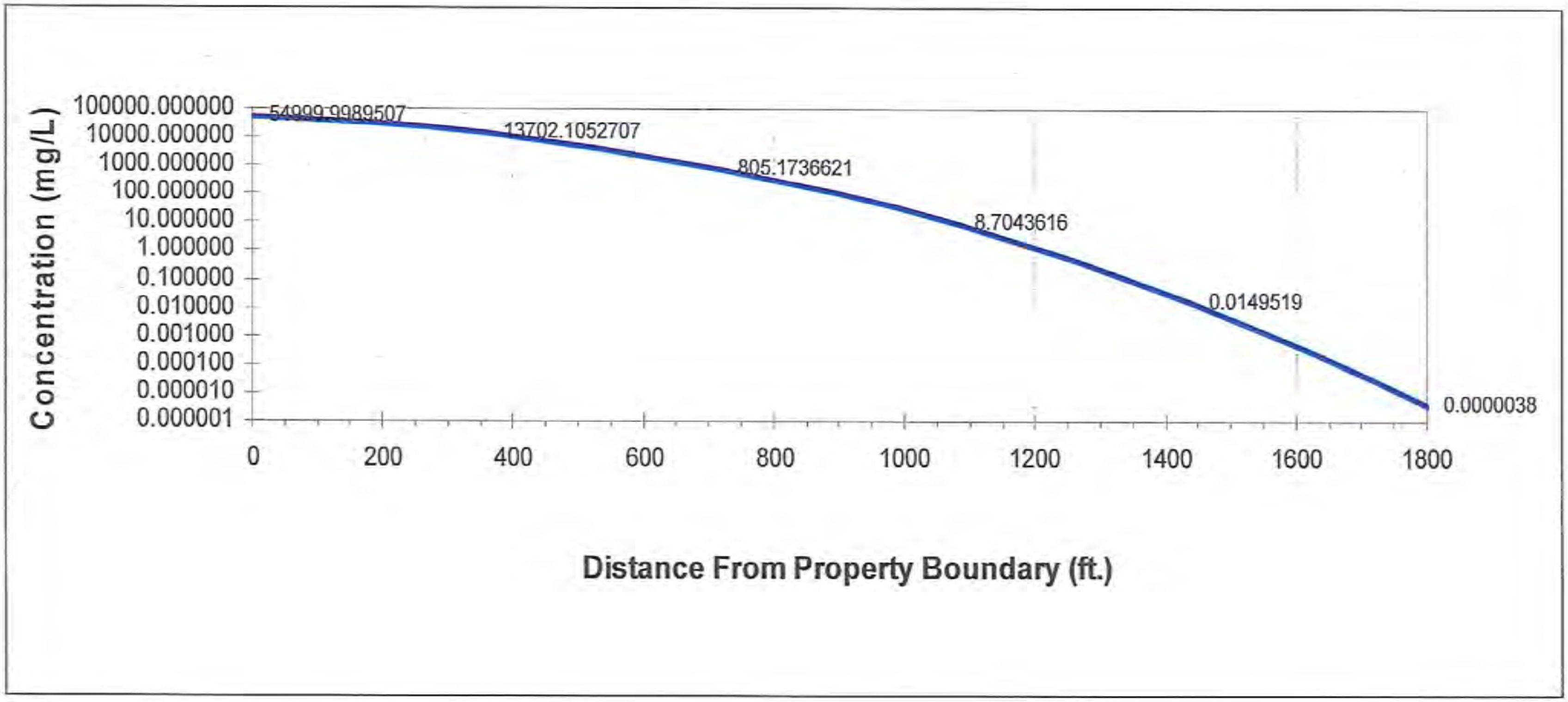


Figure A18
Fate and Transport Modeling for Site Specific CULs
Chrysene
Precision Engineering, Inc.
Seattle, Washington

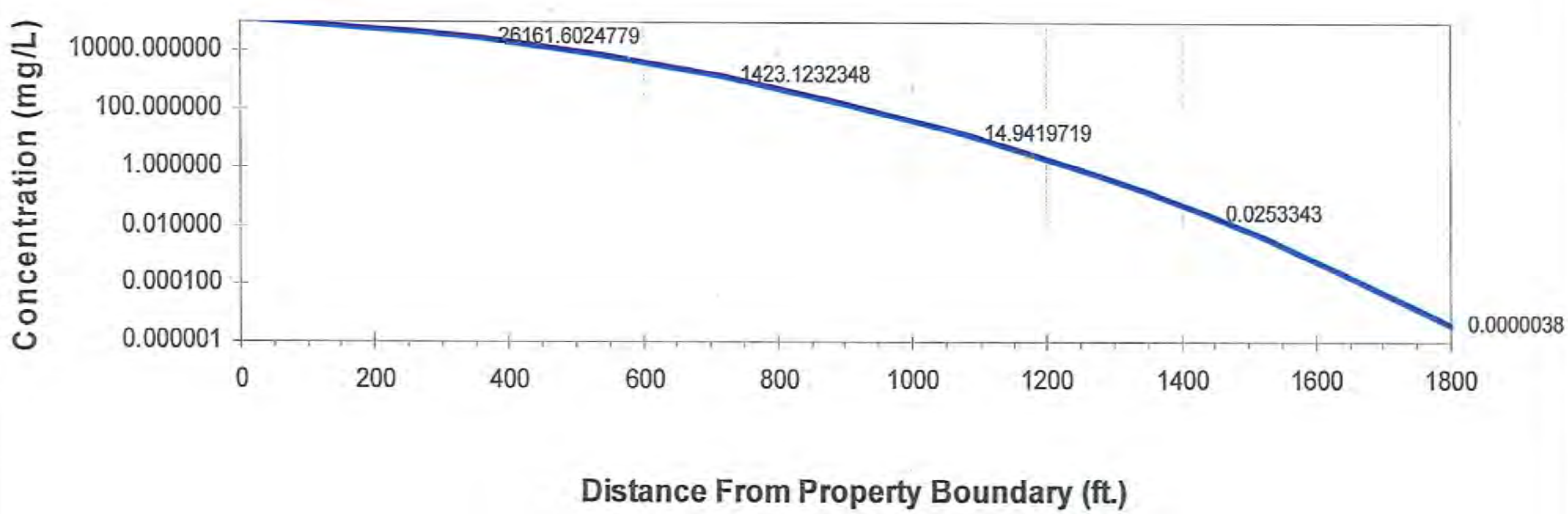


Figure A19
Fate and Transport Modeling for Site Specific CULs
Dibenzo(a,h)anthracene
Precision Engineering, Inc.
Seattle, Washington

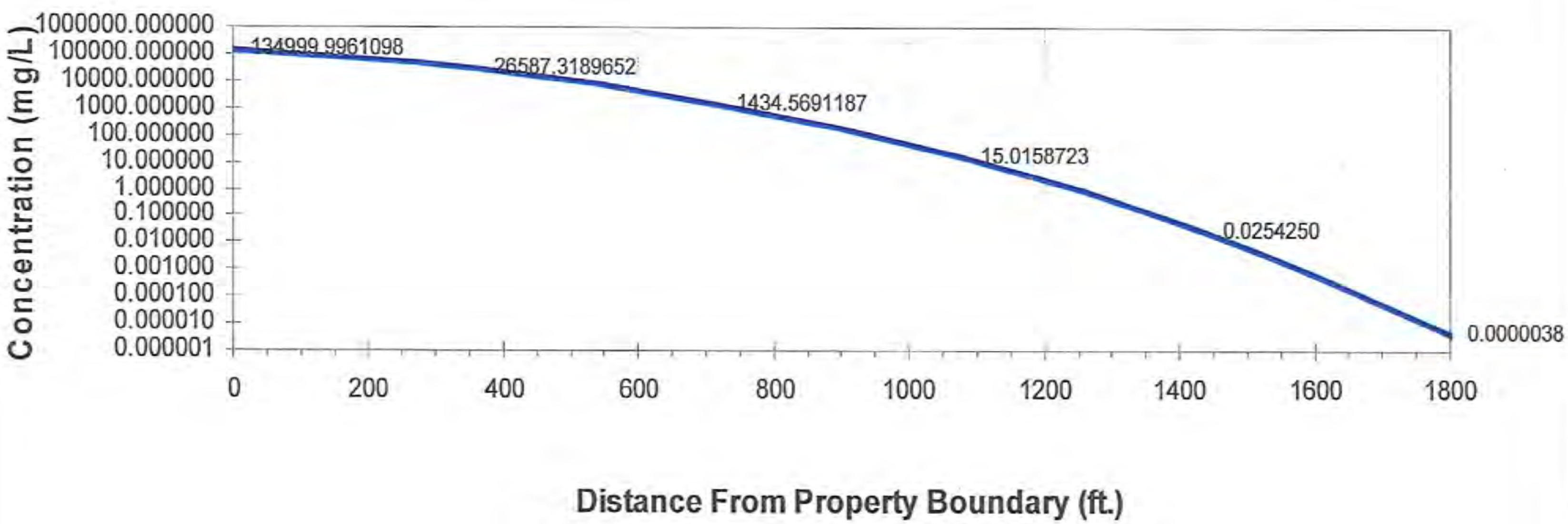
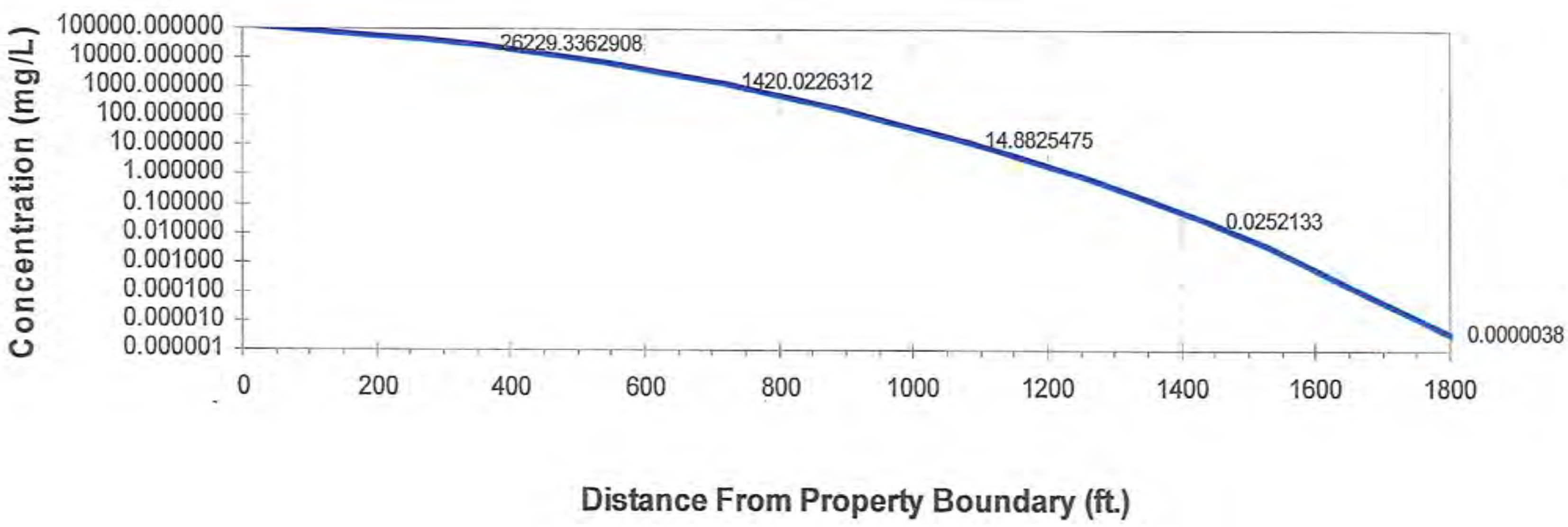


Figure A20
Fate and Transport Modeling for Site Specific CULs
Indeno(1,2,3-cd)pyrene
Precision Engineering, Inc.
Seattle, Washington



APPENDIX B

CROSS SECTION

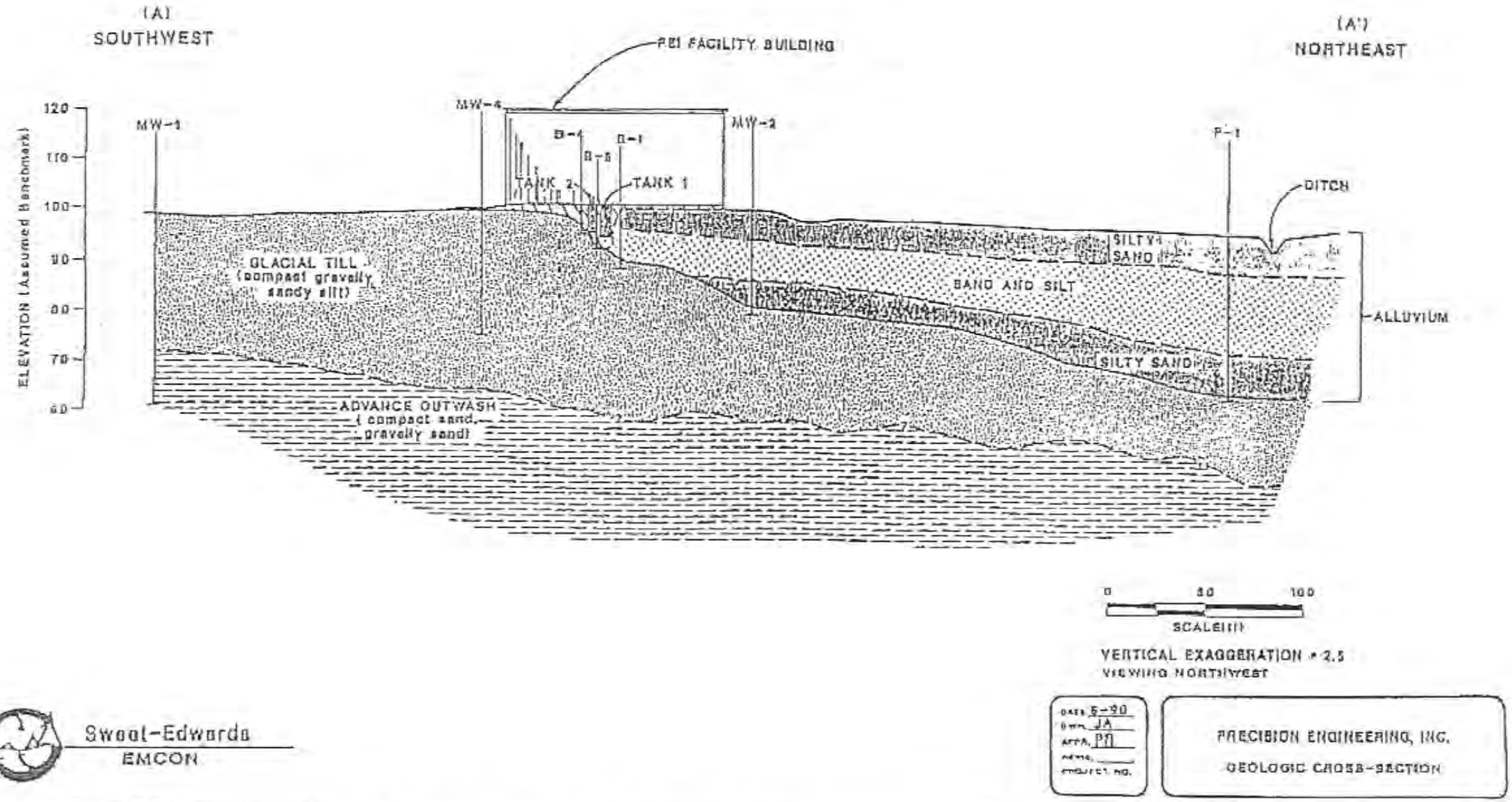
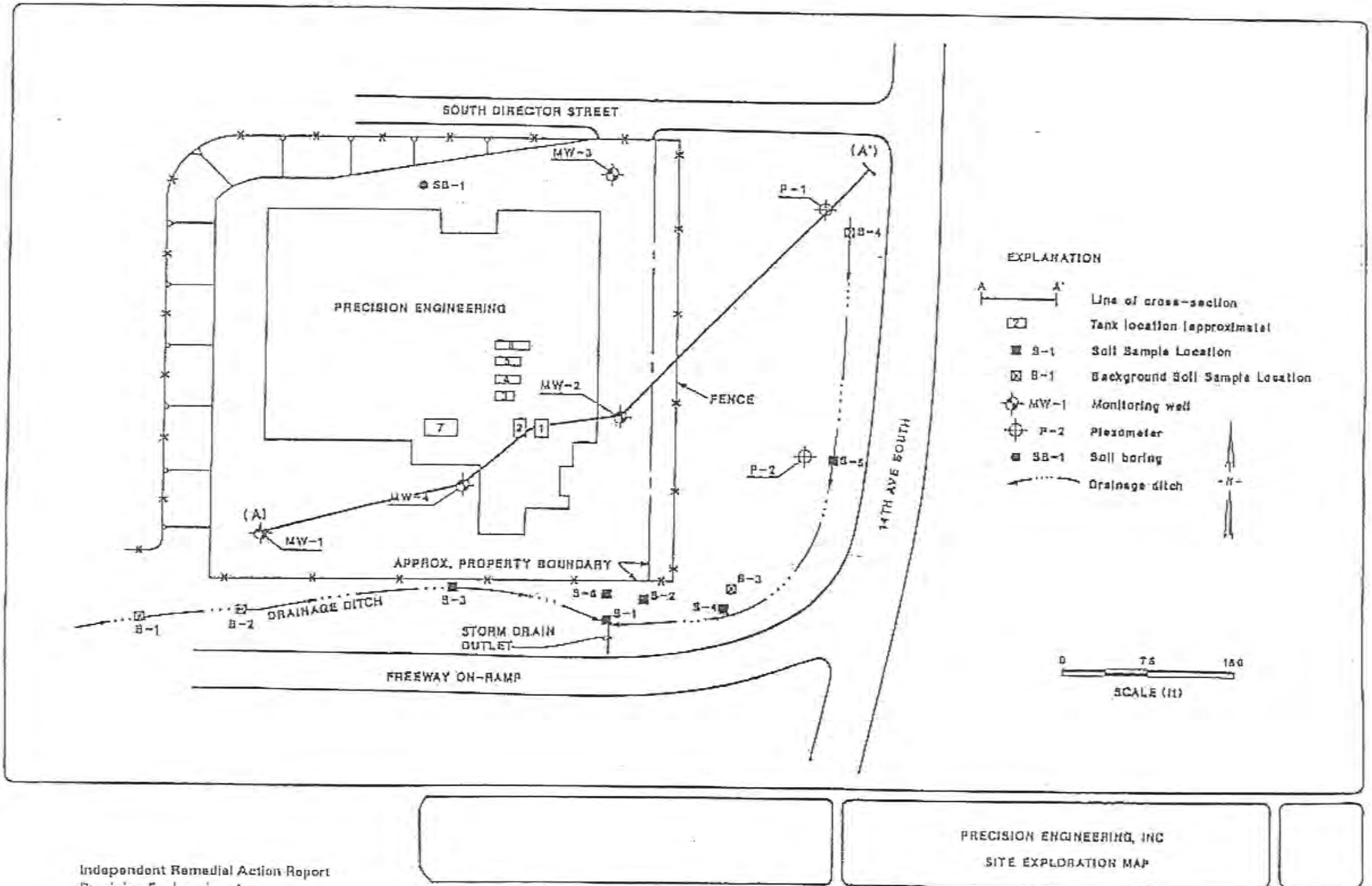


Figure 2.8.1 is a cross-section through the study area that depicts the stratigraphic relationship between the soil units. The cross-section shows the alluvium thinning towards the west until it is absent beneath the PEI facility.

2.16 Map of Site - Site Plan



APPENDIX C

BORING LOGS AND WELL DEVELOPMENT FORMS

Well Development Form

MAUL FOSTER ALONGI
ENVIRONMENTAL & ENGINEERING CONSULTANTS

Project No.	8006.08.04	Date	12/21/2005		
Site Location:	Seattle, WA	Well:	MW-5		
Name:	Precision Engineering	Initial DTB:	19.60	Final DTB	19.66
Development Method:	P-pump/Bailer	Initial DTW:	6.00	Final DTW	7.51
Total Water Removed	24.75 gallons	Pore Volume:	2.22 gallons		
Water Contained	Yes	Casing Diameter:	2"		
Estimated Specific Capacity		Meter No.			

Time	Cum. Vol Removed	Sand/Silt	pH	EC (µhos)	Temp	DO	Eh	Comments
7:43	2.25	660.00	7.14	1,471	18.7			Pump on at 7:28; stop pump and surge w/bailer.
7:54	4.50	396.00	6.73	1,487	19.2			Water is electric yellow/orange.
8:07	6.75	147.50	6.56	1,388	19.2			
8:17	9.00	77.30	6.12	1,346	19.1			
8:32	11.25	47.40	5.96	1,369	19.0			
8:46	13.50	13.89	5.89	1,337	19.2			
9:02	15.75	271.00	5.84	1,329	19.1			Stopped pump and surged w/bailer.
9:11	18.00	61.80	5.79	1,322	19.2			
9:22	20.25	21.50	5.76	1,316	19.1			
9:33	22.50	5.67	5.74	1,317	19.1			
9:46	24.75	3.32	5.71	1,314	19.0			

Well Development Form

MAUL FOSTER ALONGI
ENVIRONMENTAL & ENGINEERING CONSULTANTS

Project No. 8006.08.04		Date 12/16 & 21/2005	
Site Location: Seattle, WA		Well: MW-6	
Name: Precision Engineering		Initial DTB: 19.85	Final DTB 19.86
Development Method: P-pump/Bailer		Initial DTW: 5.09	Final DTW dry
Total Water Removed 41.5 gallons		Pore Volume: 2.40 gallons	
Water Contained Yes		Casing Diameter: 2"	
Estimated Specific Capacity		Meter No.	

Time	Cum. Vol Removed	Sand/Silt	pH	EC (µhos)	Temp	DO	Eh	Comments
12:37	5.0	116.9	7.07	3,290	17.6			12/16/05. Conductivity won't calibrate. Orangish yellow color.
12:46	10.0	81.7	6.24	2,960	17.9			Surged right after 10.0 gal w/bailer.
12:58	12.5	228.0	6.34	2,900	17.3			Well went dry after approximately 14 gal.
14:02	15.0	121.9	6.49	1,913	17.2			Pump back on at 13:58. Clear w/yellowish tint. Surged w/bailer.
14:21	17.5	117.2	6.55	1,775	16.7			
14:55	20.0	49.5	6.52	1,722	15.5			
15:15	22.5	28.1	6.53	1,701	15.0			
13:24	25.0	127.1	6.78	1,866	16.6			12/21/05. Surged with bailer.
13:33	27.5	332.0	6.50	1,820	17.4			
13:41	30.0	122.3	6.46	1,751	17.6			
13:51	32.5	103.1	6.35	1,749	17.6			Yellow/orange in color.
14:03	35.0	60.7	6.36	1,767	17.3			
14:20	37.5	91.2	6.51	1,741	17.1			Well went dry.
15:05	40.0	47.1	6.55	1,800	17.0			Well went dry.
15:30	41.5	117.0	6.52	1,750	17.1			Well went dry.

Well Development Form

MAUL FOSTER ALONGI
ENVIRONMENTAL & ENGINEERING CONSULTANTS

Project No. 8006.08.04	Date 12/19 & 21/2005		
Site Location: Seattle, WA	Well: MW-7		
Name: Precision Engineering	Initial DTB: 30.00	Final DTB	31.3
Development Method: P-pump/Bailer	Initial DTW: 6.10	Final DTW	dry
Total Water Removed 54.0 gallons	Pore Volume: 3.9 gallons		
Water Contained Yes	Casing Diameter: 2"		
Estimated Specific Capacity	Meter No.		

Time	Cum. Vol Removed	Sand/Silt	pH	EC (μhos)	Temp	DO	Eh	Comments
11:19	8.0	358.0	7.75	2,080	15.5			12/19/05. Surged w/bailer before pumping.
11:49	12.0	644.0	7.47	1,970	16.9			
12:32	16.0	428.0	7.28	1,980	16.9			
13:06	20.0	342.0	7.16	2,060	16.4			Switch to a bailer.
13:32	24.0	411.0	7.15	1,980	16.3			
14:00	28.0	130.2	7.04	2,000	16.4			
14:25	32.0	87.3	7.02	2,000	16.4			
14:40	36.0	73.6	6.97	1,970	16.5			
15:00	40.0	50.1	6.96	1,970	16.4			
15:10	42.0	54.7	6.95	2,000	16.4			
10:33	43.0	474.0	6.78	1,555	16.5			12/21/05. DTB = 31.15 DTW = 5.49
10:45	44.0	173.2	6.82	1,199	16.0			Surge w/bailer.
10:52	45.0	171.2	6.76	1,194	16.7			
10:57	46.0	219.0	6.72	1,193	16.5			
11:08	48.0	98.6	6.74	1,190	16.2			
11:27	50.0	29.6	6.74	1,186	16.1			
11:43	52.0	15.05	6.75	1,176	16.1			
12:04	54.0	5.69	6.79	1,165	16.3			Clear w/slight yellow tint.

Well Development Form

MAUL FOSTER ALONGI
ENVIRONMENTAL & ENGINEERING CONSULTANTS

Project No. 8006.08.04		Date 12/19 & 20/2005	
Site Location: Seattle, WA		Well: MW-8	
Name: Precision Engineering		Initial DTB: 18.10	Final DTB 19.55
Development Method: P-pump/Bailer		Initial DTW: 3.90	Final DTW dry
Total Water Removed 29.0 gallons		Pore Volume: 2.3 gallons	
Water Contained Yes		Casing Diameter: 2"	
Estimated Specific Capacity		Meter No.	

Time	Cum. Vol Removed	Sand/Silt	pH	EC (μhos)	Temp	DO	Eh	Comments
14:38	4.5	>1,000	7.02	2,040	16.7			Well went dry after one pore volume.
15:12	7.0	>1,000	6.93	1,970	16.5			Let recharge.
15:58	9.3	171.0	6.49	2,130	15.4			
7:36	11.6	689.0	7.23	2,260	16.0			12/20/05. Surge w/bailer. Sheen in purge water. Purge w/bailer.
8:33	13.9	726.0	7.16	2,220	15.5			
10:17	16.2	303.0	7.25	2,240	13.6			Switched back to p-pump.
11:04	18.5	429.0	6.79	2,100	15.5			
12:17	20.8	308.0	7.11	2,060	13.6			
13:30	23.1	115.6	6.58	2,010	15.4			
14:34	25.4	83.7	6.57	1,970	15.3			
15:12	26.5	63.4	6.52	1,960	15.2			
15:39	27.7	60.7	6.55	1,930	14.9			Yellow tint with sheen.
15:51	28.4	44.3	6.52	1,950	14.9			
16:05	29.0	27.7	6.53	1,974	14.8			

Maul Foster & Alongi, Inc.	Geologic Borehole Log/Well Construction		
	Project Number: 0053.01.03	Well Number: GP-1	Sheet: 1 of 1

Project Name	Precision Engineering	TOC Elevation (feet)	--
Project Location	1231 S. Director Street, Seattle, WA 98108	Surface Elevation (feet)	--
Start/End Date	6/7/05 to 6/9/05	Northing	
Driller/Equipment	Boart Longyear/Geoprobe	Easting	
Geologist/Engineer	S. Mauldin	Hole Depth	15.0-feet
Sample Method	Direct Push	Outer Hole Diam	2-inch

Depth (feet, BGS)	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Soil Description
0	100%	GP				0 to 0.5 feet: CONCRETE.
0.5–1						0.5 to 13.0 feet: SANDY SILT with GRAVEL (SM); dark yellowish brown; 50% fines, nonplastic; 40% sand, fine to coarse; 10% gravel, fine, rounded to subrounded; micaceous; stiff; dry.
2				GP1-S-1.5		
4	100%	GP				
6	100%	GP				@ 5.5 to 6.0 feet: Reddish brown mottling.
6	100%	GP		GP1-S-6.0		
8	78%	GP				
10				GP1-S-10.0		
13	100%	GP				13.0 to 15.0 feet: SILT (ML); dark gray; 100% fines, nonplastic; very stiff; dry.
15						Total Depth : 15.0 feet bgs

NOTES: 1) Abandon borehole with 3/8-inch bentonite chips hydrated with potable water. 2) GP = geoprobe. 3) Borings were not surveyed.

