Ecology Review Draft Remedial Investigation Report
Pederson's Fryer Farms
Pierce County, Washington

September 29, 2011

Prepared for

Washington State Department of Ecology

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EXECUTIVE SUMMARY

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LIST OF ABBREVIATIONS AND ACRONYMS

BGS	Below Ground Surface
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey

1.0 INTRODUCTION

This document presents the results of the remedial investigation (RI) for the former Pederson's Fryer Farms (PFF) property located at 2901 72nd Street East in Tacoma, Washington (the site). Responsibility for conducting the RI has been delegated to the Washington Department of Ecology (Ecology) in a bankruptcy court proceeding. Landau Associates was selected by Ecology to implement the RI.

Leaking underground storage tanks (USTs) at the site have resulted in releases of total petroleum hydrocarbons (TPH) and related constituents to soil and groundwater. Some preliminary RI (pre RI) cleanup actions included UST decommissioning and removal and TPH-impacted soil removal; however, prior and recent RI field investigations indicate that soil and groundwater contamination remains. This RI documents and characterizes the nature and extent of contamination at the PFF property and adjacent properties; an evaluation of site remediation alternatives will be presented in a separate feasibility study (FS) report. The location of the site is shown on the vicinity map on Figure 1-1.

1.1 SITE DESCRIPTION AND BACKGROUND

PFF operated as a poultry processing facility from 1948 to 1998. The former PFF property originally consisted of six separate parcels [Environmental Partners, Inc. (EPI) 2003a]. According to information on file at the Tacoma Public Library, PFF declared bankruptcy in 1996 and the business was sold to Foster Farms of Modesto, California in 1997. The poultry processing facility continued to operate until 1998 (EPI 2003a) when it was apparently closed. All six parcels have been sold and are owned by various entities. For convenience, these parcels have been designated as Parcels 1 through 6. Parcel locations, designated parcel names (e.g. Parcel 1), tax parcel numbers, and current parcel owners based on tax assessor records are shown on Figure 1-2.

Parcels 3 and 4 were determined to be clean and were sold in 2001 by the bankruptcy trustee, Steinberg and Associates (Environmental Associates 2001; EPI 2003a). The southern portion of Parcel 6 had a gas station (known as Dee Dee's Grocery). Remedial actions were implemented in the vicinity of the gas station and the site received a no further action (NFA) determination from Ecology in February 1998 (Facility Site ID 78151695); the site now hosts a seasonal farm stand. The primary focus of current remedial actions is on Parcels 1 and 2, currently owned by Waller Enterprises, LLC (herein referred to as the PFF property). Parcel 1 is the primary location of the former poultry processing plant where 10 separate USTs have been identified. Parcel 2 is an adjacent residential property where a single UST and a stockpile have been identified. Pipeline Road, owned by Tacoma City Water, separates Parcels 1 through

5 from Parcel 6. The Pipeline Road parcel (i.e., Parcel 7) is of interest since it is impacted by historical releases from the PFF property (EPI 2003a). The location of Parcel 7 is also shown on Figure 1-2.

Site documentation has identified the 11 historical USTs into seven locations on the PFF property. For convenience, each of these locations has been labeled as separate areas A through G. The 11 USTs contained gasoline, diesel, or heating oil. A description of each UST area is presented in Table 1-1 along with the current status of each UST. Excavated soil (the stockpile) from the Area B and Area C USTs is located on Parcel 2. The location of each UST area and the stockpile are shown on Figure 1-3.

1.2 REGULATORY FRAMEWORK

Site cleanup, including this RI and the FS, is being accomplished under the Washington State Model Toxics Control Act (MTCA). The site is not currently covered by an Ecology administrative action. Additionally, the site is not currently subject to the permit exemptions provided in RCW 70.105D.090. Regulatory authority over the site lies with the Tacoma Pierce County Health Department (TPCHD) and Ecology. TPCHD has authority to require cleanup of leaking UST sites in Pierce County. Ecology serves as the direct manager of site investigation and cleanup activities. Landau Associates has been contracted by Ecology to implement the RI/FS.

To facilitate the implementation of the RI/FS, Ecology is working with the former Pederson’s Fryer Farms insurance company and the current property owner (Russo family). Ecology finances the RI/FS work upfront and submits invoices to the insurance company for reimbursement every 30 days; this arrangement was determined by the bankruptcy court under a provision of an Agreement and Assignment (Ecology 2010). To facilitate project communication and invoicing, Landau Associates provides Ecology with monthly reports detailing all RI/FS activities. Ecology and Landau Associates work with the current property owner to keep them apprised of RI/FS progress and to facilitate site access for RI/FS field work.

1.3 PURPOSE

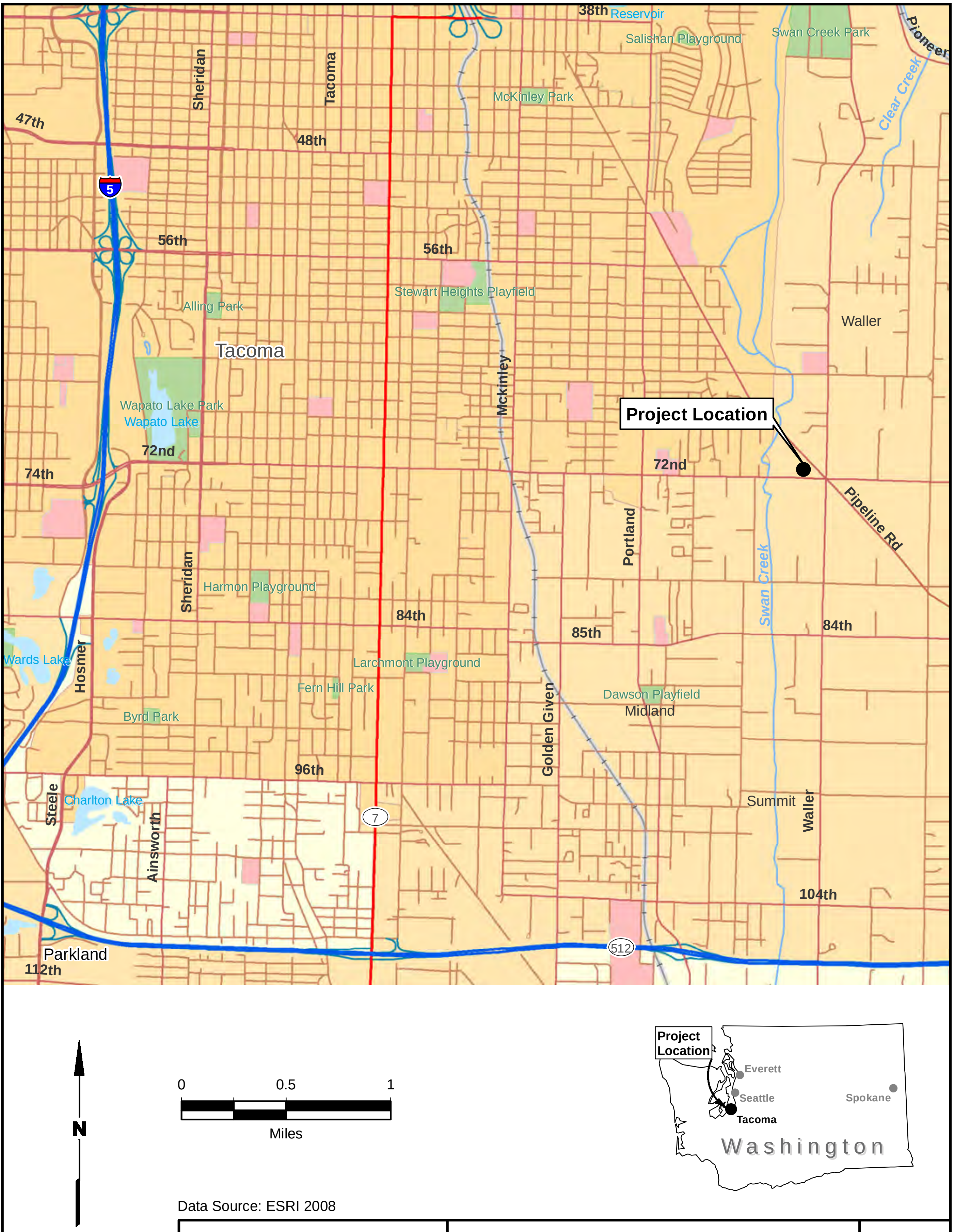
The purpose of the RI is to collect, develop, and evaluate sufficient information regarding the site to enable the evaluation of suitable remedial action alternatives in the FS and selection of a cleanup action. Specifically, the RI:

- Characterizes the nature and extent of contamination for affected media (i.e., soil and groundwater) using previous and current data from RI field investigations
- Presents a detailed conceptual site model
- Identifies applicable cleanup regulations and standards for affected media

This document presents the information collected and the evaluations performed to achieve this purpose.

1.4 REPORT ORGANIZATION

Section 2.0 of this report presents a summary of pre RI and current investigative activities conducted at the site for the RI. Section 3.0 presents the preliminary cleanup levels. Section 4.0 describes physical characteristics of the study area including the geology and hydrogeology. Section 5.0 presents the nature and extent of contamination. Section 6.0 presents a conceptual model of contaminant fate and transport. Section 7.0 describes the uses of this report and Section 8.0 provides references.



Data Source: ESRI 2008

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Landau Associates

Pederson's Fryer Farms
Pierce County, Washington

Vicinity Map

Figure
1-1

Y:\Projects\136006\MapDocs\RI Report\Fig1-2-Property.mxd 9/14/2011 NAD 1983 StatePlane Washington South FIPS 4602 Feet

Legend

① Property Numbering ID

- - - - Tax Parcel

Data Source: Pierce County GIS; I3 Imagery

Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

LANDAU ASSOCIATES

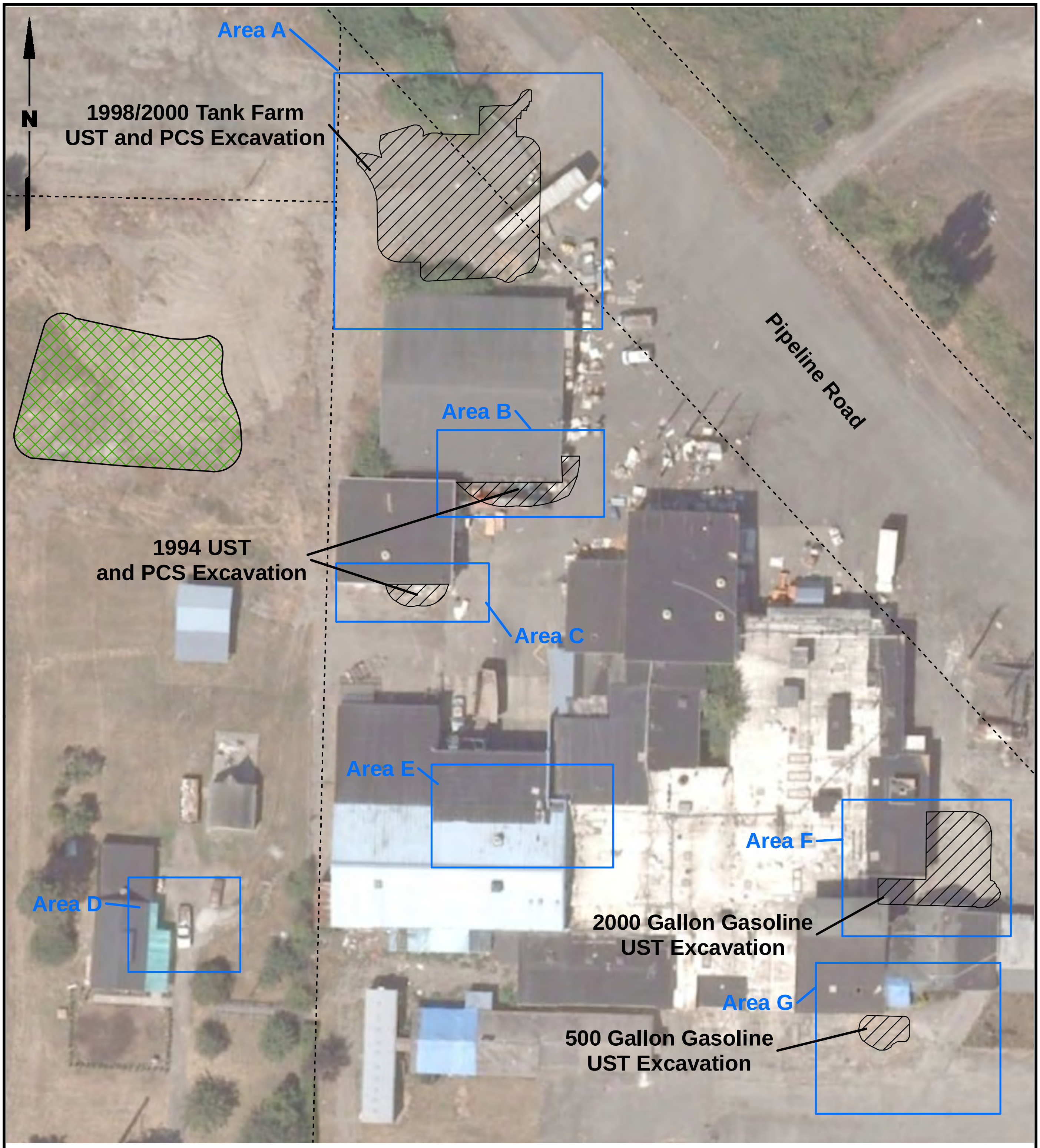
0 150 300

Scale in Feet

Pederson's Fryer Farms
Pierce County, Washington

Property Boundaries and Ownership

Figure
1-2



Legend

☐	Area of Concern
▨	Former Excavation Area
🟩	Area B and C Stockpile
------	Tax Parcel

Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

0 60 120

Scale in Feet

Data Source: Pierce County GIS;
Bing Maps Aerial 2010.

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LANDAU ASSOCIATES

Pederson's Fryer Farms
Pierce County, Washington

Areas of Concern

Figure
1-3

TABLE 1-1
SUMMARY OF AREAS OF CONCERN
PEDERSON'S FRYER FARMS RI

Area of Concern	Tank History	Tank Status	Residual Soil Contamination
Area A	Northern Tank Farm: - 12,000 gal diesel tank - 8,000 gal gasoline tank - 6,000 gal diesel tank - 550 gal new oil tank	All four tanks closed in place in January 1997. All four tanks removed in March 1998.	Residual soil impacts along the NE corner, east sidewall, south sidewall, SW corner, and throughout the bottom of the excavation. A smear zone also exists at the deep groundwater zone.
Area B	- 3,000 gal diesel tank - 6,000 gal unleaded gasoline tank - two pump islands	Tanks and pump islands removed in 1994	3,000 gal diesel tank excavation had clean confirmation samples. 6,000 gal tank had remaining contamination on east sidewall but low concentrations (22 and 31 mg/kg gas); Pump islands had remaining contamination on west sidewall extending beneath building and base of excavation (14 ft BGS) (2,420 and 1,470 mg/kg gasoline) with lower level gasoline detections on the northern wall (14 ft BGS) (66 mg/kg gasoline). Two soil borings were drilled in May 2011 which showed remaining contamination beneath the building (6.5 ft BGS) (100 mg/kg gasoline) and at NE corner of the original excavation (5 ft BGS and 15' BGS) (1100 mg/kg and 370 mg/kg gasoline).
Area C	300 gal waste oil tank	Tank removed in 1994	Contaminated soil remained along the north wall (against building) from 4 to 8 ft BGS (10000 mg/kg and 39000 mg/kg lube oil). Two soil borings were drilled in May 2011 which indicated that no waste oil soil contamination remains beneath the building or to the NE of the former excavation area.
Area D	500 gal heating oil tank	Closed in place in January 1997. Still exists on site.	One soil boring was drilled in May 2011 adjacent and northeast of the UST. Samples were collected at 7.5 ft and 12.5 ft BGS. Only low level lube oil contamination was detected at 77 mg/kg at 7.5 ft BGS.
Area E	8,000 gal diesel/heating oil tank	Closed in place January 1997. Decommissioned June/July 2011.	Eleven total soil borings have been drilled in Area E adjacent to the UST or related piping. Diesel low level contamination has been found along the east side of the UST, below the tank, south of the tank, and along the UST piping. Of the diesel detections, the highest concentrations just below or above preliminary MTCA clean up levels were south of the UST (10 ft BGS) (1300 mg/kg) and along the piping (9.5 ft BGS) (12000 mg/kg).
Area F	2,000 gal gasoline UST	Closed in place January 1997. Removed August 2000.	Contamination remained at the limits of excavation all the way around the SW finger of the excavation and south sidewall (under buildings). Three new soil borings and two monitoring wells were drilled in May 2011. Diesel contamination along the eastern edge of, northeast of, and east of the former excavation was not detected or was very low level for gasoline. However, gasoline contamination was detected above preliminary MTCA CULs through the excavation area (10 ft BGS) (110 mg/kg) and beneath the adjacent building to the west (1.5 ft and 4.5 ft BGS) (19000 mg/kg and 1900 mg/kg).
Area G	500 gal gasoline UST	Closed in place January 1997. Removed August 2000.	Contamination remained in the sidewall at the NE corner (near MW-15, partially under building and landscaping). One soil boring and two monitoring wells were drilled in May 2011. Gasoline contamination was detected above preliminary MTCA CULs just NE of the former excavation area (15 ft BGS) (1200 mg/kg) and further east (15 ft BGS) (110 mg/kg).

2.0 SITE INVESTIGATIONS

This section provides a description of (pre RI and RI site investigations. Section 2.1 presents pre RI investigations conducted prior to November 2010. Section 2.2 provides a general summary of RI site investigations conducted by Landau Associates beginning in November 2010 for the RI and the FS. Section 2.3 summarizes the site investigations by UST area (i.e., areas A through G).

2.1 PREVIOUS SITE INVESTIGATIONS

Initial investigations and remedial actions were performed between 1994 and 1998. A general timeline of initial site investigations and remedial actions includes:

- **1994** – Area B and Area C USTs and fuel islands were identified, decommissioned, and removed. Work was overseen by Saltbush Environmental Services, Inc. (Saltbush) for PFF. Actual UST removal contractor was Langseth Environmental Service Inc. (Langseth).
- **1996 –** Phase I/Phase II environmental site assessment (ESA) of Parcel 1 and Parcel 7. Site work included drilling and sampling soil borings near Parcel 1 USTs. Work done by Agra Earth and Environmental, Inc. (Agra) for Jacki Pederson.
- **1997** – The remaining USTs (Area A, D, E, F, and G) were located and temporarily closed in place. According to associated documentation, closure consisted of pumping out product, flushing and triple rinsing each tank. Fill ports were plugged with slurry and capped (Langseth 1997). Later, all but the two USTs in Areas D and E were removed (EPI 2003a). Work was done by Langseth directly for PFF.

All known site work that occurred between 1998 and 2006 was done by *EPI* on behalf of Steinberg & Associates. A summary of the EPI work includes:

- **1998** – Removal of the four Area A USTs. Soil confirmation samples were collected and petroleum impacted soil [350 cubic yards (yd^3)] was stockpiled at the site.
- **1999** –Initial limited site assessment consisting of six temporary monitoring wells installed and sampled at Areas A, B, E, F, and G.
- **2000**
  - Larger remedial excavation resulting from the evaluation of the 1998 Area A excavation confirmation soil samples. Confirmation soil samples were collected and petroleum impacted soil from Area A (3,737 yd^3) was stored at the site.
  - UST removal and associated remedial excavation of Area F and Area G USTs. During UST removal, confirmation soil samples were collected to determine the necessity of additional excavation. Both Area F and Area G were further excavated and soil confirmation samples were collected. Petroleum impacted soil from Area F (910 yd^3) and Area G (145 yd^3) were stored at the site.