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
0053.01.03	GP-10	1 of 1

Project Name	Precision Engineering	TOC Elevation (feet)	--
Project Location	1231 S. Director Street, Seattle, WA 98108	Surface Elevation (feet)	--
Start/End Date	6/17/05 to 6/17/05	Northing	
Driller/Equipment	Boart Longyear/Geoprobe	Easting	
Geologist/Engineer	A. Hughes	Hole Depth	15.0-feet
Sample Method	Direct Push	Outer Hole Diam	2-inch

Depth (feet, BGS)	Well Details	Sample Data: Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Soil Description
0		75%	GP				0 to 0.4 feet: CONCRETE.
1							0.4 to 15.0 feet: SANDY SILT with GRAVEL (ML); dark yellowish brown; 60% fines, nonplastic; 25% sand, fine; 15% gravel, fine to coarse, subround to angular; micaceous; stiff; dry to damp.
2					GP10-S-1.5		@ 1.5 feet: Brownish gray.
3							
4		100%	GP				
5							
6							
7		100%	GP		GP10-S-7.0		@ 7.0 to 12.0 feet: Percentages 65% fines, 30% sand, and 5% gravel.
8							
9							
10		100%	GP				
11							
12							
13		100%	GP				
14					GP10-S-13.5		@ 14.0 feet: Moist to wet and percentages 65% fines, 30% sand, and 5% gravel.
15							

Total Depth : 15.0 feet bgs

NOTES: 1) Abandon borehole with 3/8-inch bentonite chips hydrated with potable water. 2) GP = geoprobe. 3) Borings were not surveyed.

Geologic Borehole Log/Well Construction

Maul Foster & Alongi, Inc.	Project Number	Well Number	Sheet
	0053.01.03	GP-11	1 of 1

Project Name	Precision Engineering	TOC Elevation (feet)	--
Project Location	1231 S. Director Street, Seattle, WA 98108	Surface Elevation (feet)	--
Start/End Date	6/17/05 to 6/17/05	Northing	
Driller/Equipment	Boart Longyear/Geoprobe	Easting	
Geologist/Engineer	A. Hughes	Hole Depth	7.0-feet
Sample Method	Direct Push	Outer Hole Diam	2-inch

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
0			95%	GP					0 to 0.4 feet: CONCRETE.
0.4									0.4 to 4.0 feet: SILTY SAND with GRAVEL (SM); dark yellowish brown; 30% fines, nonplastic; 55% sand, fine to coarse; 15% gravel, fine to coarse, subangular to angular; firm; dry.
2						GP11-S-2.0			
4			100%	GP					4.0 to 7.0 feet: SANDY SILT (ML); dark yellowish brown with reddish brown mottling; 70% fines, nonplastic; 30% sand, fine; trace fine, subrounded gravel; damp to moist.
6.5			100%	GP		GP11-S-6.5			@ 6.5 feet: Moist to wet.
7									Refusal at 7.0 feet bgs.

NOTES: 1) Abandon borehole with 3/8-inch bentonite chips hydrated with potable water. 2) GP = geoprobe. 3) Borings were not surveyed.

Geologic Borehole Log/Well Construction

Maul Foster & Alongi, Inc.	Project Number 0053.01.03	Well Number GP-2	Sheet 1 of 2

Project Name	Precision Engineering	TOC Elevation (feet)	--
Project Location	1231 S. Director Street, Seattle, WA 98108	Surface Elevation (feet)	--
Start/End Date	6/7/05 to 6/9/05	Northing	
Driller/Equipment	Boart Longyear/Geoprobe	Easting	
Geologist/Engineer	S. Mauldin	Hole Depth	30.0-feet
Sample Method	Direct Push	Outer Hole Diam	2-inch

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
0			69%	GP					0 to 0.5 feet: CONCRETE.
1						GP2-S-1.0			0.5 to 7.0 feet: SANDY SILT with GRAVEL (SM); dark yellowish brown; 50% fines, nonplastic; 40% sand, fine to coarse; 10% gravel, fine, rounded to subrounded; micaceous; stiff; dry.
2									
3									
4			100%	GP					
5									
6			100%	GP					
7									7.0 to 30.0 feet: SILT with SAND (ML); gray; 85% fines, nonplastic; 15% sand, fine; trace medium to coarse gravel; very stiff; dry.
8									
9									
10			64%	GP		GP2-S-10.0			
11									
12									
13									
14									
15			76%	GP GW					@ 15.0 feet: Dark gray; low plasticity; percentages 95% fines and 5% sand.
16									
17									
18						GP2-W-17.5-recon			
19									
20									

NOTES: 1) Abandon borehole with 3/8-inch bentonite chips hydrated with potable water. 2) GP = geoprobe. 3) Borings were not surveyed.

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Maul Foster & Alongi, Inc.	Geologic Borehole Log/Well Construction		
	Project Number 0053.01.03	Well Number GP-2	Sheet 2 of 2

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
			78%	GP					
21									
22									
23									
24									
25			100%	GP					
26									
27									
28									
29									
30									

Total Depth : 30.0 feet bgs

NOTES: 1) Abandon borehole with 3/8-inch bentonite chips hydrated with potable water. 2) GP = geoprobe. 3) Borings were not surveyed.

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
0053.01.03	GP-3	1 of 1

Project Name	**Precision Engineering**	TOC Elevation (feet)	--
Project Location	**1231 S. Director Street, Seattle, WA 98108**	Surface Elevation (feet)	--
Start/End Date	**6/9/05 to 6/9/05**	Northing	
Driller/Equipment	**Boart Longyear/Geoprobe**	Easting	
Geologist/Engineer	**S. Mauldin**	Hole Depth	**15.0-feet**
Sample Method	**Direct Push**	Outer Hole Diam	**2-inch**

Depth (feet, BGS)	Percent Recovery	Collection Method	Name (Type)	Soil Description
0	70%	GP		0 to 0.5 feet: CONCRETE.
0.5				0.5 to 2.0 feet: SANDY SILT with GRAVEL (SM); dark yellowish brown; 50% fines, nonplastic; 40% sand, fine to coarse; 10% gravel, fine, angular; micaceous; stiff; dry.
2			GP3-S-2.0	2.0 to 5.0 feet: SILT (ML); gray; 100% fines, nonplastic; very stiff; dry.
5	95%	GP	GP3-S-6.0	5.0 to 8.0 feet: SANDY SILT with GRAVEL (SM); grayish brown with orangish mottling; 50% fines, nonplastic; 30% sand, fine to coarse; 20% gravel, fine, angular; micaceous; stiff; dry.
8	83%	GP		8.0 to 15.0 feet: SILT with GRAVELS (ML); dark gray; 100% fines, nonplastic; trace gravel; very stiff; dry.
12	100%	GP		@ 12.0 feet: Damp.
14			GP3-S-14.0	
15				Total Depth : 15.0 feet bgs

NOTES: 1) Abandon borehole with 3/8-inch bentonite chips hydrated with potable water. 2) GP = geoprobe. 3) Borings were not surveyed.

Geologic Borehole Log/Well Construction

Maul Foster & Alongi, Inc.

Project Number	Well Number	Sheet
0053.01:03	GP-4	1 of 1

Project Name	**Precision Engineering**	TOC Elevation (feet)	--
Project Location	**1231 S. Director Street, Seattle, WA 98108**	Surface Elevation (feet)	--
Start/End Date	**6/16/05 to 6/16/05**	Northing	
Driller/Equipment	**Boart Longyear/Geoprobe**	Easting	
Geologist/Engineer	**A. Hughes**	Hole Depth	**10.0-feet**
Sample Method	**Direct Push**	Outer Hole Diam	**2-inch**

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
0			68%	GP					0 to 0.5 feet: CONCRETE.
1									0.5 to 0.9 feet: GRAVELLY SAND (SW); dark yellowish brown; 10% fines; 70% sand, fine to medium; 20% gravel, fine, subround; micaceous; damp.
2						GP4-S-1.5			0.9 to 9.7 feet: SANDY SILT (ML); dark yellowish brown; 65% fines, non to low plasticity; 35% sand, fine; micaceous; damp to moist.
3									@ 1.2 feet: Dark gray to dark grayish brown.
4									
5			70%	GP					@ 5.0 feet: Wet; trace organics.
6	∇			GW					
7									
8						GP5-W-8.0			
9									
10									9.7 to 10.0 feet: SILT (ML); dark grayish brown with reddish brown mottling; 100% fines, nonplastic; firm; moist to wet.

Total Depth : 10.0 feet bgs

NOTES: 1) Abandon borehole with 3/8-inch bentonite chips hydrated with potable water. 2) GP = geoprobe. 3) Borings were not surveyed. 4) DTW = depth to water in feet (ft) below ground surface (bgs). The water levels are approximate.

∇ DTW = 6.2 feet bgs

Maul Foster & Alongi, Inc.	Geologic Borehole Log/Well Construction		
	Project Number 0053.01.03	Well Number GP-5	Sheet 1 of 1

Project Name	Precision Engineering	TOC Elevation (feet)	--
Project Location	1231 S. Director Street, Seattle, WA 98108	Surface Elevation (feet)	--
Start/End Date	6/16/05 to 6/16/05	Northing	
Driller/Equipment	Boart Longyear/Geoprobe	Easting	
Geologist/Engineer	A. Hughes	Hole Depth	20.0-feet
Sample Method	Direct Push	Outer Hole Diam	2-inch

Depth (feet, BGS)	Well Details	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Soil Description
0		98%	GP				0 to 0.3 feet: ASPHALT.
0.3							0.3 to 2.5 feet: GRAVELLY SILT (ML): dark grayish brown; 80% fines, nonplastic; 20% gravel, fine to coarse, subangular; trace fine sand; damp.
1.5					GP5-S-1.5		
2.5							2.5 to 20.0 feet: SILT with GRAVEL (ML); dark grayish brown; 90 to 95% fines, nonplastic; 5 to 10% gravel, fine; trace fine sand; very stiff; dry to damp.
5		98%	GP				
8					GP5-S-8.0		
10		100%	GP				
11.2							@ 11.2 to 12.0 feet: Percentages change to 80% fines and 20% gravels.
14	∇	100%	GP		GP5-S-14.0		@ 14.0 feet: Moist to wet.
16			GW				
18		50%	GP		GP5-W-18.0		
20							Total Depth : 20.0 feet bgs

NOTES: 1) Abandon borehole with 3/8-inch bentonite chips hydrated with potable water. 2) GP = geoprobe. 3) Borings were not surveyed. 4) DTW = depth to water in feet (ft) below ground surface (bgs). The water levels are approximate.

∇ DTW = 14.0 feet bgs

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Geologic Borehole Log/Well Construction

Maul Foster & Alongi, Inc.	Project Number	Well Number	Sheet
	0053.01.03	GP-6	1 of 1

Project Name	**Precision Engineering**	TOC Elevation (feet)	--
Project Location	**1231 S. Director Street, Seattle, WA 98108**	Surface Elevation (feet)	--
Start/End Date	**6/16/05 to 6/16/05**	Northing	
Driller/Equipment	**Boart Longyear/Geoprobe**	Easting	
Geologist/Engineer	**A. Hughes**	Hole Depth	**20.0-feet**
Sample Method	**Direct Push**	Outer Hole Diam	**2-inch**

Depth (feet, BGS)	Well Details	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Soil Description
0		100%	GP				0 to 0.5 feet: CONCRETE.
0.5–1					GP6-S-1.0		0.5 to 20.0 feet: SANDY SILT with GRAVEL (ML); dark yellowish brown; 65% fines, nonplastic; 20% sand, fine; 15% gravel, fine to coarse, subangular to angular; micaceous; very stiff; dry to damp. @ 0.5 to 1.0 feet: Greenish yellow staining.
5		100%	GP				
7							@ 7.0 feet: Dark gray to dark brownish grey.
8		100%	GP		GP6-S-8.0		@ 8.0 to 11.5 feet: Percentage change to 60% fines, 15% sand, and 25% gravel.
11.5		100%	GP				
14.5		100%	GP		GP6-S-14.5		@ 14.5 to 20.0 feet: Sluff in samplers is moist to wet while soil is dry to damp.
16	∇		GW				
17.5		100%	GP		GP6-W-18.0		
20							Total Depth : 20.0 feet bgs

NOTES: 1) Abandon borehole with 3/8-inch bentonite chips hydrated with potable water. 2) GP = geoprobe. 3) Borings were not surveyed. 4) DTW = depth to water in feet (ft) below ground surface (bgs). The water levels are approximate.

∇ **DTW = 15.9 feet bgs**

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
0053.01.03	GP-7	1 of 1

Project Name	**Precision Engineering**	TOC Elevation (feet)	--
Project Location	**1231 S. Director Street, Seattle, WA 98108**	Surface Elevation (feet)	--
Start/End Date	**6/16/05 to 6/16/05**	Northing	
Driller/Equipment	**Boart Longyear/Geoprobe**	Easting	
Geologist/Engineer	**A. Hughes**	Hole Depth	**16.0-feet**
Sample Method	**Direct Push**	Outer Hole Diam	**2-inch**

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
0			25%	GP					0 to 0.5 feet: CONCRETE.
0.5									0.5 to 1.5 feet: Void below concrete.
1.5									1.5 to 16.0 feet: SILTY SAND (SM); dark yellowish brown; 20 to 25% fines, low plasticity; 70% sand, fine; 5 to 10% gravel, fine, subrounded; micaceous; damp.
2						GP7-S-2.0			
5			50%	GP					@ 5.0 feet: Damp to moist.
8						GP7-S-8.0			
10			40%	GP					@ 10.0 feet: Wet.
12	∇			GW					
14						GP7-W-14.0			
16									Total Depth : 16.0 feet bgs

NOTES: 1) Abandon borehole with 3/8-inch bentonite chips hydrated with potable water. 2) GP = geoprobe. 3) Borings were not surveyed. 4) DTW = depth to water in feet (ft) below ground surface (bgs). The water levels are approximate. 5) Becuase of the large void below the concrete the borehole was only abandoned to the top of the soil.

∇ **DTW = 12.3 feet bgs**

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
0053.01.03	GP-8	1 of 1

Project Name	Precision Engineering	TOC Elevation (feet)	--
Project Location	1231 S. Director Street, Seattle, WA 98108	Surface Elevation (feet)	--
Start/End Date	6/16/05 to 6/16/05	Northing	
Driller/Equipment	Boart Longyear/Geoprobe	Easting	
Geologist/Engineer	A. Hughes	Hole Depth	12.0-feet
Sample Method	Direct Push	Outer Hole Diam	2-inch

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
0			60%	GP					0 to 0.5 feet: CONCRETE.
1									0.5 to 1.0 feet: GRAVELLY SAND (SW); dark yellowish brown; 10% fines; 60% sand, fine to coarse; 30% gravel, fine to medium, subangular; micaceous; damp.
2						GP8-S-1.5			0.9 to 9.7 feet: SANDY SILT (ML); dark brownish gray; 65% fines, non to low plasticity; 35% sand, fine; micaceous; damp to moist.
3									
4									
5			46%	GP					@ 5.0 feet: Trace organics and from approximately 9.6 feet to 9.8 feet below ground surface 100% organics.
6									
7									
8	∇			GW					
9									
10			100%	GP		GP8-W-10.0			9.8 to 11.6 feet: SILT (ML); dark grayish brown; 100% fines, nonplastic; trace fine sand; firm; moist to wet.
11									
12									11.6 to 12.0 feet: GRAVELLY SILT (ML); dark grayish brown; 70% fines, nonplastic; 10% sand, fine; 20% gravel, fine, subround; stiff; damp to moist.

Total Depth : 12.0 feet bgs

NOTES: 1) Abandon borehole with 3/8-inch bentonite chips hydrated with potable water. 2) GP = geoprobe. 3) Borings were not surveyed. 4) DTW = depth to water in feet (ft) below ground surface (bgs). The water levels are approximate.

∇ DTW = 7.7 feet bgs

Geologic Borehole Log/Well Construction

Maul Foster & Alongi, Inc.	Project Number	Well Number	Sheet
	0053.01.03	GP-9	1 of 1

Project Name	**Precision Engineering**	TOC Elevation (feet)	--
Project Location	**1231 S. Director Street, Seattle, WA 98108**	Surface Elevation (feet)	--
Start/End Date	**6/17/05 to 6/17/05**	Northing	
Driller/Equipment	**Boart Longyear/Geoprobe**	Easting	
Geologist/Engineer	**A. Hughes**	Hole Depth	**10.0-feet**
Sample Method	**Direct Push**	Outer Hole Diam	**2-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
0			28%	GP					0 to 0.5 feet: CONCRETE.
1									0.5 to 1.5 feet: Void below concrete.
2						GP9-S-2.0			1.5 to 10.0 feet: SILTY SAND (SM); dark yellowish brown; 40% fines, low plasticity; 55% sand, fine; 5% gravel, medium, subangular; damp.
3									
4									
5			4%	GP					@ 4.9 feet: Wet.
6									
7									
8									
9									
10									Total Depth : 10.0 feet bgs

NOTES: 1) Abandon borehole with 3/8-inch bentonite chips hydrated with potable water. 2) GP = geoprobe. 3) Borings were not surveyed. 4) Becuase of the large void below the concrete the borehole was only abandoned to the top of the soil.

Geologic Borehole Log/Well Construction

Maul Foster & Alongi, Inc.	Project Number	Well Number	Sheet
	8006.08.04	GP12	1 of 1

Project Name	Precision Engineering
Project Location	1231 S. Director Street, Seattle, Washington 98108
Start/End Date	12/13/05 to 12/13/05
Driller/Equipment	Cascade Drilling/Geoprobe
Geologist/Engineer	M. Gibson
Sample Method	Direct Push

TOC Elevation (feet)	
Surface Elevation (feet)	
Northing	
Easting	
Hole Depth	8.0-feet
Outer Hole Diam	3 1/4-inch

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
			50%	GP					0 to 0.5 feet: CONCRETE.
1									0.5 to 8.0 feet: GRAVELLY SAND with SILT (SW); 15% fines, nonplastic; 60% sand, fine to medium; 25% gravels, fine to medium, angular to subrounded; dry.
2									
3						GP12-S-3.0			
4			100%	GP					@ 4.0 feet: Increase in courseness; sand, course; gravel, fine to medium.
5						GP12-S-5.0			@ 5.0 feet: Wet.
6									
7									
8									Total Depth: 8.0 feet bgs.

NOTES: 1) Abandon borehole with 3/8-inch bentonite chips hydrated with potable water. 2) GP = geoprobe.

Maul Foster & Alongi, Inc.	Geologic Borehole Log/Well Construction		
	Project Number 8006.08.04	Well Number GP13	Sheet 1 of 1

Project Name	**Precision Engineering**	TOC Elevation (feet)	
Project Location	**1231 S. Director Street, Seattle, Washington 98108**	Surface Elevation (feet)	
Start/End Date	**12/14/05 to 12/14/05**	Northing	
Driller/Equipment	**Cascade Drilling/Geoprobe**	Easting	
Geologist/Engineer	**M. Gibson**	Hole Depth	**10.0-feet**
Sample Method	**Direct Push**	Outer Hole Diam	**3 1/4-inch**

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
0			75%	GP					0 to 0.5 feet: CONCRETE.
1						GP13-S-1.0			0.5 to 3.5 feet: SILTY SAND (SM); dark brown; 30% fines, nonplastic; 70% sand, fine, dense; damp.
2									
3									
4			75%	GP					3.5 to 4.5 feet: SILT with SAND (ML); dark brown; 85% fines, low plasticity; 15% sand, fine; moist.
5									4.5 to 8.0 feet: GRAVELLY SILT with SAND (ML); dark grayish brown; 70% fines, low to medium plasticity; 10% sand, fine; 20% gravels, fine to medium; moist.
6				GW		GP13-S-6.0			@ 6.0 feet: Wet.
7									
8						GP13-W-8.0			
9									
10									

Total Depth: 10.0 feet bgs

NOTES: 1) Abandon borehole with 3/8-inch bentonite chips hydrated with potable water. 2) GP = geoprobe.

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Geologic Borehole Log/Well Construction

Maul Foster & Alongi, Inc.	Project Number	Well Number	Sheet
	8006.08.04	GP14	1 of 1

Project Name	Precision Engineering	TOC Elevation (feet)	
Project Location	1231 S. Director Street, Seattle, Washington 98108	Surface Elevation (feet)	
Start/End Date	12/13/05 to 12/13/05	Northing	
Driller/Equipment	Cascade Drilling/Geoprobe	Easting	
Geologist/Engineer	M. Gibson	Hole Depth	8.0-feet
Sample Method	Direct Push	Outer Hole Diam	3 1/4-inch

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
			100%	GP					0 to 0.5 feet: CONCRETE.
1									0.5 to 1.0 feet: SILTY SAND with GRAVEL (SM); brown; 30% fines, nonplastic; 60% sand, fine; 10% gravels, fine to medium, subangular; dry.
2									1.0 to 7.0 feet: SANDY SILT with GRAVEL (ML); yellowish brown; 70% fines, nonplastic; 20% sand, fine; 10% gravels, fine to medium, subangular; dry.
3						GP14-S-3.0			
4			100%	GP					
5									
6			100%	GP		GP14-S-6.0			
7									7.0 to 8.0 feet: SILTY SAND with GRAVEL (SM); light yellowish brown; 30% fines, nonplastic; 60% sand, fine to course; 10% gravels, fine to medium; wet.
8									Total Depth: 8.0 feet bgs.

NOTES: 1) Abandon borehole with 3/8-inch bentonite chips hydrated with potable water. 2) GP = geoprobe.

Geologic Borehole Log/Well Construction

Maul Foster & Alongi, Inc.	Project Number	Well Number	Sheet
	8006.08.04	GP15	1 of 1

Project Name	**Precision Engineering**	TOC Elevation (feet)	
Project Location	**1231 S. Director Street, Seattle, Washington 98108**	Surface Elevation (feet)	
Start/End Date	**12/13/05 to 12/13/05**	Northing	
Driller/Equipment	**Cascade Drilling/Geoprobe**	Easting	
Geologist/Engineer	**M. Gibson**	Hole Depth	**10.0-feet**
Sample Method	**Direct Push**	Outer Hole Diam	**3 1/4-inch**

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
0			100%	GP					0 to 0.5 feet: CONCRETE.
1									0.5 to 8.0 feet: SILTY SAND (SM); dark gray; 20% fines, nonplastic; 80% sand, fine; trace gravels, fine; damp.
2									
3						GP15-S-3.0			
4			100%	GP					
5									@ 5.0 feet: Organic debris; black; wet.
6				GW		GP15-S-6.0			
7									
8						GP15-W-8.0			
9									
10									Total Depth: 10.0 feet bgs.

NOTES: 1) Abandon borehole with 3/8-inch bentonite chips hydrated with potable water. 2) GP = geoprobe.

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8006.08.04	GP16	1 of 1

Project Name	Precision Engineering	TOC Elevation (feet)	
Project Location	1231 S. Director Street, Seattle, Washington 98108	Surface Elevation (feet)	
Start/End Date	12/13/05 to 12/13/05	Northing	
Driller/Equipment	Cascade Drilling/Geoprobe	Easting	
Geologist/Engineer	M. Gibson	Hole Depth	10.5-feet
Sample Method	Direct Push	Outer Hole Diam	3 1/4-inch

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
			100%	GP					0 to 0.5 feet: CONCRETE.
1						GP16-S-1.0			0.5 to 8.0 feet: SILTY SAND with GRAVEL (SM); gray with iron staining; 20% fines, nonplastic; 65% sand, fine; 15% gravels, fine to medium, angular to subrounded; damp.
2									
3									@ 3.0 feet: Color change to yellowish brown; dry.
4			100%	GP					@ 4.0 feet: Water in the top of the sample.
5						GP16-S-5.0			
6									@ 6.0 feet: Dry.
7			100%	GP					@ 7.0 feet: Wet.
8									8.0 to 10.5 feet: SANDY SILT with GRAVEL (ML); light gray; 70% fines, nonplastic, stiff; 20% sand, fine; 10% gravels, fine to medium, subrounded; dry.
9									@ 9.5 feet: Color change to yellowish brown.
10									

Total Depth: 10.5 feet bgs. Hit refusal.

NOTES: 1) Abandon borehole with 3/8-inch bentonite chips hydrated with potable water. 2) GP = geoprobe.

Maul Foster & Alongi, Inc.	Geologic Borehole Log/Well Construction		
	Project Number 8006.08.04	Well Number GP17	Sheet 1 of 1

Project Name	**Precision Engineering**	TOC Elevation (feet)	
Project Location	**1231 S. Director Street, Seattle, Washington 98108**	Surface Elevation (feet)	
Start/End Date	**12/13/05 to 12/13/05**	Northing	
Driller/Equipment	**Cascade Drilling/Geoprobe**	Easting	
Geologist/Engineer	**M. Gibson**	Hole Depth	**8.0-feet**
Sample Method	**Direct Push**	Outer Hole Diam	**3 1/4-inch**

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
			100%	GP					0 to 0.5 feet: CONCRETE.
1						GP17-S-1.0			0.5 to 7.0 feet: SANDY SILT with GRAVEL(ML); dark brown; 70% fines, nonplastic; 20% sand, fine; 10% gravels, fine to medium; angular to subrounded; damp.
2									
3									
4			100%	GP					
5									
6						GP17-S-6.0			@ 6.0 feet: Color change to gray; wet.
7									7.0 to 8.0 feet: SANDY SILT (ML); yellowish brown with iron staining; 70% fines, nonplastic; 30% sand, fine to medium; damp.
8									Total Depth: 8.0 feet bgs.

NOTES: 1) Abandon borehole with 3/8-inch bentonite chips hydrated with potable water. 2) GP = geoprobe.

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8006.08.04	GP18	1 of 1

Project Name	Precision Engineering	TOC Elevation (feet)	
Project Location	1231 S. Director Street, Seattle, Washington 98108	Surface Elevation (feet)	
Start/End Date	12/13/05 to 12/13/05	Northing	
Driller/Equipment	Cascade Drilling/Geoprobe	Easting	
Geologist/Engineer	M. Gibson	Hole Depth	4.0-feet
Sample Method	Direct Push	Outer Hole Diam	3 1/4-inch

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
			100%	GP					0 to 0.5 feet: CONCRETE.
1						GP18-S-1.0			0.5 to 4.0 feet: SILTY SAND with GRAVEL (SM); light gray; 20% fines, nonplastic; 70% sand, fine, dense; 10% gravels, fine to medium; odor; damp.
2									@ 2.0 feet: Color change to dark brown; dry.
3			100%	GP					@ 2.5 feet: Color change to yellowish brown.
4									

Total Depth: 4.0 feet bgs. Hit refusal.

NOTES: 1) Abandon borehole with 3/8-inch bentonite chips hydrated with potable water. 2) GP = geoprobe.

Geologic Borehole Log/Well Construction

Maul Foster & Alongi, Inc.	Project Number	Well Number	Sheet
	8006.08.04	GP19	1 of 1

Project Name	**Precision Engineering**	TOC Elevation (feet)	
Project Location	**1231 S. Director Street, Seattle, Washington 98108**	Surface Elevation (feet)	
Start/End Date	**12/13/05 to 12/13/05**	Northing	
Driller/Equipment	**Cascade Drilling/Geoprobe**	Easting	
Geologist/Engineer	**M. Gibson**	Hole Depth	**9.5-feet**
Sample Method	**Direct Push**	Outer Hole Diam	**3 1/4-inch**

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
0			100%	GP					0 to 0.5 feet: CONCRETE.
1						GP19-S-1.0 GPDUP-S-1.0			0.5 to 2.0 feet: SILTY SAND with GRAVEL (SM); gray with brown mottling; 30% fines, nonplastic; 60% sand, fine; 10% gravels, fine to medium, angular to subrounded; damp.
2									2.0 to 8.0 feet: SANDY SILT (ML); dark brown; 60% fines, low plasticity, stiff; 40% sand, fine; damp to moist.
4			100%	GP					
5									@ 5.0 feet: Trace gravels, fine to medium.
7						GP19-S-7.0			@ 7.0 feet: Wet.
8			100%	GP					8.0 to 9.5 feet: SILTY SAND with GRAVEL (SM); yellowish brown; 30% fines, nonplastic; 60% sand, fine; 10% gravels, fine to medium; dry.