  - Due to the large volume of soil removed from the Area A excavation as well as soil removed from the Area B, C, F, and G excavations, EPI conducted an *ex situ* soil bioremediation treatability study for petroleum impacted stockpiled soil. Based on the results of the treatability study, a full-scale version was proposed. Area B and Area C soil was determined to be "clean" and therefore did not need further treatment and remained as a stockpile dispersed on Parcel 2.

- **2001 through 2002**– Full scale *ex situ* bioremediation of the Area A, F, and G petroleum impacted stockpile soil (using soil windrows). Treated soil suitable for backfill combined with imported backfill material was used to fill the Area A, F, and G excavation cavities; treated soil unsuitable for backfill (625 yd^3) was hauled offsite for thermal treatment and disposal.
- **2001**
  - A Phase I ESA of Parcel 3 and Parcel 4 was done by Environmental Associates, Inc. for Vietnamese Buddhist Community Church c/o First Pacific Marketing.
  - Groundwater investigation of Areas A, B, F, and G. Monitoring wells MW-1 through MW-16 were installed; a grab sample was collected while advancing MW-7, but the well was immediately decommissioned. All other wells were sampled following development (2nd quarter) and during the dry season (3rd quarter).
- **2003**
  - Installation of monitoring well MW-17 following the final backfill of clean soil at the Area A excavation cavity.
  - Conducted four quarterly groundwater sampling events.
- **2004** – Additional groundwater investigation at Area A. Wells MW-7R and MW-18 through MW-22 were installed.
- **2004** – Conducting quarterly groundwater sampling during the 1st, 3rd, and 4th quarters.
- **2005** – Conducting quarterly groundwater sampling during the 2nd and 3rd quarters.

Historical site investigation documentation was evaluated while scoping current RI investigative work. A full list of report references associated with the above pre RI site investigations are presented in Appendix A. All EPI monitoring well locations and the Area B/Area C clean stockpile location are shown on Figure 2-1. Also shown on Figure 2-1 is the approximate extent of soil excavations at Areas A, B, C, F and G.

2.2 CURRENT SITE INVESTIGATIONS

No remedial actions were completed at the site from 2007 through 2009. In March 2010, Ecology completed an initial site reconnaissance in preparation for issuing a request for proposal for cleanup of the property. This initial reconnaissance included sounding the depth of each well and measuring groundwater levels.

Landau Associates began current PFF site investigations in late 2010. In November 2010, a complete round of water levels were collected from all EPI installed groundwater monitoring wells (MW-1 through MW-6, MW-7R, and MW-8 through MW-22); measurement of free product was also attempted using an oil interface probe.

In December 2010, all EPI (pre RI) wells were surveyed and a complete round of groundwater samples were collected using a combination of disposable bailers, a non-dedicated Grundfos™, and dedicated Waterra™ pumps (Waterra). Upon reviewing the December 2010 analytical results, Ecology requested that wells MW-4, MW-17, and MW-19 be resampled for constituents of concern [gasoline range organics (GRO), diesel range organics (DRO), oil range organics (ORO), and BTEX][1] and that additional parameters (sulfate and nitrate) be analyzed; this additional sampling occurred in February 2011. Wells MW-4, MW-17, and MW-19 were re-sampled using dedicated Watterra pumps and tubing, whereas all four locations were previously sampled with the non-dedicated Grundfos. A comparison of GRO, DRO, ORO, and BTEX concentrations from the December 2010 and February 2011 events is presented in Table 2-1. The February 2011 GRO concentration increased at MW-4 and MW-17. GRO concentrations exceeded current MTCA Method A cleanup level (CUL) of 800 µg/L at MW-17. The February DRO concentrations increased at all three wells; all three exceeded current MTCA Method A CUL of 500 µg/L. Following the February sampling event and the evaluation of the results, it was determined that dedicated Waterras and tubing would be used instead of the Grundfos. Disposable bailers continue to be used at wells that remain nearly dry year-round.

Groundwater data from the November 2010, December 2010, and February 2011 sampling events were evaluated and compared to historical data. To facilitate the data evaluation process, a Microsoft® Access database was created for PFF that includes all relevant historical data and RI data. Initial sampling and conceptual model review were the basis for scoping the RI. This scope is documented in an RI/FS work plan (Landau Associates 2011a) that was submitted to Ecology in April 2011 for approval. This RI/FS work plan was produced to further evaluate the current nature and extent of site contamination. Any modifications from the RI/FS work plan received Ecology approval prior to implementation. All RI and FS field work is summarized in sections 2.2.1 and 2.2.2.

2.2.1 REMEDIAL INVESTIGATION FIELD INVESTIGATION

RI field work began in March 2011. A summary of RI field work is as follows:

- **May 2011** – RI drilling program

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[1] GRO, DRO, and ORO are collectively referred to as TPH. Volatile TPH constituents: benzene, toluene, ethylbenzene and xylenes are collectively referred to as BTEX.

  - Pumped out product from Area E UST for initial investigation
  - Drilled 19 soil borings; 10 of the borings were indoors and required the use of a limited access rig (a geoprobe); the other nine were outside and drilled using hollow-stem auger
  - Drilled four shallow groundwater monitoring wells
  - Drilled seven deep groundwater monitoring wells
  - Collected soil samples from all soil borings and monitoring well borings for chemical analysis
  - Collected borehole groundwater samples from select soil borings for chemical analysis
  - Decommissioned seven pre RI groundwater monitoring wells
  - Sampled four confirmation soil samples from the Area B/C stockpile (previously determined to be clean by EPI)
  - Used GPS to record locations of all outdoor soil borings
- **May 2011** – Began monthly groundwater level collection events
- **June 2011**
  - Conducted early and late June groundwater quality sampling events
  - Surveyed all wells and indoor soil borings
- **June/July 2011** – Pumped, rinsed, inerted, and decommissioned Area E UST in place with concurrence and necessary permits from TPCHD, Ecology, and Pierce County Fire Marshall
- **July 2011**
  - Installed data loggers in monitoring wells MW-6, MW-27D, and MW-32D, installed a barologger in well MW-27D; data from the loggers is downloaded monthly
  - Conducted 8 hour free product recovery pilot test; disposal company retrieved recovered groundwater the following day
- **July/August 2011 –** Completed investigation derived waste disposal (i.e., drilling soil, groundwater, and decontamination water); associated documentation is compiled in Appendix B.

The location of RI soil borings, RI wells, pre RI wells, decommissioned pre RI wells, and the Area B/C stockpile samples are shown on Figure 2-1. During the RI, existing wells, new wells and outdoor soil boring locations were surveyed and measured with a GPS or hand measured depending on their location. Survey information for wells is presented in Table 2-2. The location and elevation information for RI soil borings is presented in Table 2-3.

RI soil borings A-2 and A-3 and wells MW-23D and MW-24D were all proposed to be on Parcel 7, which is owned by Tacoma Public Utilities (TPU). TPU allowed soil borings A-2 and A-3 to be drilled during the May 2011 drilling program via the issuance of a limited right of entry; however, TPU had not provided permit approval for the drilling and installation of wells MW-23D and MW-24D. Meanwhile, upon evaluating the May 2011 drilling program data results and updating the site conceptual model, it was determined that additional deep groundwater data from Parcel 1 and Parcel 2 were needed to further define the nature and extent of contamination. This additional drilling scope is documented in an RI/FS work plan addendum (Landau Associates 2011b). The additional RI scope includes indoor air sampling at a building near Area F and Area G. Indoor air sampling requirements are summarized in Ecology's *Draft Guidance for Remediation of Petroleum Contaminated sites* (Ecology 2010b).

Ecology approved the RI/FS work plan addendum on August 9, 2011. The RI/FS addendum field work was scheduled for September 14 through September 23, 2011. Site access for Parcel 7 has not been received from TPU. Since Ecology already has site access for Parcel 6[2] directly east of Parcel 7, well MW-23D will be moved to Parcel 7. MW-23D may be installed in the future. The RI/FS addendum field work results will be incorporated into the FS report. All RI site access agreements and permits are provided in Appendix C.

2.2.2 FEASIBILITY STUDY FIELD INVESTIGATION

The RI/FS work plan discussed three preliminary remedial options and associated pilot tests for the FS: Monitored Natural Attenuation (MNA), Free Product Recovery, and Enhanced Passive Bioremediation. During the early June 2011 groundwater sampling event, MNA parameters were analyzed for select wells as defined in the RI/FS work plan. The Free Product Recovery pilot test was conducted in July 2011. The Enhanced Passive Bioremediation pilot test (i.e. clear water injection) was conducted in August 2011. The data results and evaluation for these three remedial options will be discussed in detail in the FS report.

2.3 AREA SPECIFIC INVESTIGATION SUMMARY

Areas A through G have undergone various remedial investigations and interim actions to date. A summary of work overseen or done by past consultants is listed above under Section 2.1; a summary of work overseen or done by Landau Associates is discussed above under Section 2.2. Individual summaries of the relevant historical and current investigative work by UST area are discussed below. Limited data results are presented in the following sections to the extent that they are relevant to subsequent investigation activities. Results are compared to MTCA Method A CULs for groundwater and Method A soil CULs for unrestricted land uses. A complete summary of the data and the nature and extent of contamination is presented in Section 5.0.

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[2] Ecology and Smith's Landing LLC (Parcel 6) finalized a site access agreement on April 15, 2011. See Appendix C.

2.3.1 AREA A

A total of four USTs were located in Area A, also known as the northern tank farm. The Area A USTs included: 12,000-gallon and 6,000-gallon diesel tanks, an 8,000-gallon gasoline tank, and a 550-gallon oil[3] tank. The date of installation for these tanks is unknown. The first known Area A investigative work was the Phase I/Phase II ESA done in 1996 by Agra. Agra had a total of seven soil borings drilled east, northeast, and immediately adjacent to the USTs, the deepest of which was 33.5 ft below ground surface (BGS). The soil samples were analyzed for one or more of the following: GRO, DRO, ORO, BTEX, and carcinogenic polycyclic aromatic hydrocarbons (cPAHs). Results indicated that three samples taken from two separate soil borings adjacent to the USTs exceeded the MTCA Method A CUL for GRO (30 mg/kg) at depths of 19 ft BGS, 31 ft BGS, and 33.5 ft BGS. The 31 ft BGS and the 33.5 ft BGS samples also exceeded the MTCA Method A CUL for DRO (2,000 mg/kg). Agra also collected two groundwater borehole samples: one adjacent to the tanks (Parcel 1); one northeast on Parcel 7. Groundwater results from both boring locations exceeded the MTCA Method A cleanup level for GRO, DRO, and ORO. In addition to these main constituents of concern, the borehole sample adjacent to the USTs exceeded the MTCA CULs for cPAHs.

In 1997, Langseth performed temporary UST closures of the four Area A USTs. In 1998, EPI removed the four Area A USTs and stockpiled 350 yd^3 of TPH impacted soil onsite for later disposal; soil confirmation samples indicated that contamination remained. Soil confirmation samples were collected from the sidewalls and bottom of the excavation cavity and additional test pits. These data indicated that the extent of TPH impacts extended beyond the excavation limits both horizontally and vertically (EPI 2003a).

In 1999, EPI did an initial limited site assessment that included two temporary wells (EPI-MW-3 and EPI-MW-4) in Area A screened in a shallow water bearing zone (between 25 ft and 35 ft BGS, and 15 ft and 25 ft BGS, respectively). Groundwater samples from one well were analyzed for GRO, DRO, ORO, and BTEX and the other was analyzed for DRO and ORO only. Samples from the first well exceeded MTCA Method A CULs for GRO, DRO, and total xylenes. Samples from the second well exceed the DRO concentrations CUL.

In 2000, EPI conducted a large interim remedial excavation at Area A. The extent of this second excavation included the 1998 excavation extent but was deeper and covered a larger area. The excavation was about 60 ft by 65 ft and extended to a depth of 27 ft BGS. The excavation depth terminated at 27 ft BGS due to sidewall sloughing concerns. Sixty-four sidewall and 44 bottom confirmation soil samples

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[3] This oil tank is referred to as a “new” oil tank. It is not clear what is meant by the term “new” since it was not defined in historical environmental reports.

were collected. Twenty-eight confirmation soil samples exceeded the MTCA Method A CUL for DRO. The highest confirmation soil sampling result for DRO was 48,000 mg/kg along the east side wall at 12 ft BGS. The excavated petroleum impacted soil (approximately 3,737 yd^3) was stored at the site for later disposal.

Later in 2000, EPI conducted *ex situ* soil bioremediation via a treatability study onsite (EPI 2003a). The study was successful and resulted in full scale *ex situ* bioremediation operation, which included the use of soil windrows. Treated soil was used to backfill the Area A excavation with the concurrence of Ecology and TPCHD. In addition to the treated soil, 1,626 yd^3 of clean imported backfill was used to supplement treated soil. At the Area A excavation, an impermeable liner was placed at 10 ft BGS in anticipation of an additional remediation scheme that was never implemented (EPI 2003a). After windrow soil was removed for backfill or offsite disposal, confirmation soil samples were collected from the windrow locations (EPI 2003a). Windrows on Parcel 3 were sampled in 2001 for GRO, DRO, ORO, and BTEX. None of the samples exceeded MTCA cleanup levels. Windrows on Parcels 5 and 6 were sampled in September 2002 for GRO, DRO, ORO, and cPAHs. One of the windrows on Parcel 6 exceeded the MTCA Method A CUL for cPAHs. Additional soil was excavated and the area was resampled in November 2002. The resample soil concentrations met the cPAH CUL.

In 2001, 2003, and 2004: a total of thirteen groundwater monitoring wells were installed in or adjacent to Area A. These wells include MW-1 through MW-6, MW-7R, and MW-17 through MW-22. EPI conducted groundwater sampling events between 2001 and 2005.

In 2006, EPI submitted a remediation systems pilot test work plan (EPI 2006). The work plan focused on Area A. General objectives of the work plan scope were to evaluate hydraulic and pneumatic properties of the subsurface by applying pilot scale dual phase extraction technologies at MW-17 and MW-20. There is no documentation that the work plan scope was implemented. Submittal of this work plan appears to be the last major remedial action activity conducted by EPI at the site.

In May 2011, Landau Associates drilled five soil borings (A-1 through A-5) and installed three new groundwater monitoring wells [one shallow (MW-26S); two deep (MW-25D and MW-27D)][4]. Soil samples and groundwater borehole samples (A-2, A-3, A-4, and A-5) were collected in accordance with the RI/FS work plan.

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[4] Shallow wells are defined as wells with the bottom of the well screen at or above 45 ft BGS. Deep wells are defined as wells with the bottom of the well screen deeper than 45 ft BGS.

2.3.2 AREA B

Historical petroleum contaminant sources at Area B included two gasoline pump islands, one 6,000-gallon gasoline UST, and one 3,000-gallon diesel UST. The first documented investigative work at this area was the UST and fuel island assessment, decommissioning, and removal done in 1994 by Saltbush. The tanks were removed along with approximately 100 to 120 yd^3 of TPH contaminated soil that was stockpiled northwest of the storage building on Parcel 2. Confirmation soil samples associated with the diesel and gas tanks were below current MTCA Method A CULs for GRO[5] and DRO. During the excavation, there was no field evidence of a leak from the two USTs though there was evidence of a release around the pump islands (Saltbush 1994). During the pump island excavation, there was a noticeable gasoline odor at 3 ft to 4 ft BGS. After completing the excavation, bottom and confirmation soil samples were collected. The western sidewall samples detected gasoline (by Method WTPH-418.1) and xylenes above MTCA CUL at 14 ft BGS. Additionally, two bottom confirmation samples detected gasoline above the MTCA CUL.

During the 1996 Agra Phase I/Phase II ESA, one soil boring was drilled just northeast of the former Area B fuel islands along the associated piping. Soil samples were collected at 11 ft and 20 ft BGS and were analyzed for gasoline and BTEX. The 11 ft BGS sample had gasoline, ethylbenzene, and xylene concentrations above current MTCA CULs; all other analyses were below detectable limits. The 20 ft sample data results were all below detectable limits.

In 1999, EPI did an initial limited site assessment that included one temporary well (EPI-MW-5) in Area B screened in a shallow water bearing zone (screened between 10 ft and 20 ft BGS). Groundwater samples were analyzed for GRO, DRO, ORO, and BTEX. Results showed GRO, DRO, ORO, and total xylenes concentrations above current MTCA Method CULs. In 2000, all Area B and Area C soil stockpiled following the 1994 remedial excavation was evaluated as part of EPI's *ex situ* soil bioremediation treatability study. During this treatability study, EPI determined that the stockpiled Area B/Area C soil was clean and required no further treatment. This soil remains as a dispersed stockpile on Parcel 2.

In 2001, three groundwater monitoring wells were installed in, or adjacent to, Area B. These wells are MW-8, MW-9, and MW-10. Subsequent groundwater sampling events were conducted by EPI through 2005. From 2001 through 2005, all three wells were noted to be dry during at least one sampling event. In 2010, Landau Associates sampled all pre RI groundwater monitoring wells. In May 2011,

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[5] The MTCA Method A cleanup level for soil is either 30 mg/kg or 100 mg/kg depending on the concentration of BTEX constituents. The cleanup level has preliminarily been set at 30 mg/kg until the percentage of BTEX in soil can be documented.

Landau Associates drilled two shallow soil borings (B-1 and B-2) in Area B and one deep well (MW-28D) northeast of Area B. Soil samples were collected in accordance with the RI/FS work plan.

2.3.3 AREA C

In 1994, the Area C UST was removed in conjunction with Area B UST removal (Saltbush 1994). The Area C UST was a 300-gallon waste oil tank. The tank was apparently formerly an above ground tank that was later buried. During excavation, it was noted that the tank was damaged. Approximately 50 to 60 yd^3 of TPH contaminated soil was removed and placed with the stockpile for Area B USTs. Confirmation samples were collected for TPH by Method WTPH-418.1. Semivolatile organic compound (SVOC) and polychlorinated biphenyl (PCB) analyses were also apparently collected, though the results were not reported (Saltbush 1994). It appears that the total excavation depth was about 6 ft BGS as shown in drawings from the UST removal report. Some contamination was left in place on the north sidewall underneath the adjacent building. The observed oil was described as heavy, but was not explicitly identified as ORO. Two north sidewall confirmation soil sample results exceeded the DRO and ORO MTCA Method A CULs. The maximum concentration was 39,000 mg/kg (Method WTPH-418.1).

During the 1996 Agra Phase I/Phase II ESA, one indoor soil boring was drilled just north of the former Area C UST. A soil sample was collected at 11 ft BGS and was analyzed for heating oil by method WTPH-D; heating oil was not detected. In 2000, all Area C soil stockpiled following the 1994 remedial excavation was evaluated as part of EPI's *ex situ* soil bioremediation treatability study. During this treatability study, EPI determined that Area C soil was clean and required no further treatment, so it was dispersed as a stockpile on Parcel 2.

In 2001, EPI drilled, installed, sampled (at time of drilling), and decommissioned one temporary groundwater monitoring well (MW-7) in Area C. Soil samples were collected at depths between 7 ft and 25 ft BGS and were analyzed for gasoline, diesel, heating oil, and BTEX. DRO and ORO were detected at 7 ft and 10 ft BGS; GRO and BTEX were not detected in any samples. Groundwater samples were analyzed for VOCs; only 1,1-dichloroethane was detected at 8.0 µg/L.

In May 2011, Landau Associates drilled one shallow soil boring (C-1), one shallow well (MW-34S), and one deep well (MW-31D) in Area C. Soil samples were collected in accordance with the RI/FS work plan.

2.3.4 AREA D

Area D consists of a 500-gallon heating oil tank formerly associated with a residence on Parcel 2. The heating oil tank was closed in place in 1997 (Langseth 1997). The tank has not been removed and no investigations had been conducted until 2010.

During a site reconnaissance visit by Landau Associates on November 4, 2010, the exact location of the tank could not be identified, but a vertical concrete pipe believed to be the UST fill port was noted. In March 2011, a geophysical investigation was done to locate the Area D (and Area E) UST and any associated structures or anomalies. For the Area D UST, electromagnetic (EM-61) and ground penetrating radar (GPR) techniques were used. The UST was interpreted to be 5.5 ft long with a diameter of 4 ft. The depth to the top of the UST from the ground surface appeared to be 1.2 ft. The associated geophysical investigation report is provided in Appendix D.

In May 2011, Landau Associates drilled one 15-ft soil boring (D-1) along the northeast corner of the Area D UST. Field screening did not indicate the presence of heating oil contamination and groundwater was not encountered.

2.3.5 AREA E

Area E consists of an 8,000-gallon diesel/heating oil tank located beneath one of the Parcel 1 buildings. During the 1996 Agra Phase I/Phase II ESA, three indoor soil borings were drilled using a limited access hollow stem auger rig. Two borings were drilled west and one south of the UST (Agra 1996). The soil borings were drilled down to 16.5 ft BGS (sample collected at bottom), 12 ft BGS (sample collected at 11.5 ft BGS), and 16 ft BGS (sample collected at bottom). Field observations indicate that the soil was moist to wet between 5 ft and 15 ft BGS. All samples were analyzed for TPH (by Method WTPH-HCID); results were below detectable limits. In 1997, the tank was closed in place (Langseth 1997). No additional investigations had been conducted in Area E until 2010.

During a site reconnaissance visit by Landau Associates on November 4, 2010, the exact location of the tank could not be identified; however, it was apparent that the general area of the tank location had limited overhead access. The ceiling height of the portion of the building built over the tank is approximately 12 ft. Additionally, the doorway opening height leading into that portion of the building is 7 ft.

During the March 2011 geophysical investigation: EM-61, GPR, and radiodetection (RD) techniques were used to locate the Area E UST and associated piping (Duoos 2011). Due to the equipment interferences resulting from the presence of heavy rebar in the reinforced concrete building slab, GPR and EM-61 did not prove to be effective. The RD equipment helped to locate what was later determined to be old 3-inch diameter piping extended from the UST fill port to the old boiler room. During the geophysical survey, the location of the fill port was identified. The fill port was noted to be filled with CDF (consistent with Langseth documentation); however, the orientation of the tank remained unclear. Following the geophysical survey, Landau Associates confined space entry certified field personnel entered a crawl space located approximately where the Area E UST former piping was detected. The UST was not observed but piping was noted to extend northwest and east from the crawl space. This observation was consistent with the supposition that the piping connected to the boiler, which is located east of the Area E UST. It also indicated that piping for the boiler may have connected to a secondary tank that was located outside the building on the north side.

A phone call was made to Langseth to ask about the UST orientation. Langseth connected Landau Associates with former property owner Larry Pederson, who met Landau Associates field personnel at the site on April 5. Mr. Pederson recalled that the tank was oriented east to west, which was inconsistent with the documentation by Agra in their Phase I/Phase II ESA.

On May 3, Glacier Environmental Services removed CDF from the Area E UST fill pipe to provide access to the UST. On May 5, Drain-Pro, Inc. removed approximately 1,500 gallons of product and residual liquid from the Area E UST and disposed of it at Marine Vacuum Services, Inc. Immediately after the contents were removed, APS conducted a video survey of the UST to document the tank condition, orientation and dimensions. Also on May 5, Cascade Concrete Sawing and Drilling (Cascade Concrete) did coring prep work for six indoor soil boring locations and saw cut a 4ft by 4ft area over the tank to assist with the future Area E UST decommissioning activity.

On May 5 and May 6, 2011: six indoor soil borings were drilled (E-1, E-2, E-3, E-5, E-6, and E-7) using a direct push probe and collected a borehole sample at E-2. Three soil borings were drilled around the UST (E-2 to the east, E-1 to the west, and E-3 to the south) and three were drilled along the former UST piping (E-5, E-6, and E-7). The E-2 groundwater grab sample was collected from the bottom of the boring using a temporary screen on the direct push tooling. Soil samples and the groundwater borehole sample were collected in accordance with the RI/FS work plan.

Preparation for and the execution of the Area E UST decommissioning occurred during May and June 2011. Landau Associates obtained a UST decommissioning permit from TPCHD on May 12, 2011 and a Flam/Comb Tank Removal Permit from the Pierce County Fire Prevention Bureau on May 23, 2011; permits are in Appendix C. The Area E UST decommissioning project was scheduled to occur over a four day period. On June 29, Green Earthworks Construction (GEC) and their subcontractor Drain-Pro, Inc. inerted and cleaned the Area E UST via a triple rinse. Following the cleaning process an opening was cut in the bottom of the UST to allow drilling and sampling below the tank. Prior to drilling, the tank dimensions were measured and found to be 8 ft (diameter) by 21.25 ft (length). On June 30, Cascade Drilling and Landau Associates drilled and sampled two borings [one beneath the tank (E-4) and one south of the tank (E-3a)] to depths of 25 ft and 30 ft BGS, respectively. On July 1, GEC filled the UST with CDF. On July 6, GEC patched the concrete surface slab.

2.3.6 AREA F

A single 2,000-gallon gasoline UST was located in Area F. The UST was located on the east side of the large southern-most building on Parcel 1. During the 1996 Agra Phase I/Phase II ESA, three soil borings were drilled using a strataprobe: one east of UST, one west of UST, and one approximately 40 ft northeast of the UST (Agra 1996). The borings next to the tank were drilled to 22 ft BGS and 31 ft BGS with samples collected at various depths. One sample from each boring had TPH detections. Gasoline and benzene were detected at the 11 ft BGS sample from the boring west of the UST; the concentration was 12 mg/kg (below CUL) and 0.1 mg/kg (above CUL), respectively. Gasoline was also detected at the 7 ft BGS sample collected from the boring east of the UST (adjacent to UST vent piping). The concentration was 340 mg/kg (above CUL). BTEX constituents were also detected in this sample above CULs. Analytical results and field observations of soil from the northeast boring did not indicate the presence of TPH soil contamination.

In 1997, Langseth performed a temporary UST closure of the Area F UST. In 2000, EPI removed the UST and took soil confirmation soil samples adjacent to the tank. During removal, the tank was reported to be in good condition but tank piping appeared to be cracked and there was visual and olfactory evidence of TPH contamination. Based on confirmation sample analytical results, a large remedial excavation was performed (EPI 2003a). The excavation extended to a depth of 14 ft BGS between two buildings; the maximum extent of the excavation was 25 ft BGS. The lateral extent of the excavation was limited by concerns that building footings may be undermined. A total of 910 yd^3 of TPH contaminated soil was removed. The soil was treated as part of EPI's full scale *ex situ* bioremediation operation (see Section 2.3.1). Treated soil was used to backfill the Area F excavation with the concurrence of Ecology and TPCHD.

Thirty-nine final confirmation soil samples were collected during the 2000 excavation. Nine of these samples exceeded current MTCA Method A CUL primarily for GRO; the maximum concentration was 3,000 mg/kg. At least one of the four BTEX constituents exceeded MTCA Method A cleanup samples in four locations. In addition to TPH and BTEX analyses, two samples were collected from the excavated soil and sampled for lead. The maximum lead concentration was 6 mg/kg. This value is consistent with background soil lead concentrations (Ecology 1994).

In May 2011, Landau Associates drilled two outdoor soil borings (F-1 and F-2), one shallow indoor soil boring (F-3), one shallow well (MW-35S), and one deep well (MW-29D). Soil samples were collected in accordance with the RI/FS work plan.

2.3.7 AREA G

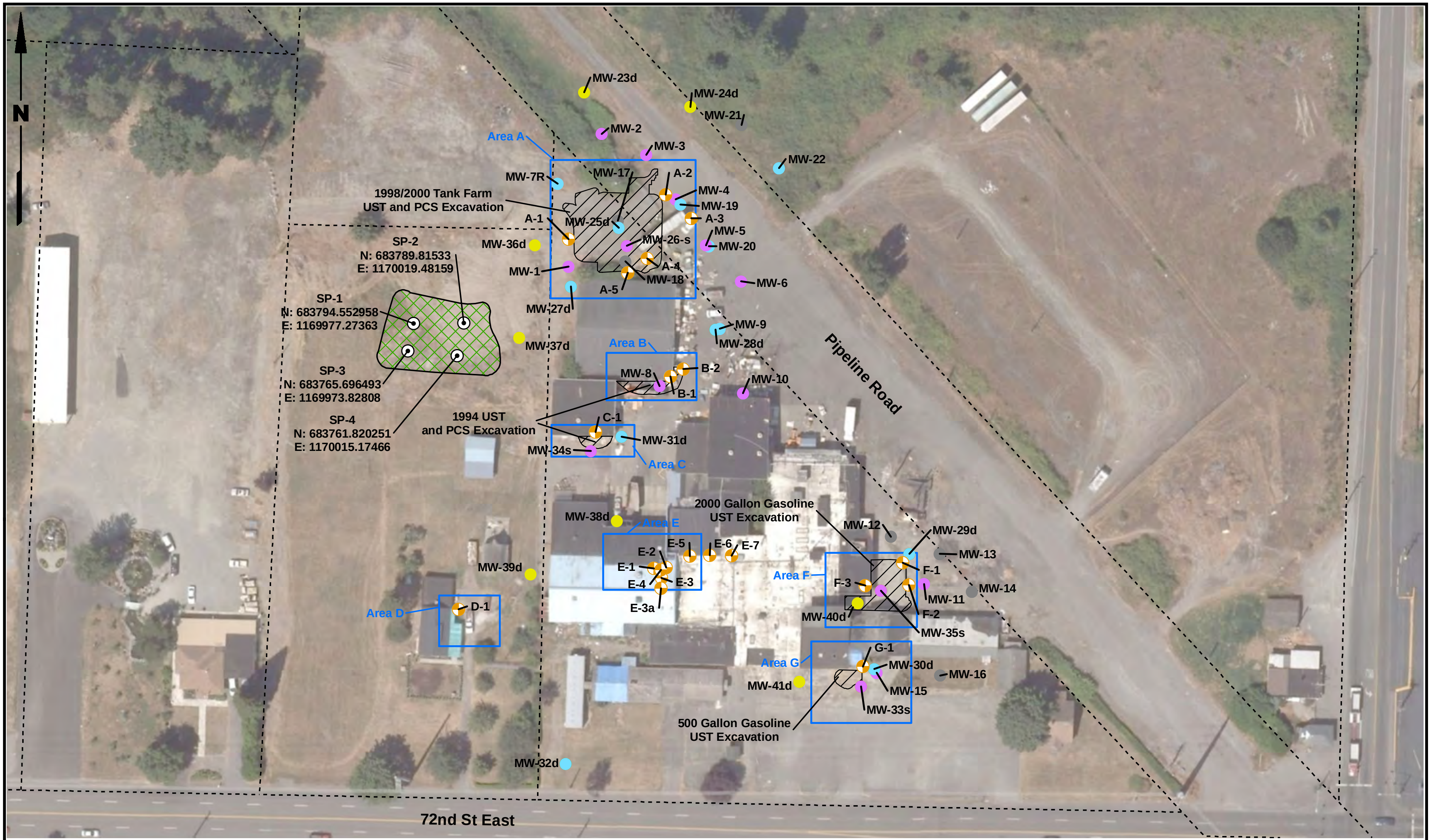
A single 500-gallon gasoline UST was located in Area G. The UST was located on the south side of the large southern-most building. During the Agra 1996 Phase I/Phase II ESA, two soil borings were drilled using a strataprobe: one north and one south of the UST (Agra 1996). The northern boring was drilled to 14 ft BGS and the southern boring was drilled to 16 ft BGS. One sample was collected at each boring: one at 10 ft BGS and one at 11 ft BGS. Although field observations had indicated the trace presence of a hydrocarbon, analytical results for WTPH-HCID were below detectable limits.

In 1997, Langseth performed a temporary UST closure of the Area G UST. In 2000, EPI removed the UST and took soil confirmation samples adjacent to the tank. Based on confirmation sample analytical results, a remedial excavation was performed (EPI 2003a). The excavation extended to a depth of 14 ft BGS. The lateral extent of the excavation was limited by concerns that the building footing may be undermined. A total of 145 yd^3 of TPH contaminated soil was removed. The soil was treated as part of EPI's full scale *ex situ* bioremediation operation (see Section 2.3.1). Treated soil was used to backfill the Area G excavation with the concurrence of Ecology and TPCHD.

Twenty-eight final confirmation soil samples were collected. Only three samples exceeded current MTCA Method A CULs samples for GRO or BTEX constituents. The maximum GRO concentration was 183 mg/kg. In addition to GRO and BTEX analyses, two samples were collected from the excavated soil and sampled for lead. The maximum lead concentration was 4 mg/kg. This value is consistent with background soil lead concentrations (Ecology 1994).

In May 2011, Landau Associates drilled one outdoor soil boring (G-1), one shallow well (MW-33S), and one deep well (MW-30D) in Area G. Soil samples were collected in accordance with the RI/FS work plan.

Y:\Projects\136006\MapDocs\RI Report\Fig2-1-SiteExplorationPlan.mxd 9/15/2011 NAD 1983 StatePlane Washington South FIPS 4602 Feet



● Proposed Deep Monitoring Well
● Decommissioned Wells
● Existing Monitoring Well - Deep
● Existing Monitoring Well - Shallow

◐ Boring
⊙ Stockpile Sample Locations
- - - Tax Parcel
☐ Area of Concern

▨ Former Excavation Area
▦ Area B and C Stockpile

Data Sources: Pierce County GIS;
Bing Maps Aerial 2010.

Notes
1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

0 120 240
Scale in Feet

LANDAU ASSOCIATES

Pederson's Fryer Farms
Pierce County, Washington

Site Exploration Plan

Figure
2-1

TABLE 2-1
COMPARISON OF INITIAL RI SAMPLING RESULTS FOR SELECT WELLS
PEDERSON'S FRYER FARMS RI

Well	GRO (mg/L)		BTEX (ug/L)		DRO (mg/L)		ORO (mg/L)	
	Dec-10	Feb-11	Dec-10	Feb-11	Dec-10	Feb-11	Dec-10	Feb-11
MW-4	ND	**0.11**	ND	ND	**0.31**	**0.66**	ND	ND
MW-17	**0.35**	**2.4**	ND	ND	**2.5**	**410**	ND	ND
MW-19	**0.56**	**0.35**	ND	ND	**0.17**	**4.7**	ND	ND

GRO = Gasoline Range Organics
BTEX = Benzene, Toluene, Ethylbenzene, and Xylene
DRO = Diesel Range Organics
ORO = Oil Range Organics
ND = not detected
Bold = Detected compound.text is above current MTCA Method A cleanup level
Box = Exeeds current MTCA Method A cleanup level

TABLE 2-2
MONITORING WELL SURVEY
PEDERSON'S FRYER FARMS RI

Well Name	Northing	Easting	Well Monument Rim Elevation	Top of 2" PVC Elevation	Ground Elevation
MW-1	683836.91	1170109.24	406.03	405.66	--
MW-2	683948.81	1170137.22	404.60	404.19	401.53
MW-3	683931.57	1170175.11	402.27	401.82	--
MW-4	683893.73	1170199.69	404.13	403.78	--
MW-5	683855.05	1170225.46	405.74	405.31	--
MW-6	683824.50	1170254.79	406.00	405.66	--
MW-7R	683906.90	1170100.17	405.13	404.82	--
MW-8	683736.04	1170186.29	410.21	409.90	406.90
MW-9*	683784.55	1170236.91	407.09	406.80	--
MW-10	683730.00	1170256.64	407.31	406.95	--
MW-11	683568.83	1170409.54	407.51	406.99	--
MW-12*	683609.10	1170381.54	406.37	406.11	--
MW-13*	683594.68	1170422.54	406.65	406.36	--
MW-14*	683562.80	1170449.64	Obliterated	407.11	407.50
MW-15	683494.22	1170369.24	409.43	409.06	--
MW-16*	683491.91	1170422.82	409.48	408.99	--
MW-17*	683875.71	1170151.09	405.53	405.22	--
MW-18*	683841.41	1170157.43	406.32	406.11	--
MW-19	683889.41	1170203.71	404.30	403.97	--
MW-20	683854.11	1170227.87	405.78	405.57	--
MW-21*	683956.51	1170255.41	405.38	405.00	401.48
MW-22	683920.24	1170287.10	405.79	405.03	402.53
MW-25D	683869.77	1170151.91	405.53	404.90	405.53
MW-26S	683854.44	1170158.68	405.97	405.52	405.97
MW-27D	683820.237	1170111.519	406.38	405.85	406.38
MW-28D	683783.99	1170233.359	407.09	406.79	407.09
MW-29D	683594.779	1170396.826	407.35	406.88	407.35
MW-30D	683497.266	1170367.161	409.38	409.05	409.38
MW-31D	683693.504	1170153.992	407.21	406.80	407.21
MW-32D	683417.431	1170106.817	407.35	406.88	407.35
MW-33S	683482.792	1170356.254	409.23	408.88	409.23
MW-34S	683681.206	1170128.32	406.65	406.26	406.65
MW-35S	683563.55	1170373.138	407.97	407.59	407.97

Survey: Coordinate System and Zone: Washington State Plane, South Zone Coordinates.
Horizontal Datum: NAD 83(91), South Zone, US FEET. Vertical Datum: NAVD88, US FEET.
Ground elevation surveyed for above-ground monuments and MW-14. MW-14 was originally a flush mount but was obliterated so it could not be surveyed.
All units in feet.
-- = No data
* = Decommissioned well

TABLE 2-3
SOIL BORING LOCATION - SURVEY AND GPS COORDINATES
PEDERSON'S FRYER FARMS RI

Soil Boring Name	Method	Northing	Easting	Ground Elevation
B-1	Survey	683744.08	1170195.37	407.37
B-2	GPS	683750.45	1170206.34	--
C-1	Survey	683692.26	1170140.27	408.85
E-1	Survey	683582.03	1170181.17	408.74
E-2	Survey	683582.84	1170191.62	408.83
E-3	Survey	683574.16	1170187.64	408.76
E-3a	Hand	683565.36	1170187.24	--
E-4	Hand	683580.98	1170187.24	--
E-5	Survey	683592.46	1170211.91	409.32
E-6	Survey	683593.38	1170228.57	409.29
E-7	Survey	683592.91	1170246.85	409.40
F-1	GPS	683568.13	1170396.45	--
F-2	GPS	683568.13	1170396.45	--
F-3	Survey	683567.70	1170359.93	408.09
G-1	GPS	683499.238	1170357.667	--

Coordinate System and Zone: Washington State Plane, South Zone Coordinates

Horizontal Datum: NAD 83(91), South Zone, US FEET.

Vertical Datum: NAVD88, US FEET.

-- Not measured

Hand = measured with a tape; Survey = professional survey; GPS = measured with a global positioning system

To convert elevations shown hereon to NGVD29 elevations please subtract 3.47 From NAVD88 values.