Total Depth: 9.5 feet bgs.

NOTES: 1) Abandon borehole with 3/8-inch bentonite chips hydrated with potable water. 2) GP = geoprobe.

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8006.08.04	GP20	1 of 1

Project Name	Precision Engineering	TOC Elevation (feet)	
Project Location	1231 S. Director Street, Seattle, Washington 98108	Surface Elevation (feet)	
Start/End Date	12/14/05 to 12/14/05	Northing	
Driller/Equipment	Cascade Drilling/Geoprobe	Easting	
Geologist/Engineer	M. Gibson	Hole Depth	8.0-feet
Sample Method	Direct Push	Outer Hole Diam	3 1/4-inch

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
			80%	GP					0 to 0.5 feet: CONCRETE.
1						GP20-S-1.0			0.5 to 1.5 feet: SILTY SAND with GRAVEL (SM); brownish gray; 20% fines, nonplastic; 70% sand, fine; 10% gravels, fine to medium, subrounded; slight odor; damp to moist.
2									1.5 to 8.0 feet: SILTY SAND (SM); dark blackish brown; 35% fines, nonplastic; 65% sand, fine; trace organics at top of sample; slight odor; moist
3									
4			100%	GP					
5									Grades to sandy silt.
6						GP20-S-6.0			
7									@ 7.0 feet: Wet.
8									Total Depth: 8.0 feet bgs.

NOTES: 1) Abandon borehole with 3/8-inch bentonite chips hydrated with potable water. 2) GP = geoprobe.

Maul Foster & Alongi, Inc.	Geologic Borehole Log/Well Construction		
	Project Number 8006.08.04	Well Number GP21	Sheet 1 of 1

Project Name	Precision Engineering	TOC Elevation (feet)	
Project Location	1231 S. Director Street, Seattle, Washington 98108	Surface Elevation (feet)	
Start/End Date	12/14/05 to 12/14/05	Northing	
Driller/Equipment	Cascade Drilling/Geoprobe	Easting	
Geologist/Engineer	M. Gibson	Hole Depth	8.0-feet
Sample Method	Direct Push	Outer Hole Diam	3 1/4-inch

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
			50%	GP					0 to 0.5 feet: CONCRETE.
1						GP21-S-1.0			0.5 to 4.0 feet: SILTY SAND with GRAVEL (SM); light yellowish brown; 20% fines, nonplastic; 70% sand, fine; 10% gravels, fine, subangular; dry to damp.
2									@ 2.0 feet: Color change to gray; damp.
3									
4			100%	GP					4.0 to 8.0 feet: SILTY SAND (SM); dark blackish brown; 35% fines, low to medium plasticity; 65% sand, fine; moist.
5									
6									
7						GP21-S-6.5			@ 7.0 feet: Wet.
8									Total Depth: 8.0 feet bgs.

NOTES: 1) Abandon borehole with 3/8-inch bentonite chips hydrated with potable water. 2) GP = geoprobe.

Geologic Borehole Log/Well Construction

Maul Foster & Alongi, Inc.

Project Number	Well Number	Sheet
8006.08.04	GP22	1 of 1

Project Name	**Precision Engineering**	TOC Elevation (feet)	
Project Location	**1231 S. Director Street, Seattle, Washington 98108**	Surface Elevation (feet)	
Start/End Date	**12/13/05 to 12/13/05**	Northing	
Driller/Equipment	**Cascade Drilling/Geoprobe**	Easting	
Geologist/Engineer	**M. Gibson**	Hole Depth	**12.0-feet**
Sample Method	**Direct Push**	Outer Hole Diam	**3 1/4-inch**

Depth (feet, BGS)	Percent. Recovery	Collection Method	Number	Name (Type)	Blows/6"	Soil Description
0	100%	GP				0 to 0.5 feet: CONCRETE.
0.5						0.5 to 12.0 feet: SILTY SAND with GRAVEL (SM); brown; 20% fines, nonplastic; 70% sand, fine; 10% gravels, fine to medium, angular to subrounded; dry.
1				GP22-S-1.0		
3						@ 3.0 feet: Color change to yellowish brown.
4	100%	GP				
5				GP22-S-5.0		@ 5.0 feet: Color change to gray; increase in density.
6	100%	GP				
8	100%	GP				
10	100%	GP		GP22-S-10.0		@ 10.0 feet: Color change to brown; wet.
11						@ 11.0 feet: Color change to yellowish brown; dry.
12						

NOTES: 1) Abandon borehole with 3/8-inch bentonite chips hydrated with potable water. 2) GP = geoprobe.

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Maul Foster & Alongi, Inc.	Geologic Borehole Log/Well Construction		
	Project Number 8006.08.04	Well Number GP23	Sheet 1 of 1

Project Name	**Precision Engineering**	TOC Elevation (feet)	
Project Location	**1231 S. Director Street, Seattle, Washington 98108**	Surface Elevation (feet)	
Start/End Date	**12/14/05 to 12/14/05**	Northing	
Driller/Equipment	**Cascade Drilling/Geoprobe**	Easting	
Geologist/Engineer	**M. Gibson**	Hole Depth	**11.0-feet**
Sample Method	**Direct Push**	Outer Hole Diam	**3 1/4-inch**

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
			100%	GP					0 to 0.5 feet: CONCRETE.
1						GP23-S-1.0			0.5 to 11.0 feet: SILTY SAND with GRAVEL (SM); light yellowish brown; 20% fines, nonplastic; 70% sand, fine, loose; 10% gravels; dry.
2									@ 2.0 feet: Color change to gray; dense.
3									
4			100%	GP					
5									
6			100%	GP					
7						GP23-S-7.0			
8			100%	GP					
9									
10			100%	GP					
11						GP23-S-10.5			

Total Depth: 11.0 feet bgs. Hit refusal.

NOTES: 1) Abandon borehole with 3/8-inch bentonite chips hydrated with potable water. 2) GP = geoprobe.

Maul Foster & Alongi, Inc.	Geologic Borehole Log/Well Construction		
	Project Number 8006.08.04	Well Number GP24	Sheet 1 of 1

Project Name	**Precision Engineering**	TOC Elevation (feet)	
Project Location	**1231 S. Director Street, Seattle, Washington 98108**	Surface Elevation (feet)	
Start/End Date	**12/14/05 to 12/14/05**	Northing	
Driller/Equipment	**Cascade Drilling/Geoprobe**	Easting	
Geologist/Engineer	**M. Gibson**	Hole Depth	**10.0-feet**
Sample Method	**Direct Push**	Outer Hole Diam	**3 1/4-inch**

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
0			100%	GP					0 to 0.5 feet: CONCRETE.
1									0.5 to 5.5 feet: SILTY SAND with GRAVEL (SM); gray; 20% fines, nonplastic; 70% sand, fine; 10% gravels, fine to medium, subangular to subrounded; dry.
3						GP24-S-3.0 GPDUP-S-3.0			
4			100%	GP					
6									5.5 to 6.5 feet: SANDY SILT (ML); gray; 70% fines, nonplastic, very stiff; 30% sand, fine; dry.
7			100%	GP		GP24-S-6.5			6.5 to 9.5 feet: SILTY SAND with GRAVEL (SM); gray; 20% fines, nonplastic; 70% sand, fine; 10% gravels, fine to medium, subangular to subrounded; dry.
9						GP24-S-9.0			
10									9.5 to 10.0 feet: SANDY SILT (ML); gray; 70% fines, nonplastic, very stiff; 30% sand, fine; dry.

Total Depth: 10.0 feet bgs.

NOTES: 1) Abandon borehole with 3/8-inch bentonite chips hydrated with potable water. 2) GP = geoprobe.

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Geologic Borehole Log/Well Construction

Maul Foster & Alongi, Inc.	Project Number	Well Number	Sheet
	8006.08.04	GP25	1 of 1

Project Name	**Precision Engineering**	TOC Elevation (feet)	
Project Location	**1231 S. Director Street, Seattle, Washington 98108**	Surface Elevation (feet)	
Start/End Date	**12/12/05 to 12/12/05**	Northing	
Driller/Equipment	**Cascade Drilling/Geoprobe**	Easting	
Geologist/Engineer	**M. Gibson**	Hole Depth	**10.0-feet**
Sample Method	**Direct Push**	Outer Hole Diam	**3 1/4-inch**

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
0			100%	GP					0 to 0.5 feet: ASPHALT.
1						GP25-S-1.0			0.5 to 7.0 feet: SAND with GRAVEL (SW); light gray; trace fines; 85% sand, fine, dense; 15% gravels, fine to medium, angular to subrounded; dry.
3			100%	GP					
7			100%	GP		GP25-S-7.0			7.0 to 10.0 feet: SANDY SILT (ML); brownish gray; 70% fines; 30% sand, fine to medium; wet.
10									

Total Depth: 10.0 feet bgs.

NOTES: 1) Abandon borehole with 3/8-inch bentonite chips hydrated with potable water. 2) GP = geoprobe.

Geologic Borehole Log/Well Construction

Maul Foster & Alongi, Inc.	Project Number	Well Number	Sheet
	8006.08.04	GP26	1 of 1

Project Name	**Precision Engineering**	TOC Elevation (feet)	
Project Location	**1231 S. Director Street, Seattle, Washington 98108**	Surface Elevation (feet)	
Start/End Date	**12/12/05 to 12/12/05**	Northing	
Driller/Equipment	**Cascade Drilling/Geoprobe**	Easting	
Geologist/Engineer	**M. Gibson**	Hole Depth	**9.5-feet**
Sample Method	**Direct Push**	Outer Hole Diam	**3 1/4-inch**

Depth (feet, BGS)	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Soil Description
0	100%	GP				0 to 0.5 feet: ASPHALT.
0.5						0.5 to 9.5 feet: SAND with GRAVEL (SW); light gray with spots of brownish yellow; 85% sand, fine, dense; 15% gravel, fine to medium; dry.
1				GP26-S-1.0		
4	100%	GP				
6						@ 6.0 feet: Color change to spots of greenish yellow.
7	100%	GP		GP26-S-7.0		
8	100%	GP				
9.5				GP26-S-9.5		Total Depth: 9.5 feet bgs. Hit refusal.

NOTES: 1) Abandon borehole with 3/8-inch bentonite chips hydrated with potable water. 2) GP = geoprobe.

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Maul Foster & Alongi, Inc.	Geologic Borehole Log/Well Construction		
	Project Number 8006.08.04	Well Number GP27	Sheet 1 of 1

Project Name	**Precision Engineering**	TOC Elevation (feet)	
Project Location	**1231 S. Director Street, Seattle, Washington 98108**	Surface Elevation (feet)	
Start/End Date	**12/12/05 to 12/12/05**	Northing	
Driller/Equipment	**Cascade Drilling/Geoprobe**	Easting	
Geologist/Engineer	**M. Gibson**	Hole Depth	**13.5-feet**
Sample Method	**Direct Push**	Outer Hole Diam	**3 1/4-inch**

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
0			100%	GP					0 to 0.5 feet: ASPHALT.
1						GP27-S-1.0			0.5 to 13.5 feet: SAND with GRAVEL (SW); light gray; trace fines; 85% sand, fine, dense; 15% gravels, fine to medium, angular to subrounded; dry.
2									
3									
4			100%	GP					
5									
6									@ 6.0 feet: Color change to slight pinkish color with spots of yellow.
7						GP27-S-6.5			
7.5			100%	GP					
8									@ 8.0 feet: Decrease in courseness; gravels, fine.
9									
10			100%	GP					
11									
12			100%	GP					
13						GP27-S-13.0			

Total Depth: 13.5 feet bgs.

NOTES: 1) Abandon borehole with 3/8-inch bentonite chips hydrated with potable water. 2) GP = geoprobe.

Geologic Borehole Log/Well Construction

Maul Foster & Alongi, Inc.	Project Number	Well Number	Sheet
	8006.08.04	GP28	1 of 1

Project Name	**Precision Engineering**	TOC Elevation (feet)	
Project Location	**1231 S. Director Street, Seattle, Washington 98108**	Surface Elevation (feet)	
Start/End Date	**12/12/05 to 12/12/05**	Northing	
Driller/Equipment	**Cascade Drilling/Geoprobe**	Easting	
Geologist/Engineer	**M. Gibson**	Hole Depth	**9.5-feet**
Sample Method	**Direct Push**	Outer Hole Diam	**3 1/4-inch**

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
0			100%	GP					0 to 0.5 feet: ASPHALT
1						GP28-S-1.0			0.5 to 4.0 feet: SILTY SAND with GRAVEL (SM); light brownish gray; 30% fines, nonplastic; 60% sand, fine; 10% gravels, fine to medium, angular to subrounded; damp to moist.
2									
3			100%	GP					
4									4.0 to 9.5 feet: SAND with GRAVEL (SW); light gray with spots of brown; trace fines; 85% sand, fine; 15% gravels, fine to medium, angular to subrounded; dry.
5									
6									
7			100%	GP		GP28-S-7.0			
8									@ 7.5 feet: Moist to Wet.
9									

Total Depth: 9.5 feet bgs.

NOTES: 1) Abandon borehole with 3/8-inch bentonite chips hydrated with potable water. 2) GP = geoprobe.

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8006.08.04	GP29	1 of 1

Project Name	Precision Engineering	TOC Elevation (feet)	
Project Location	1231 S. Director Street, Seattle, Washington 98108	Surface Elevation (feet)	
Start/End Date	12/12/05 to 12/12/05	Northing	
Driller/Equipment	Cascade Drilling/Geoprobe	Easting	
Geologist/Engineer	M. Gibson	Hole Depth	8.0-feet
Sample Method	Direct Push	Outer Hole Diam	3 1/4-inch

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
			100%	GP					0 to 0.5 feet: ASPHALT.
1						GP29-S-1.0			0.5 to 2.0 feet: GRAVELLY SAND with SILT (SW); greenish gray; 5% fines, nonplastic; 70% sand, fine; 25% gravels, fine to medium; damp.
2									2.0 to 6.5 feet: SILTY SAND (SM); dark brown; 30% fines, nonplastic; 70% sand, fine; damp.
3									
4			100%	GP					
5									
6						GP29-S-6.0			
7									6.5 to 8.0 feet: SANDY SILT with GRAVEL (ML); brown; 60% fines, medium plasticity; 30% sand, fine to medium; 10% gravels, fine; trace organics and woody debris; wet.
8									

Total Depth: 8.0 feet bgs.

NOTES: 1) Abandon borehole with 3/8-inch bentonite chips hydrated with potable water. 2) GP = geoprobe.

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8006.08.04	GP30	1 of 1

Project Name	Precision Engineering
Project Location	1231 S. Director Street, Seattle, Washington 98108
Start/End Date	12/12/05 to 12/12/05
Driller/Equipment	Cascade Drilling/Geoprobe
Geologist/Engineer	M. Gibson
Sample Method	Direct Push
TOC Elevation (feet)	
Surface Elevation (feet)	
Northing	
Easting	
Hole Depth	8.0-feet
Outer Hole Diam	3 1/4-inch

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
			100%	GP					0 to 0.5 feet: ASPHALT.
1						GP30-S-1.0			0.5 to 8.0 feet: SILTY SAND (SM); greenish gray; 30% fines, nonplastic; 70% sand, fine; trace gravels, fine; damp.
2									
3									
4			100%	GP					@ 3.5 feet: Color change to dark brown; some organics.
5									
6						GP30-S-6.0			
7									@ 6.5 feet: Color change to blackish brown; wet.
8									

Total Depth: 8.0 feet bgs.

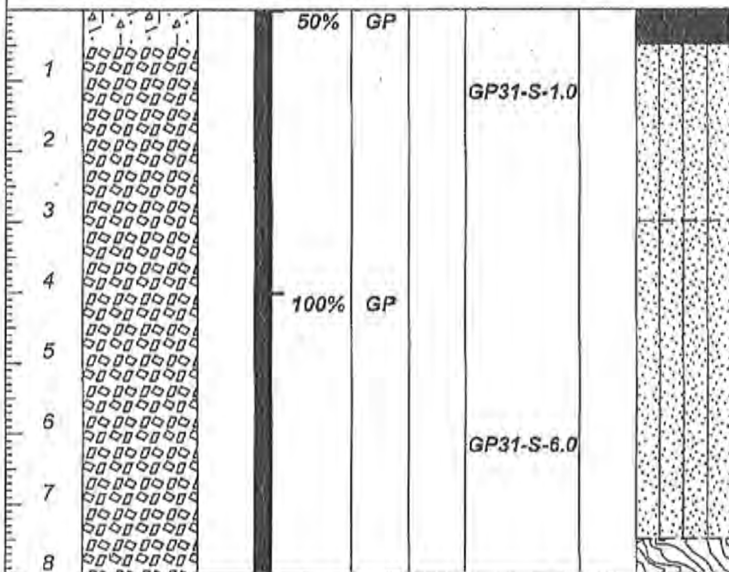
NOTES: 1) Abandon borehole with 3/8-inch bentonite chips hydrated with potable water. 2) GP = geoprobe.

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8006.08.04	GP31	1 of 1

Project Name	Precision Engineering	TOC Elevation (feet)	
Project Location	1231 S. Director Street, Seattle, Washington 98108	Surface Elevation (feet)	
Start/End Date	12/12/05 to 12/12/05	Northing	
Driller/Equipment	Cascade Drilling/Geoprobe	Easting	
Geologist/Engineer	M. Gibson	Hole Depth	8.0-feet
Sample Method	Direct Push	Outer Hole Diam	3 1/4-inch



Depth (feet, BGS)	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Soil Description
0	50%	GP				0 to 0.5 feet: ASPHALT.
0.5						0.5 to 3.0 feet: SILTY SAND with GRAVEL (SM); greenish gray; 20% fines, nonplastic; 70% sand, fine; 10% gravels, fine; damp.
1				GP31-S-1.0		
3						3.0 to 8.0 feet: SILTY SAND (SM); dark brown; 20% fines, nonplastic; 80% sand, fine; damp to moist.
4	100%	GP				
6				GP31-S-6.0		
6.5						@ 6.5 feet: Color change to blackish brown; wet.
7.5						7.5 to 8.0 feet: WOODY DEBRIS.

Total Depth: 8.0 feet bgs.

NOTES: 1) Abandon borehole with 3/8-inch bentonite chips hydrated with potable water. 2) GP = geoprobe.

Maul Foster & Alongi, Inc.	Geologic Borehole Log/Well Construction		
	Project Number 8006.08.04	Well Number GP32	Sheet 1 of 1

Project Name	**Precision Engineering**	TOC Elevation (feet)	
Project Location	**1231 S. Director Street, Seattle, Washington 98108**	Surface Elevation (feet)	
Start/End Date	**12/14/05 to 12/14/05**	Northing	
Driller/Equipment	**Cascade Drilling/Geoprobe**	Easting	
Geologist/Engineer	**M. Gibson**	Hole Depth	**3.0-feet**
Sample Method	**Direct Push**	Outer Hole Diam	**3 1/4-inch**

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
			100%						0 to 0.5 feet: CONCRETE.
1						GP32-S-1.0			0.5 to 3.0 feet: SILTY SAND with GRAVEL (SM); orangish brown; 20 % fines, nonplastic; 70% sand, fine, dense; 10% gravels, fine to medium; odor; damp.
2									@ 1.0 feet: Color change to yellowish brown; dry.
3									Total Depth: 3.0 feet bgs. Hit refusal.

NOTES: 1) Abandon borehole with 3/8-inch bentonite chips hydrated with potable water. 2) GP = geoprobe.

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Maul Foster & Alongi, Inc.	Geologic Borehole Log/Well Construction		
	Project Number 8006.08.04	Well Number MW5	Sheet 1 of 2

Project Name	Precision Engineering	TOC Elevation (feet)	
Project Location	1231 S. Director Street, Seattle, WA 98108	Surface Elevation (feet)	
Start/End Date	12/15/05 to 12/15/05	Northing	
Driller/Equipment	Cascade Drilling/Hollow Stem Auger	Easting	
Geologist/Engineer	Merideth Gibson	Hole Depth	20.5-feet
Sample Method	Split Spoon	Outer Hole Diam	10.25-inch

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
0									0 to 10.0 feet: See boring log for GP19.
1									
2									
3									
4									
5									
6									
7									
8									
9									
10			10%	SS			50/2"		10.0 to 20.5 feet: SANDY SILT with GRAVEL; grayish brown; 70% fines, low plasticity; 20% sand, fine to medium; 10% grave;s, fine to medium; wet.
11									
12									
13			25%	SS			50/4"		
14									
15			25%	SS			50/4"		@ 15.0 feet: Large Gravel, subrounded.
16									
17									
18			28%	SS			50/5"		@ 17.5 feet: Large Gravel approximately 3-inches in diameter, damp.
19									
20									

NOTES: 1.) SS = 2.5-inch x 1.5-foot long steel split spoon sampler. 2.) bgs = below ground surface.

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Maul Foster & Alongi, Inc.	Geologic Borehole Log/Well Construction		
	Project Number 8006.08.04	Well Number MW5	Sheet 2 of 2

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
			100%	SS			50/6"		@ 20.0 feet: Dry.
									Total Depth: 20.5 feet bgs.

NOTES: 1.) SS = 2.5-inch x 1.5-foot long steel split spoon sampler. 2.) bgs = below ground surface.

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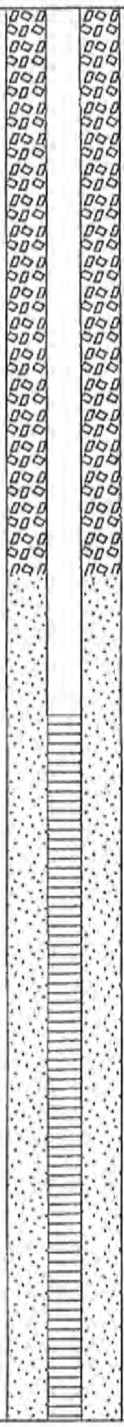
Geologic Borehole Log/Well Construction

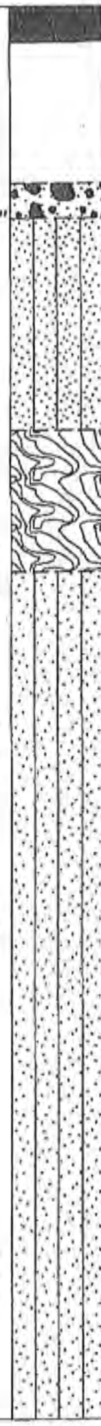
Maul Foster & Alongi, Inc.	Project Number	Well Number	Sheet
	8006.08.04	MW6	1 of 2

Project Name	**Precision Engineering**	TOC Elevation (feet)	
Project Location	**1231 S. Director Street, Seattle, WA 98108**	Surface Elevation (feet)	
Start/End Date	**12/15/05 to 12/15/05**	Northing	
Driller/Equipment	**Cascade Drilling/Hollow Stem Auger**	Easting	
Geologist/Engineer	**Merideth Gibson**	Hole Depth	**20.8-feet**
Sample Method	**Split Spoon**	Outer Hole Diam	**10.25-inch**

Well Details:



Lithologic Column:



Depth (feet, BGS)	Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Soil Description
0 to 0.5							0 to 0.5 feet: ASPHALT.
2.5 to 3.0	2.5–4.0	56%	SS			19 50/6"	2.5 to 3.0 feet: SANDY GRAVEL (GW); dark brown with lenses of green and black; 40% sand, fine to medium; 60% gravel, fine to medium; damp.
3.0 to 6.0	5.0–6.5	100%	SS			11 12 13	3.0 to 6.0 feet: SILTY SAND (SM); dark gray; 35% fines, non plastic; 65% sand, fine, dense; moist.
6.0 to 8.0							6.0 to 8.0 feet: WOODY DEBRIS.
8.0 to 20.0	7.5–9.0	90%	SS			10 11 10	8.0 to 20.0 feet: SILT with SAND (ML); light grayish brown with spots of black; 90% fines, low plasticity; 10% sand, fine; trace organics; wet.
10.0	10.0–11.5	100%	SS			10 11 15	@ 10.0 feet: Color change to pinkish grayish brown.
12.5	12.5–14.0	100%	SS			24 20 19	@ 12.5 feet: Increase in stiffness.
15.0	15.0–16.5	90%	SS				@ 15.0 feet: Color change to grayish brown with spots of black.
16.5							@ 16.5 feet: Trace woody debris.
17.5	17.5–19.0	100%	SS			20 19 12	

NOTES: 1.) SS = 2.5-inch x 1.5-foot long steel split spoon sampler. 2.) bgs = below ground surface.

Maul Foster & Alongi, Inc.	Geologic Borehole Log/Well Construction		
	Project Number 8006.08.04	Well Number MW6	Sheet 2 of 2

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
			100%	SS					20.0 to 20.75 feet: SILTY GRAVEL with SAND (GM); grayish brown; 20% fines, medium plasticity; 15% sand, fine to course; 65% gravels, fine to medium, approximately 3-inches in diamete; wet.
									Total Depth: 20.75 feet bgs.

NOTES: 1.) SS = 2.5-inch x 1.5-foot long steel split spoon sampler. 2.) bgs = below ground surface.

Geologic Borehole Log/Well Construction

Maul Foster & Alongi, Inc.	Project Number	Well Number	Sheet
	8006.08.04	MW7	1 of 2

Project Name	Precision Engineering	TOC Elevation (feet)	
Project Location	1231 S. Director Street, Seattle, WA 98108	Surface Elevation (feet)	
Start/End Date	12/16/05 to 12/16/05	Northing	
Driller/Equipment	Cascade Drilling/Hollow Stem Auger	Easting	
Geologist/Engineer	Merideth Gibson	Hole Depth	35.5-feet
Sample Method	Split Spoon	Outer Hole Diam	10.25-inch

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
0–2.5									0 to 0.5 feet: ASPHALT.
3			67%	SS			4 5 5		2.5 to 3.5 feet: GRAVELLY SAND (SW); dark brown; trace fines; 70% sand, fine to course; 30% gravels, fine; dry to damp.
4									3.5 to 5.0 feet: SILTY SAND (SM); dark grayish brown; 30% fines, low plasticity; 70% sand, fine; damp.
5–6			100%	SS			3 6 5		5.0 to 7.5 feet: SANDY SILT with GRAVEL (ML); light grayish brown; 70% fines, non plastic; 20% sand, fine; 10% gravels, fine to medium; trace organics; damp to moist.
8			100%	SS			1 2 4		7.5 to 13.5 feet: SANDY SILT (ML); light grayish brown; 70% fines, non plastic; 30% sand, fine, dense; trace organics; moist.
9									@ 8.5 feet: Wet.
10–11			100%	SS			3 4 4		
12									@ 11.5 feet: Woody debris.
13			100%	SS			5 6 7		@ 12.5 feet: Color change to light pinkish grayish brown; increase in fines, some clay.
14									13.5 to 16.0 feet: SAND with SILT (SP-SM); dark brown; 15% fines, non plastic; 85% sand, fine; trace shells; wet.
15–16			100%	SS			3 3 3		
16–17									16.0 to 18.0 feet: SILT with SAND (ML); grayish brown; 85% fines, low to medium plasticity; 15% sand, fine; trace shells; wet.
18–20			67%	SS			8 10 26		18.0 to 28.8 feet: GRAVELLY SAND with SILT (SW); greenish gray; 10% fines, non plastic; 50% sand, fine to course; 40% gravels, fine to medium, some approximately 3-inches in diameter, subrounded; dry to damp.

NOTES: 1.) SS = 2.5-inch x 1.5-foot long steel split spoon sampler. 2.) bgs = below ground surface.

Depth (feet, BGS)	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Soil Description
20.5	50%	SS			50/6"	
22.5	50%	SS			50/6"	@ 22.5 feet: Increase in sand, decrease in fines; dry to damp.
25	50%	SS			50/5"	@ 25.5 feet: Color change to yellowish brown with iron staining; increase in fines to 15%; dry.
27.5	50%	SS			50/5"	
28.8						28.8 to 29.0 feet: SAND with SILT (SP-SM); dark gray ; 15% fines; 85% sand, fine; dry.
29.0						29.0 to 32.5 feet: SAND with GRAVEL (SW); dark gray; trace fines; 85% sand, medium; 15% gravels, fine, subangular to subrounded; wet.
30	90%	SS			50/6"	
32.5	90%	SS			17 50/6"	32.5 to 33.5 feet: SAND (SP); dark gray; 100% sand, medium; trace gravels; wet.
33.5						33.5 to 35.5 feet: GRAVELLY SAND with SILT (SW); dark brown; 10% fines; 60% sand, fine; 30% gravels; dry.
35	100%	SS			50/6"	

Total Depth: 35.5 feet bgs.