3.0 PRELIMINARY CLEANUP LEVELS

Site preliminary cleanup levels are determined during the RI for use in evaluating site cleanup alternatives in the FS. The PFF site preliminary cleanup levels were developed by doing the following: (1) developing and evaluating the preliminary conceptual site model (CSM); (2) selecting screening criteria; and (3) screening site data to determine the constituents of concern. These three steps are discussed in Sections 3.1, 3.2, and 3.3, respectively. The determined preliminary cleanup levels for the site are discussed in Section 3.4.

3.1 PRELIMINARY CONCEPTUAL SITE MODEL

The preliminary CSM represents current site conditions, identifying potential sources of hazardous substances, potentially affected media, and potential migration and exposure pathways for human and ecological receptors. It considers current conditions and future land use in assessing potential exposure pathways. Only complete pathways result in exposure. A complete pathway includes a source and mechanism of release, an exposure medium, and an exposure route by which contact can occur. A diagram of the CSM is shown on Figure 3-1. Potential sources at the site primarily include historical releases from USTs listed in Table 1-1 by area (e.g. Area A) and associated distribution piping. Information about each UST area is presented in Section 2.0 and is discussed throughout this RI. Releases from holes in the USTs, piping, and connections and spills or overfills associated with the USTs are the primary release mechanisms by which constituents of concern may be transferred from the sources to affected environmental media. Secondary release mechanisms include leaching and infiltration from soil into groundwater and vapor migration from soil into indoor air spaces. The media affected by primary and secondary release mechanisms include soil, groundwater, and indoor air.

Groundwater elevation monitoring has occurred over a number of years beginning in 2001. Based on recent groundwater elevation data, including new RI monitoring wells, flow in the deeper groundwater bearing zone is generally to the north and northwest. However, local groundwater mounding has been observed in the vicinity of the former Area A tank farm and Area F tank excavation, which creates local groundwater gradients away from the center of the mound. This mounding is likely due to the more granular fill used for excavation backfill resulting in local groundwater recharge zones for the deeper groundwater table. Shallow groundwater at the site is discontinuous and heavily influenced by seasonal weather and storm-related precipitation. A more detailed description of site hydrogeology is presented in Section 4.0.

Potential human and ecological receptors were identified for the site based on current and reasonable future site land use. It is anticipated that the site will retain its industrial character and that future land uses will be consistent with the current zoning and land use regulations. It appears that the site will meet the MTCA definition for industrial property (WAC 173-340-200 and WAC 173-340-745) although Ecology has not made a determination that industrial land use represents the reasonable maximum exposure. Potential human receptors include:

- Industrial Workers – site employees/workers/tenants
- Temporary Construction Workers – Personnel temporarily working at the site during non-routine maintenance or construction activities
- Future Residents – Adults or children who may, in the future, reside on the property currently part of the site
- Water Supply Consumers – Adults and children who consume privately supplied water impacted by constituents of concern from the site.

There are no likely potential ecological receptors applicable to the site. Although MTCA requires consideration of terrestrial plants and animals that may potentially be exposed to hazardous substances, the site is expected to qualify for exclusion from further terrestrial ecological evaluation under WAC 173-340-7491(1)(b) because virtually all contaminated soil is or will be covered by buildings, paved roads, pavement, or other physical barriers that will prevent exposure. An institutional control, as required by WAC 173-340-440, will have to be established so long as contamination remains in soil at 15 feet or less BGS.

The complete exposure pathways with a low potential for exposure identified for qualitative evaluation in the RI include:

- Potential exposure of temporary construction workers via ingestion, dermal contact, and inhalation (particulate and volatile emissions) of constituents of concern in onsite soil
- Potential exposure of temporary construction workers via dermal contact and inhalation of constituents of concern in groundwater
- Potential exposure of industrial workers via inhalation of volatile compounds in indoor and outdoor air from constituents of concern in groundwater and soil
- Potential future exposures of offsite residents to constituents of concern in groundwater used as a drinking water source via ingestion, dermal contact, and inhalation.
- Potential future exposures of onsite residents to constituents of concern in soil and groundwater via ingestion, dermal contact, and inhalation.

These exposure pathways will be considered in development of screening and preliminary cleanup levels in Sections 3.2 and 3.4.

3.2 SCREENING CRITERIA

Soil and groundwater screening criteria were developed based on the CSM and MTCA requirements. These criteria are summarized below.

3.2.1 SOIL SCREENING CRITERIA

Soil screening criteria were developed for unrestricted land use in accordance with WAC-173-340-740. Although it appears the site will meet the MTCA definition for an industrial property, Ecology has not made a determination that industrial land use represents the reasonable maximum exposure. Therefore, the screening criteria will be based on MTCA Method A unrestricted land use clean up levels rather than industrial. Using the unrestricted land use provides a conservative evaluation of constituents for initial screening of data and addresses potential exposure pathways identified in the CSM, including potential exposure of future onsite residents and protection of groundwater potentially used as drinking water.

Per WAC 173-340-704, “Method A may be used to establish cleanup levels at sites that have few hazardous substances and … sites where numerical standards are available in this chapter for applicable state and federal laws for all indicator hazardous substances in the media for which the Method A cleanup level is being used.” Per WAC 173-340-740(2)(b), under MTCA Method A, soil cleanup levels for unrestricted land uses must be at least as stringent as all of the following:

- MTCA Method A table values (WAC 173-340-900, Table 740-1)
- Concentrations established under state and federal laws
- Concentrations that do not exceed natural background or the practical quantitation limit (PQL) for indicator hazardous substances for which there are no MTCA table values or applicable state and federal laws.

The soil to vapor pathway was also considered in evaluating the use of Method A soil cleanup levels as screening criteria due to the confirmed presence of petroleum constituents beneath site buildings. Ecology draft guidance on vapor intrusion (Ecology 2009) indicates that:

> Consistent with WAC 173-340-740(3)(b)(iii)(C)(III), at sites where soil cleanup levels are being established that will be protective of groundwater as a drinking water resource, these levels are likely to be low enough to be protective of indoor air via the VI pathway. However, this cannot be assumed at all sites.

Based on the draft guidance, the Method A cleanup level can be used as a screening level, but cannot automatically be assumed to be protective of indoor air via the vapor intrusion pathway. Therefore, if cleanup to Method A levels is ultimately performed, confirmation indoor air samples will have to be collected to demonstrate the protectiveness of final contaminant concentrations in soil relative to the vapor intrusion pathway.

Based on the evaluation above and because all contamination at the site is apparently resultant from gasoline, diesel, or heating oil UST releases, the MTCA Method A table values (WAC 173-340-900, Table 740-1) are applicable as screening criteria for the site. Soil screening criteria are presented in Table 3-1.

3.2.2 GROUNDWATER SCREENING CRITERIA

Similar to the screening level for soil, the Method A cleanup levels for groundwater are considered applicable and will be used as screening criteria for the site. Groundwater at the facility is not used as drinking water; however, to provide a conservative evaluation of constituents, and to address potential exposure pathways identified in the CSM, screening criteria were based on drinking water as the highest potential beneficial use for groundwater. Per WAC 173-340-720(3)(b), under MTCA Method A, groundwater cleanup levels for potable water must be at least as stringent as all of the following:

- MTCA Method A table values (WAC 173-340-900, Table 720-1)
- Concentrations established under state and federal laws, including MCLs established under the Safe Drinking Water Act (SDWA; 40 CFR 141), MCL goals for non-carcinogens established under the SDWA; MCLs established by the state board of health (WAC 246-290)
- Concentrations that do not exceed natural background or the PQL for indicator hazardous substances for which there are no MTCA table values or applicable state and federal laws.

Based on these criteria, the MTCA Method A table values (WAC 173-340-900, Table 720-1) are applicable as screening criteria for the site. Groundwater screening criteria are presented in Table 3-2.

3.3 CONSTITUENTS OF CONCERN

Constituents of concern were identified as those constituents that exceeded the screening criteria. Soil data results indicated that the constituents of concern for soil are:

- GRO
- DRO
- ORO
- BTEX
- Napthalene

Groundwater data results indicated that the constituents of concern for groundwater are:

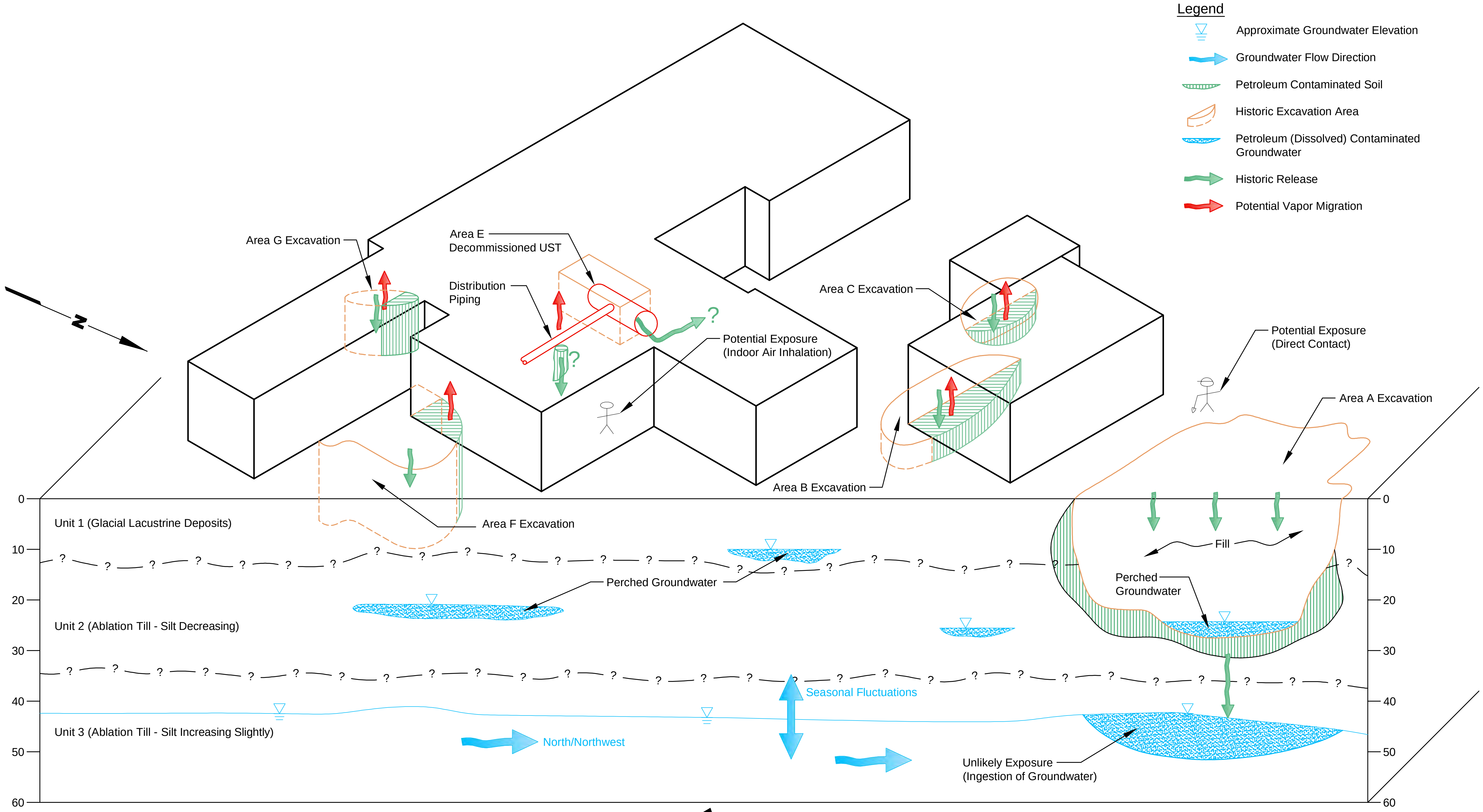
- GRO
- DRO
- ORO

- Benzene
- Xylenes

As part of the RI, sampling was also performed for PCBs, lead, fuel additives [1,2-dibromoethane (EDB), 1,2-dichloroethane (EDC), and methyl tertiary-butyl ether (MTBE)], and cPAHs at various locations across the site. Lead and cPAHs were detected in soil and groundwater at several locations; however, the concentrations did not exceed the respective screening criteria. Therefore, none of these contaminants are considered constituents of concern.

3.4 PRELIMINARY CLEANUP LEVELS

Preliminary cleanup levels were developed for all constituents that exceeded screening criteria in a given media; therefore, preliminary soil and groundwater cleanup levels were developed for the constituents of concern in soil and groundwater identified in Section 3.3. Groundwater and soil preliminary cleanup levels are summarized in Tables 3-1 and 3-2, respectively. Final site cleanup levels will be established by Ecology in the cleanup action plan (CAP) following completion of the RI and FS.



Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

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Peterson's Fryer Farms | V:\136\006\010.012\Figure 3-1.dwg (A) "Figure 3-1" 9/26/2011

LANDAU ASSOCIATES

Pederson's Fryer Farms
Pierce County, Washington

Conceptual Site Model

Figure
3-1

TABLE 3-1
SOIL SCREENING CRITERIA AND PRELIMINARY CLEANUP LEVELS
PEDERSON'S FRYER FARMS RI

	Soil Screening Criteria (a)	Soil Preliminary Cleanup Levels (f)
TOTAL PETROLEUM HYDROCARBONS (mg/kg)		
NWTPH-Dx		
Diesel Range Organics	2000	2000
Lube Oil	2000	2000
NWTPH-Gx		
Gasoline Range Organics	30/100 (b)	30/100 (b)
BTEX (mg/kg)		
Method SW8021B		
Benzene	0.03	0.03
Toluene	7	7
Ethylbenzene	6	6
m, p-Xylene		
o-Xylene		
Total Xylenes	9 (c)	9 (c)
PAHs (mg/kg)		
Method 8270C		
Naphthalene		
2-Methylnaphthalene		
1-Methylnaphthalene		
Total Naphthalenes	5 (d)	5 (d)
Acenaphthylene		
Acenaphthene		
Fluorene		
Phenanthrene		
Anthracene		
Fluoranthene		
Pyrene		
Benzo[a]anthracene		
Chrysene		
Benzo[b]fluoranthene		
Benzo[k]fluoranthene		
Benzo[a]pyrene		
Indeno[1,2,3-cd]pyrene		
Dibenz(a,h)anthracene		
Benzo[g,h,i]perylene		
Dibenzofuran		
cPAH TEQ	0.1 (e)	

TABLE 3-1
SOIL SCREENING CRITERIA AND PRELIMINARY CLEANUP LEVELS
PEDERSON'S FRYER FARMS RI

TOTAL METALS (mg/kg)			
Method 6010B			
Lead	250		
PCBs (mg/kg)			
Method 8082			
PCB-1016			
PCB-1221			
PCB-1232			
PCB-1242			
PCB-1248			
PCB-1254			
PCB-1260			
Total PCBs	1		

(a) MTCA Method A CULs for Unrestricted Land Uses were used as screening criteria

(b) Screening criteria is 30 mg/kg if benzene is present and 100 mg/kg if benzene is not present.

(c) Screening criteria cannot be exceeded by the sum of individual xylene concentrations.

(d) Screening criteria cannot be exceeded by the sum of Naphthalene, 2-Methylnaphthalene, and 1-Methylnaphthalene.

(e) Screening criteria based on toxicity equivalency methodology.

(f) Preliminary cleanup levels are the screening criteria for the determined constituents of concern.

TABLE 3-2
GROUNDWATER SCREENING CRITERIA AND PRELIMINARY CLEANUP LEVELS
PEDERSON'S FRYER FARMS RI

	Groundwater Screening Criteria (a)	Groundwater Preliminary Cleanup Levels (g)
TOTAL PETROLEUM HYDROCARBONS (mg/L)		
NWTPH-Dx		
Diesel Range Organics	0.5	0.5
Lube Oil	0.5	0.5
NWTPH-Gx		
Gasoline Range Organics	0.8/1.0 (b)	0.8/1.0 (b)
BTEX (µg/L)		
Method SW8021B / SW8260B		
Benzene	5	5
Toluene	1000	
Ethylbenzene	700	
m, p-Xylene	1000 (c)	1000 (c)
o-Xylene	1000 (c)	1000 (c)
Methyl tert-butyl ether	20	
VOLATILES (µg/L)		
Method 8260B		
1,2-Dichloroethane	5	
Methyl tert-butyl ether	20	
Naphthalene	--	
EDB (µg/L)		
Method 8011		
Ethylene Dibromide	0.01	
DISSOLVED METALS (µg/L)		
Method 200.8		
Lead	15	

TABLE 3-2
GROUNDWATER SCREENING CRITERIA AND PRELIMINARY CLEANUP LEVELS
PEDERSON'S FRYER FARMS RI

PAHs (µg/L)		
Method 8270C SIM		
Naphthalene	--	
2-Methylnaphthalene	--	
1-Methylnaphthalene	--	
Total Naphthalenes (d)	160	
Acenaphthylene	--	
Acenaphthene	--	
Fluorene	--	
Phenanthrene	--	
Anthracene	--	
Fluoranthene	--	
Pyrene	--	
Benzo[a]anthracene	--	
Chrysene	--	
Benzo[b]fluoranthene	--	
Benzo[k]fluoranthene	--	
Benzo[a]pyrene	--	
Indeno[1,2,3-cd]pyrene	--	
Dibenz(a,h)anthracene	--	
Benzo[g,h,i]perylene	--	
cPAH TEQ (e)	0.1 (f)	

(a) MTCA Method A CULs were used as screening criteria.

(b) MTCA Method A cleanup level is 0.8 ug/L if benzene is present and 1.0 ug/L if benzene is not present.

(c) Cleanup level cannot be exceeded by the sum of individual xylene concentrations.

(d) MTCA Method A cleanup level for naphthalenes is a total value for naphthalene, 1-methyl naphthalene, and 2-methyl naphthalene.

(e) TEQ = toxicity equivalency factor as described in WAC 173-340-708(8).

(f) cPAH cleanup screening levels based on practical quantitation limit (PQL) for individual cPAHs.

(g) Preliminary cleanup levels are the screening criteria for the determined constituents of concern.

4.0 SITE PHYSICAL CHARACTERISTICS

Specific physical characteristics of the PFF site relevant to the RI are described and evaluated in this section. These characteristics include site setting (e.g., topography, meteorology, surface water) geology and hydrogeology.

4.1 SITE SETTING

The PFF site lies within a broad upland drift plain that occupies much of south Tacoma (Jones *et.al.*, 1999). This south Tacoma drift plain is bounded to the northeast by the alluvial valley of the Puyallup River and to the west by the south Tacoma Channel Vashon[6] age glacial outwash feature. To the south and southwest, the upland drift plain is transected by lowland areas associated with the Kirby Channel and the Clover Creek Channel, two additional glacial outwash features (Walters and Kimmel 1968) that are now part of the Clover Creek drainage. The location of the site relative to regional physiography is shown on Figure 4-1.

The topography in the northern portion of the drift plain where the site is located consists of gently undulating hills oriented north-south reflecting striations associated with the most recent Vashon glaciation. The ground surface of the drift plain in this area is variable but is generally between about elevation 380 ft [7] to about elevation 440 ft. The ground surface at the site is between about elevation 400 ft and 408 ft. The topography in the vicinity of the site is shown on Figure 4-2.

Precipitation in the vicinity of the site is estimated at between about 30 and 40 inches annually (Sumioka et.al. 1998). Precipitation infiltrates, becomes surface water runoff or evapotranspirates. Most of the surrounding area outside the City of Tacoma does not have a stormwater conveyance system (Pierce County 2005) so surface water runoff will eventually end up in nearby drainage course. Daily precipitation for the period corresponding to the RI (November 2010 to August 2011) is presented on Figure 4-2a[8].

The site is located in Water Resources Inventory Area 10 (WRIA 10) which is the Puyallup-White River watershed. A number of small creeks or streams drain the northern portion of the drift plain. The creeks run south to north, parallel with the glacial topography and discharge into the Puyallup River or Commencement Bay. The site is located between the Swan Creek drainage and the Clear Creek drainage basins. Swan Creek is located approximately 800 ft west of the western property boundary. South of the 64th Street East[9], the stream is mapped by the United State Geological Survey (USGS 1981) as being seasonally intermittent, with a flat gradient and a weakly incised channel. The USGS maintains

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[6] Vashon refers to the most recent glacial episode in the Puget Sound lowland; approximately 10,000 years before present.

[7] The datum of all elevations is NAVD88 unless otherwise noted.

[8] Precipitation is measured at the University of Puget Sound weather station located approximately 5 miles northwest of the site.

[9] Swan Creek crosses 64th Street E about 2,600 ft northwest of the site.

a stream gauge on Swan Creek south of 72nd Street E[10]. At the Swan Creek gauge, the average annual flow is 4.7 cubic feet per second (cfs) and the stream is recorded as being dry during much of the summer (USGS 2011). North of 64th Street East, Swan Creek is mapped as a perennial stream. At this point, the stream gradient channel steepens and becomes more steeply incised as it drops off the drift plain into the Puyallup River valley. Clear Creek is a similar type of drainage that is located approximately 3,400 ft east of the site. Squally Creek is a smaller intermittent stream located north of the site between Swan Creek and Clear Creek. The locations of these drainages are shown on Figure 4-2.

4.2 GEOLOGY

A regional geologic conceptual model was developed based on existing data and reports. The regional geologic conceptual model provides a framework to interpret additional geologic observations made during the RI.

4.2.1 REGIONAL GEOLOGIC SETTING

The regional geology of the south Tacoma drift plain consists of older glacial and interglacial deposits overlying a thick sequence of Vashon age drift. In the central portion of the drift plain, where the site is located, the Vashon drift is interpreted to be over 150 ft thick (Brown and Caldwell 1991; Jones *et.al.* 1999). The Southeast Tacoma Mutual Water District drilled a deep well (505 ft deep) about 1.5 miles southwest of the site[11] in 1947. This well is one of the closest deep wells to the site and appeared to encounter till like material to at least 140 ft depth.

Vashon drift deposits were deposited during the Vashon Stade of the Fraser Glaciation, the most recent glaciation in the Puget Sound area. These deposits typically consist of advance outwash sand and gravels beneath glacial till and recessional outwash deposits. The advance outwash is typically a moderate to high permeability deposit that is defined as the uppermost regional aquifer in the north portion of the drift plain (Jones *et.al.* 1999). Glacial till is a relatively low permeability deposit. Two principal types of till occur in central Pierce County (Walters and Kimmel 1968). Lodgement till is a basal glacial ice deposit and therefore, is very dense. Ablation till is formed by let-down of material from within and on the surface of the glacier as ice melted; therefore, it is less compact and more permeable. It is locally present on top of lodgement till. Both lodgement and ablation till typically consist of a mix of unstratified gravel in a matrix of sand and silt. Lodgement till is gray while ablation till, because it is more permeable, is typically weathered to a brownish gray. Recessional outwash deposits are meltwater deposits from the receding glacier. These deposits vary from coarse grained fluvial deposits to fine

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[10] The stream gauge is located approximately 2,700 ft southwest of the site.

[11] This well is located in Township 19N, Range 3E, Section 34. It is represented as well 34L1 or 34L01 on various geologic maps and records.

grained lacustrine deposits. Thick coarse-grained recessional deposits are present north of the site between the Swan Creek and Squally Creek drainages. The gravel pits present along Waller Road mine these deposits (Figure 4-2). The uppermost layer of silt present at the surface on the site is interpreted to be a fine-grained recessional deposit.

Glacial till is mapped as the predominant surface deposit throughout the drift plain (Troost in Review; Walsh 1987). Advance outwash is also mapped as outcropping at about elevation 340 ft along Swan Creek north of the site and about elevation 380 ft along Clear Creek directly east of the site. Advance outwash deposits are also mapped in the Squally drainage at about elevation 300 ft; however, the upper portion of this drainage consists of recessional gravel deposits at the surface that likely cover this contact where it would otherwise be exposed. Northeast of the site, these Vashon recessional gravel deposits are mapped over a broad area between the Swan Creek and Squally Creek drainages. These deposits are coarse grained and likely very permeable. Gravel operations off Waller Road mine these deposits north of the site (Figure 4-2). The contact between the recessional gravel deposits and the underlying till is variable where it is exposed in these gravel pits above about elevation 170 ft (Ecology 1977). A map of the surficial geology in the project area is shown on Figure 4-3. Note that the thin layer of shallow glacial lacustrine deposits encountered in explorations at the site are not shown on the surficial geologic map. These deposits are mapped as occurring only locally in limited areas near the site as Kitsap silt loam (USDA Soil Conservation Service 1979). Therefore, it is assumed that fine grained recessional deposits of lacustrine origin only occur locally at the site and are a limited geologic deposit in the project area.

4.2.2 SITE GEOLOGY

RI explorations encountered glacial lacustrine deposits overlying ablation till throughout the site. In some areas, fill is present at the surface. None of the borings encountered advance outwash deposits. The glacial lacustrine deposits were designated as geologic Unit 1. The ablation till was segmented into geologic Units 2 and 3 depending on silt content. Geologic conditions at individual RI site explorations are presented in boring logs in Appendix E. The thickness of these units at the site is presented on five cross sections. The cross section locations are shown on Figure 4-4. The cross sections A-A' through E-E' are presented on Figures 4-5 through 4-9.

The glacial lacustrine Unit 1 was present at all exploration locations except where it had been removed by excavation (e.g., in UST excavation areas). Unit 1 typically consists of loose to medium dense, fine to medium sand and silt. There is often a trace (less than 5 percent) of gravel. Occasionally, the gravel content increases near the base of this unit. The unit thickness is typically 10 to 15 ft; the soil color is gray to brown.

The transition from Unit 1 to the underlying ablation till is marked by a change in soil texture and soil density. The ablation till is almost always very dense, has coarser soil texture and is typically poorly graded. This unit is typically described as a very dense sandy gravel or gravely sand with varying amounts of silt between about 5 and 40 percent by weight. The upper portion (i.e., above a depth of about 35 ft) of the ablation till appears to be less silty than the lower portion, though there is a lot of variation in soil texture throughout this sequence. The less silty portion is designated Unit 2; the somewhat siltier lower portion of the ablation till is designated Unit 3. These two units are designated on RI boring logs (Appendix E) and on geologic cross sections (Figures 4-5 through 4-9).

The deepest boring at the site (MW-19) extended to a depth of 65 ft or about elevation 339. It does not appear that advance outwash deposits were encountered in this boring or other deep borings. Vashon advance outwash is typically a poorly graded sand deposit with less than 5 percent silt. The advance outwash is mapped as outcropping along Swan Creek at about elevation 340, northwest of the site. However, based on water well logs, the ablation till appears to be very thick beneath portions of the drift plain toward the south. Therefore, it is probably difficult to predict how deep or how thick Vashon advance deposits are directly beneath the site based on outcrops along the various creeks.

4.3 HYDROGEOLOGY

Two hydrogeologic units were defined at the site occurring within the ablation till. These units are defined based on piezometric head measurements and well depth. The shallow water bearing zone occurs as discontinuous perched groundwater zones between about 5 ft BGS and 45 ft BGS. The deep water bearing zone occurs as a continuous water table within the ablation till below about 45 ft BGS.

4.3.1 SHALLOW WATER BEARING ZONE

The shallow water bearing zone consists of perched water within the ablation till. Shallow wells are defined as wells with the bottom of the well screen at or above 45 ft BGS (Landau Associates 2011a). There are currently 14 shallow zone wells. Ten of these wells were installed prior to the current RI (pre RI wells); the screen length of these wells ranges between 15 and 30 ft. Four of the shallow zone wells were installed during the RI (RI wells); the screen length of these wells is 10 or 15 ft. An additional shallow zone well, MW-16, was decommissioned during the RI. The location of existing wells and decommissioned pre RI wells is shown on Figure 4-4. A summary of shallow zone well information is presented in Table 4-1.

Water levels at pre RI wells were measured between 2001 and 2005 (pre RI work), and 2010 to present (RI work). Based on this long-term data record, groundwater level fluctuations are as much as 7.6 ft annually at some wells (i.e., at MW-6) while at other wells the annual fluctuation is only a few feet. A long-term water level hydrograph for select shallow zone wells is presented on Figure 4-10.

RI water level measurements began in November 2010; December 2010 measurements were also collected. New RI wells were installed in May, at which point, monthly water level measurements were initiated at all wells (remaining pre RI wells and new RI wells). There are currently seven shallow wells in the vicinity of Area A. Water levels in these wells varied from a maximum of about elevation 379 (MW-26S) to a minimum of about elevation 361 (MW-6). The degree of seasonal fluctuation at Area A wells also varied spatially during the RI water level measurement period from a maximum of 7.6 ft at well MW-6 to a minimum of 1.6 ft at MW-26. Hydrographs of Area A wells for the RI measurement period are presented on Figure 4-11. Groundwater level measurements are presented in Table 4-2.

Excluding Area A, there is seven other shallow water bearing zone wells screened at or near various UST areas. Water levels in these other wells varied from a maximum of elevation 401.8 (MW-34S at Area C) to a minimum of elevation 361.8 (MW-10 near Area B). With the exception of well MW-15, the seasonal fluctuation in these wells was less than 2.8 ft. At MW-15, the seasonal fluctuation was about 4.2 ft. Hydrograph of shallow wells outside of Area A for the RI measurement period are presented on Figure 4-12. Groundwater level measurements are presented in Table 4-2.

Groundwater levels in the shallow water bearing zone are highly variable both temporally and spatially. This variation is attributed primarily to two factors. The first factor is heterogeneity of shallow zone soil. Ablation till is a heterogeneous deposit. Infiltrating precipitation tends to collect in more permeable portions of the till resulting in multiple saturated horizons. For example, MW-34S is screened almost entirely in Unit 1 while MW-1 is screened predominantly across Unit 2 (compare screen lengths on Figure 4-7), yet both of the wells are saturated. Another example of heterogeneity is the water levels in Area G wells MW-15 and MW-33S. These two wells are about 25 ft apart and are both screened from about 15 to 30 ft BGS. MW-15 is continuously saturated while MW-33S went dry in July 2011 (see Figure 4-12). Soil heterogeneity associated with UST excavations also has the potential to impact groundwater levels in the shallow zone. For example, the highest groundwater levels at Area A are at MW-26S which is screened in backfill in the Area A excavation. At this location, the excavation appears to consist of more permeable soil that facilitates and concentrates groundwater recharge. The second factor affecting groundwater level variability is screen length. Pre RI wells are typically screened over a 20 to 30- ft interval entirely within the till. Wells screened in this manner, in a low permeability deposit, typically act as sumps where groundwater seeps into the screen interval collecting in the bottom of the well. The groundwater accumulates in thickness until the rate of seepage out equals the rate of seepage into the well. Evidence for this type of effect is seasonal fluctuation of 7.6 ft at well MW-6. This degree of seasonal fluctuation is more than would be expected based on an annual precipitation rate of 33 inches. The degree of seasonal fluctuation at MW-6 represents about 27 inches of infiltration[12] accounting for porosity (assumed to be 0.30). Based on an annual precipitation rate of 33 inches, infiltration is estimated to be roughly about 16 inches[13].

Two shallow zone wells, MW-1 and MW-4, show an increase in water levels from July to August 2011 (see Figure 4-11). There is a similar increase in the water level at deep well MW-9 (see Section 4.3.2). The reason for this dry season and localized increase in groundwater levels is not clear, but may be due to property tenant activities (e.g., cleaning or washing).

4.3.2 DEEP WATER BEARING ZONE

The deep water bearing zone consists of a continuously saturated conditions within the ablation till that defines a predictable water table. Deep wells are defined as wells with the bottom of the well screen below 45 ft BGS (Landau Associates 2011a). There are currently 12 deep zone wells. Five of these wells were installed pre RI; the screen length of these wells ranges between 20 and 35 ft. Seven of the deep zone wells were installed during the RI; the screen length of these wells is 10 or 15 ft. Six additional deep zone wells (MW-12, MW-13, MW-14, MW-17, MW-18, MW-21), were decommissioned during the RI. The rationale for decommissioning these wells is discussed in the RI work plan (Landau Associates 2011a). The location of existing and decommissioned RI wells is shown on Figure 4-4. A summary of deep zone well information is presented in Table 4-1.

Water levels at pre RI wells were measured between 2001 and 2005 (pre RI work), and 2010 to present (RI work). Based on this long-term data record, groundwater level fluctuations are as much as 15 ft annually (i.e., at MW-7R) at some wells, while at other wells, the annual fluctuation is only a few feet. A long-term water level hydrograph for select deep zone wells is presented on Figure 4-13.

There are currently eight deep wells in the vicinity of Area A. From November 2010 to August 2011 (the RI measurement period), water levels in these wells varied from a maximum of elevation 365.46 (MW-7R) to a minimum of elevation 349.54 (MW-22). The degree of seasonal fluctuation at Area A wells also varied spatially during the RI measurement period from a maximum of 15.54 ft at well MW-7R to a minimum of 3.79 ft at MW-27D. Hydrographs of Area A wells for the RI measurement period are presented on Figure 4-14. Deep zone groundwater level measurements are presented in Table

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[12] 7.6 ft * 12in/ft * porosity (0.30) = 27.4 in.

[13] Bauer and Martin (1997) estimate recharge for Clear Creek basin to be about 50 % of precipitation.

4-3. The maximum degree of seasonal groundwater fluctuation at each well for the period November 2010 to August 2011 is also shown on Table 4-3.

As mentioned in the previous section, the groundwater level hydrograph for MW-9 indicates an increase in groundwater levels between July and August 2011. This increase is counter to the expected seasonal trend. If washwater or other water discharge was occurring in this area, the very long well screen at MW-9 could be facilitating this localized water level effect[14]. The screen at this well is 35 ft and the top of the screen is about 12 ft BGS (see Figure 4-9).

Excluding Area A, there are four other deep water bearing zone wells. Three of these wells are screened near other UST areas: MW-29D (Area F), MW-30D (Area G), and MW-31D (Area C). Well MW-32D was installed as an upgradient well. Water levels in these other wells varied from a maximum of elevation 358.22 (MW-29D at Area F) to a minimum of elevation 353.88 (MW-31D near Area C). The amount of seasonal water level fluctuation was relatively high at wells MW-29D (6.07 ft) and MW-30D (7.17 ft). A lower degree of seasonal fluctuation is present at Wells MW-31D (2.65 ft) and MW-32D (2.52 ft). Hydrograph of shallow wells outside of Area A for the RI measurement period are presented on Figure 4-15. Groundwater level measurements and seasonal fluctuation calculations are presented in Table 4-3.

Groundwater levels in the deep water bearing zone represent a continuous saturated water table. However, for a continuous water bearing zone there is a much higher degree of spatial variation in seasonal groundwater level fluctuations than would normally be expected. Wells that exhibit a high degree of seasonal fluctuation are near relatively large excavation areas. In particular, Area A and Area F appear likely to cause enhanced recharge to the deep water bearing zone. Groundwater mounds near these areas appear to form during the winter and slowly dissipate during the summer. Wells that are not near these excavation areas (i.e., MW-31D and MW-32D) appear relatively unaffected by mounding. The degree of measured seasonal fluctuation at these two wells was only about 2.6 ft, much less than wells near Area A and Area F. A continuous water level hydrograph comparing the August 2011 water level decline at wells MW-27D (Area A) and MW-32D (upgradient well) is presented in Figure 4-16. This figure demonstrates the steeper rate of water level decline at well MW-27D. Note the mounding effect at well MW-27D associated with the clear water injection test at Area A wells MW-25D and MW-26S on August 3.

Two existing wells that show the highest degree of seasonal fluctuation are wells MW-7R (15.54 ft) and MW-22 (11.21 ft), both located near Area A. The degree of seasonal fluctuation at these two wells

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[14] MW-9 is an unusual well in that it has a distinct brown biological scum on the water table or in the well that coats sampling tubes and water level measurement probes.

is anomalously high relative to other deep wells near Area A. It is likely that the degree of water level fluctuation at these two wells is in part associated with the long screens that extend above the water table. It is possible, or likely, that these long screens produce a sump effect (similar to that seen at some shallow zone wells) that concentrates recharge and causes the water levels to rise higher in the winter than they otherwise would from a rise in the deep water bearing zone water table.

4.3.3 GROUNDWATER FLOW

Groundwater flow in the shallow water bearing zone is assumed to be predominantly vertical. The location of enhanced recharge, particularly at Areas A and F, likely cause a sufficient localized gradient to also cause some degree of radial flow horizontally. However, there is not a consistent horizontal gradient that is discernable in shallow zone water levels. This suggests that soil heterogeneity and well screen location are the strongest factors in controlling shallow zone water levels. Groundwater levels for the June 28-30, 2011 are shown for all shallow zone monitoring wells on Figure 4-17.

Regional groundwater flow in the deep water bearing zone is assumed to be to the north toward Swan Creek and Squally Creek. Swan Creek runs approximately 800 ft west of the site. However, at this location, the creek is weakly incised into the till above elevation 370 ft. It is therefore unlikely that the deep water bearing zone discharges to the creek at this location. It is not until the creek passes north of Pipeline Road (northwest of the site) that it is incised deep enough to intercept the deep water bearing zone water table. A number of springs also occur north of the site along Waller Road at the contact of the till and recessional gravels (Figure 4-3). These springs may also represent regional groundwater discharge.

Deep water bearing zone groundwater flow at the site is complicated by mounding associated with Area A and Area F that appears to be superimposed on a relatively flat northerly regional gradient. During the winter, it appears that these mounds become significantly more pronounced due to enhanced infiltration through the excavation areas. During the summer, the mounds dissipate but were still observed during the August 2011 groundwater level measurement event. Deep water bearing zone groundwater level contours for the months of May through August 2011 are presented on Figure 4-18 through 4-21.

4.3.4 HYDRAULIC PARAMETER ESTIMATES

Hydraulic parameters were not directly measured for the ablation till for the RI. Based on soil texture, it is assumed that the hydraulic conductivity is less than 10 ft/day. As part of the FS, two pilot tests were conducted. The first test was a free product recovery test that involved pumping well MW-25D for 8 hours. Pumping this two inch well at about 1.2 gpm caused a drawdown of about 6 ft in the well.