NOTES: 1.) SS = 2.5-inch x 1.5-foot long steel split spoon sampler. 2.) bgs = below ground surface.

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8006.08.04	MW8	1 of 2

Project Name	Precision Engineering	TOC Elevation (feet)	
Project Location	1231 S. Director Street, Seattle, WA 98108	Surface Elevation (feet)	
Start/End Date	12/15/05 to 12/15/05	Northing	
Driller/Equipment	Cascade Drilling/Hollow Stem Auger	Easting	
Geologist/Engineer	Merideth Gibson	Hole Depth	20.2-feet
Sample Method	Split Spoon	Outer Hole Diam	10.25-inch

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
0–0.5									0 to 0.5 feet: ASPHALT.
2.5–3.5			75%	SS			14 23 13		2.5 to 3.5 feet: SAND with GRAVEL; greenish gray; trace fines; 85% sand, fine; 15% gravels, fine to medium; dry.
3.5–5.0									3.5 to 5.0 feet: SAND with SILT (SP-SM); gray with spots of black; 30% fines, non plastic; 70% sand, fine; trace hard substance with beads of white material in the center, strong odor, damp to moist.
5.0–8.0			100%	SS			2 6 9		5.0 to 8.0 feet: SANDY SILT (ML); dark blackish brown with lenses of greenish gray; 70% fines, non plastic; 30% sand; moist. @ 6.0 feet: Color change to dark brown.
8.0–11.0			100%	SS			5 8 8		8.0 to 11.0 feet: SILT with SAND (ML); light grayish brown; 85% fines, medium plasticity; 15% sand, fine; trace organics; wet.
10			100%	SS			7 8 14		
11.0–15.0									11.0 to 15.0 feet: SILT (ML); grayish brown; 95% fines, low plasticity; 5% sand, fine; wet.
12.5			67%	SS			17 50/6"		
15.0–17.5			67%	SS			22 50/6"		15.0 to 17.5 feet: GRAVELLY SAND with SILT NODULES(SW); dark brownish gray; 10% fines; 60% sand, medium; 30% gravels, fine to medium; wet.
17.5–20.2			34%	SS			50/3"		17.5 to 20.2 feet: GRAVEL with SILT and SAND (GW-GM); dark brownish gray; 10% fines; low plasticity; 10% sand, fine to medium; 80% gravels, medium to course; wet.

NOTES: 1.) SS = 2.5-inch x 1.5-foot long steel split spoon sampler. 2.) bgs = below ground surface.

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
			100%	SS			50/2"		
									Total Depth: 20.2 feet bgs.

NOTES: 1.) SS = 2.5-inch x 1.5-foot long steel split spoon sampler. 2.) bgs = below ground surface.

APPENDIX D

LABORATORY ANALYTICAL REPORTS

SEVERN TRENT STL

ANALYTICAL REPORT

Job Number: 580-2284-1

Job Description: Precision Metals

For:
Maul Foster & Alongi Inc
7223 NE Hazel Dell Ave
Suite B
Vancouver, WA 98665

Attention: Alan Huges

Heather Curbow
Project Mgmt. Assistant
hcurbow@stl-inc.om
05/15/2006
Revision: 1

Project Manager: Tom Coyner

STL Seattle is a part of Severn Trent Laboratories, Inc.

Case Narrative for job: 580-J2284-1

Client: Maul Foster & Alongi Inc

Date: 05/15/2006

6010B-Hexavalent chromium
Analysis Batch: 580-6211
Samples 580-2284-1, -2, -3, -10, -11, -12, -22

Samples 580-2284-1and 580-2284-22 were prepped for chromium IV analysis 1 hour and 33 minutes past the 24 hold time, the samples are flagged with "H". Samples 580-2284-2, -3, -10, -11, -12 were prepped within the required 24hr hold time and the "H" flags were omitted due to ontime lab prep.

login

Other Deficiency

Sample Times were changed on the COC, on the bottles and in login for the following samples per Aaron Jimbrosnick 4/21/06.

Sample ID: HA7-0.5 from 1405 to 1805
HA7-1.5 from 1420 to 1820

HA8-0.5 from 1330 to 1730
HA8-1.5 from 1345 to 1845

Affected Items
Sample: 580-2284-8
Sample: 580-2284-6

METHOD SUMMARY

Client: Maul Foster & Alongi Inc

Job Number: 580-2284-1

Description	Lab Location	Method	Preparation Method
Matrix: Solid			
Inductively Coupled Plasma - Atomic Emission Spectrometry	STL-SEA	SW846 6010B	
Acid Digestion of Sediments, Sludges, and Soils	STL-SEA		SW846 3050B
Chromium, Hexavalent (Coprecipitation,	STL-SEA		SW846 7195
Percent Moisture	STL-SEA	EPA PercentMoisture	
Matrix: Water			
Volatile Organic Compounds by GC/MS	STL-SEA	SW846 8260B	
Purge-and-Trap	STL-SEA		SW846 5030B
Semivolatile Organic Compounds by GC/MS (Selective Ion Monitoring)	STL-SEA	SW846 8270C	
Separatory Funnel Liquid-Liquid Extraction	STL-SEA		SW846 3510C
Semi-Volatile Petroleum Products by NWTPH-Dx	STL-SEA	NWTPH NWTPH-Dx	
Separatory Funnel Liquid-Liquid Extraction	STL-SEA		SW846 3510C
Inductively Coupled Plasma - Atomic Emission Spectrometry	STL-SEA	SW846 6010B	
Chromium, Hexavalent (Coprecipitation,	STL-SEA		SW846 7195
Sample Filtration performed in the Field	STL-SEA		FIELD_FLTRD
Inductively Coupled Plasma - Mass Spectrometry	STL-SEA	SW846 6020	
Sample Filtration performed in the Field	STL-SEA		FIELD_FLTRD

LAB REFERENCES:

STL-SEA = STL-Seattle

METHOD REFERENCES:

EPA - US Environmental Protection Agency

SW846 - "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

SAMPLE SUMMARY

Client: Maul Foster & Alongi Inc | Job Number: 580-2284-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
580-2284-1	MW7-041806	Water	04/18/2006 1430	04/19/2006 1400
580-2284-2	MW4-041806	Water	04/18/2006 1750	04/19/2006 1400
580-2284-3	MW1-041806	Water	04/18/2006 1830	04/19/2006 1400
580-2284-4	HA6-0.5	Solid	04/18/2006 1930	04/19/2006 1400
580-2284-6	HA7-0.5	Solid	04/18/2006 1805	04/19/2006 1400
580-2284-8	HA8-0.5	Solid	04/18/2006 1730	04/19/2006 1400
580-2284-10	MW2-041906	Water	04/19/2006 0815	04/19/2006 1400
580-2284-11	MW6-041906	Water	04/19/2006 1015	04/19/2006 1400
580-2284-12	MW5-041906	Water	04/19/2006 1230	04/19/2006 1400
580-2284-13	HA9-0.5	Solid	04/19/2006 0820	04/19/2006 1400
580-2284-15	HA10.05	Solid	04/19/2006 0950	04/19/2006 1400
580-2284-17	HA11-0.5	Solid	04/19/2006 1030	04/19/2006 1400
580-2284-19	HA12-.05	Solid	04/19/2006 1130	04/19/2006 1400
580-2284-21	TRIP BLANK	Water	04/19/2006 0000	04/19/2006 1400
580-2284-22	MW- DUP-041806	Water	04/18/2006 1430	04/19/2006 1400

Analytical Data

Client: Maul Foster & Alongi Inc

Job Number: 580-2284-1

Client Sample ID: **MW7-041806**

Lab Sample ID: 580-2284-1
Client Matrix: Water

Date Sampled: 04/18/2006 1430
Date Received: 04/19/2006 1400

8260B Volatile Organic Compounds by GC/MS

Method: 8260B
Preparation: 5030B
Dilution: 1.0
Date Analyzed: 04/25/2006 2242
Date Prepared: 04/25/2006 2242

Analysis Batch: 580-6218

Instrument ID: ITS40
Lab File ID: X24029.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Vinyl chloride	ND		0.14	1.0
trans-1,2-Dichloroethene	ND		0.091	1.0
cis-1,2-Dichloroethene	ND		0.062	1.0
Trichloroethene	ND		0.055	1.0

Surrogate	%Rec	Acceptance Limits
Fluorobenzene (Surr)	103	80 - 120
Toluene-d8	101	80 - 120
Ethylbenzene-d10	108	80 - 120
4-Bromofluorobenzene (Surr)	91	80 - 120
Trifluorotoluene (Surr)	115	80 - 120

Analytical Data

Client: Maul Foster & Alongi Inc

Job Number: 580-2284-1

Client Sample ID: **MW4-041806**

Lab Sample ID:	580-2284-2		Date Sampled:	04/18/2006 1750
Client Matrix:	Water		Date Received:	04/19/2006 1400

8260B Volatile Organic Compounds by GC/MS

Method:	8260B	Analysis Batch: 580-6218	Instrument ID:	ITS40
Preparation:	5030B		Lab File ID:	X24028.D
Dilution:	1.0		Initial Weight/Volume:	5 mL
Date Analyzed:	04/25/2006 2216		Final Weight/Volume:	5 mL
Date Prepared:	04/25/2006 2216			

Analyte	Result (ug/L)	Qualifier	MDL	RL
Vinyl chloride	ND		0.14	1.0
trans-1,2-Dichloroethene	ND		0.091	1.0
cis-1,2-Dichloroethene	ND		0.062	1.0
Trichloroethene	ND		0.055	1.0

Surrogate	%Rec	Acceptance Limits
Fluorobenzene (Surr)	100	80 - 120
Toluene-d8	105	80 - 120
Ethylbenzene-d10	110	80 - 120
4-Bromofluorobenzene (Surr)	95	80 - 120
Trifluorotoluene (Surr)	119	80 - 120

Client: Maul Foster & Alongi Inc

Job Number: 580-2284-1

Client Sample ID: **MW1-041806**

Lab Sample ID:	580-2284-3	Date Sampled:	04/18/2006 1830
Client Matrix:	Water	Date Received:	04/19/2006 1400

8260B Volatile Organic Compounds by GC/MS

Method:	8260B	Analysis Batch: 580-6377	Instrument ID:	ITS40
Preparation:	5030B		Lab File ID:	X24098.D
Dilution:	1.0		Initial Weight/Volume:	5 mL
Date Analyzed:	05/01/2006 1606		Final Weight/Volume:	5 mL
Date Prepared:	05/01/2006 1606			

Analyte	Result (ug/L)	Qualifier	MDL	RL
Vinyl chloride	ND		0.14	1.0
trans-1,2-Dichloroethene	ND		0.091	1.0
cis-1,2-Dichloroethene	ND		0.062	1.0
Trichloroethene	ND		0.055	1.0

Surrogate	%Rec	Acceptance Limits
Fluorobenzene (Surr)	97	80 - 120
Toluene-d8	104	80 - 120
Ethylbenzene-d10	103	80 - 120
4-Bromofluorobenzene (Surr)	107	80 - 120
Trifluorotoluene (Surr)	113	80 - 120

Client: Maul Foster & Alongi Inc   Job Number: 580-2284-1

Client Sample ID: MW2-041906

Lab Sample ID: 580-2284-10   Date Sampled: 04/19/2006 0815
Client Matrix: Water   Date Received: 04/19/2006 1400

8260B Volatile Organic Compounds by GC/MS

Method: 8260B   Analysis Batch: 580-6218   Instrument ID: ITS40
Preparation: 5030B   Lab File ID: X24026.D
Dilution: 1.0   Initial Weight/Volume: 5 mL
Date Analyzed: 04/25/2006 2125   Final Weight/Volume: 5 mL
Date Prepared: 04/25/2006 2125

Analyte	Result (ug/L)	Qualifier	MDL	RL
Vinyl chloride	ND		0.14	1.0
trans-1,2-Dichloroethene	ND		0.091	1.0
cis-1,2-Dichloroethene	ND		0.062	1.0
Trichloroethene	ND		0.055	1.0

Surrogate	%Rec	Acceptance Limits
Fluorobenzene (Surr)	101	80 - 120
Toluene-d8	100	80 - 120
Ethylbenzene-d10	110	80 - 120
4-Bromofluorobenzene (Surr)	100	80 - 120
Trifluorotoluene (Surr)	119	80 - 120

Client: Maul Foster & Alongi Inc

Job Number: 580-2284-1

Client Sample ID: **MW6-041906**

Lab Sample ID: 580-2284-11
Client Matrix: Water

Date Sampled: 04/19/2006 1015
Date Received: 04/19/2006 1400

8260B Volatile Organic Compounds by GC/MS

Method: 8260B
Preparation: 5030B
Dilution: 1.0
Date Analyzed: 05/01/2006 1633
Date Prepared: 05/01/2006 1633

Analysis Batch: 580-6377

Instrument ID: ITS40
Lab File ID: X24099.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Vinyl chloride	ND		0.14	1.0
trans-1,2-Dichloroethene	ND		0.091	1.0
cis-1,2-Dichloroethene	ND		0.062	1.0
Trichloroethene	ND		0.055	1.0

Surrogate	%Rec	Acceptance Limits
Fluorobenzene (Surr)	104	80 - 120
Toluene-d8	103	80 - 120
Ethylbenzene-d10	100	80 - 120
4-Bromofluorobenzene (Surr)	105	80 - 120
Trifluorotoluene (Surr)	108	80 - 120

Analytical Data

Client: Maul Foster & Alongi Inc

Job Number: 580-2284-1

Client Sample ID: **MW5-041906**

Lab Sample ID: 580-2284-12
Client Matrix: Water

Date Sampled: 04/19/2006 1230
Date Received: 04/19/2006 1400

8260B Volatile Organic Compounds by GC/MS

Method: 8260B
Preparation: 5030B
Dilution: 1.0
Date Analyzed: 04/25/2006 2034
Date Prepared: 04/25/2006 2034

Analysis Batch: 580-6218

Instrument ID: ITS40
Lab File ID: X24024.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Vinyl chloride	ND		0.14	1.0
trans-1,2-Dichloroethene	ND		0.091	1.0
cis-1,2-Dichloroethene	1.1		0.062	1.0
Trichloroethene	7.9		0.055	1.0

Surrogate	%Rec	Acceptance Limits
Fluorobenzene (Surr)	99	80 - 120
Toluene-d8	97	80 - 120
Ethylbenzene-d10	103	80 - 120
4-Bromofluorobenzene (Surr)	94	80 - 120
Trifluorotoluene (Surr)	115	80 - 120

Analytical Data

Client: Maul Foster & Alongi Inc | Job Number: 580-2284-1

Client Sample ID: **TRIP BLANK**

Lab Sample ID: 580-2284-21
Client Matrix: Water

Date Sampled: 04/19/2006 0000
Date Received: 04/19/2006 1400

8260B Volatile Organic Compounds by GC/MS

Method: 8260B
Preparation: 5030B
Dilution: 1.0
Date Analyzed: 04/25/2006 2009
Date Prepared: 04/25/2006 2009

Analysis Batch: 580-6218

Instrument ID: ITS40
Lab File ID: X24023.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Vinyl chloride	ND		0.14	1.0
trans-1,2-Dichloroethene	ND		0.091	1.0
cis-1,2-Dichloroethene	ND		0.062	1.0
Trichloroethene	ND		0.055	1.0

Surrogate	%Rec	Acceptance Limits
Fluorobenzene (Surr)	99	80 - 120
Toluene-d8	101	80 - 120
Ethylbenzene-d10	100	80 - 120
4-Bromofluorobenzene (Surr)	101	80 - 120
Trifluorotoluene (Surr)	113	80 - 120

Analytical Data

Client: Maul Foster & Alongi Inc

Job Number: 580-2284-1

Client Sample ID: **MW- DUP-041806**

Lab Sample ID:	580-2284-22	Date Sampled:	04/18/2006 1430
Client Matrix:	Water	Date Received:	04/19/2006 1400

8260B Volatile Organic Compounds by GC/MS

Method:	8260B	Analysis Batch: 580-6218	Instrument ID:	ITS40
Preparation:	5030B		Lab File ID:	X24022.D
Dilution:	1.0		Initial Weight/Volume:	5 mL
Date Analyzed:	04/25/2006 1943		Final Weight/Volume:	5 mL
Date Prepared:	04/25/2006 1943			

Analyte	Result (ug/L)	Qualifier	MDL	RL
Vinyl chloride	ND		0.14	1.0
trans-1,2-Dichloroethene	ND		0.091	1.0
cis-1,2-Dichloroethene	ND		0.062	1.0
Trichloroethene	ND		0.055	1.0

Surrogate	%Rec	Acceptance Limits
Fluorobenzene (Surr)	98	80 - 120
Toluene-d8	101	80 - 120
Ethylbenzene-d10	106	80 - 120
4-Bromofluorobenzene (Surr)	93	80 - 120
Trifluorotoluene (Surr)	112	80 - 120

Client: Maul Foster & Alongi Inc | Job Number: 580-2284-1

Client Sample ID: **MW7-041806**

Lab Sample ID: 580-2284-1 | Date Sampled: 04/18/2006 1430

Client Matrix: Water | Date Received: 04/19/2006 1400

8270C Semivolatile Organic Compounds by GC/MS (Selective Ion Monitoring)

Method:	8270C	Analysis Batch: 580-6034		Instrument ID:	5973N
Preparation:	3510C	Prep Batch: 580-5990		Lab File ID:	HP01649.D
Dilution:	1.0			Initial Weight/Volume:	985 mL
Date Analyzed:	04/20/2006 1503			Final Weight/Volume:	10 mL
Date Prepared:	04/20/2006 0842			Injection Volume:	

Analyte	Result (ug/L)	Qualifier	MDL	RL
Naphthalene	0.023	J	0.0061	0.10
2-Methylnaphthalene	0.014	J	0.0091	0.13
1-Methylnaphthalene	ND		0.032	0.10
Acenaphthylene	0.028	J	0.0041	0.10
Acenaphthene	0.011	J	0.0030	0.10
Fluorene	0.013	J	0.0081	0.10
Phenanthrene	0.022	J B	0.0030	0.10
Anthracene	0.037	J	0.0081	0.10
Fluoranthene	0.036	J	0.0091	0.10
Pyrene	0.037	J B	0.013	0.10
Benzo[a]anthracene	0.035	J	0.0091	0.10
Chrysene	0.013	J	0.0091	0.10
Benzofluoranthene	ND		0.031	0.20
Benzo[a]pyrene	ND		0.061	0.20
Indeno[1,2,3-cd]pyrene	0.039	J	0.015	0.10
Dibenz(a,h)anthracene	0.038	J	0.012	0.10
Benzo[g,h,i]perylene	ND		0.018	0.10

Surrogate	%Rec	Acceptance Limits
Nitrobenzene-d5	83	34 - 146
2-Fluorobiphenyl	90	35 - 143
Terphenyl-d14	89	35 - 166

Analytical Data

Client: Maul Foster & Alongi Inc

Job Number: 580-2284-1

Client Sample ID: **MW4-041806**

Lab Sample ID: 580-2284-2
Client Matrix: Water

Date Sampled: 04/18/2006 1750
Date Received: 04/19/2006 1400

8270C Semivolatile Organic Compounds by GC/MS (Selective Ion Monitoring)

Method: 8270C
Preparation: 3510C
Dilution: 1.0
Date Analyzed: 04/20/2006 1526
Date Prepared: 04/20/2006 0842

Analysis Batch: 580-6034
Prep Batch: 580-5990

Instrument ID: 5973N
Lab File ID: HP01650.D
Initial Weight/Volume: 980 mL
Final Weight/Volume: 10 mL
Injection Volume:

Analyte	Result (ug/L)	Qualifier	MDL	RL
Naphthalene	0.011	J	0.0061	0.10
2-Methylnaphthalene	ND		0.0092	0.13
1-Methylnaphthalene	ND		0.033	0.10
Acenaphthylene	0.019	J	0.0041	0.10
Acenaphthene	ND		0.0031	0.10
Fluorene	ND		0.0082	0.10
Phenanthrene	0.0064	J B	0.0031	0.10
Anthracene	ND		0.0082	0.10
Fluoranthene	0.029	J	0.0092	0.10
Pyrene	0.030	J B	0.013	0.10
Benzo[a]anthracene	ND		0.0092	0.10
Chrysene	ND		0.0092	0.10
Benzofluoranthene	ND		0.032	0.20
Benzo[a]pyrene	ND		0.061	0.20
Indeno[1,2,3-cd]pyrene	ND		0.015	0.10
Dibenz(a,h)anthracene	ND		0.012	0.10
Benzo[g,h,i]perylene	ND		0.018	0.10

Surrogate	%Rec	Acceptance Limits
Nitrobenzene-d5	90	34 - 146
2-Fluorobiphenyl	101	35 - 143
Terphenyl-d14	100	35 - 166

Client: Maul Foster & Alongi Inc

Job Number: 580-2284-1

Client Sample ID: **MW1-041806**

Lab Sample ID:	580-2284-3	Date Sampled:	04/18/2006 1830
Client Matrix:	Water	Date Received:	04/19/2006 1400

8270C Semivolatile Organic Compounds by GC/MS (Selective Ion Monitoring)

Method:	8270C	Analysis Batch: 580-6034	Instrument ID:	5973N
Preparation:	3510C	Prep Batch: 580-5990	Lab File ID:	HP01651.D
Dilution:	1.0		Initial Weight/Volume:	1050 mL
Date Analyzed:	04/20/2006 1549		Final Weight/Volume:	10 mL
Date Prepared:	04/20/2006 0842		Injection Volume:	

Analyte	Result (ug/L)	Qualifier	MDL	RL
Naphthalene	0.011	J	0.0057	0.095
2-Methylnaphthalene	ND		0.0086	0.12
1-Methylnaphthalene	ND		0.030	0.095
Acenaphthylene	0.020	J	0.0038	0.095
Acenaphthene	0.0038	J	0.0029	0.095
Fluorene	ND		0.0076	0.095
Phenanthrene	0.024	J B	0.0029	0.095
Anthracene	0.030	J	0.0076	0.095
Fluoranthene	0.053	J	0.0086	0.095
Pyrene	0.043	J B	0.012	0.095
Benzo[a]anthracene	0.029	J	0.0086	0.095
Chrysene	0.014	J	0.0086	0.095
Benzofluoranthene	ND		0.030	0.19
Benzo[a]pyrene	ND		0.057	0.19
Indeno[1,2,3-cd]pyrene	0.034	J	0.014	0.095
Dibenz(a,h)anthracene	ND		0.011	0.095
Benzo[g,h,i]perylene	ND		0.017	0.095

Surrogate	%Rec	Acceptance Limits
Nitrobenzene-d5	81	34 - 146
2-Fluorobiphenyl	90	35 - 143
Terphenyl-d14	91	35 - 166

Analytical Data

Client: Maul Foster & Alongi Inc | Job Number: 580-2284-1

Client Sample ID: MW2-041906

Lab Sample ID: 580-2284-10
Client Matrix: Water

Date Sampled: 04/19/2006 0815
Date Received: 04/19/2006 1400

8270C Semivolatile Organic Compounds by GC/MS (Selective Ion Monitoring)

Method: 8270C	Analysis Batch: 580-6034	Instrument ID:	5973N
Preparation: 3510C	Prep Batch: 580-5990	Lab File ID:	HP01652.D
Dilution: 1.0		Initial Weight/Volume:	915 mL
Date Analyzed: 04/20/2006 1612		Final Weight/Volume:	10 mL
Date Prepared: 04/20/2006 0842		Injection Volume:	

Analyte	Result (ug/L)	Qualifier	MDL	RL
Naphthalene	0.93		0.0066	0.11
2-Methylnaphthalene	ND		0.0098	0.14
1-Methylnaphthalene	ND		0.035	0.11
Acenaphthylene	ND		0.0044	0.11
Acenaphthene	0.015	J	0.0033	0.11
Fluorene	ND		0.0087	0.11
Phenanthrene	0.0052	J B	0.0033	0.11
Anthracene	0.035	J	0.0087	0.11
Fluoranthene	0.032	J	0.0098	0.11
Pyrene	ND		0.014	0.11
Benzo[a]anthracene	0.031	J	0.0098	0.11
Chrysene	ND		0.0098	0.11
Benzofluoranthene	ND		0.034	0.22
Benzo[a]pyrene	ND		0.066	0.22
Indeno[1,2,3-cd]pyrene	ND		0.016	0.11
Dibenz(a,h)anthracene	ND		0.013	0.11
Benzo[g,h,i]perylene	ND		0.020	0.11

Surrogate	%Rec	Acceptance Limits
Nitrobenzene-d5	86	34 - 146
2-Fluorobiphenyl	91	35 - 143
Terphenyl-d14	89	35 - 166

Client: Maul Foster & Alongi Inc Job Number: 580-2284-1

Client Sample ID: **MW6-041906**

Lab Sample ID:	580-2284-11	Date Sampled:	04/19/2006 1015
Client Matrix:	Water	Date Received:	04/19/2006 1400

8270C Semivolatile Organic Compounds by GC/MS (Selective Ion Monitoring)

Method:	8270C	Analysis Batch: 580-6034	Instrument ID:	5973N	
Preparation:	3510C	Prep Batch: 580-5990	Lab File ID:	HP01653.D	
Dilution:	1.0		Initial Weight/Volume:	965	mL
Date Analyzed:	04/20/2006 1635		Final Weight/Volume:	10	mL
Date Prepared:	04/20/2006 0842		Injection Volume:		

Analyte	Result (ug/L)	Qualifier	MDL	RL
Naphthalene	0.013	J	0.0062	0.10
2-Methylnaphthalene	0.012	J	0.0093	0.13
1-Methylnaphthalene	ND		0.033	0.10
Acenaphthylene	ND		0.0041	0.10
Acenaphthene	ND		0.0031	0.10
Fluorene	ND		0.0083	0.10
Phenanthrene	0.011	J B	0.0031	0.10
Anthracene	0.039	J	0.0083	0.10
Fluoranthene	0.033	J	0.0093	0.10
Pyrene	0.034	J B	0.013	0.10
Benzo[a]anthracene	ND		0.0093	0.10
Chrysene	ND		0.0093	0.10
Benzofluoranthene	ND		0.032	0.21
Benzo[a]pyrene	ND		0.062	0.21
Indeno[1,2,3-cd]pyrene	ND		0.016	0.10
Dibenz(a,h)anthracene	ND		0.012	0.10
Benzo[g,h,i]perylene	ND		0.019	0.10

Surrogate	%Rec	Acceptance Limits
Nitrobenzene-d5	77	34 - 146
2-Fluorobiphenyl	79	35 - 143
Terphenyl-d14	76	35 - 166

Client: Maul Foster & Alongi Inc

Job Number: 580-2284-1

Client Sample ID: **MW5-041906**

Lab Sample ID: 580-2284-12
Client Matrix: Water

Date Sampled: 04/19/2006 1230
Date Received: 04/19/2006 1400

8270C Semivolatile Organic Compounds by GC/MS (Selective Ion Monitoring)

Method:	8270C	Analysis Batch: 580-6034	Instrument ID:	5973N
Preparation:	3510C	Prep Batch: 580-5990	Lab File ID:	HP01654.D
Dilution:	1.0		Initial Weight/Volume:	1050 mL
Date Analyzed:	04/20/2006 1658		Final Weight/Volume:	10 mL
Date Prepared:	04/20/2006 0842		Injection Volume:	

Analyte	Result (ug/L)	Qualifier	MDL	RL
Naphthalene	0.13		0.0057	0.095
2-Methylnaphthalene	0.017	J	0.0086	0.12
1-Methylnaphthalene	ND		0.030	0.095
Acenaphthylene	0.020	J	0.0038	0.095
Acenaphthene	0.0061	J	0.0029	0.095
Fluorene	ND		0.0076	0.095
Phenanthrene	0.014	J B	0.0029	0.095
Anthracene	0.033	J	0.0076	0.095
Fluoranthene	0.032	J	0.0086	0.095
Pyrene	0.032	J B	0.012	0.095
Benzo[a]anthracene	ND		0.0086	0.095
Chrysene	ND		0.0086	0.095
Benzofluoranthene	ND		0.030	0.19
Benzo[a]pyrene	ND		0.057	0.19
Indeno[1,2,3-cd]pyrene	ND		0.014	0.095
Dibenz(a,h)anthracene	ND		0.011	0.095
Benzo[g,h,i]perylene	ND		0.017	0.095