The resulting calculated specific capacity (Sc) is about 0.2 gpm/ft. Driscoll (1986) provides a simple empirical equation to estimate transmissivity of an unconfined aquifer:

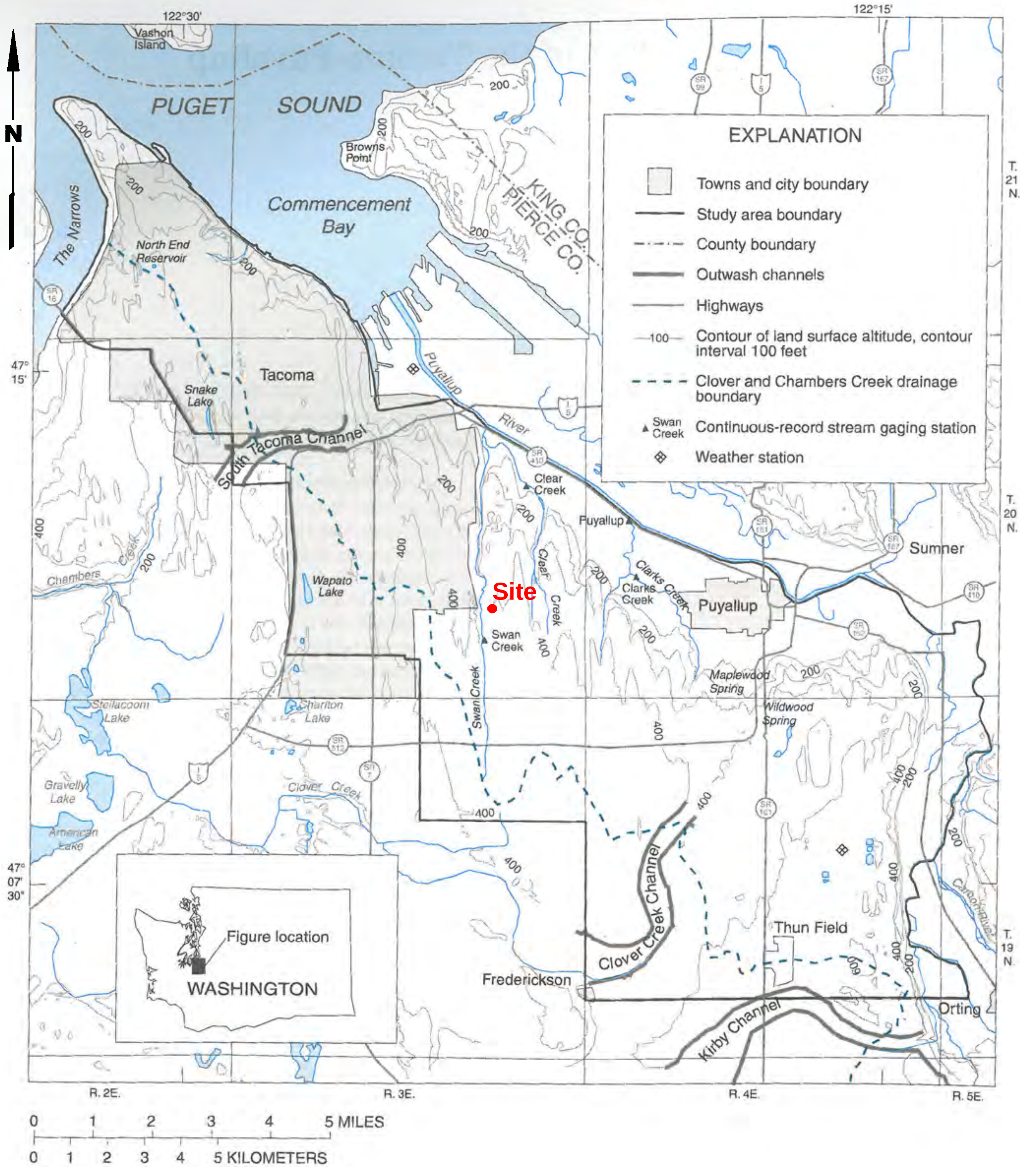
$$Sc = T/1500$$

Where: Sc = Specific capacity in gpm/ft

T = transmissivity in gpd/ft.

Based on this equation, the calculated transmissivity is about 40 ft^2/day (300 gpd/ft). If the aquifer is assumed to be 15 ft thick, the resulting hydraulic conductivity is about 2.7 ft/day.

The second pilot test was a clear water injection test at shallow zone wells MW-15 and MW-26S and deep zone well MW-25D. At all three wells, the gravity injection rate exceeded 10 gpm. The free product recovery test and the clear water injection tests will be discussed in more detail in the FS report.



Y:\Projects\136006\MapDocs\RI Report\Fig4-1-RegionalPhysiography.mxd 9/22/2011 North American 1983 UTM Zone 10N

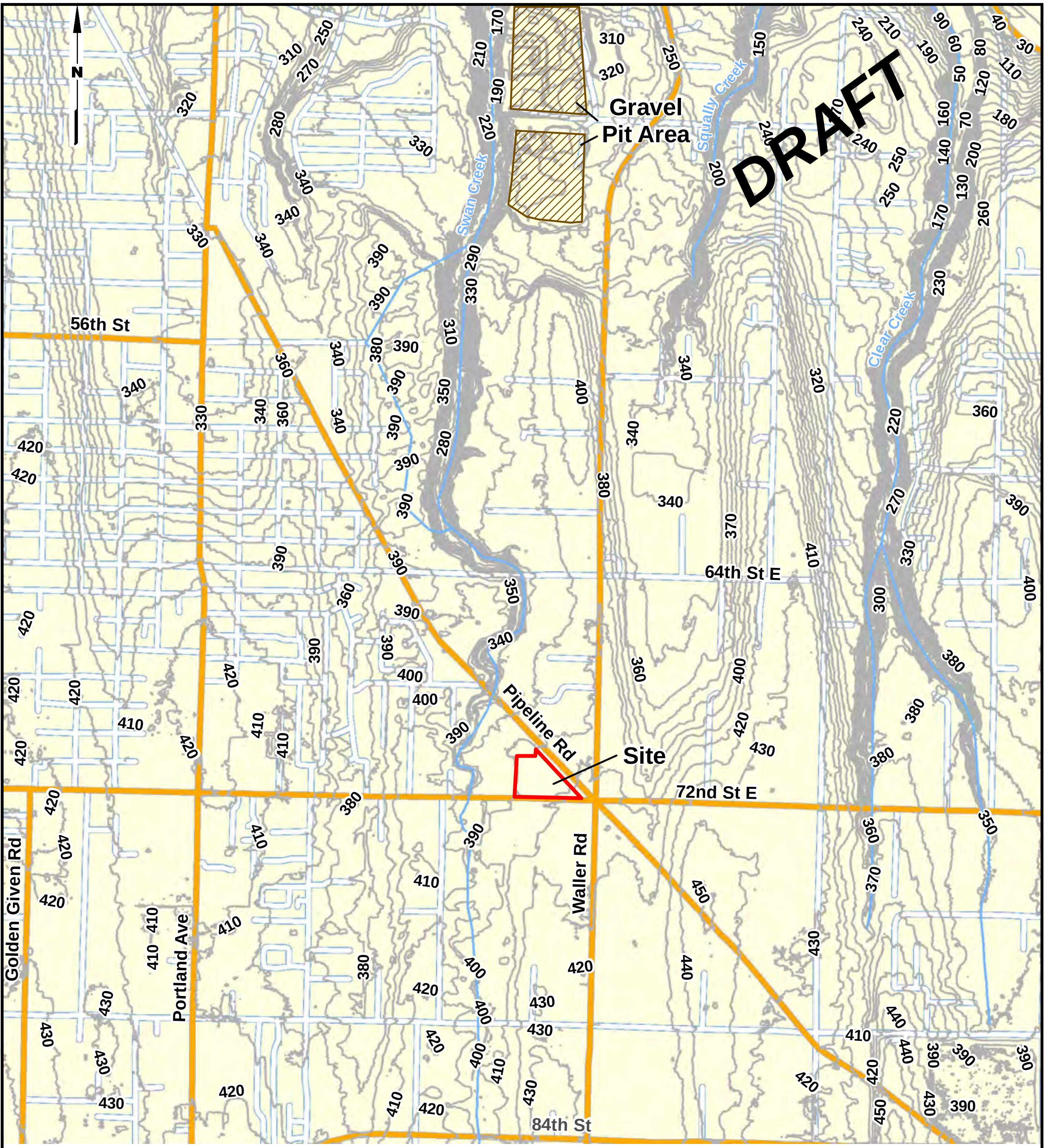
Data Source: Jones, M.A., L.A. Orr, J.C. Ebbert, and S.S. Sumioka. 1999. Report: Ground-Water Hydrology of the Tacoma-:Puyallup Area, Pierce County. Water-Resource Investigations Report 99-4013. United States Geological Survey. Tacoma, Washington.

Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

LANDAU ASSOCIATES

Pederson's Fryer Farms Pierce County, Washington	**Regional Physiography**	Figure 4-1



Legend

🟥 PFF Project Area

▨ Gravel Pit Areas

— 10ft Contours

Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

0 1,700 3,400

Scale in Feet

Data Source: Puget Sound LIDAR Consortium

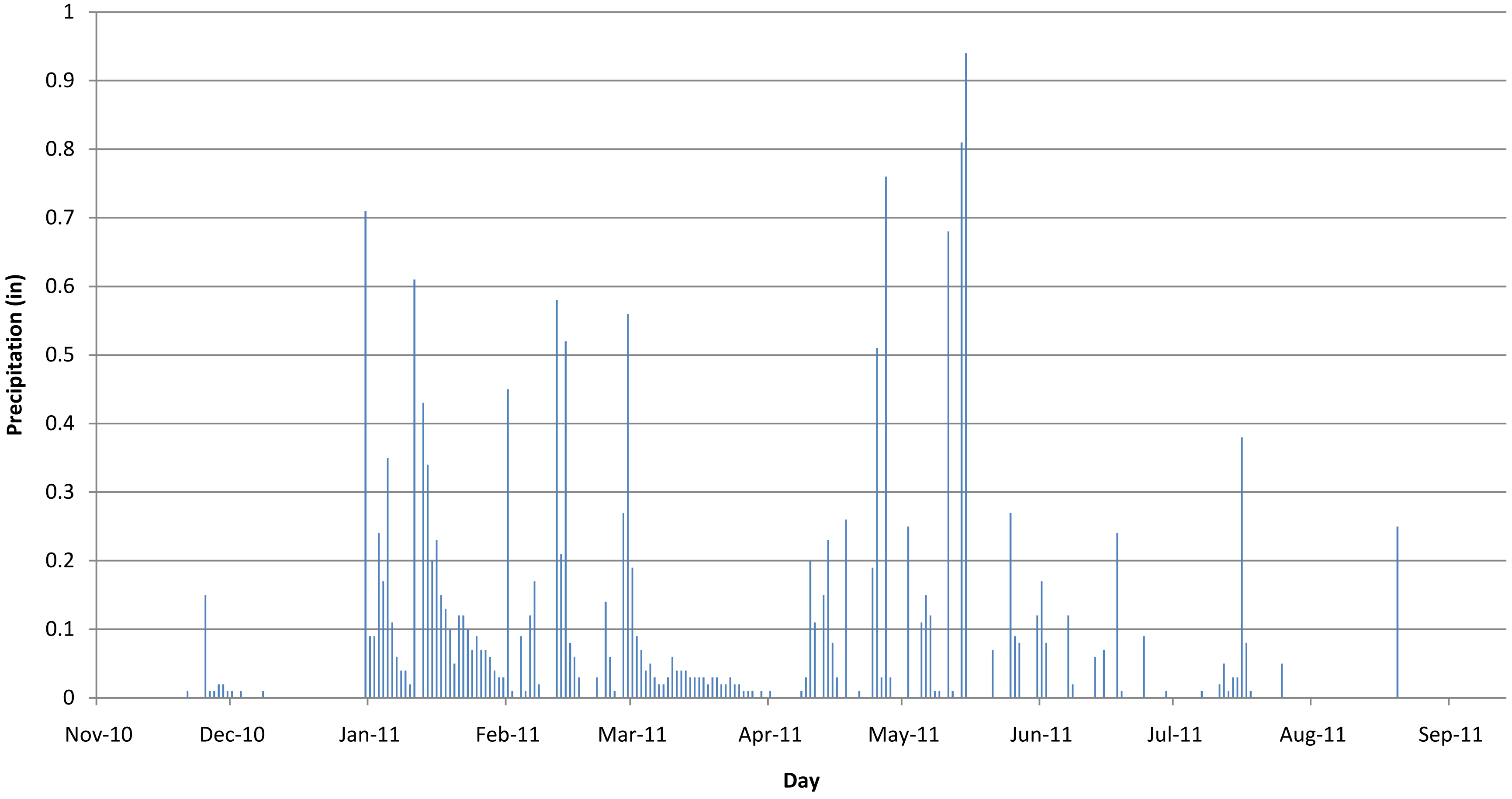
Y:\Projects\136006\MapDocs\RI Report\Fig4-2-Topography_small.mxd 9/21/2011 NAD 1983 StatePlane Washington North FIPS 4601 Feet

LANDAU ASSOCIATES

Pederson's Fryer Farms
Pierce County, Washington

Topography

Figure
4-2

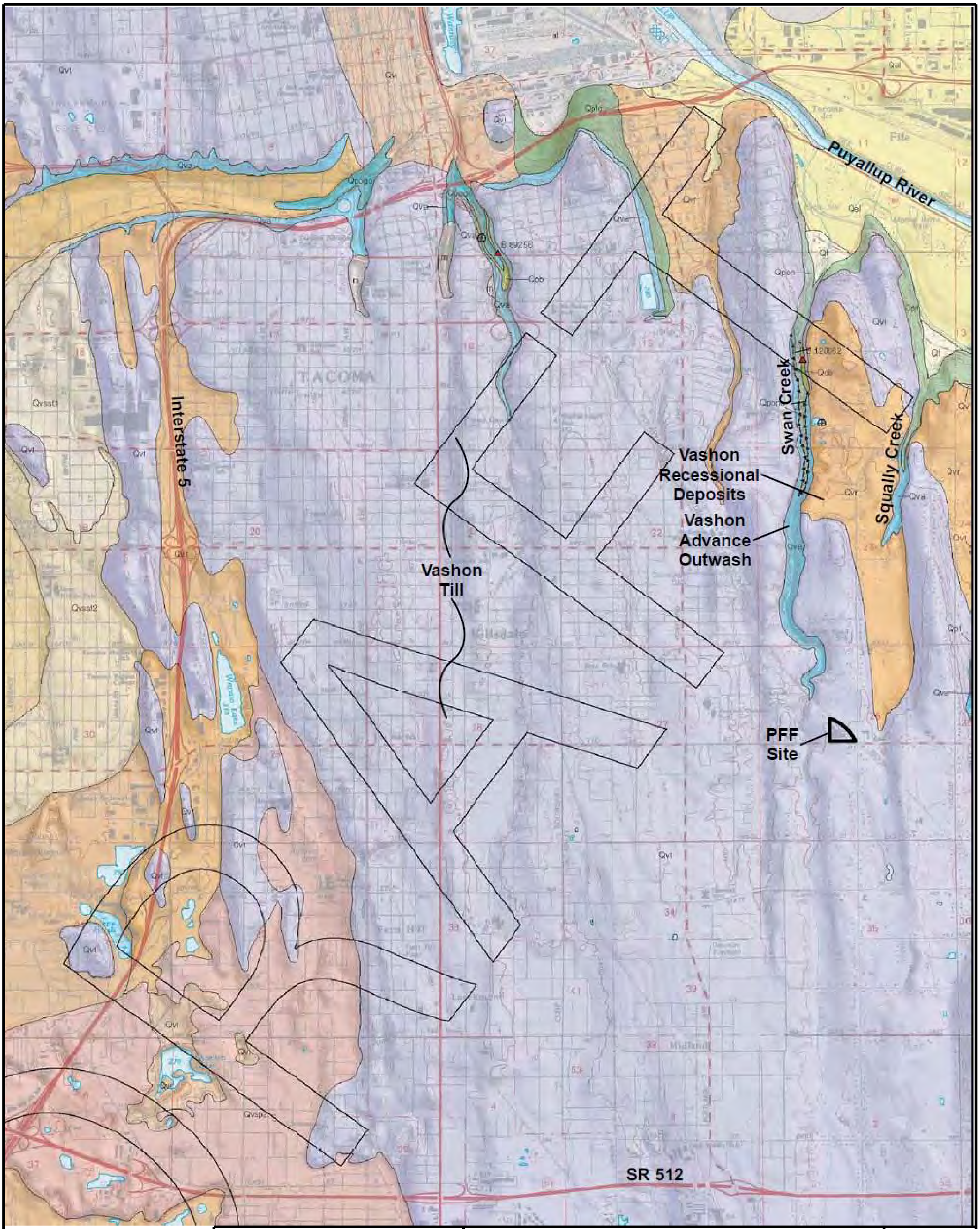


LANDAU ASSOCIATES

Pederson's Fryer Farms
Pierce County, Washington

**Daily Precipitation:
Tacoma, Washington**

Figure
4-2a



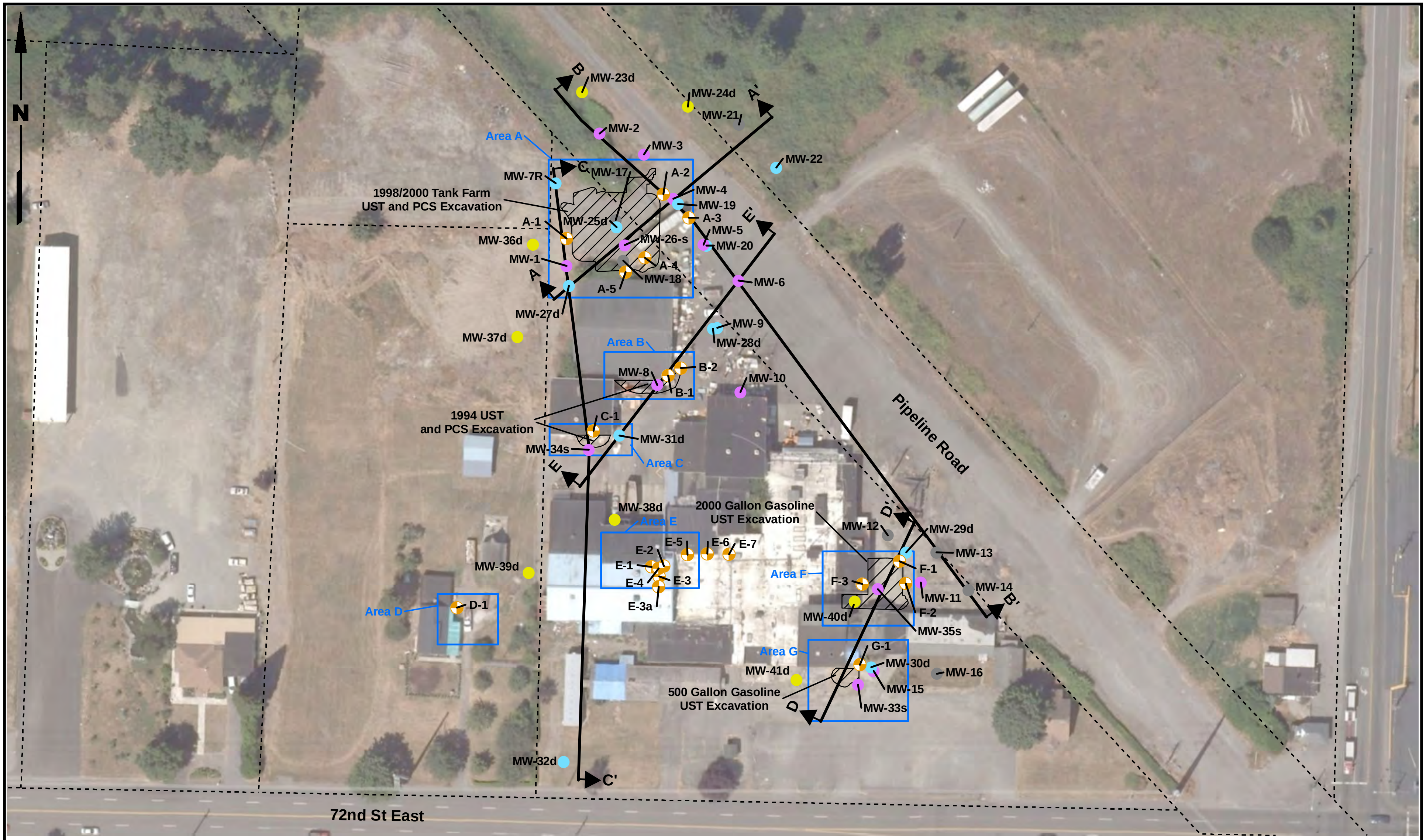
LANDAU ASSOCIATES

Pederson's Fryer Farms
Pierce County,Washington

Surficial Geology

Figure
4-3

Y:\Projects\136006\MapDocs\RI Report\Fig4-4-SoilBorings&Wells.mxd 9/20/2011 NAD 1983 StatePlane Washington South FIPS 4602 Feet



● Proposed Deep Monitoring Well
● Decommissioned Wells
● Existing Monitoring Well - Deep
● Existing Monitoring Well - Shallow

◐ Boring
- - - - Tax Parcel
▨ Former Excavation Area
☐ Area of Concern

A A' Cross Section Location

0 120 240
Scale in Feet

Data Sources: Pierce County GIS;
Bing Maps Aerial 2010.

Notes

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

LANDAU ASSOCIATES

Pederson's Fryer Farms
Pierce County, Washington

Soil Borings and Groundwater Monitoring Wells

Figure
4-4

Legend

MW-1 — Project Exploration Designation

(Offset 16' W) — Offset Distance in Feet and Direction

Top of Exploration

Groundwater Level (At time of drilling)

Groundwater Level (After time of drilling)

Inferred Geologic Contact

Well Screen Interval

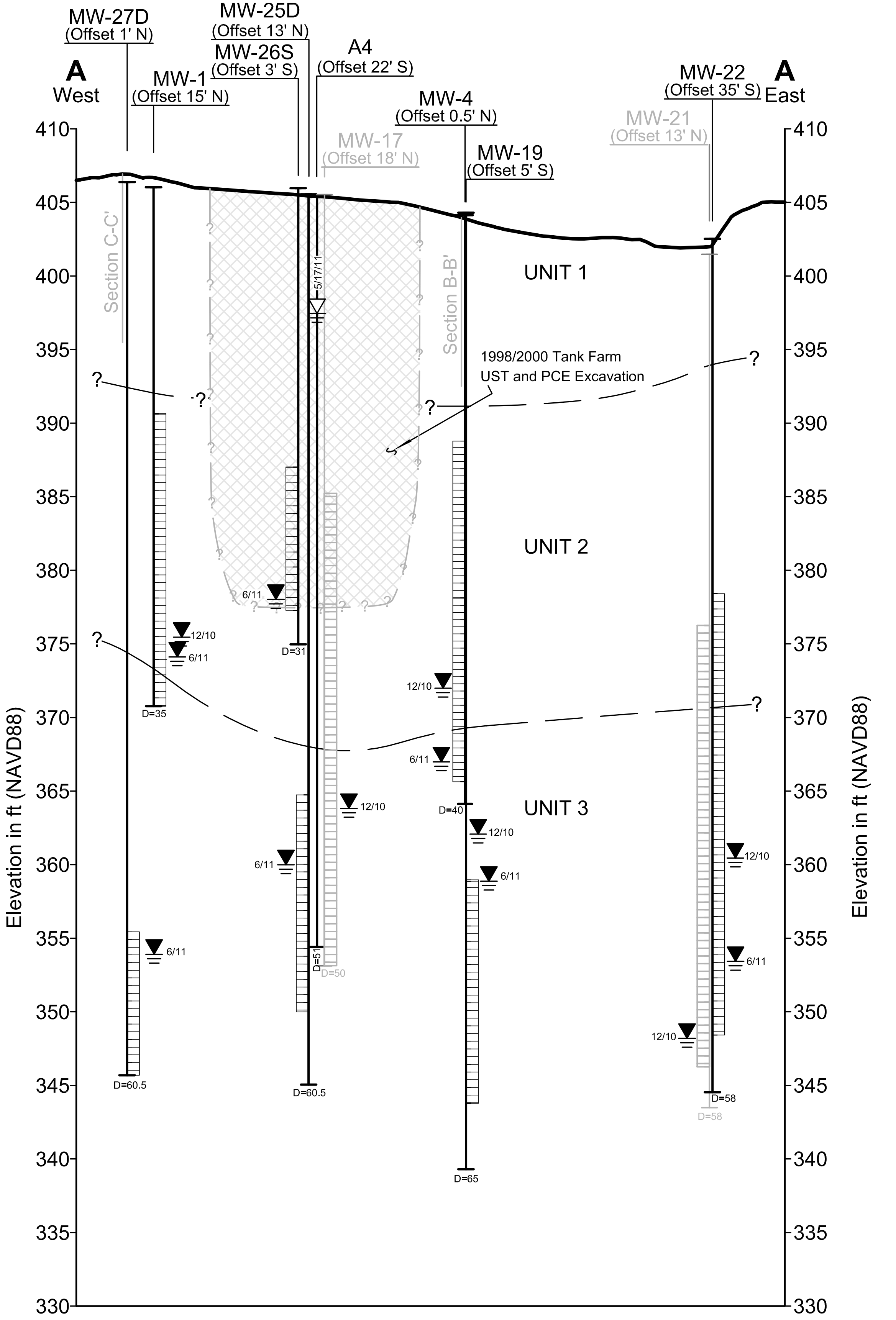
Bottom of Exploration

D=14 — Depth of Exploration (Below Ground Surface - ft)

▨ Bioremediated Fill

Notes

1. See report text for full descriptions of geologic units. Geologic units are generally defined as follows:
   - Unit 1 - Lacustrine deposit
   - Unit 2 - Ablation Till with decreasing silt content
   - Unit 3 - Ablation Till with gradual silt content increase
2. For cross-section profile location, see Site Exhibit 2011 Remedial Investigation figure, Figure 3.
3. Wells shown in gray were decommissioned in May 2011
4. Wells with only June 2011 water levels were installed in May 2011.
5. December 2010 water levels were collected between 12/06/10 and 12/08/10. June 2011 water levels were collected between 6/28/11 and 6/30/11.
6. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.



Ground Surface Profile Source: Puget Sound LiDAR Consortium, 2005

0 50 100

Horizontal Scale: 1" = 50'
Vertical Scale: 1" = 10'

Pederson's Fryer Farms
Pierce County, Washington

Geologic Cross Section A-A'

Figure
4-5

LANDAU ASSOCIATES

Peterson's Fryer Farms | Y:\136\006\T\CADD\Sections-A-E.dwg (A) "Figure 4-5" 9/21/2011

Legend

MW-1 — Project Exploration Designation

(Offset 16' W) — Offset Distance in Feet and Direction

Top of Exploration

▽ Groundwater Level (At time of drilling)

▼ Groundwater Level (After time of drilling)

Inferred Geologic Contact

Well Screen Interval

Bottom of Exploration

D=14 — Depth of Exploration (Below Ground Surface - ft)

▨ Bioremediated Fill

Notes

1. See report text for full descriptions of geologic units. Geologic units are generally defined as follows:
   - Unit 1 - Lacustrine deposit
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2. For cross-section profile location, see Site Exhibit 2011 Remedial Investigation figure, Figure 3.
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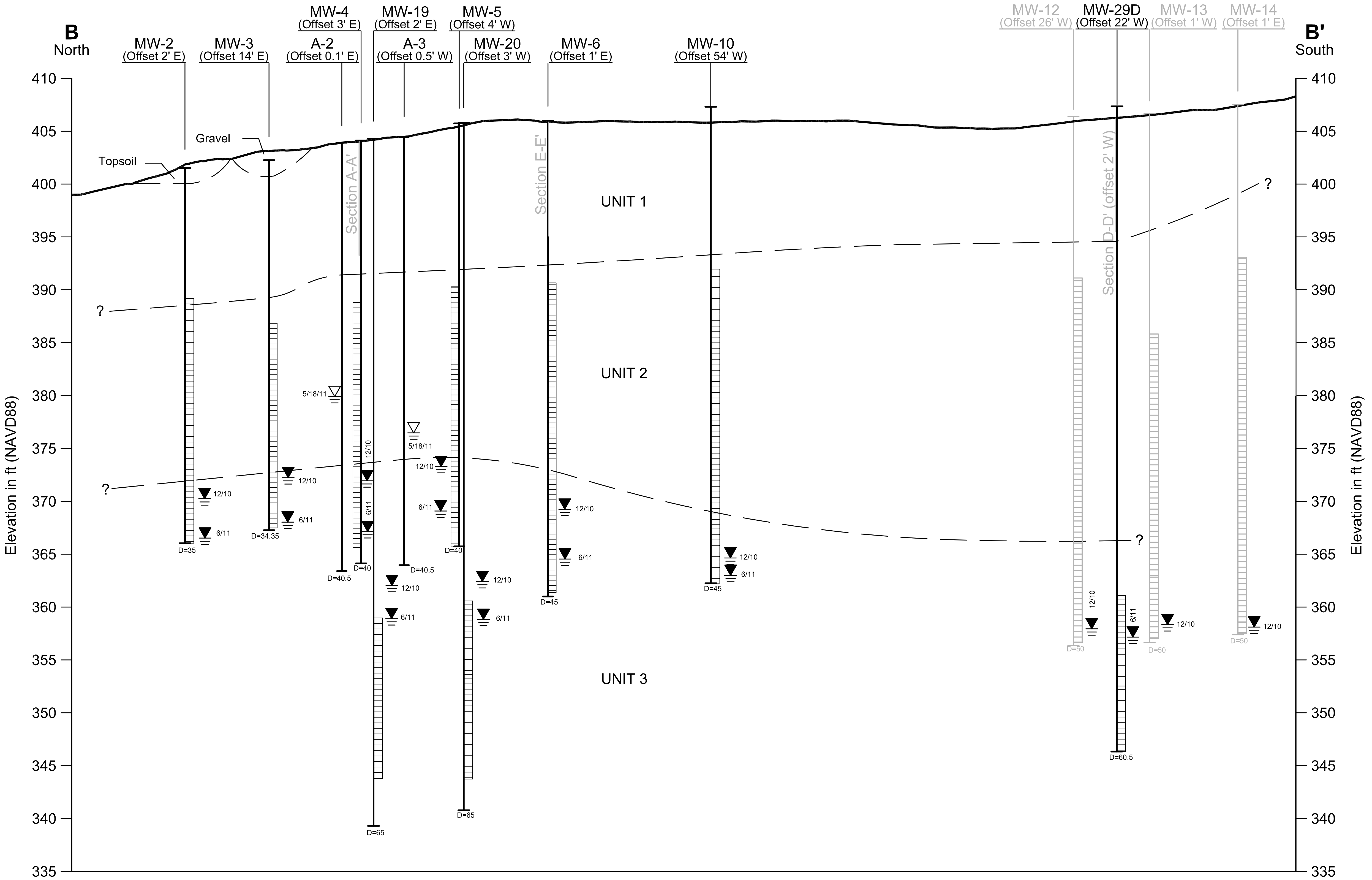
6. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.



Ground Surface Profile Source: Puget Sound LiDAR Consortium, 2005

0 50 100

Horizontal Scale: 1" = 50'

Vertical Scale: 1" = 10'

Pederson's Fryer Farms
Pierce County, Washington

Geologic Cross Section B-B'

Figure
4-6

LANDAU ASSOCIATES

LANDAU ASSOCIATES, INC. | Y:\136\006\T\CADD\Sections-A-E.dwg (A) "Figure 4-6" 9/21/2011

Legend

MW-1 — Project Exploration Designation
(Offset 16' W) — Offset Distance in Feet and Direction
Top of Exploration
Groundwater Level (At time of drilling)
Groundwater Level (After time of drilling)
Inferred Geologic Contact
Well Screen Interval
Bottom of Exploration
D=14 — Depth of Exploration (Below Ground Surface - ft)
▨ Bioremediated Fill

Notes

1. See report text for full descriptions of geologic units. Geologic units are generally defined as follows:
   - Unit 1 - Lacustrine deposit
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2. For cross-section profile location, see Site Exhibit 2011 Remedial Investigation figure, Figure 3.
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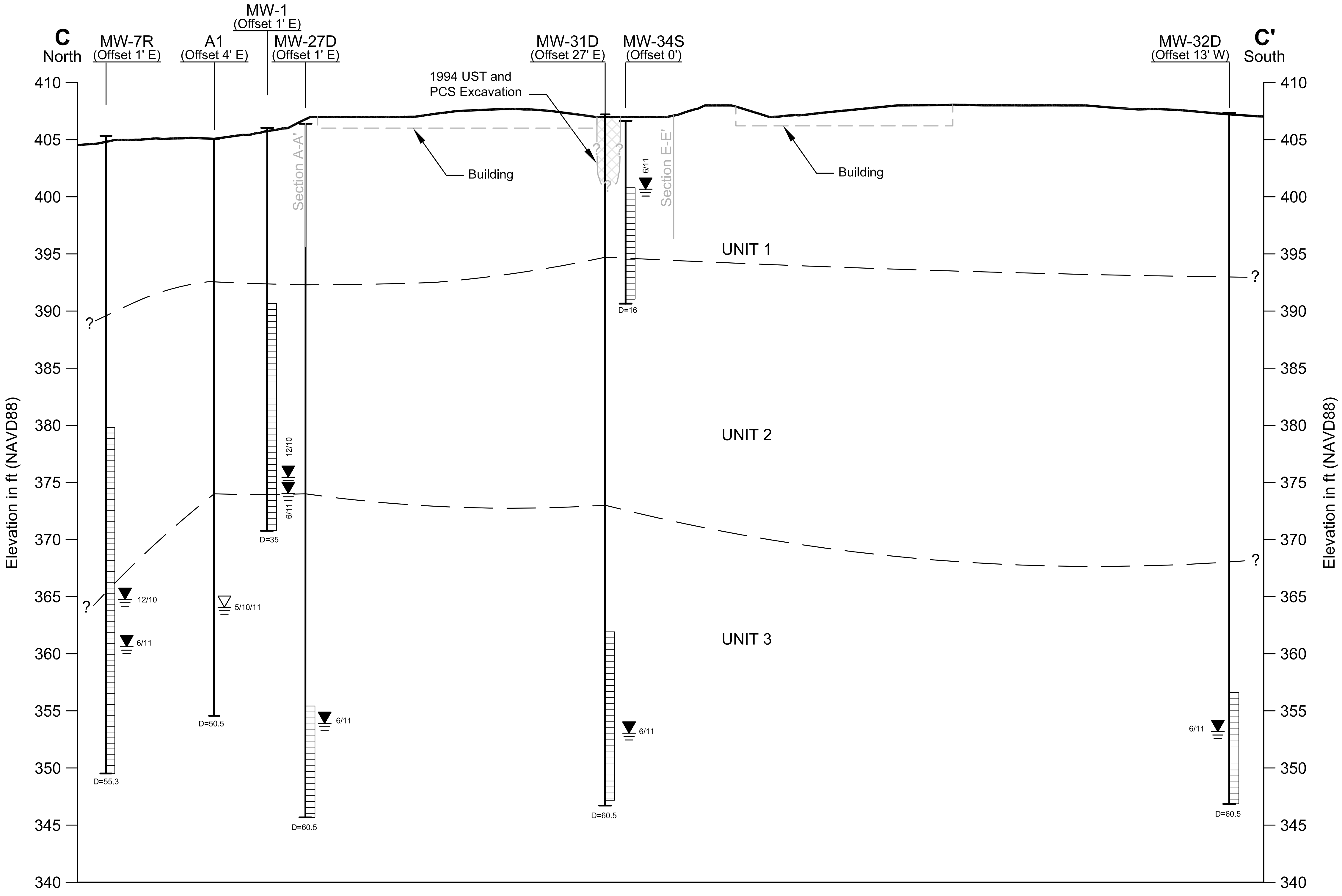
6. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.



Ground Surface Profile Source: Puget Sound LiDAR Consortium, 2005

0 50 100
Horizontal Scale: 1" = 50'
Vertical Scale: 1" = 10'

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Pederson's Fryer Farms
Pierce County, Washington

Geologic Cross Section C-C'

Figure
4-7

LANDAU ASSOCIATES, INC. | Y:\136\006\T\CADD\Sections-A-E.dwg (A) "Figure 4-7" 9/21/2011

Legend

MW-1	Project Exploration Designation
(Offset 16' W)	Offset Distance in Feet and Direction
	Top of Exploration
	Groundwater Level (At time of drilling)
	Groundwater Level (After time of drilling)
	Inferred Geologic Contact
	Well Screen Interval
	Bottom of Exploration
D=14	Depth of Exploration (Below Ground Surface - ft)
▨	Bioremediated Fill

Notes

1. See report text for full descriptions of geologic units. Geologic units are generally defined as follows:
   - Unit 1 - Lacustrine deposit
   - Unit 2 - Ablation Till with decreasing silt content
   - Unit 3 - Ablation Till with gradual silt content increase
2. For cross-section profile location, see Site Exhibit 2011 Remedial Investigation figure, Figure 3.
3. Wells shown in gray were decommissioned in May 2011
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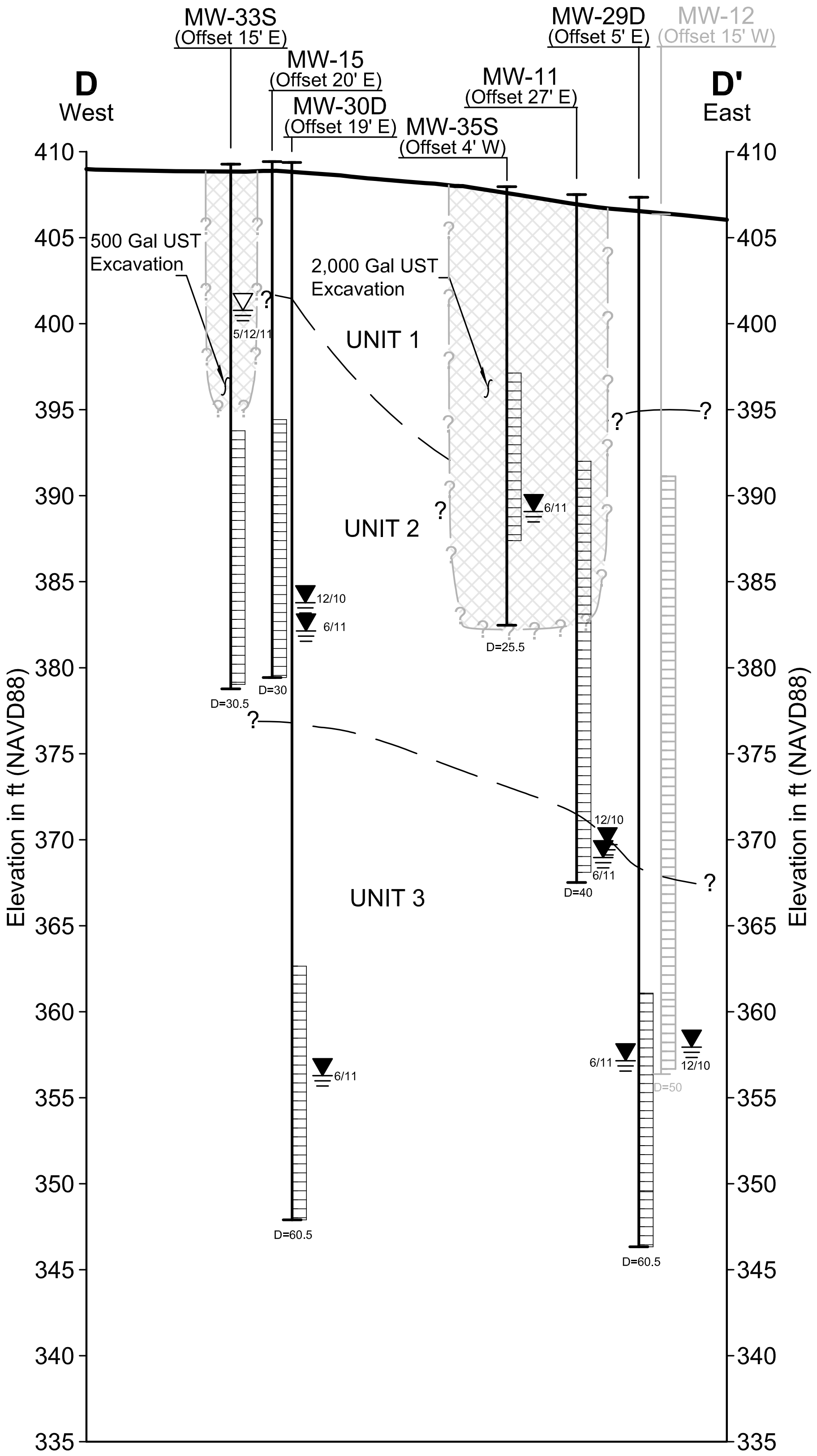
5. December 2010 water levels were collected between 12/06/10 and 12/08/10. June 2011 water levels were collected between 6/28/11 and 6/30/11.
6. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.