Surrogate	%Rec	Acceptance Limits
Nitrobenzene-d5	81	34 - 146
2-Fluorobiphenyl	88	35 - 143
Terphenyl-d14	88	35 - 166

Client: Maul Foster & Alongi Inc

Job Number: 580-2284-1

Client Sample ID: MW- DUP-041806

Lab Sample ID:	580-2284-22	Date Sampled:	04/18/2006 1430
Client Matrix:	Water	Date Received:	04/19/2006 1400

8270C Semivolatile Organic Compounds by GC/MS (Selective Ion Monitoring)

Method:	8270C	Analysis Batch: 580-6034	Instrument ID: 5973N
Preparation:	3510C	Prep Batch: 580-5990	Lab File ID: HP01655.D
Dilution:	1.0		Initial Weight/Volume: 985 mL
Date Analyzed:	04/20/2006 1720		Final Weight/Volume: 10 mL
Date Prepared:	04/20/2006 0842		Injection Volume:

Analyte	Result (ug/L)	Qualifier	MDL	RL
Naphthalene	0.019	J	0.0061	0.10
2-Methylnaphthalene	ND		0.0091	0.13
1-Methylnaphthalene	ND		0.032	0.10
Acenaphthylene	ND		0.0041	0.10
Acenaphthene	0.0043	J	0.0030	0.10
Fluorene	ND		0.0081	0.10
Phenanthrene	0.0081	J B	0.0030	0.10
Anthracene	0.029	J	0.0081	0.10
Fluoranthene	ND		0.0091	0.10
Pyrene	ND		0.013	0.10
Benzo[a]anthracene	ND		0.0091	0.10
Chrysene	ND		0.0091	0.10
Benzofluoranthene	ND		0.031	0.20
Benzo[a]pyrene	ND		0.061	0.20
Indeno[1,2,3-cd]pyrene	ND		0.015	0.10
Dibenz(a,h)anthracene	ND		0.012	0.10
Benzo[g,h,i]perylene	ND		0.018	0.10

Surrogate	%Rec	Acceptance Limits
Nitrobenzene-d5	91	34 - 146
2-Fluorobiphenyl	99	35 - 143
Terphenyl-d14	96	35 - 166

Client: Maul Foster & Alongi Inc | Job Number: 580-2284-1

Client Sample ID: MW7-041806

Lab Sample ID: 580-2284-1
Client Matrix: Water

Date Sampled: 04/18/2006 1430
Date Received: 04/19/2006 1400

NWTPH-Dx Semi-Volatile Petroleum Products by NWTPH-Dx

Method: NWTPH-Dx
Preparation: 3510C
Dilution: 1.0
Date Analyzed: 04/20/2006 1601
Date Prepared: 04/20/2006 1118

Analysis Batch: 580-6025
Prep Batch: 580-6001

Instrument ID: HP6890
Lab File ID: FA26391.D
Initial Weight/Volume: 975 mL
Final Weight/Volume: 5 mL
Injection Volume:
Column ID: PRIMARY

Analyte	Result (mg/L)	Qualifier	RL
Motor Oil (>C24-C36)	ND		0.51
#2 Diesel (C10-C24)	ND		0.26

Surrogate	%Rec	Acceptance Limits
o-Terphenyl	102	50 - 150

Client: Maul Foster & Alongi Inc | Job Number: 580-2284-1

Client Sample ID: MW4-041806

Lab Sample ID:	580-2284-2	Date Sampled:	04/18/2006 1750
Client Matrix:	Water	Date Received:	04/19/2006 1400

NWTPH-Dx Semi-Volatile Petroleum Products by NWTPH-Dx

Method:	NWTPH-Dx	Analysis Batch: 580-6025	Instrument ID:	HP6890
Preparation:	3510C	Prep Batch: 580-6001	Lab File ID:	FA26392.D
Dilution:	1.0		Initial Weight/Volume:	925 mL
Date Analyzed:	04/20/2006 1621		Final Weight/Volume:	5 mL
Date Prepared:	04/20/2006 1118		Injection Volume:	
			Column ID:	PRIMARY

Analyte	Result (mg/L)	Qualifier	RL
Motor Oil (>C24-C36)	ND		0.54
#2 Diesel (C10-C24)	ND		0.27

Surrogate	%Rec	Acceptance Limits
o-Terphenyl	113	50 - 150

Client: Maul Foster & Alongi Inc

Job Number: 580-2284-1

Client Sample ID: MW1-041806

Lab Sample ID: 580-2284-3
Client Matrix: Water

Date Sampled: 04/18/2006 1830
Date Received: 04/19/2006 1400

NWTPH-Dx Semi-Volatile Petroleum Products by NWTPH-Dx

Method: NWTPH-Dx
Preparation: 3510C
Dilution: 1.0
Date Analyzed: 04/20/2006 1642
Date Prepared: 04/20/2006 1118

Analysis Batch: 580-6025
Prep Batch: 580-6001

Instrument ID: HP6890
Lab File ID: FA26393.D
Initial Weight/Volume: 965 mL
Final Weight/Volume: 5 mL
Injection Volume:
Column ID: PRIMARY

Analyte	Result (mg/L)	Qualifier	RL
Motor Oil (>C24-C36)	ND		0.52
#2 Diesel (C10-C24)	ND		0.26

Surrogate	%Rec	Acceptance Limits
o-Terphenyl	115	50 - 150

Client: Maul Foster & Alongi Inc

Job Number: 580-2284-1

Client Sample ID: MW2-041906

Lab Sample ID:	580-2284-10	Date Sampled:	04/19/2006 0815
Client Matrix:	Water	Date Received:	04/19/2006 1400

NWTPH-Dx Semi-Volatile Petroleum Products by NWTPH-Dx

Method:	NWTPH-Dx	Analysis Batch: 580-6025	Instrument ID:	HP6890
Preparation:	3510C	Prep Batch: 580-6001	Lab File ID:	FA26394.D
Dilution:	1.0		Initial Weight/Volume:	865 mL
Date Analyzed:	04/20/2006 1702		Final Weight/Volume:	5 mL
Date Prepared:	04/20/2006 1118		Injection Volume:	
			Column ID:	PRIMARY

Analyte	Result (mg/L)	Qualifier	RL
Motor Oil (>C24-C36)	ND		0.58
#2 Diesel (C10-C24)	0.41		0.29

Surrogate	%Rec	Acceptance Limits
o-Terphenyl	123	50 - 150

Analytical Data

Client: Maul Foster & Alongi Inc

Job Number: 580-2284-1

Client Sample ID: **MW6-041906**

Lab Sample ID:	580-2284-11	Date Sampled:	04/19/2006 1015
Client Matrix:	Water	Date Received:	04/19/2006 1400

NWTPH-Dx Semi-Volatile Petroleum Products by NWTPH-Dx

Method:	NWTPH-Dx	Analysis Batch: 580-6025	Instrument ID:	HP6890
Preparation:	3510C	Prep Batch: 580-6001	Lab File ID:	FA26395.D
Dilution:	1.0		Initial Weight/Volume:	915 mL
Date Analyzed:	04/20/2006 1723		Final Weight/Volume:	5 mL
Date Prepared:	04/20/2006 1118		Injection Volume:	
			Column ID:	PRIMARY

Analyte	Result (mg/L)	Qualifier	RL
Motor Oil (>C24-C36)	1.2		0.55
#2 Diesel (C10-C24)	0.76		0.27

Surrogate	%Rec	Acceptance Limits
o-Terphenyl	67	50 - 150

Client: Maul Foster & Alongi Inc

Job Number: 580-2284-1

Client Sample ID: MW5-041906

Lab Sample ID:	580-2284-12	Date Sampled:	04/19/2006 1230
Client Matrix:	Water	Date Received:	04/19/2006 1400

NWTPH-Dx Semi-Volatile Petroleum Products by NWTPH-Dx

Method:	NWTPH-Dx	Analysis Batch: 580-6025	Instrument ID: HP6890
Preparation:	3510C	Prep Batch: 580-6001	Lab File ID: FA26396.D
Dilution:	1.0		Initial Weight/Volume: 980 mL
Date Analyzed:	04/20/2006 1743		Final Weight/Volume: 5 mL
Date Prepared:	04/20/2006 1118		Injection Volume:
			Column ID: PRIMARY

Analyte	Result (mg/L)	Qualifier	RL
Motor Oil (>C24-C36)	ND		0.51
#2 Diesel (C10-C24)	ND		0.26

Surrogate	%Rec	Acceptance Limits
o-Terphenyl	116	50 - 150

Client: Maul Foster & Alongi Inc | Job Number: 580-2284-1

Client Sample ID: MW- DUP-041806

Lab Sample ID:	580-2284-22	Date Sampled:	04/18/2006 1430
Client Matrix:	Water	Date Received:	04/19/2006 1400

NWTPH-Dx Semi-Volatile Petroleum Products by NWTPH-Dx

Method:	NWTPH-Dx	Analysis Batch: 580-6025	Instrument ID:	HP6890
Preparation:	3510C	Prep Batch: 580-6001	Lab File ID:	FA26397.D
Dilution:	1.0		Initial Weight/Volume:	975 mL
Date Analyzed:	04/20/2006 1804		Final Weight/Volume:	5 mL
Date Prepared:	04/20/2006 1118		Injection Volume:	
			Column ID:	PRIMARY

Analyte	Result (mg/L)	Qualifier	RL
Motor Oil (>C24-C36)	ND		0.51
#2 Diesel (C10-C24)	ND		0.26

Surrogate	%Rec	Acceptance Limits
o-Terphenyl	118	50 - 150

Client: Maul Foster & Alongi Inc

Job Number: 580-2284-1

Client Sample ID: MW7-041806

Lab Sample ID:	580-2284-1	Date Sampled:	04/18/2006 1430
Client Matrix:	Water	Date Received:	04/19/2006 1400

6010B Inductively Coupled Plasma - Atomic Emission Spectrometry-Dissolved

Method:	6010B	Analysis Batch: 580-6211	Instrument ID:	PE Optima 3200 DV
Preparation:	7195	Prep Batch: 580-5974	Lab File ID:	N/A
Dilution:	1.0		Initial Weight/Volume:	10 mL
Date Analyzed:	04/26/2006 1226		Final Weight/Volume:	10 mL
Date Prepared:	04/19/2006 1603			

Analyte	Result (mg/L)	Qualifier	RL
Hexavalent chromium	ND	H	0.020

6020 Inductively Coupled Plasma - Mass Spectrometry-Dissolved

Method:	6020	Analysis Batch: 580-6111	Instrument ID:	PE Sciex Elan 6100
Preparation:	N/A		Lab File ID:	N/A
Dilution:	5.0		Initial Weight/Volume:	50 mL
Date Analyzed:	04/24/2006 1105		Final Weight/Volume:	50 mL
Date Prepared:	N/A			

Analyte	Result (mg/L)	Qualifier	RL
Arsenic	0.0071		0.0020
Lead	ND		0.0020
Chromium	0.013		0.0020
Copper	0.0024		0.0020
Selenium	0.0050		0.0020

Client: Maul Foster & Alongi Inc

Job Number: 580-2284-1

Client Sample ID: MW4-041806

Lab Sample ID:	580-2284-2	Date Sampled:	04/18/2006 1750
Client Matrix:	Water	Date Received:	04/19/2006 1400

6010B Inductively Coupled Plasma - Atomic Emission Spectrometry-Dissolved

Method:	6010B	Analysis Batch: 580-6211	Instrument ID:	PE Optima 3200 DV
Preparation:	7195	Prep Batch: 580-5974	Lab File ID:	N/A
Dilution:	1.0		Initial Weight/Volume:	10 mL
Date Analyzed:	04/26/2006 1244		Final Weight/Volume:	10 mL
Date Prepared:	04/19/2006 1603			

Analyte	Result (mg/L)	Qualifier	RL
Hexavalent chromium	0.023		0.020

6020 Inductively Coupled Plasma - Mass Spectrometry-Dissolved

Method:	6020	Analysis Batch: 580-6111	Instrument ID:	PE Sciex Elan 6100
Preparation:	N/A		Lab File ID:	N/A
Dilution:	5.0		Initial Weight/Volume:	50 mL
Date Analyzed:	04/24/2006 1110		Final Weight/Volume:	50 mL
Date Prepared:	N/A			

Analyte	Result (mg/L)	Qualifier	RL
Arsenic	0.015		0.0020
Lead	ND		0.0020
Chromium	0.0020		0.0020
Copper	ND		0.0020
Selenium	ND		0.0020

Client: Maul Foster & Alongi Inc | Job Number: 580-2284-1

Client Sample ID: MW1-041806

Lab Sample ID:	580-2284-3	Date Sampled:	04/18/2006 1830
Client Matrix:	Water	Date Received:	04/19/2006 1400

6010B Inductively Coupled Plasma - Atomic Emission Spectrometry-Dissolved

Method:	6010B	Analysis Batch: 580-6211	Instrument ID:	PE Optima 3200 DV
Preparation:	7195	Prep Batch: 580-5974	Lab File ID:	N/A
Dilution:	1.0		Initial Weight/Volume:	10 mL
Date Analyzed:	04/26/2006 1246		Final Weight/Volume:	10 mL
Date Prepared:	04/19/2006 1603			

Analyte	Result (mg/L)	Qualifier	RL
Hexavalent chromium	ND		0.020

6020 Inductively Coupled Plasma - Mass Spectrometry-Dissolved

Method:	6020	Analysis Batch: 580-6111	Instrument ID:	PE Sciex Elan 6100
Preparation:	N/A		Lab File ID:	N/A
Dilution:	5.0		Initial Weight/Volume:	50 mL
Date Analyzed:	04/24/2006 1115		Final Weight/Volume:	50 mL
Date Prepared:	N/A			

Analyte	Result (mg/L)	Qualifier	RL
Arsenic	0.033		0.0020
Lead	ND		0.0020
Chromium	ND		0.0020
Copper	ND		0.0020
Selenium	ND		0.0020

Client: Maul Foster & Alongi Inc | Job Number: 580-2284-1

Client Sample ID: HA6-0.5

Lab Sample ID:	580-2284-4		Date Sampled:	04/18/2006 1930
Client Matrix:	Solid	% Moisture: 19.5	Date Received:	04/19/2006 1400

6010B Inductively Coupled Plasma - Atomic Emission Spectrometry

Method:	6010B	Analysis Batch: 580-6339	Instrument ID:	PE Optima 3200 DV
Preparation:	7195	Prep Batch: 580-6303	Lab File ID:	N/A
Dilution:	1.0		Initial Weight/Volume:	5.2167 g
Date Analyzed:	04/28/2006 2112		Final Weight/Volume:	50 mL
Date Prepared:	04/28/2006 0930			

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Hexavalent chromium		2.8		0.0025	0.24

Client: Maul Foster & Alongi Inc | Job Number: 580-2284-1

Client Sample ID: HA7-0.5

Lab Sample ID:	580-2284-6		Date Sampled:	04/18/2006 1805
Client Matrix:	Solid	% Moisture: 14.9	Date Received:	04/19/2006 1400

6010B Inductively Coupled Plasma - Atomic Emission Spectrometry

Method:	6010B	Analysis Batch: 580-6339	Instrument ID:	PE Optima 3200 DV
Preparation:	7195	Prep Batch: 580-6303	Lab File ID:	N/A
Dilution:	1.0		Initial Weight/Volume:	5.0782 g
Date Analyzed:	04/28/2006 2131		Final Weight/Volume:	50 mL
Date Prepared:	04/28/2006 0930			

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Hexavalent chromium		0.22	J	0.0025	0.23

Analytical Data

Client: Maul Foster & Alongi Inc

Job Number: 580-2284-1

Client Sample ID: HA8-0.5

Lab Sample ID:	580-2284-8		Date Sampled:	04/18/2006 1730
Client Matrix:	Solid	% Moisture: 15.6	Date Received:	04/19/2006 1400

6010B Inductively Coupled Plasma - Atomic Emission Spectrometry

Method:	6010B	Analysis Batch: 580-6339	Instrument ID:	PE Optima 3200 DV
Preparation:	7195	Prep Batch: 580-6303	Lab File ID:	N/A
Dilution:	1.0		Initial Weight/Volume:	5.1002 g
Date Analyzed:	04/28/2006 2134		Final Weight/Volume:	50 mL
Date Prepared:	04/28/2006 0930			

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Hexavalent chromium		0.26		0.0025	0.23

Client: Maul Foster & Alongi Inc | Job Number: 580-2284-1

Client Sample ID: MW2-041906

Lab Sample ID:	580-2284-10	Date Sampled:	04/19/2006 0815
Client Matrix:	Water	Date Received:	04/19/2006 1400

6010B Inductively Coupled Plasma - Atomic Emission Spectrometry-Dissolved

Method:	6010B	Analysis Batch: 580-6211		Instrument ID:	PE Optima 3200 DV
Preparation:	7195	Prep Batch: 580-5974		Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	10 mL
Date Analyzed:	04/26/2006 1248			Final Weight/Volume:	10 mL
Date Prepared:	04/19/2006 1603				

Analyte	Result (mg/L)	Qualifier	RL
Hexavalent chromium	ND		0.020

6020 Inductively Coupled Plasma - Mass Spectrometry-Dissolved

Method:	6020	Analysis Batch: 580-6111	Instrument ID:	PE Sciex Elan 6100
Preparation:	N/A		Lab File ID:	N/A
Dilution:	5.0		Initial Weight/Volume:	50 mL
Date Analyzed:	04/24/2006 1120		Final Weight/Volume:	50 mL
Date Prepared:	N/A			

Analyte	Result (mg/L)	Qualifier	RL
Arsenic	0.0038		0.0020
Lead	ND		0.0020
Chromium	0.021		0.0020
Copper	0.0025		0.0020
Selenium	0.010		0.0020

Analytical Data

Client: Maul Foster & Alongi Inc

Job Number: 580-2284-1

Client Sample ID: MW6-041906

Lab Sample ID:	580-2284-11	Date Sampled:	04/19/2006 1015
Client Matrix:	Water	Date Received:	04/19/2006 1400

6010B Inductively Coupled Plasma - Atomic Emission Spectrometry-Dissolved

Method:	6010B	Analysis Batch: 580-6211	Instrument ID:	PE Optima 3200 DV
Preparation:	7195	Prep Batch: 580-5974	Lab File ID:	N/A
Dilution:	1.0		Initial Weight/Volume:	10 mL
Date Analyzed:	04/26/2006 1250		Final Weight/Volume:	10 mL
Date Prepared:	04/19/2006 1603			

Analyte	Result (mg/L)	Qualifier	RL
Hexavalent chromium	ND		0.020

6020 Inductively Coupled Plasma - Mass Spectrometry-Dissolved

Method:	6020	Analysis Batch: 580-6111	Instrument ID:	PE Sciex Elan 6100
Preparation:	N/A		Lab File ID:	N/A
Dilution:	5.0		Initial Weight/Volume:	50 mL
Date Analyzed:	04/24/2006 1125		Final Weight/Volume:	50 mL
Date Prepared:	N/A			

Analyte	Result (mg/L)	Qualifier	RL
Arsenic	0.024		0.0020
Lead	ND		0.0020
Chromium	0.047		0.0020
Copper	0.0051		0.0020
Selenium	0.019		0.0020

Client: Maul Foster & Alongi Inc

Job Number: 580-2284-1

Client Sample ID: MW5-041906

Lab Sample ID: 580-2284-12
Client Matrix: Water

Date Sampled: 04/19/2006 1230
Date Received: 04/19/2006 1400

6010B Inductively Coupled Plasma - Atomic Emission Spectrometry-Dissolved

Method: 6010B
Preparation: 7195
Dilution: 100
Date Analyzed: 04/26/2006 1252
Date Prepared: 04/19/2006 1603

Analysis Batch: 580-6211
Prep Batch: 580-5974

Instrument ID: PE Optima 3200 DV
Lab File ID: N/A
Initial Weight/Volume: 10 mL
Final Weight/Volume: 10 mL

Analyte	Result (mg/L)	Qualifier	RL
Hexavalent chromium	350		2.0

6020 Inductively Coupled Plasma - Mass Spectrometry-Dissolved

Method: 6020
Preparation: N/A
Dilution: 5.0
Date Analyzed: 04/24/2006 1130
Date Prepared: N/A

Analysis Batch: 580-6111

Instrument ID: PE Sciex Elan 6100
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result (mg/L)	Qualifier	RL
Arsenic	0.0049		0.0020
Lead	ND		0.0020
Chromium	32		0.0020
Copper	ND		0.0020
Selenium	ND		0.0020

Client: Maul Foster & Alongi Inc | Job Number: 580-2284-1

Client Sample ID: HA9-0.5

Lab Sample ID:	580-2284-13		Date Sampled:	04/19/2006 0820
Client Matrix:	Solid	% Moisture: 35.4	Date Received:	04/19/2006 1400

6010B Inductively Coupled Plasma - Atomic Emission Spectrometry

Method:	6010B	Analysis Batch: 580-6339	Instrument ID:	PE Optima 3200 DV
Preparation:	7195	Prep Batch: 580-6303	Lab File ID:	N/A
Dilution:	1.0		Initial Weight/Volume:	5.0611 g
Date Analyzed:	04/28/2006 2136		Final Weight/Volume:	50 mL
Date Prepared:	04/28/2006 0930			

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Hexavalent chromium		3.4		0.0033	0.31

Client: Maul Foster & Alongi Inc | Job Number: 580-2284-1

Client Sample ID: HA10.05

Lab Sample ID:	580-2284-15		Date Sampled:	04/19/2006 0950
Client Matrix:	Solid	% Moisture: 25.1	Date Received:	04/19/2006 1400

6010B Inductively Coupled Plasma - Atomic Emission Spectrometry

Method:	6010B	Analysis Batch: 580-6339	Instrument ID:	PE Optima 3200 DV
Preparation:	7195	Prep Batch: 580-6303	Lab File ID:	N/A
Dilution:	1.0		Initial Weight/Volume:	5.0038 g
Date Analyzed:	04/28/2006 2138		Final Weight/Volume:	50 mL
Date Prepared:	04/28/2006 0930			

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Hexavalent chromium		0.074	J	0.0029	0.27

Client: Maul Foster & Alongi Inc

Job Number: 580-2284-1

Client Sample ID: HA11-0.5

Lab Sample ID:	580-2284-17		Date Sampled:	04/19/2006 1030
Client Matrix:	Solid	% Moisture: 22.9	Date Received:	04/19/2006 1400

6010B Inductively Coupled Plasma - Atomic Emission Spectrometry

Method:	6010B	Analysis Batch: 580-6339	Instrument ID:	PE Optima 3200 DV
Preparation:	7195	Prep Batch: 580-6303	Lab File ID:	N/A
Dilution:	1.0		Initial Weight/Volume:	5.0515 g
Date Analyzed:	04/28/2006 2140		Final Weight/Volume:	50 mL
Date Prepared:	04/28/2006 0930			

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Hexavalent chromium		0.45		0.0027	0.26

Client: Maul Foster & Alongi Inc

Job Number: 580-2284-1

Client Sample ID: HA12-.05

Lab Sample ID:	580-2284-19		Date Sampled:	04/19/2006 1130
Client Matrix:	Solid	% Moisture: 33.2	Date Received:	04/19/2006 1400

6010B Inductively Coupled Plasma - Atomic Emission Spectrometry

Method:	6010B	Analysis Batch: 580-6305	Instrument ID:	PE Optima 3200 DV
Preparation:	3050B	Prep Batch: 580-6275	Lab File ID:	N/A
Dilution:	1.0		Initial Weight/Volume:	0.5597 g
Date Analyzed:	04/28/2006 0926		Final Weight/Volume:	50 mL
Date Prepared:	04/27/2006 1435			

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Arsenic		9.0		0.59	6.7
Lead		220	B	0.11	2.0
Cadmium		0.48	J B	0.011	0.67
Chromium		46	B	0.029	1.3
Copper		39	B	0.072	1.3

Client: Maul Foster & Alongi Inc

Job Number: 580-2284-1

Client Sample ID: MW- DUP-041806

Lab Sample ID:	580-2284-22	Date Sampled:	04/18/2006 1430
Client Matrix:	Water	Date Received:	04/19/2006 1400

6010B Inductively Coupled Plasma - Atomic Emission Spectrometry-Dissolved

Method:	6010B	Analysis Batch: 580-6211	Instrument ID:	PE Optima 3200 DV
Preparation:	7195	Prep Batch: 580-5974	Lab File ID:	N/A
Dilution:	1.0		Initial Weight/Volume:	10 mL
Date Analyzed:	04/26/2006 1255		Final Weight/Volume:	10 mL
Date Prepared:	04/19/2006 1603			

Analyte	Result (mg/L)	Qualifier	RL
Hexavalent chromium	ND	H	0.020

6020 Inductively Coupled Plasma - Mass Spectrometry-Dissolved

Method:	6020	Analysis Batch: 580-6111	Instrument ID:	PE Sciex Elan 6100
Preparation:	N/A		Lab File ID:	N/A
Dilution:	5.0		Initial Weight/Volume:	50 mL
Date Analyzed:	04/24/2006 1136		Final Weight/Volume:	50 mL
Date Prepared:	N/A			

Analyte	Result (mg/L)	Qualifier	RL
Arsenic	0.0073		0.0020
Lead	ND		0.0020
Chromium	0.013		0.0020
Copper	0.0033		0.0020
Selenium	0.0046		0.0020

General Chemistry

Client Sample ID: HA6-0.5

Lab Sample ID: 580-2284-4 | Date Sampled: 04/18/2006 1930
Client Matrix: Solid | Date Received: 04/19/2006 1400

Analyte	Result	Qual	Units	RL	Dil	Method
Percent Solids	80		%	0.10	1.0	PercentMoisture
	Anly Batch: 580-6139	Date Analyzed	04/25/2006 0829			
Percent Moisture	20		%	0.10	1.0	PercentMoisture
	Anly Batch: 580-6139	Date Analyzed	04/25/2006 0829			

Client Sample ID: HA7-0.5

Lab Sample ID: 580-2284-6 | Date Sampled: 04/18/2006 1805
Client Matrix: Solid | Date Received: 04/19/2006 1400

Analyte	Result	Qual	Units	RL	Dil	Method
Percent Solids	85		%	0.10	1.0	PercentMoisture
	Anly Batch: 580-6139	Date Analyzed	04/25/2006 0829			
Percent Moisture	15		%	0.10	1.0	PercentMoisture
	Anly Batch: 580-6139	Date Analyzed	04/25/2006 0829			

Client Sample ID: HA8-0.5

Lab Sample ID: 580-2284-8 | Date Sampled: 04/18/2006 1730
Client Matrix: Solid | Date Received: 04/19/2006 1400

Analyte	Result	Qual	Units	RL	Dil	Method
Percent Solids	84		%	0.10	1.0	PercentMoisture
	Anly Batch: 580-6139	Date Analyzed	04/25/2006 0829			
Percent Moisture	16		%	0.10	1.0	PercentMoisture
	Anly Batch: 580-6139	Date Analyzed	04/25/2006 0829			

General Chemistry

Client Sample ID: HA9-0.5

Lab Sample ID: 580-2284-13　　Date Sampled: 04/19/2006 0820
Client Matrix: Solid　　Date Received: 04/19/2006 1400

Analyte	Result	Qual	Units	RL	Dil	Method
Percent Solids	65		%	0.10	1.0	PercentMoisture
	Anly Batch: 580-6139	Date Analyzed	04/25/2006 0829			
Percent Moisture	35		%	0.10	1.0	PercentMoisture
	Anly Batch: 580-6139	Date Analyzed	04/25/2006 0829			

Client Sample ID: HA10.05

Lab Sample ID: 580-2284-15　　Date Sampled: 04/19/2006 0950
Client Matrix: Solid　　Date Received: 04/19/2006 1400

Analyte	Result	Qual	Units	RL	Dil	Method
Percent Solids	75		%	0.10	1.0	PercentMoisture
	Anly Batch: 580-6139	Date Analyzed	04/25/2006 0829			
Percent Moisture	25		%	0.10	1.0	PercentMoisture
	Anly Batch: 580-6139	Date Analyzed	04/25/2006 0829			

Client Sample ID: HA11-0.5

Lab Sample ID: 580-2284-17　　Date Sampled: 04/19/2006 1030
Client Matrix: Solid　　Date Received: 04/19/2006 1400

Analyte	Result	Qual	Units	RL	Dil	Method
Percent Solids	77		%	0.10	1.0	PercentMoisture
	Anly Batch: 580-6139	Date Analyzed	04/25/2006 0829			
Percent Moisture	23		%	0.10	1.0	PercentMoisture
	Anly Batch: 580-6139	Date Analyzed	04/25/2006 0829			

Client: Maul Foster & Alongi Inc

Job Number: 580-2284-1

General Chemistry

Client Sample ID: **HA12-.05**

Lab Sample ID: 580-2284-19
Client Matrix: Solid

Date Sampled: 04/19/2006 1130
Date Received: 04/19/2006 1400

Analyte	Result	Qual	Units	RL	Dil	Method
Percent Solids	67		%	0.10	1.0	PercentMoisture
	Anly Batch: 580-6139	Date Analyzed	04/25/2006 0829			
Percent Moisture	33		%	0.10	1.0	PercentMoisture
	Anly Batch: 580-6139	Date Analyzed	04/25/2006 0829			

Client: Maul Foster & Alongi Inc | Job Number: 580-2284-1

Method Blank - Batch: 580-6218

Method: 8260B
Preparation: 5030B

Lab Sample ID: MB 580-6218/3
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 04/25/2006 1433
Date Prepared: 04/25/2006 1433

Analysis Batch: 580-6218
Prep Batch: N/A
Units: ug/L

Instrument ID: ITS40
Lab File ID: X24010.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result	Qual	MDL	RL
Vinyl chloride	ND		0.14	1.0
trans-1,2-Dichloroethene	ND		0.091	1.0
cis-1,2-Dichloroethene	ND		0.062	1.0
Trichloroethene	ND		0.055	1.0

Surrogate	% Rec	Acceptance Limits
Fluorobenzene (Surr)	98	80 - 120
Toluene-d8	100	80 - 120
Ethylbenzene-d10	101	80 - 120
4-Bromofluorobenzene (Surr)	98	80 - 120
Trifluorotoluene (Surr)	118	80 - 120

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Maul Foster & Alongi Inc

Job Number: 580-2284-1

Laboratory Control/
Laboratory Control Duplicate Recovery Report - Batch: 580-6218

Method: 8260B
Preparation: 5030B

LCS Lab Sample ID:	LCS 580-6218/1	Analysis Batch:	580-6218	Instrument ID:	ITS40
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	X24007.D
Dilution:	1.0	Units:	ug/L	Initial Weight/Volume:	5 mL
Date Analyzed:	04/25/2006 1317			Final Weight/Volume:	5 mL
Date Prepared:	04/25/2006 1317				

LCSD Lab Sample ID:	LCSD 580-6218/2	Analysis Batch:	580-6218	Instrument ID:	ITS40
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	X24008.D
Dilution:	1.0	Units:	ug/L	Initial Weight/Volume:	5 mL
Date Analyzed:	04/25/2006 1342			Final Weight/Volume:	5 mL
Date Prepared:	04/25/2006 1342				

Analyte	% Rec. LCS	LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
Vinyl chloride	108	110	50 - 145	2	20		
trans-1,2-Dichloroethene	95	97	60 - 140	2	20		
cis-1,2-Dichloroethene	96	102	70 - 125	6	20		
Trichloroethene	92	95	75 - 125	3	13		

Surrogate	LCS % Rec	LCSD % Rec	Acceptance Limits
Fluorobenzene (Surr)	100	102	80 - 120
Toluene-d8	96	103	80 - 120
Ethylbenzene-d10	100	107	80 - 120
4-Bromofluorobenzene (Surr)	94	97	80 - 120
Trifluorotoluene (Surr)	103	104	80 - 120

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Maul Foster & Alongi Inc

Job Number: 580-2284-1

Method Blank - Batch: 580-6377

Method: 8260B
Preparation: 5030B

Lab Sample ID: MB 580-6377/1	Analysis Batch: 580-6377	Instrument ID: ITS40
Client Matrix: Water	Prep Batch: N/A	Lab File ID: X24092.D
Dilution: 1.0	Units: ug/L	Initial Weight/Volume: 5 mL
Date Analyzed: 05/01/2006 1325		Final Weight/Volume: 5 mL
Date Prepared: 05/01/2006 1325		

Analyte	Result	Qual	MDL	RL
Vinyl chloride	ND		0.14	1.0
trans-1,2-Dichloroethene	ND		0.091	1.0
cis-1,2-Dichloroethene	ND		0.062	1.0
Trichloroethene	ND		0.055	1.0

Surrogate	% Rec	Acceptance Limits
Fluorobenzene (Surr)	103	80 - 120
Toluene-d8	99	80 - 120
Ethylbenzene-d10	99	80 - 120
4-Bromofluorobenzene (Surr)	104	80 - 120
Trifluorotoluene (Surr)	113	80 - 120

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Maul Foster & Alongi Inc

Job Number: 580-2284-1

Laboratory Control/
Laboratory Control Duplicate Recovery Report - Batch: 580-6377

Method: 8260B
Preparation: 5030B

LCS Lab Sample ID:	LCS 580-6377/4	Analysis Batch: 580-6377	Instrument ID: ITS40
Client Matrix:	Water	Prep Batch: N/A	Lab File ID: X24087.D
Dilution:	1.0	Units: ug/L	Initial Weight/Volume: 5 mL
Date Analyzed:	05/01/2006 1116		Final Weight/Volume: 5 mL
Date Prepared:	05/01/2006 1116		

LCSD Lab Sample ID:	LCSD 580-6377/5	Analysis Batch: 580-6377	Instrument ID: ITS40
Client Matrix:	Water	Prep Batch: N/A	Lab File ID: X24088.D
Dilution:	1.0	Units: ug/L	Initial Weight/Volume: 5 mL
Date Analyzed:	05/01/2006 1142		Final Weight/Volume: 5 mL
Date Prepared:	05/01/2006 1142		

Analyte	% Rec. LCS	% Rec. LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
Vinyl chloride	90	88	50 - 145	2	20		
trans-1,2-Dichloroethene	97	95	60 - 140	2	20		
cis-1,2-Dichloroethene	101	101	70 - 125	0	20		
Trichloroethene	96	97	75 - 125	0	13		

Surrogate	LCS % Rec	LCSD % Rec	Acceptance Limits
Fluorobenzene (Surr)	106	101	80 - 120
Toluene-d8	106	105	80 - 120
Ethylbenzene-d10	104	107	80 - 120
4-Bromofluorobenzene (Surr)	107	106	80 - 120
Trifluorotoluene (Surr)	101	103	80 - 120

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Maul Foster & Alongi Inc

Job Number: 580-2284-1

Method Blank - Batch: 580-5990

Method: 8270C
Preparation: 3510C

Lab Sample ID: MB 580-5990/1-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 04/20/2006 1355
Date Prepared: 04/20/2006 0842

Analysis Batch: 580-6034
Prep Batch: 580-5990
Units: ug/L

Instrument ID: 5973N
Lab File ID: HP01646.D
Initial Weight/Volume: 1000 mL
Final Weight/Volume: 10 mL
Injection Volume:

Analyte	Result	Qual	MDL	RL
Naphthalene	ND		0.0060	0.10
2-Methylnaphthalene	ND		0.0090	0.13
1-Methylnaphthalene	ND		0.032	0.10
Acenaphthylene	ND		0.0040	0.10
Acenaphthene	ND		0.0030	0.10
Fluorene	ND		0.0080	0.10
Phenanthrene	0.0039	J	0.0030	0.10
Anthracene	ND		0.0080	0.10
Fluoranthene	ND		0.0090	0.10
Pyrene	0.028	J	0.013	0.10
Benzo[a]anthracene	ND		0.0090	0.10
Chrysene	ND		0.0090	0.10
Benzofluoranthene	ND		0.031	0.20
Benzo[a]pyrene	ND		0.060	0.20
Indeno[1,2,3-cd]pyrene	ND		0.015	0.10
Dibenz(a,h)anthracene	ND		0.012	0.10
Benzo[g,h,i]perylene	ND		0.018	0.10

Surrogate	% Rec	Acceptance Limits
Nitrobenzene-d5	91	34 - 146
2-Fluorobiphenyl	98	35 - 143
Terphenyl-d14	100	35 - 166

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Maul Foster & Alongi Inc

Job Number: 580-2284-1

Laboratory Control/
Laboratory Control Duplicate Recovery Report - Batch: 580-5990

Method: 8270C
Preparation: 3510C

LCS Lab Sample ID: LCS 580-5990/2-A	Analysis Batch: 580-6034	Instrument ID: 5973N	
Client Matrix: Water	Prep Batch: 580-5990	Lab File ID: HP01647.D	
Dilution: 1.0	Units: ug/L	Initial Weight/Volume: 1000 mL	
Date Analyzed: 04/20/2006 1417		Final Weight/Volume: 10 mL	
Date Prepared: 04/20/2006 0842		Injection Volume:	

LCSD Lab Sample ID: LCSD 580-5990/3-A	Analysis Batch: 580-6034	Instrument ID: 5973N	
Client Matrix: Water	Prep Batch: 580-5990	Lab File ID: HP01648.D	
Dilution: 1.0	Units: ug/L	Initial Weight/Volume: 1000 mL	
Date Analyzed: 04/20/2006 1440		Final Weight/Volume: 10 mL	
Date Prepared: 04/20/2006 0842		Injection Volume:	

Analyte	% Rec. LCS	% Rec. LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
Naphthalene	99	98	42 - 129	1	32		
2-Methylnaphthalene	105	103	40 - 141	3	30		
1-Methylnaphthalene	109	108	50 - 150	1	50		
Acenaphthylene	106	106	46 - 128	0	45		
Acenaphthene	103	104	50 - 145	1	27		
Fluorene	114	116	46 - 143	1	29		
Phenanthrene	97	96	55 - 132	1	24		
Anthracene	98	96	51 - 134	2	28		
Fluoranthene	90	91	60 - 131	1	22		
Pyrene	88	90	48 - 157	2	38		
Benzo[a]anthracene	107	107	56 - 138	1	29		
Chrysene	102	103	57 - 139	1	33		
Benzofluoranthene	103	105	46 - 153	2	41		
Benzo[a]pyrene	114	114	53 - 137	1	27		
Indeno[1,2,3-cd]pyrene	94	94	49 - 148	1	34		
Dibenz(a,h)anthracene	89	90	49 - 150	1	42		
Benzo[g,h,i]perylene	94	95	52 - 147	1	32		

Surrogate	LCS % Rec	LCSD % Rec	Acceptance Limits
Nitrobenzene-d5	93	92	34 - 146
2-Fluorobiphenyl	98	95	35 - 143
Terphenyl-d14	96	96	35 - 166

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Maul Foster & Alongi Inc

Job Number: 580-2284-1

Method Blank - Batch: 580-6001

Method: NWTPH-Dx
Preparation: 3510C

Lab Sample ID: MB 580-6001/1-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 04/20/2006 1449
Date Prepared: 04/20/2006 1118

Analysis Batch: 580-6025
Prep Batch: 580-6001
Units: mg/L

Instrument ID: HP6890
Lab File ID: FA26388.D
Initial Weight/Volume: 1000 mL
Final Weight/Volume: 5 mL
Injection Volume:

Analyte	Result	Qual	RL
Motor Oil (>C24-C36)	ND		0.50
#2 Diesel (C10-C24)	ND		0.25

Surrogate	% Rec	Acceptance Limits
o-Terphenyl	111	50 - 150

Laboratory Control/
Laboratory Control Duplicate Recovery Report - Batch: 580-6001

Method: NWTPH-Dx
Preparation: 3510C

LCS Lab Sample ID: LCS 580-6001/2-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 04/20/2006 1509
Date Prepared: 04/20/2006 1118

Analysis Batch: 580-6025
Prep Batch: 580-6001
Units: mg/L

Instrument ID: HP6890
Lab File ID: FA26389.D
Initial Weight/Volume: 1000 mL
Final Weight/Volume: 5 mL
Injection Volume:

LCSD Lab Sample ID: LCSD 580-6001/3-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 04/20/2006 1535
Date Prepared: 04/20/2006 1118

Analysis Batch: 580-6025
Prep Batch: 580-6001
Units: mg/L

Instrument ID: HP6890
Lab File ID: FA26390.D
Initial Weight/Volume: 1000 mL
Final Weight/Volume: 5 mL
Injection Volume:

Analyte	% Rec. LCS	% Rec. LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
Motor Oil (>C24-C36)	98	99	66 - 125	1	27		
#2 Diesel (C10-C24)	105	104	70 - 140	2	27		

Surrogate	LCS % Rec	LCSD % Rec	Acceptance Limits
o-Terphenyl	112	112	50 - 150

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Maul Foster & Alongi Inc

Job Number: 580-2284-1

Method Blank - Batch: 580-5974

Method: 6010B
Preparation: 7195
Dissolved

Lab Sample ID: MB 580-5974/11-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 04/26/2006 1216
Date Prepared: 04/19/2006 1603

Analysis Batch: 580-6211
Prep Batch: 580-5974
Units: mg/L

Instrument ID: PE Optima 3200 DV
Lab File ID: N/A
Initial Weight/Volume: 10 mL
Final Weight/Volume: 10 mL

Analyte	Result	Qual	RL
Hexavalent chromium	ND		0.020

Laboratory Control/
Laboratory Control Duplicate Recovery Report - Batch: 580-5974

Method: 6010B
Preparation: 7195
Dissolved

LCS Lab Sample ID: LCS 580-5974/12-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 04/26/2006 1218
Date Prepared: 04/19/2006 1603

Analysis Batch: 580-6211
Prep Batch: 580-5974
Units: mg/L

Instrument ID: PE Optima 3200 DV
Lab File ID: N/A
Initial Weight/Volume: 10 mL
Final Weight/Volume: 10 mL

LCSD Lab Sample ID: LCSD 580-5974/13-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 04/26/2006 1221
Date Prepared: 04/19/2006 1603

Analysis Batch: 580-6211
Prep Batch: 580-5974
Units: mg/L

Instrument ID: PE Optima 3200 DV
Lab File ID: N/A
Initial Weight/Volume: 10 mL
Final Weight/Volume: 10 mL

	% Rec.						
Analyte	LCS	LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
Hexavalent chromium	98	96	80 - 120	2	20		

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Maul Foster & Alongi Inc

Job Number: 580-2284-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 580-5974

Method: 6010B
Preparation: 7195
Dissolved

MS Lab Sample ID: 580-2284-1
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 04/26/2006 1230
Date Prepared: 04/19/2006 1603

Analysis Batch: 580-6211
Prep Batch: 580-5974

Instrument ID: PE Optima 3200 DV
Lab File ID: N/A
Initial Weight/Volume: 10 mL
Final Weight/Volume: 10 mL

MSD Lab Sample ID: 580-2284-1
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 04/26/2006 1232
Date Prepared: 04/19/2006 1603

Analysis Batch: 580-6211
Prep Batch: 580-5974

Instrument ID: PE Optima 3200 DV
Lab File ID: N/A
Initial Weight/Volume: 10 mL
Final Weight/Volume: 10 mL

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Hexavalent chromium	95	92	75 - 125	4	20		

Matrix Duplicate - Batch: 580-5974

Method: 6010B
Preparation: 7195
Dissolved

Lab Sample ID: 580-2284-1
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 04/26/2006 1228
Date Prepared: 04/19/2006 1603

Analysis Batch: 580-6211
Prep Batch: 580-5974
Units: mg/L

Instrument ID: PE Optima 3200 DV
Lab File ID: N/A
Initial Weight/Volume: 10 mL
Final Weight/Volume: 10 mL

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Hexavalent chromium	0.00954	0.00526	58	20	*

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Maul Foster & Alongi Inc

Job Number: 580-2284-1

Method Blank - Batch: 580-6275

Method: 6010B
Preparation: 3050B

Lab Sample ID: MB 580-6275/8-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 04/28/2006 0843
Date Prepared: 04/27/2006 1435

Analysis Batch: 580-6305
Prep Batch: 580-6275
Units: mg/Kg

Instrument ID: PE Optima 3200 DV
Lab File ID: N/A
Initial Weight/Volume: 0.5 g
Final Weight/Volume: 50 mL

Analyte	Result	Qual	MDL	RL
Arsenic	ND		0.45	5.0
Lead	0.43	J	0.079	1.5
Cadmium	0.0084	J	0.0082	0.50
Chromium	0.029	J	0.021	1.0
Copper	0.81	J	0.054	1.0

Laboratory Control/
Laboratory Control Duplicate Recovery Report - Batch: 580-6275

Method: 6010B
Preparation: 3050B

LCS Lab Sample ID: LCS 580-6275/9-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 04/28/2006 0933
Date Prepared: 04/27/2006 1435

Analysis Batch: 580-6305
Prep Batch: 580-6275
Units: mg/Kg

Instrument ID: PE Optima 3200 DV
Lab File ID: N/A
Initial Weight/Volume: 0.5 g
Final Weight/Volume: 50 mL

LCSD Lab Sample ID: LCSD 580-6275/10-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 04/28/2006 0936
Date Prepared: 04/27/2006 1435

Analysis Batch: 580-6305
Prep Batch: 580-6275
Units: mg/Kg

Instrument ID: PE Optima 3200 DV
Lab File ID: N/A
Initial Weight/Volume: 0.5 g
Final Weight/Volume: 50 mL

Analyte	% Rec. LCS	% Rec. LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
Arsenic	99	99	80 - 120	0	35		
Lead	100	101	80 - 120	1	35		
Cadmium	95	95	80 - 120	0	35		
Chromium	98	98	80 - 120	0	35		
Copper	99	99	80 - 120	0	35		

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Maul Foster & Alongi Inc

Job Number: 580-2284-1

Method Blank - Batch: 580-6303

Method: 6010B
Preparation: 7195

Lab Sample ID: MB 580-6303/11-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 04/28/2006 2100
Date Prepared: 04/28/2006 0930

Analysis Batch: 580-6339
Prep Batch: 580-6303
Units: mg/Kg

Instrument ID: PE Optima 3200 DV
Lab File ID: N/A
Initial Weight/Volume: 5 g
Final Weight/Volume: 50 mL

Analyte	Result	Qual	MDL	RL
Hexavalent chromium	ND		0.0021	0.20

Laboratory Control/
Laboratory Control Duplicate Recovery Report - Batch: 580-6303

Method: 6010B
Preparation: 7195

LCS Lab Sample ID: LCS 580-6303/12-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 04/28/2006 2101
Date Prepared: 04/28/2006 0930

Analysis Batch: 580-6339
Prep Batch: 580-6303
Units: mg/Kg

Instrument ID: PE Optima 3200 DV
Lab File ID: N/A
Initial Weight/Volume: 5 g
Final Weight/Volume: 50 mL

LCSD Lab Sample ID: LCSD 580-6303/13-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 04/28/2006 2103
Date Prepared: 04/28/2006 0930

Analysis Batch: 580-6339
Prep Batch: 580-6303
Units: mg/Kg

Instrument ID: PE Optima 3200 DV
Lab File ID: N/A
Initial Weight/Volume: 5 g
Final Weight/Volume: 50 mL

Analyte	% Rec. LCS	LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
Hexavalent chromium	89	90	80 - 120	1	35		

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Maul Foster & Alongi Inc | Job Number: 580-2284-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 580-6303

Method: 6010B
Preparation: 7195

MS Lab Sample ID: 580-2284-4
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 04/28/2006 2126
Date Prepared: 04/28/2006 0930

Analysis Batch: 580-6339
Prep Batch: 580-6303

Instrument ID: PE Optima 3200 DV
Lab File ID: N/A
Initial Weight/Volume: 5.1119 g
Final Weight/Volume: 50 mL

MSD Lab Sample ID: 580-2284-4
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 04/28/2006 2128
Date Prepared: 04/28/2006 0930

Analysis Batch: 580-6339
Prep Batch: 580-6303

Instrument ID: PE Optima 3200 DV
Lab File ID: N/A
Initial Weight/Volume: 5.2012 g
Final Weight/Volume: 50 mL

Analyte	% Rec. MS	% Rec. MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Hexavalent chromium	-6	2	75 - 125	86	35	*	*

Matrix Duplicate - Batch: 580-6303

Method: 6010B
Preparation: 7195

Lab Sample ID: 580-2284-4
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 04/28/2006 2116
Date Prepared: 04/28/2006 0930

Analysis Batch: 580-6339
Prep Batch: 580-6303
Units: mg/Kg

Instrument ID: PE Optima 3200 DV
Lab File ID: N/A
Initial Weight/Volume: 5.0621 g
Final Weight/Volume: 50 mL

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Hexavalent chromium	2.83	3.33	16	35	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Maul Foster & Alongi Inc

Job Number: 580-2284-1

Method Blank - Batch: 580-6111

Method: 6020
Preparation: N/A

Lab Sample ID: MB 580-6111/2
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 04/24/2006 1003
Date Prepared: N/A

Analysis Batch: 580-6111
Prep Batch: N/A
Units: mg/L

Instrument ID: PE Sciex Elan 6100
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result	Qual	RL
Arsenic	ND		0.00040
Lead	ND		0.00040
Chromium	ND		0.00040
Copper	ND		0.00040
Selenium	ND		0.00040

Laboratory Control/
Laboratory Control Duplicate Recovery Report - Batch: 580-6111

Method: 6020
Preparation: N/A

LCS Lab Sample ID: LCS 580-6111/7
Client Matrix: Water
Dilution: 50
Date Analyzed: 04/24/2006 1039
Date Prepared: N/A

Analysis Batch: 580-6111
Prep Batch: N/A
Units: mg/L

Instrument ID: PE Sciex Elan 6100
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 54 mL

LCSD Lab Sample ID: LCSD 580-6111/8
Client Matrix: Water
Dilution: 50
Date Analyzed: 04/24/2006 1044
Date Prepared: N/A

Analysis Batch: 580-6111
Prep Batch: N/A
Units: mg/L

Instrument ID: PE Sciex Elan 6100
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 54 mL

	% Rec.						
Analyte	LCS	LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
Arsenic	101	100	80 - 120	1	20		
Lead	90	92	80 - 120	2	20		
Chromium	91	92	80 - 120	1	20		
Copper	99	98	80 - 120	0	20		
Selenium	104	104	80 - 120	1	20		

Calculations are performed before rounding to avoid round-off errors in calculated results.

DATA REPORTING QUALIFIERS

Client: Maul Foster & Alongi Inc

Job Number: 580-2284-1

Lab Section	Qualifier	Description
GC/MS Semi VOA		
	B	Compound was found in the blank and sample.
	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
Metals		
	B	Compound was found in the blank and sample.
	*	LCS, LCSD, MS, MSD, MD, or Surrogate exceeds the control limits
	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
	H	Sample was prepped or analyzed beyond the specified holding time

Chain of Custody Record

STL Seattle
5755 8th Street E.
Tacoma, WA 98424
Tel. 253-922-2310
Fax 253-922-5047
www.stl-inc.com

SEVERN TRENT STL®

Client: Precision Engineering
Address:
City: State: Zip Code:
Project Name and Location (State): Precision Engineering (WA)
Contract/Purchase Order/Quote No.:

Project Manager: Alan Hughes
Telephone Number (Area Code)/Fax Number: (971) 544-2139
Site Contact: Meu Gibson
Lab Contact: Tom Coyner
Carrier/Waybill Number:

Date: 4/18/06
Lab Number:
Chain of Custody Number: 24902
Page 1 of 2

Metals in soil include: arsenic, cadmium, chromium, copper, & lead

Special Instructions/ Conditions of Receipt
Metals in GW include: arsenic, chromium, copper, & selenium.

Sample I.D. and Location/Description (Containers for each sample may be combined on one line)	Date	Time	Air	Aqueous	Sed.	Soil	Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Diss Metals	NWTPH-Dx	PAHs	Hex Chrome	VOCs (limited)	Total Metals	Special Instructions/Conditions of Receipt
MW7-041806	4/18/06	14:30		X			2		1	4			X	X	X	X	X		Diss. Metals field filtered
MW4-041806	4/18/06	17:50		X			2		1	4			X	X	X	X	X		
MW1-041806	4/18/06	18:30		X			2		1	4			X	X	X	X	X		
HA6-0.5	4/18/06	19:30			X		1									X			for now only Hex Cr
HA6-1.0	4/18/06	20:00			X		1												Archive
HA7-0.5	4/18/06	14:05			X		1									X			for now only Hex Cr
HA7-1.5	4/18/06	14:20			X		1												Archive
~~HA8-0.5~~	~~4/18/06~~	~~14:05~~																	
~~HA8-1.5~~	~~4/18/06~~	~~14:20~~																	
HA8-0.5	4/18/06	13:30			X		1									X			for now only Hex Cr
HA8-1.5	4/18/06	13:45			X		1												Archive
MW2-041906	4/19/06	8:15		X			2		1	4			X	X	X	X	X		Diss Metals field filtered

Cooler: ☐ Yes ☐ No Cooler Temp:

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required (business days): ☐ 24 Hours ☐ 48 Hours ☐ 5 Days ☐ 10 Days ☐ 15 Days ☐ Other ____

QC Requirements (Specify)

1. Relinquished By: Meu Gibson Maul Foster & Alongi	Date: 4/19/06	Time: 13:30	1. Received By: [signature]	Date: 4/19/06	Time: 13:30
2. Relinquished By: [signature]	Date: 4/19/06	Time: 14:00	2. Received By:	Date:	Time:
3. Relinquished By: [signature]	Date:	Time:	3. Received By:	Date:	Time:

Comments:

DISTRIBUTION: WHITE – Stays with the Samples; CANARY – Returned to Client with Report; PINK – Field Copy

STL8274-580 (12/02)

Chain of Custody Record

STL Seattle
5755 8th Street E.
Tacoma, WA 98424
Tel. 253-922-2310
Fax 253-922-5047
www.stl-inc.com

SEVERN TRENT STL®

Client	Precision Engineering
Address	
City / State / Zip Code	
Project Name and Location (State)	Precision Engineering Seattle, WA
Contract/Purchase Order/Quote No.	
Project Manager	Alan Hughes
Telephone Number (Area Code)/Fax Number	(971) 544-2139
Site Contact	Men Gibson
Lab Contact	Tom Coyner
Carrier/Waybill Number	
Date	4/18/06
Lab Number	
Chain of Custody Number	24903
Page	2 of 2

Sample I.D. and Location/Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Matrix: Aqueous	Matrix: Sed.	Matrix: Soil	Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Diss Metals	NWTPH-Dx	PAHs	Hex Chrome	VOCs (limited)	Total Metals	Special Instructions/Conditions of Receipt
MW6-041906	4/19/06	10:15		X			2		1	4			X	X	X	X	X		Diss Metals field filtered
MW5-041906	4/19/06	12:30		X			2		1	4			X	X	X	X	X		↓
HA9 - 0.5	8:20	4/19/06			X		1									X		[scribbled out]	← for now only Hex Cr
HA9 - 1.5	8:30	4/19/06			X		1									[scribbled out]		[scribbled out]	← Archive
HA 10 - 0.5	9:50	4/19/06			X		1									X		[scribbled out]	← for now only Hex Cr
HA 10 - 1.5	10:00	4/19/06			X		1									[scribbled out]		[scribbled out]	← Archive
HA 11 - 0.5	10:30	4/19/06			X		1									X		[scribbled out]	← for now only Hex Cr
HA 11 - 1.5	10:40	4/19/06			X		1									[scribbled out]		[scribbled out]	← Archive
HA 12 - 0.5	11:30	4/19/06			X		1									[scribbled out]		X	← for now only total metals
HA 12 - 1.5	11:40	4/19/06			X		1									[scribbled out]		[scribbled out]	← Archive
Trip Blank		4/19/06		X						1							X		
MW5GWDUP-041806							2		1	4			X	X	X	X	X		

Cooler ☐ Yes ☐ No Cooler Temp: ______

Possible Hazard Identification ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal ☐ Return To Client ☐ Disposal By Lab ☐ Archive For ______ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required (business days) ☐ 24 Hours ☐ 48 Hours ☐ 5 Days ☐ 10 Days ☐ 15 Days ☐ Other ______

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished By: Men Gibson Maul Foster & Alongi	4/19/06	13:30	1. Received By: [signature]	4/19/06	13:30
2. Relinquished By: [signature]	4/19/06	4:20	2. Received By: [signature]		
3. Relinquished By			3. Received By		

Comments

DISTRIBUTION: WHITE - Stays with the Samples; CANARY - Returned to Client with Report; PINK - Field Copy

STL8274-590 (12/02)

LOGIN SAMPLE RECEIPT CHECK LIST

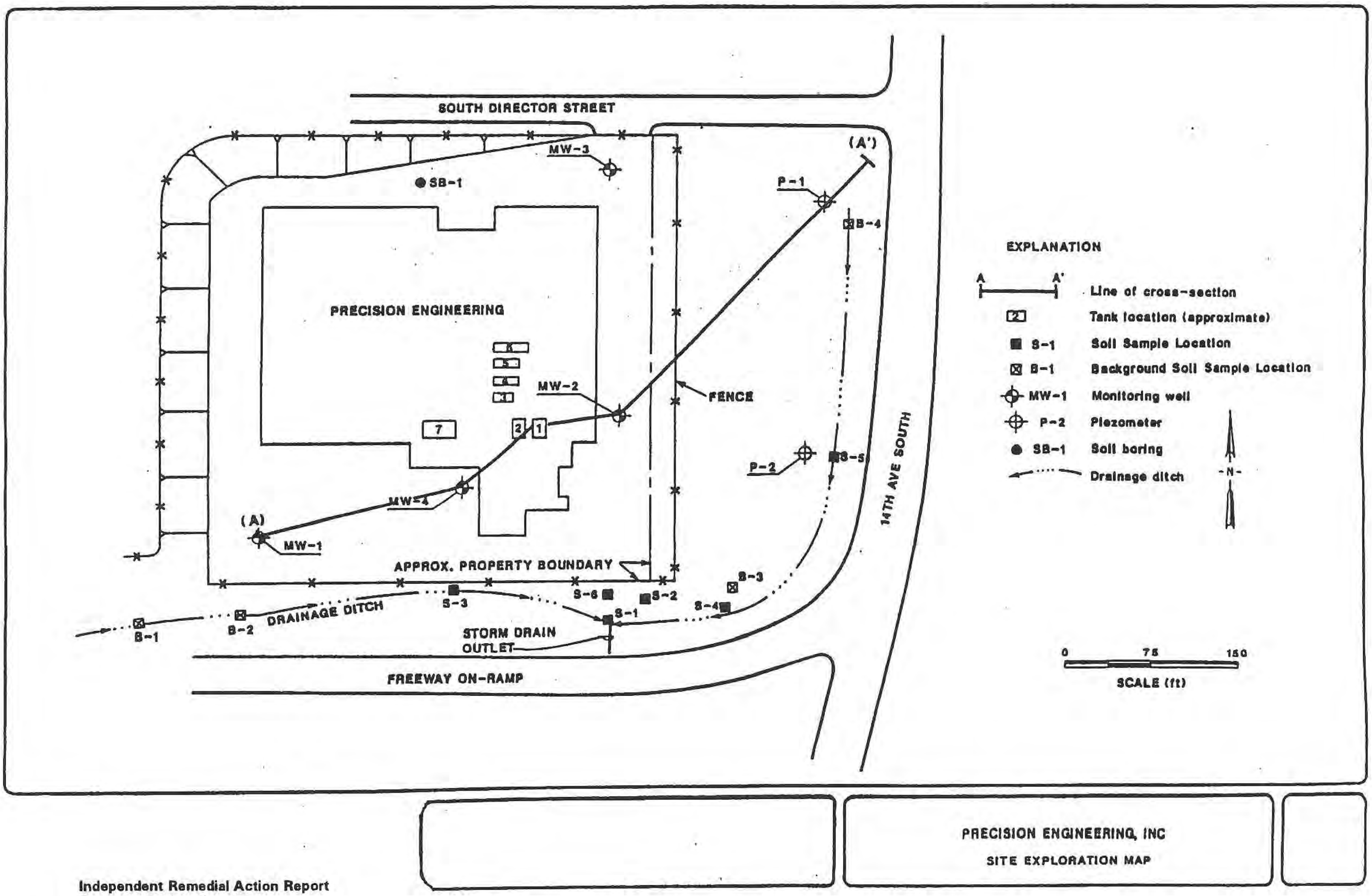
Client: Maul Foster & Alongi Inc   Job Number: 580-2284-1

Login Number: 2284

Question	T/F/NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	

APPENDIX C
Previous Geologic Cross Sections and Boring Logs

2.16 Map of Site - Site Plan



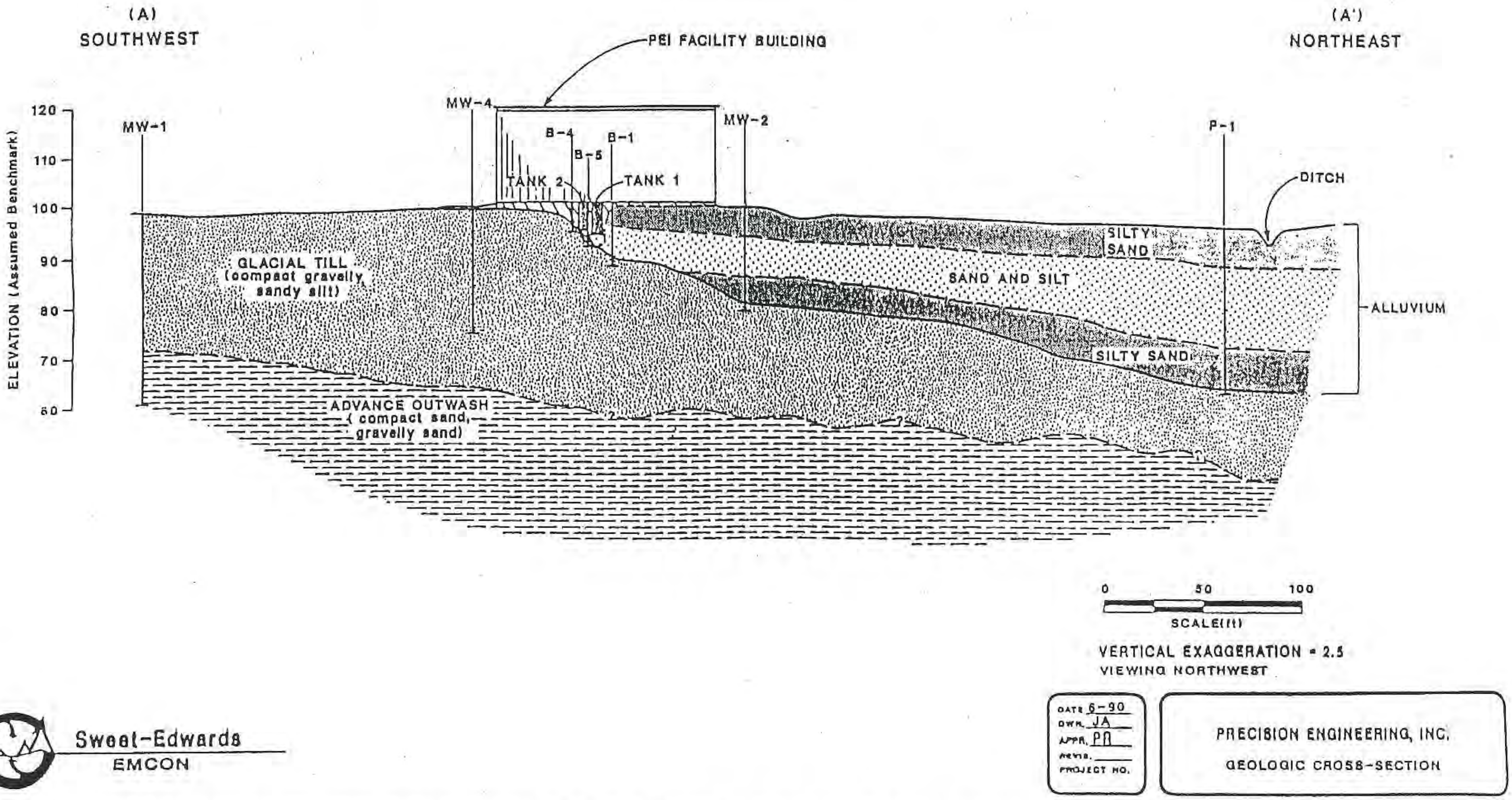
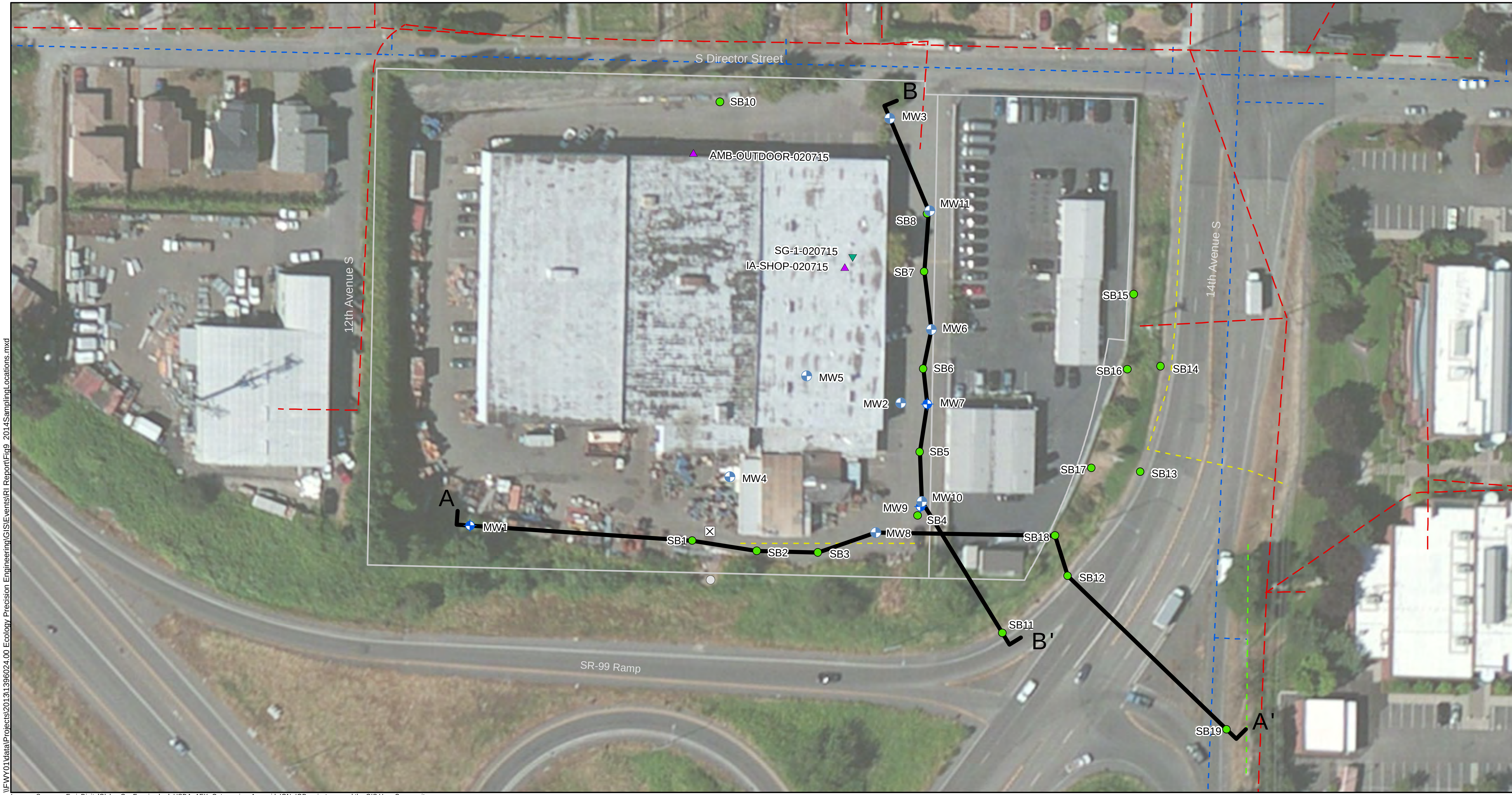


Figure 2.8.1 is a cross-section through the study area that depicts the stratigraphic relationship between the soil units. The cross-section shows the alluvium thinning towards the west until it is absent beneath the PEI facility.



Legend

- Deep Monitoring Well
- Shallow Monitoring Well
- 2014-2015 Soil Boring
- Air Sampling Location
- Subslab Sampling Location
- Catch Basin
- Outfall to Drainage Ditch
- Approximate Parcel Boundary

Utility Lines

- Puget Sound Energy gas
- Electrical
- Sewer and drainage line
- Water

A A' Location of Geologic Cross-Section (See Figure 10)

Notes:
1. All locations are approximate.
2. Approximate utility line locations from Seattle Public Utilities and markings made in the field by utility locators.

N

70 35 0 70 Feet

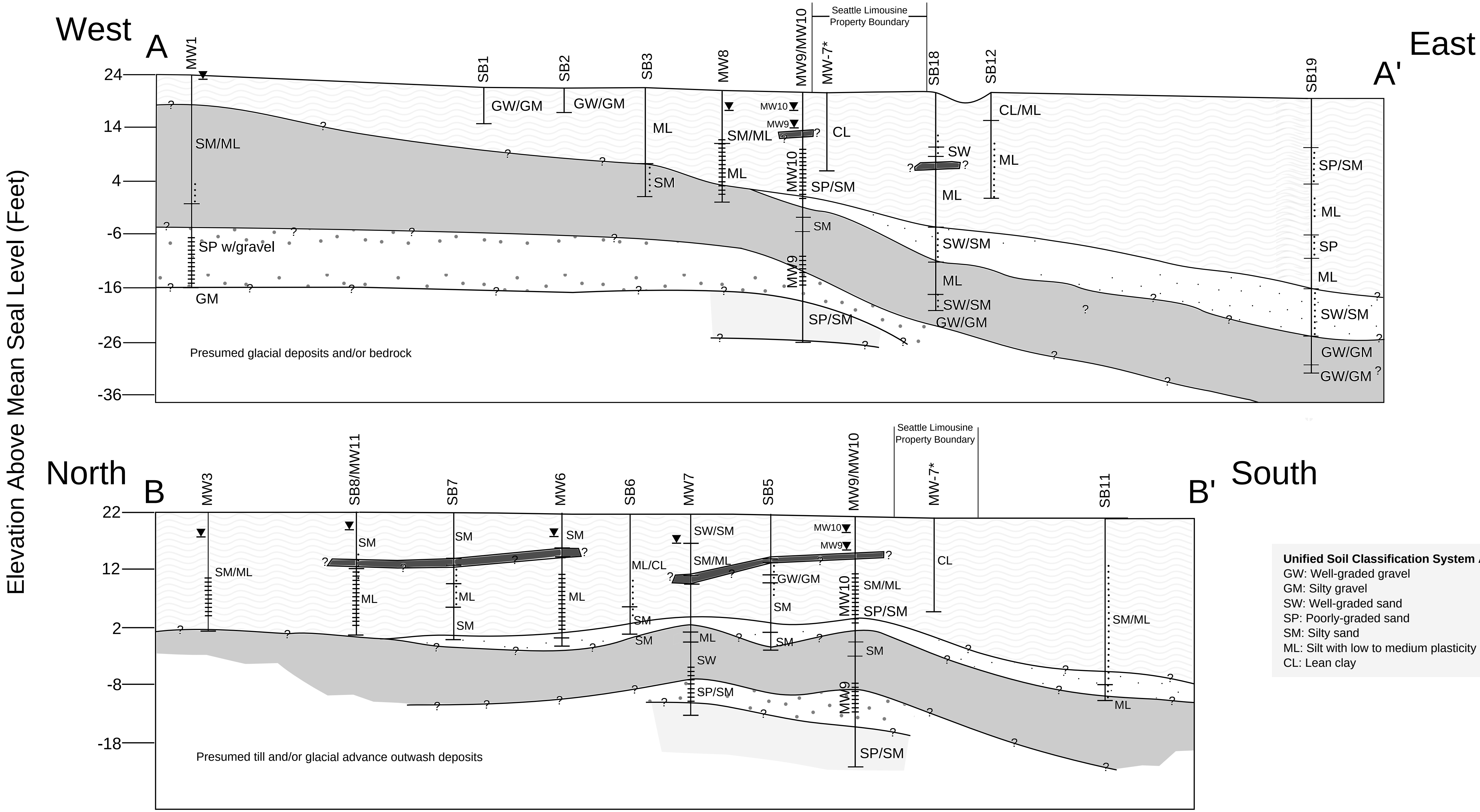
Kennedy/Jenks Consultants

Former Precision Engineering Property
Seattle, Washington

2014/2015 Remedial Investigation Sampling Locations

Figure 9

K/J Project Number 1396024.00
August 2015



Unified Soil Classification System Abbreviations
GW: Well-graded gravel
GM: Silty gravel
SW: Well-graded sand
SP: Poorly-graded sand
SM: Silty sand
ML: Silt with low to medium plasticity
CL: Lean clay

Legend

- Silts, clays, silt with sand (inferred recessional outwash and recent alluvium and fill)
- Wood, peat, woody organic material
- Sand and silt with shell fragments
- Dense to very dense silt, sand, and gravel (inferred glacial till)
- Sand and gravel with some fines (inferred advance outwash deposits or lens/interbed within the glacial sequence)
- Dense silt, sand, and gravel (inferred advance outwash deposits or possibly glacial till)

▼ Depth to water measured March 2015

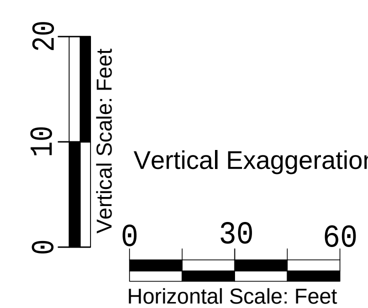
* Seattle Limousine Property

Notes:
1. All location are approximate.
2. Ground surface estimated from multiple sources, including: survey, GPS, and Google Earth elevation data.

Wet/Moisture in borings

Screened intervals

Bottom of logged boring



Vertical Exaggeration = 3X

Kennedy/Jenks Consultants

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Seattle, WA

Interpretive Geologic Cross Section A-A' and B-B'

Figure 10

1396024*00
August 2015

APPENDIX D
Potentiometric Surface Contour Maps Data

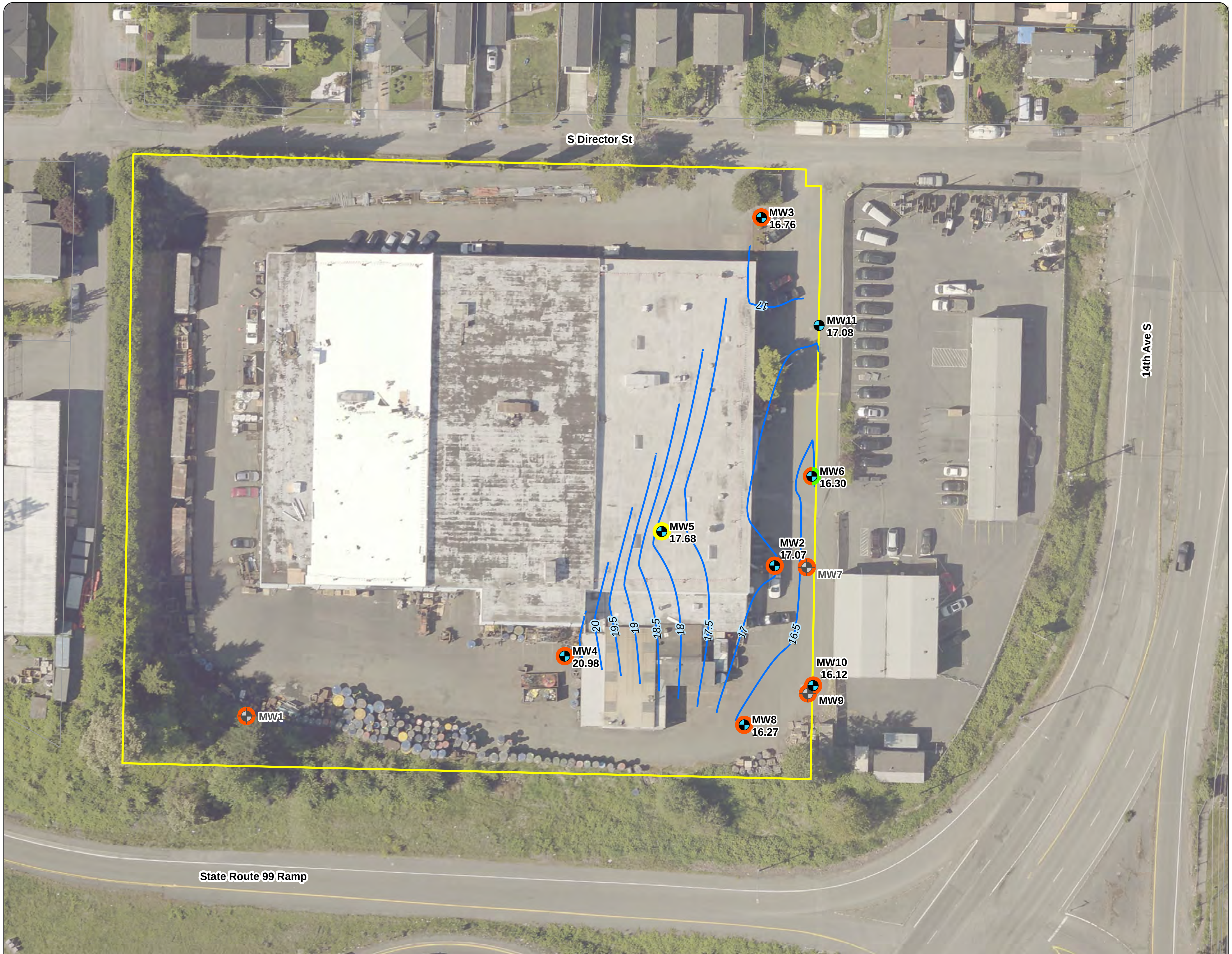

Figure C-1
Potentiometric Surface Map
Shallow Water Bearing Zone
July 2019

Precision Engineering, Inc.
Seattle, Washington

DRAFT

Legend

- Deep Monitoring Well
- Shallow Monitoring Well
- Groundwater Elevation (feet NAVD88)
- King County Parcels
- Property Parcel
- **CUL Exceedance**
- Dissolved Arsenic
- Dissolved Chromium
- TPH

Notes:
Exceedances shown represent detected concentrations above MTCA Method A, groundwater CULs; except for TCE, which represents an exceedance of the MTCA Method B vapor intrusion screening level for groundwater.
Deep monitoring wells are completed in the confined sand and gravel water-bearing zone.
Shallow monitoring wells are completed in the confined alluvial water bearing zone.
Water levels were measured on July 23 and 24, 2019.
Water level elevations were calculated from depth to water measurements using measuring point survey elevations obtained from September 5, 2014 survey data as provided in Kennedy/Jenks Consultants (2015).
CUL = cleanup level.
NAVD88 = North American Vertical Datum of 1988.
MTCA = Model Toxics Control Act.
TCE = trichloroethene.
TPH = total petroleum hydrocarbons.

0 50 100
Feet

Source: Aerial photograph obtained from King County (2019).
Well locations for MW01-MW08 obtained from survey conducted by Duncanson, Inc.

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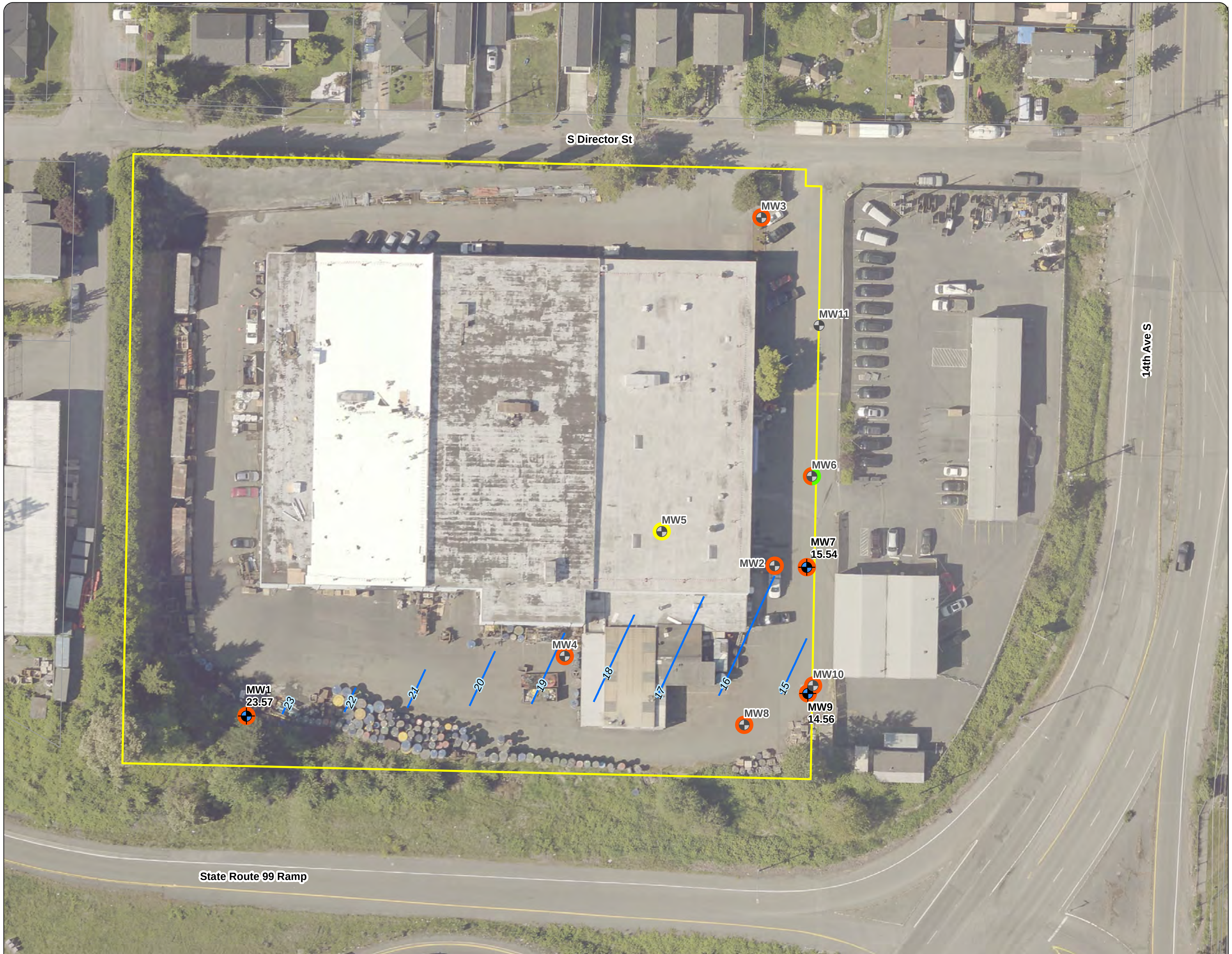
Figure C-2
Potentiometric Surface Map
Deep Water Bearing Zone
July 2019

Precision Engineering, Inc.
Seattle, Washington

DRAFT



Legend

- Deep Monitoring Well
- Shallow Monitoring Well
- Groundwater Elevation (feet NAVD88)
- King County Parcels
- Property Parcel

CUL Exceedance

- Dissolved Arsenic
- Dissolved Chromium
- TPH

Notes:
Exceedances shown represent detected concentrations above MTCA Method A, groundwater CULs; except for TCE, which represents an exceedance of the MTCA Method B vapor intrusion screening level for groundwater.
Deep monitoring wells are completed in the confined sand and gravel water-bearing zone.
Shallow monitoring wells are completed in the confined alluvial water bearing zone.
Water levels were measured on July 23 and 24, 2019.
Water level elevations were calculated from depth to water measurements using measuring point survey elevations obtained from September 5, 2014 survey data as provided in Kennedy/Jenks Consultants (2015).
CUL = cleanup level.
NAVD88 = North American Vertical Datum of 1988.
MTCA = Model Toxics Control Act.
TCE = trichloroethene.
TPH = total petroleum hydrocarbons.

0 50 100
Feet

Source: Aerial photograph obtained from King County (2019).
Well locations for MW01-MW08 obtained from survey conducted by Duncanson, Inc.

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Project:
Produced By: sturner
Approved By:
Print Date: 2/24/2021
Path: X:\1803.01_01\Projects\FigC2_Potentiometric_Surface_Map_Deep_July2019.mxd

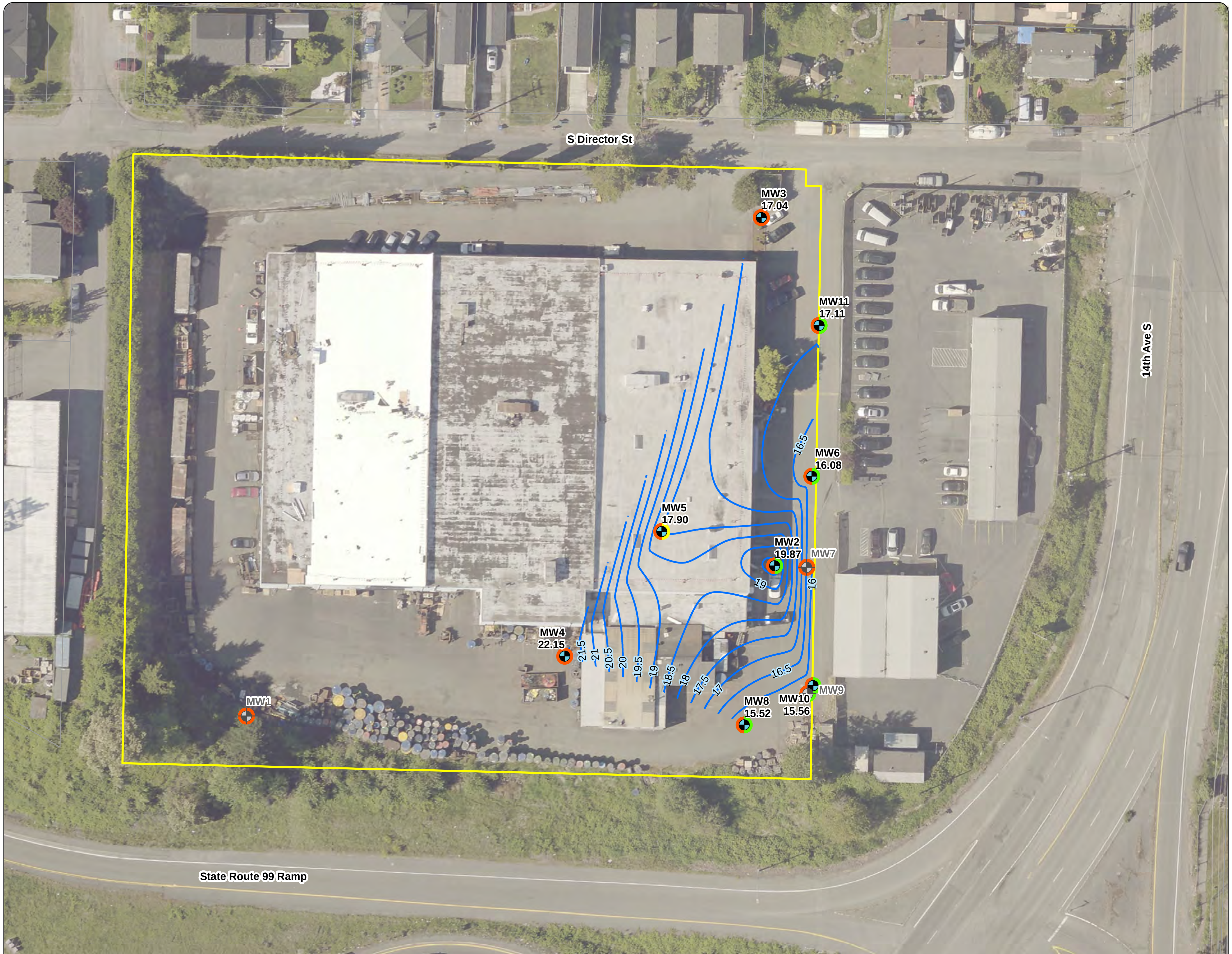

Figure C-3
Potentiometric Surface Map Shallow Water Bearing Zone December 2019

Precision Engineering, Inc.
Seattle, Washington

DRAFT

Legend

- Deep Monitoring Well
- Shallow Monitoring Well
- Groundwater Elevation (feet NAVD88)
- King County Parcels
- Property Parcel

CUL Exceedance

- Dissolved Arsenic
- Dissolved Chromium
- TPH

Notes:
Exceedances shown represent detected concentrations above MTCA Method A, groundwater CULs; except for TCE, which represents an exceedance of the MTCA Method B vapor intrusion screening level for groundwater.
Deep monitoring wells are completed in the confined sand and gravel water-bearing zone.
Shallow monitoring wells are completed in the confined alluvial water bearing zone.
Water levels were measured on December 17 and 18, 2019.
Water level elevations were calculated from depth to water measurements using measuring point survey elevations obtained from September 5, 2014 survey data as provided in Kennedy/Jenks Consultants (2015).
CUL = cleanup level.
NAVD88 = North American Vertical Datum of 1988.
MTCA = Model Toxics Control Act.
TCE = trichloroethene.
TPH = total petroleum hydrocarbons.

0 50 100
Feet

Source: Aerial photograph obtained from King County (2019).
Well locations for MW01-MW08 obtained from survey conducted by Duncanson, Inc.

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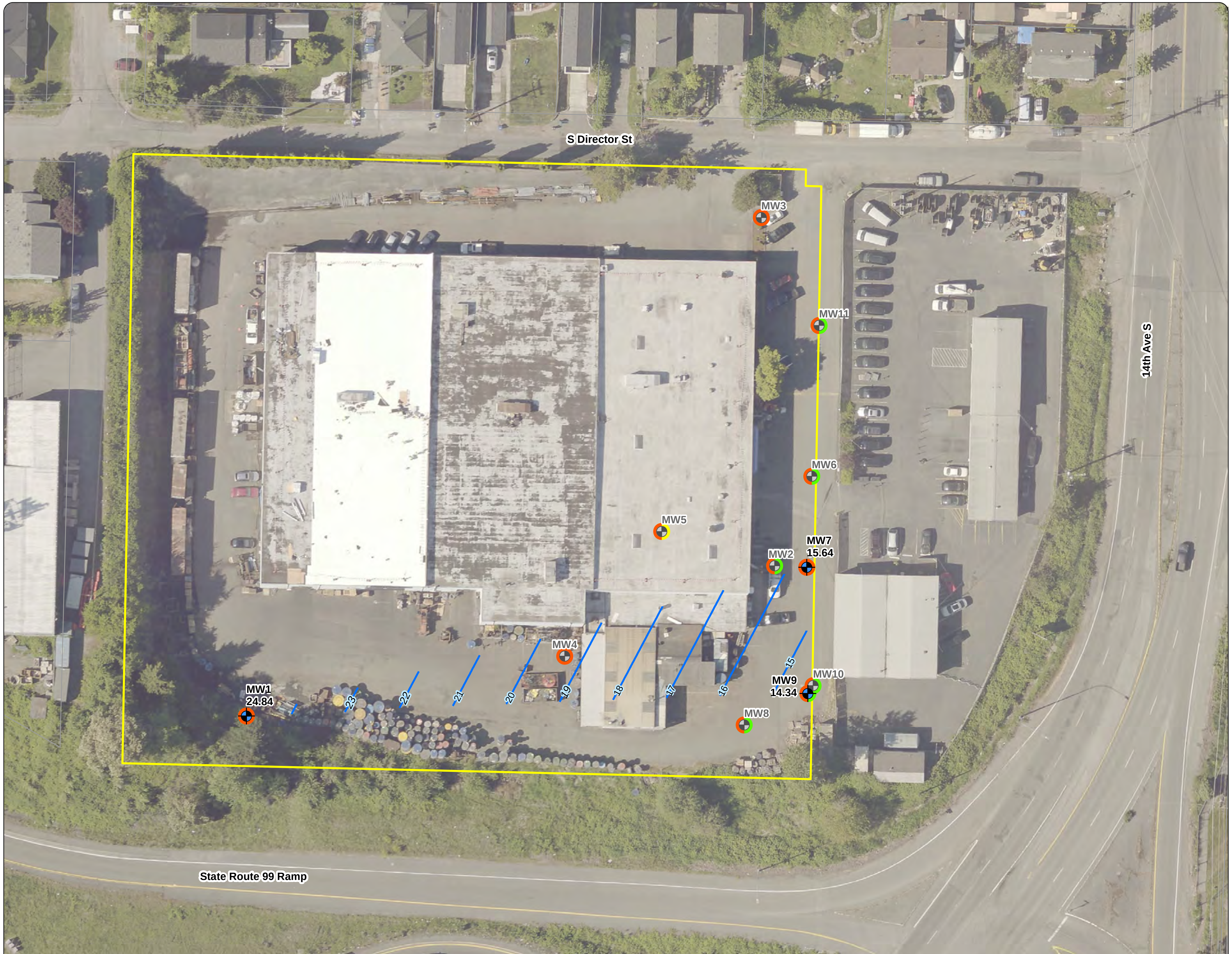
Path: X:\1803.01_01\Projects\FigC3_Potentiometric_Surface_Map_Shallow_Dec2019.mxd
Print Date: 2/24/2021
Approved By:
Produced By: sturner
Project:

Figure C-4
Potentiometric Surface Map
Deep Water Bearing Zone
December 2019

Precision Engineering, Inc.
Seattle, Washington

DRAFT



Legend

- Deep Monitoring Well
- Shallow Monitoring Well
- Groundwater Elevation (feet NAVD88)
- King County Parcels
- Property Parcel

CUL Exceedance

- Dissolved Arsenic
- Dissolved Chromium
- TPH

Notes:
Exceedances shown represent detected concentrations above MTCA Method A, groundwater CULs; except for TCE, which represents an exceedance of the MTCA Method B vapor intrusion screening level for groundwater.
Deep monitoring wells are completed in the confined sand and gravel water-bearing zone.
Shallow monitoring wells are completed in the confined alluvial water bearing zone.
Water levels were measured on December 17, 2019.
Water level elevations were calculated from depth to water measurements using measuring point survey elevations obtained from September 5, 2014 survey data as provided in Kennedy/Jenks Consultants (2015).
CUL = cleanup level.
NAVD88 = North American Vertical Datum of 1988.
MTCA = Model Toxics Control Act.
TCE = trichloroethene.
TPH = total petroleum hydrocarbons.

0 50 100
Feet

Source: Aerial photograph obtained from King County (2019).
Well locations for MW01-MW08 obtained from survey conducted by Duncanson, Inc.

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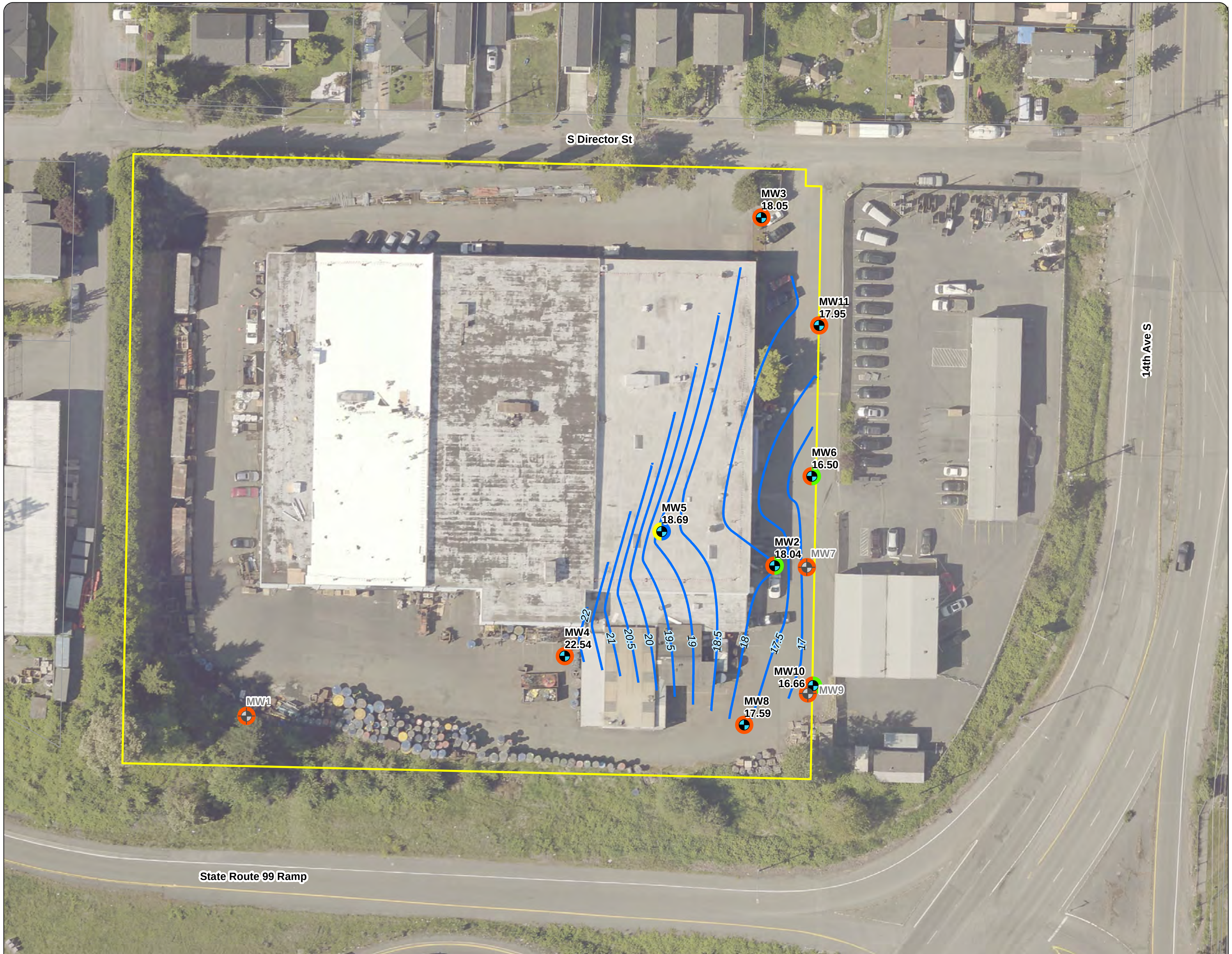
Path: X:\1803.01_01\Projects\FigC4_Potentiometric_Surface_Map_Deep_Dec2019.mxd
Print Date: 2/23/2021
Approved By:
Produced By: sturner
Project:

Figure C-5
Potentiometric Surface Map Shallow Water Bearing Zone January 2020

Precision Engineering, Inc.
Seattle, Washington
DRAFT



Legend

- Deep Monitoring Well
- Shallow Monitoring Well
- Groundwater Elevation (feet NAVD88)
- King County Parcels
- Property Parcel

CUL Exceedance

- Dissolved Arsenic
- Dissolved Chromium
- TCE
- TPH

Notes:
Exceedances shown represent detected concentrations above MTCA, Method A, groundwater cleanup levels; except for TCE, which represents an exceedance of the MTCA Method B vapor intrusion screening level for groundwater.
Deep monitoring wells are completed in the confined sand and gravel water-bearing zone.
Shallow monitoring wells are completed in the confined alluvial water bearing zone.
Water levels were measured on January 29, 2020.
Water level elevations were calculated from depth to water measurements using measuring point survey elevations obtained from September 5, 2014 survey data as provided in Kennedy/Jenks Consultants (2015).
CUL = cleanup level.
NAVD88 = North American Vertical Datum of 1988.
MTCA = Model Toxics Control Act.
TCE = trichloroethene.
TPH = total petroleum hydrocarbons.

0 50 100
Feet

Source: Aerial photograph obtained from King County (2019).
Well locations for MW01-MW08 obtained from survey conducted by Duncanson, Inc.

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Path: X:\1803.01_01\Projects\FigC5_Potentiometric_Surface_Map_Shallow_Jan2020.mxd
Print Date: 2/23/2021
Approved By:
Produced By: sturner
Project:

Figure C-6
Potentiometric Surface Map
Deep Water Bearing Zone
January 2020

Precision Engineering, Inc.
Seattle, Washington

DRAFT

Legend

- Deep Monitoring Well
- Shallow Monitoring Well
- Groundwater Elevation (feet NAVD 88)
- King County Parcels
- Property Parcel

CUL Exceedance

- Dissolved Arsenic
- Dissolved Chromium
- TCE
- TPH

Notes:
Exceedances shown represent detected concentrations above MTCA Method A, groundwater cleanup levels; except for TCE, which represents an exceedance of the MTCA Method B vapor intrusion screening level for groundwater.
Deep monitoring wells are completed in the confined sand and gravel water-bearing zone.
Shallow monitoring wells are completed in the confined alluvial water bearing zone.
Water levels were measured on January 29, 2020.
Water level elevations were calculated from depth to water measurements using measuring point survey elevations obtained from September 5, 2014 survey data as provided in Kennedy/Jenks Consultants (2015).
CUL = cleanup level.
NAVD88 = North American Vertical Datum of 1988.
MTCA = Model Toxics Control Act.
TCE = trichloroethene.
TPH = total petroleum hydrocarbons.

0 50 100
Feet

Source: Aerial photograph obtained from King County (2019).
Well locations for MW01-MW08 obtained from survey conducted by Duncanson, Inc.

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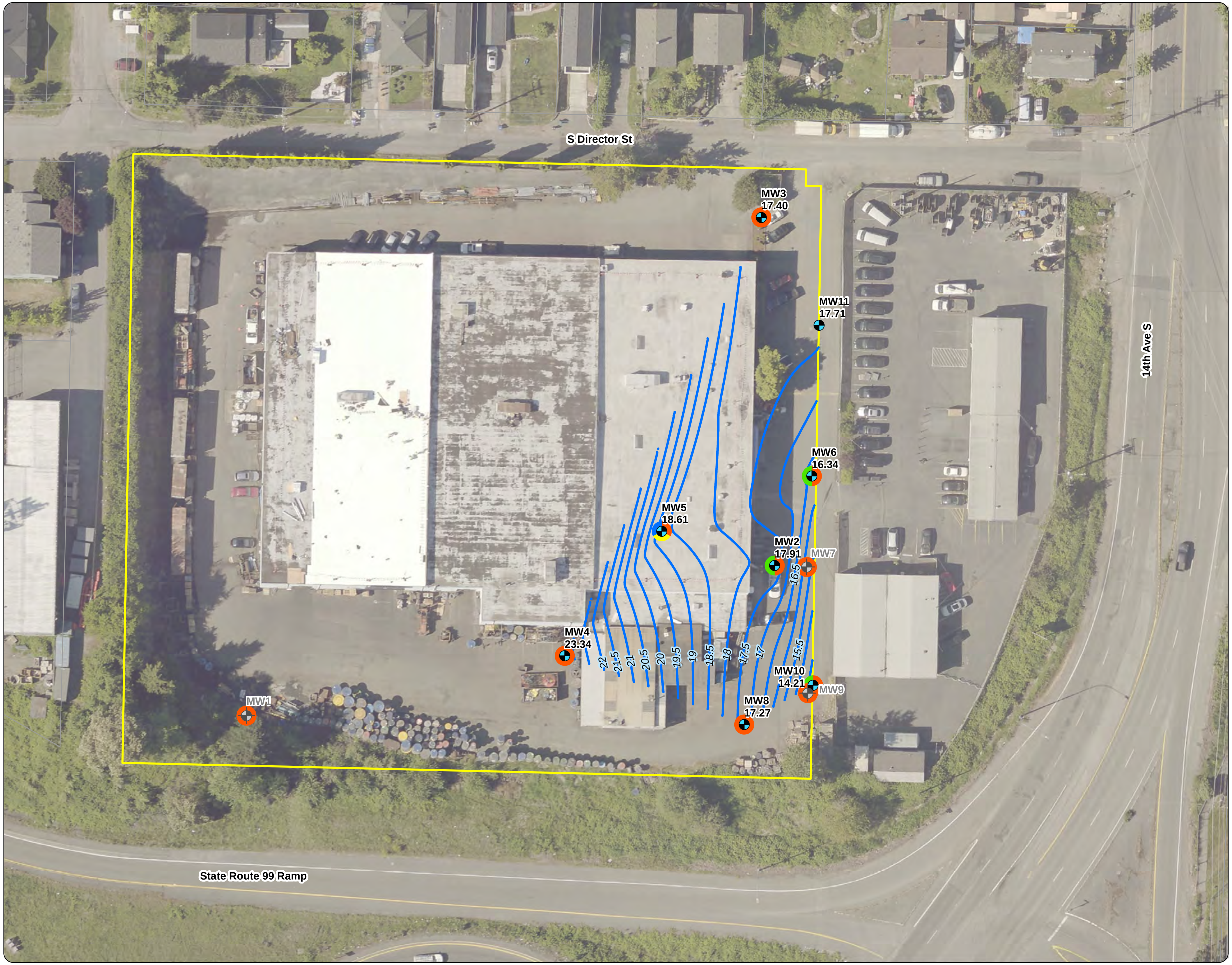
Path: X:\1803.01_01\Projects\FigC6_Potentiometric_Surface_Map_Deep_Jan2020.mxd
Print Date: 2/24/2021
Approved By:
Produced By: sturner
Project:

Figure C-7
Potentiometric Surface Map
Shallow Water Bearing Zone
April 2020

Precision Engineering, Inc.
Seattle, Washington

DRAFT



Legend

- Deep Monitoring Well
- Shallow Monitoring Well
- Groundwater Elevation (feet NAVD88)
- King County Parcels
- Property Parcel
- **CUL Exceedance**
- Dissolved Arsenic
- Dissolved Chromium
- TCE
- TPH

Notes:
Exceedances shown represent detected concentrations above MTCA Method A, groundwater CULs; except for TCE, which represents an exceedance of the MTCA Method B vapor intrusion screening level for groundwater.
Deep monitoring wells are completed in the confined sand and gravel water-bearing zone.
Shallow monitoring wells are completed in the confined alluvial water bearing zone.
Water levels were measured on April 28 and 29, 2020.
Water level elevations were calculated from depth to water measurements using measuring point survey elevations obtained from September 5, 2014 survey data as provided in Kennedy/Jenks Consultants (2015).
CUL = cleanup level.
NAVD88 = North American Vertical Datum of 1988.
MTCA = Model Toxics Control Act.
TCE = trichloroethene.
TPH = total petroleum hydrocarbons.

0 50 100
Feet

Source: Aerial photograph obtained from King County (2019).
Well locations for MW01-MW08 obtained from survey conducted by Duncanson, Inc.

MAUL FOSTER ALONGI
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Path: X:\1803.01_01\Projects\FigC7_Potentiometric_Surface_Shallow_April2020.mxd Print Date: 2/23/2021 Approved By: hgood Produced By: sturner Project: 1803.01.01

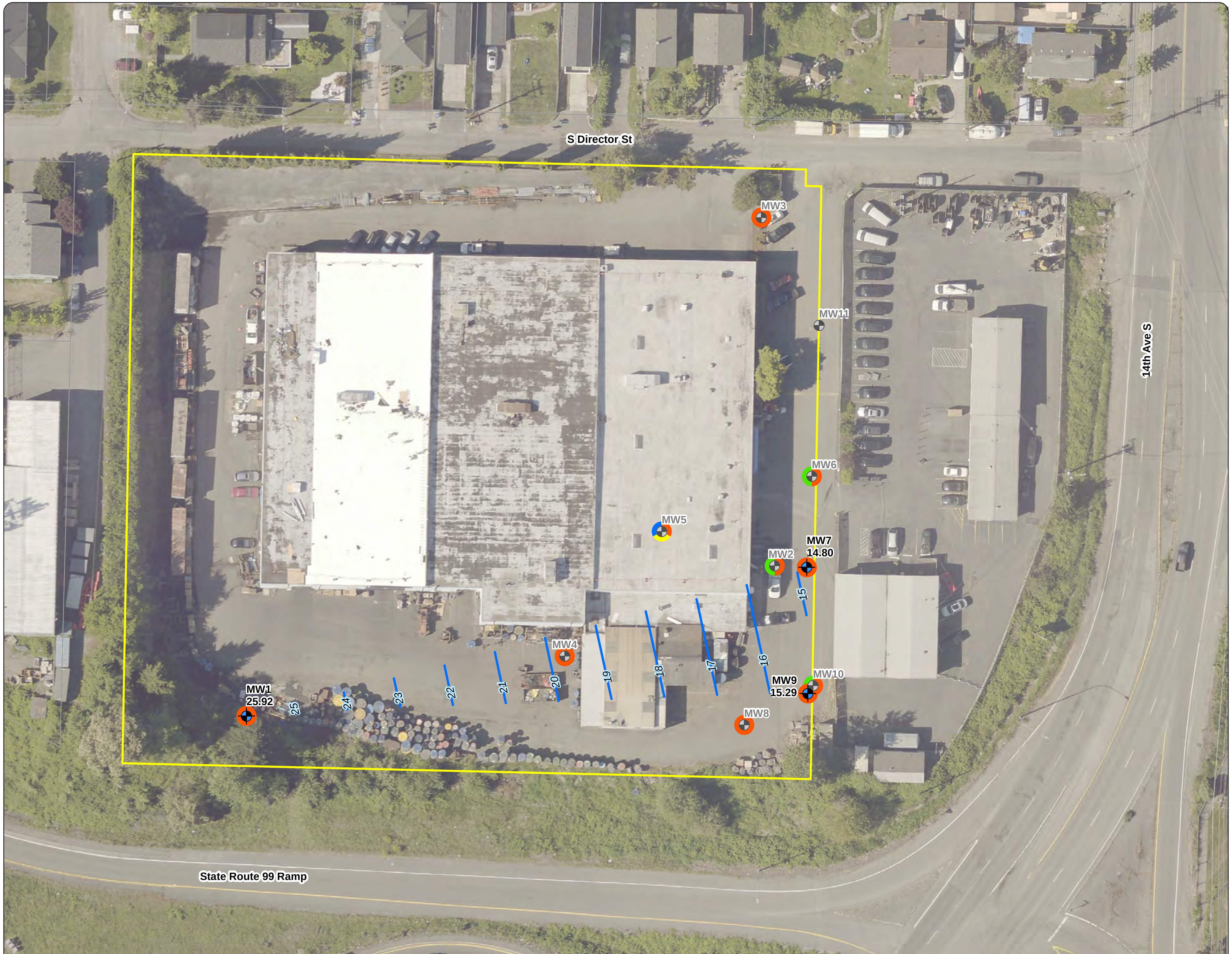

Figure C-8
Potentiometric Surface Map
Deep Water Bearing Zone
April 2020

Precision Engineering, Inc.
Seattle, Washington

DRAFT

Legend

- Deep Monitoring Well
- Shallow Monitoring Well
- Groundwater Elevation (feet NAVD88)
- King County Parcels
- Property Parcel

CUL Exceedance

- Dissolved Arsenic
- Dissolved Chromium
- TCE
- TPH

Notes:
Exceedances shown represent detected concentrations above MTCA Method A, groundwater CULs; except for TCE, which represents an exceedance of the MTCA Method B vapor intrusion screening level for groundwater.
Deep monitoring wells are completed in the confined sand and gravel water-bearing zone.
Shallow monitoring wells are completed in the confined alluvial water bearing zone.
Water levels were measured on April 28 and 29, 2020.
Water level elevations were calculated from depth to water measurements using measuring point survey elevations obtained from September 5, 2014 survey data as provided in Kennedy/Jenks Consultants (2015).
CUL = cleanup level.
NAVD88 = North American Vertical Datum of 1988.
MTCA = Model Toxics Control Act.
TCE = trichloroethene.
TPH = total petroleum hydrocarbons.

0 50 100
Feet

Source: Aerial photograph obtained from King County (2019).
Well locations for MW01-MW08 obtained from survey conducted by Duncanson, Inc.

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