Ground Surface Profile Source: Puget Sound LiDAR Consortium, 2005

0 50 100

Horizontal Scale: 1" = 50'
Vertical Scale: 1" = 10'

Pederson's Fryer Farms
Pierce County, Washington

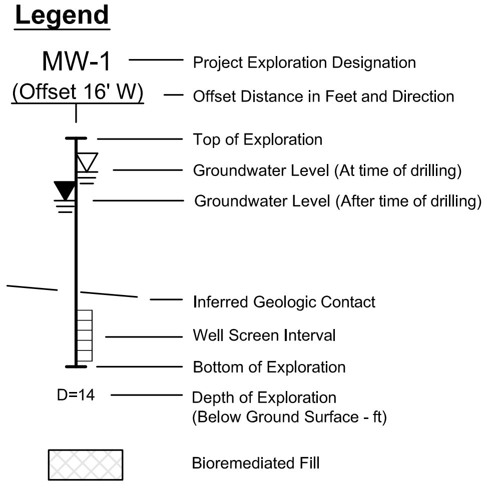
Geologic Cross Section D-D'

Figure
4-8

Peterson's Fryer Farms | Y:\136\006\T\CADD\Sections-A-E.dwg (A) "Figure 4-8" 9/21/2011

Landau Associates

Legend



Notes

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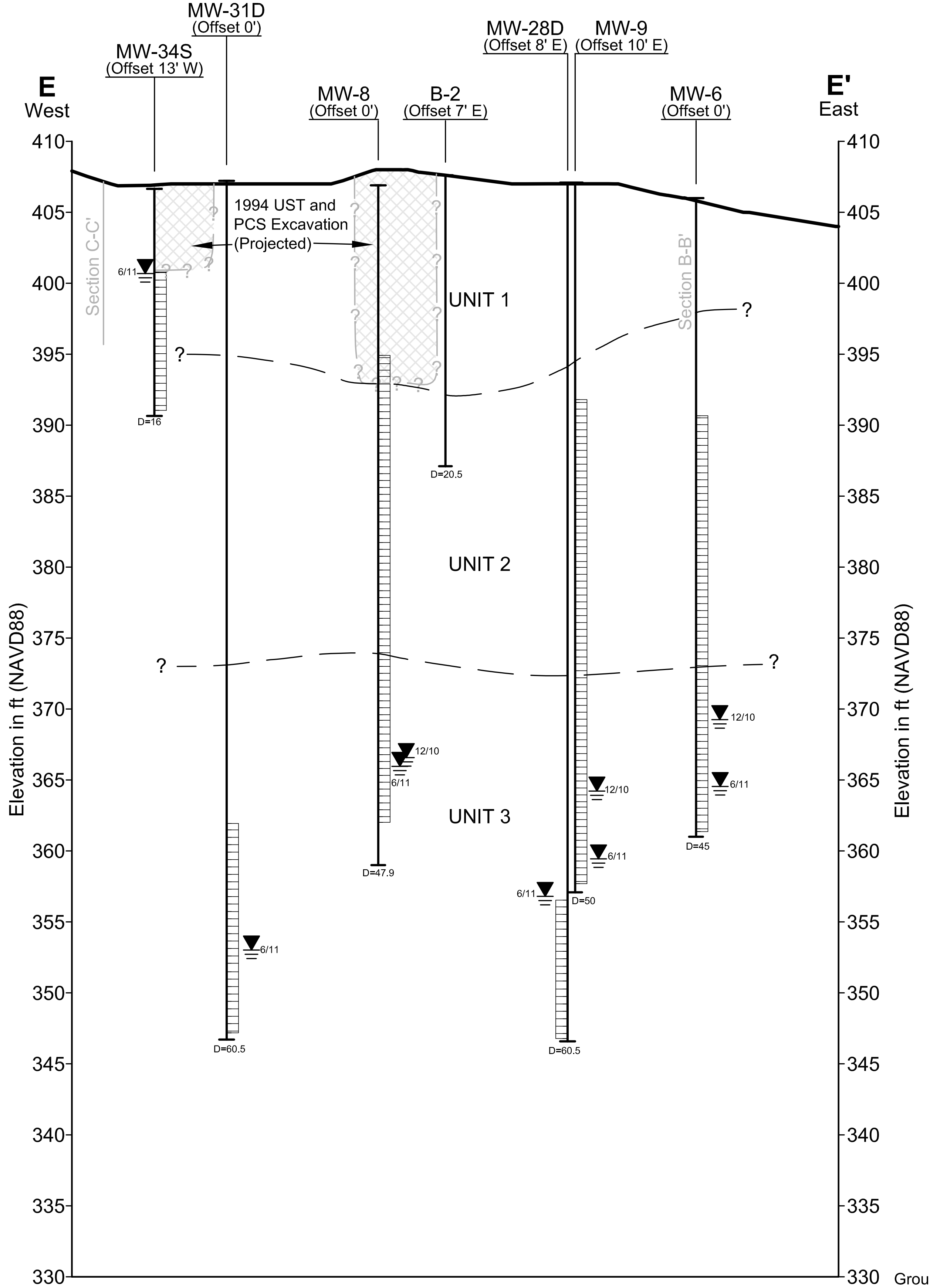
   - Unit 1 - Lacustrine deposit
   - Unit 2 - Ablation Till with decreasing silt content
   - Unit 3 - Ablation Till with gradual silt content increase
2. For cross-section profile location, see Site Exhibit 2011 Remedial Investigation figure, Figure 3.
3. Wells shown in gray were decommissioned in May 2011
4. Wells with only June 2011 water levels were installed in May 2011.
5. December 2010 water levels were collected between 12/06/10 and 12/08/10. June 2011 water levels were collected between 6/28/11 and 6/30/11.
6. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.



Ground Surface Profile Source: Puget Sound LiDAR Consortium, 2005

0 50 100
Horizontal Scale: 1" = 50'
Vertical Scale: 1" = 10'

Peterson's Fryer Farms | Y:\136\006\1T\CADD\Sections-A-E.dwg (A) "Figure 4-9" 9/21/2011

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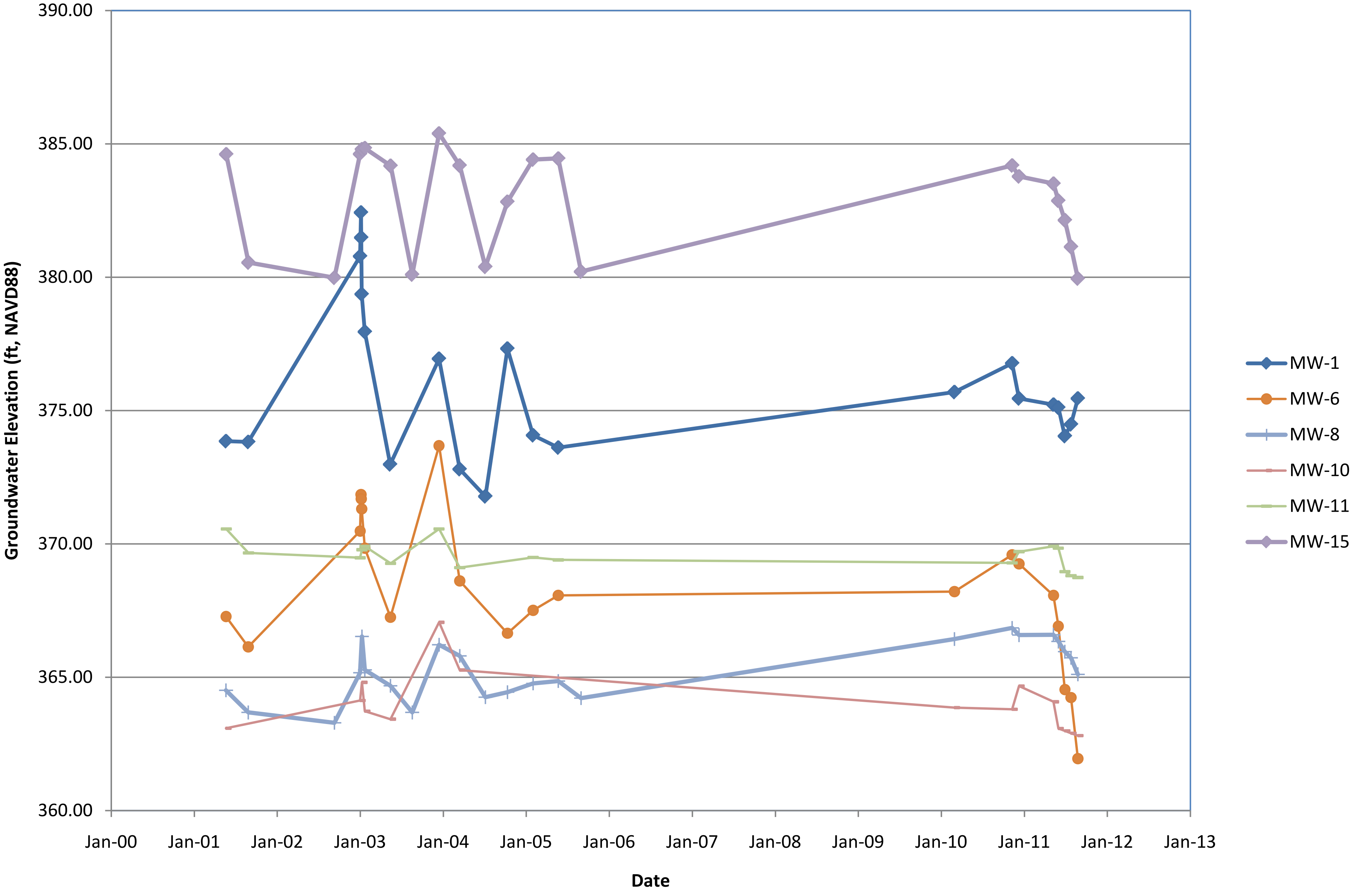
Pederson's Fryer Farms
Pierce County, Washington

Geologic Cross Section E-E'

Figure
4-9



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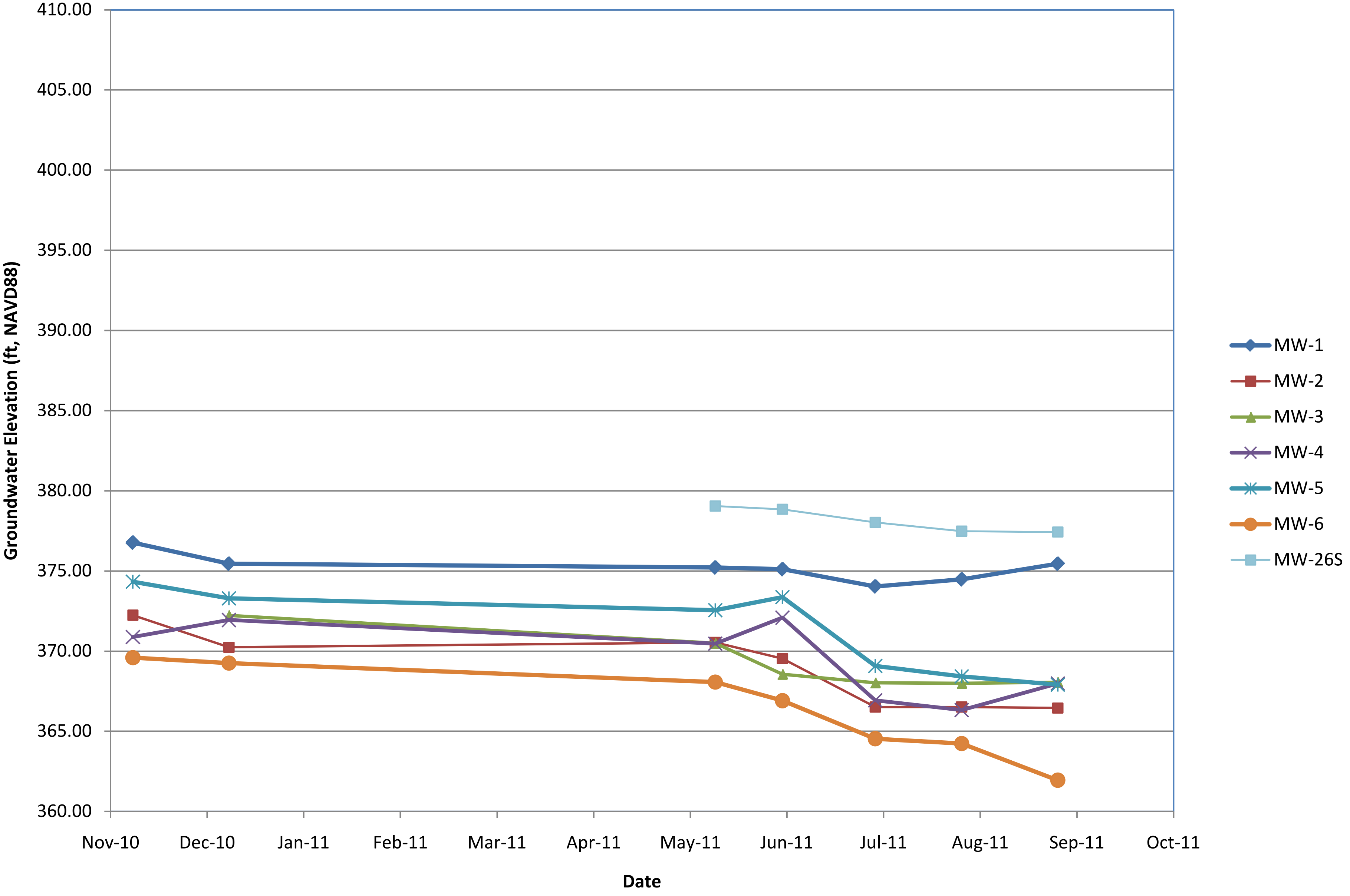
Pederson's Fryer Farms
Pierce County, Washington

Long-term Water Level Hydrographs
Shallow Water Bearing Zone

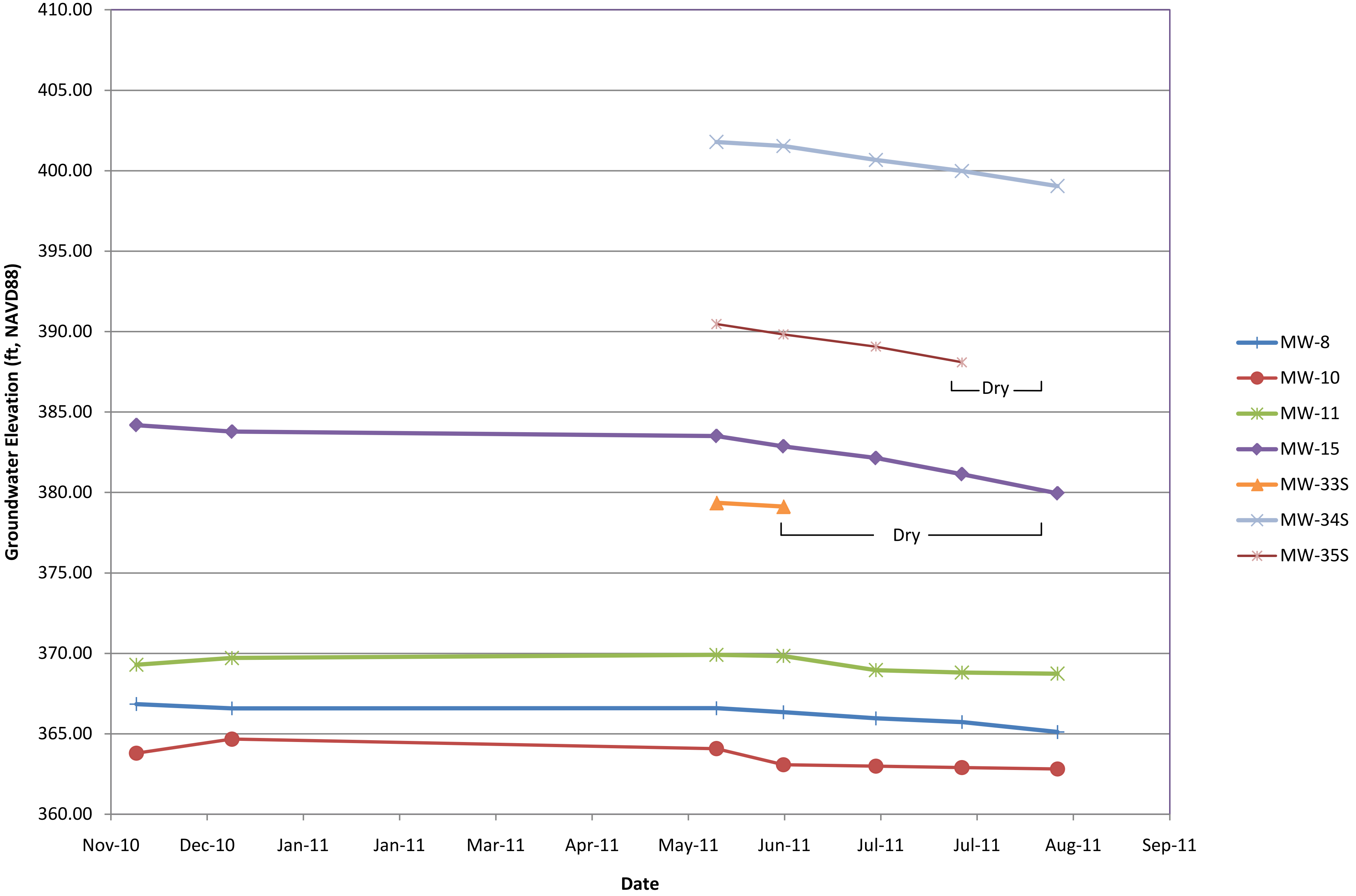
Figure
4-10



Pederson's Fryer Farm,
Pierce County, Washington

Shallow Water Bearing Zone Hydrographs: Area A

Figure
4-11

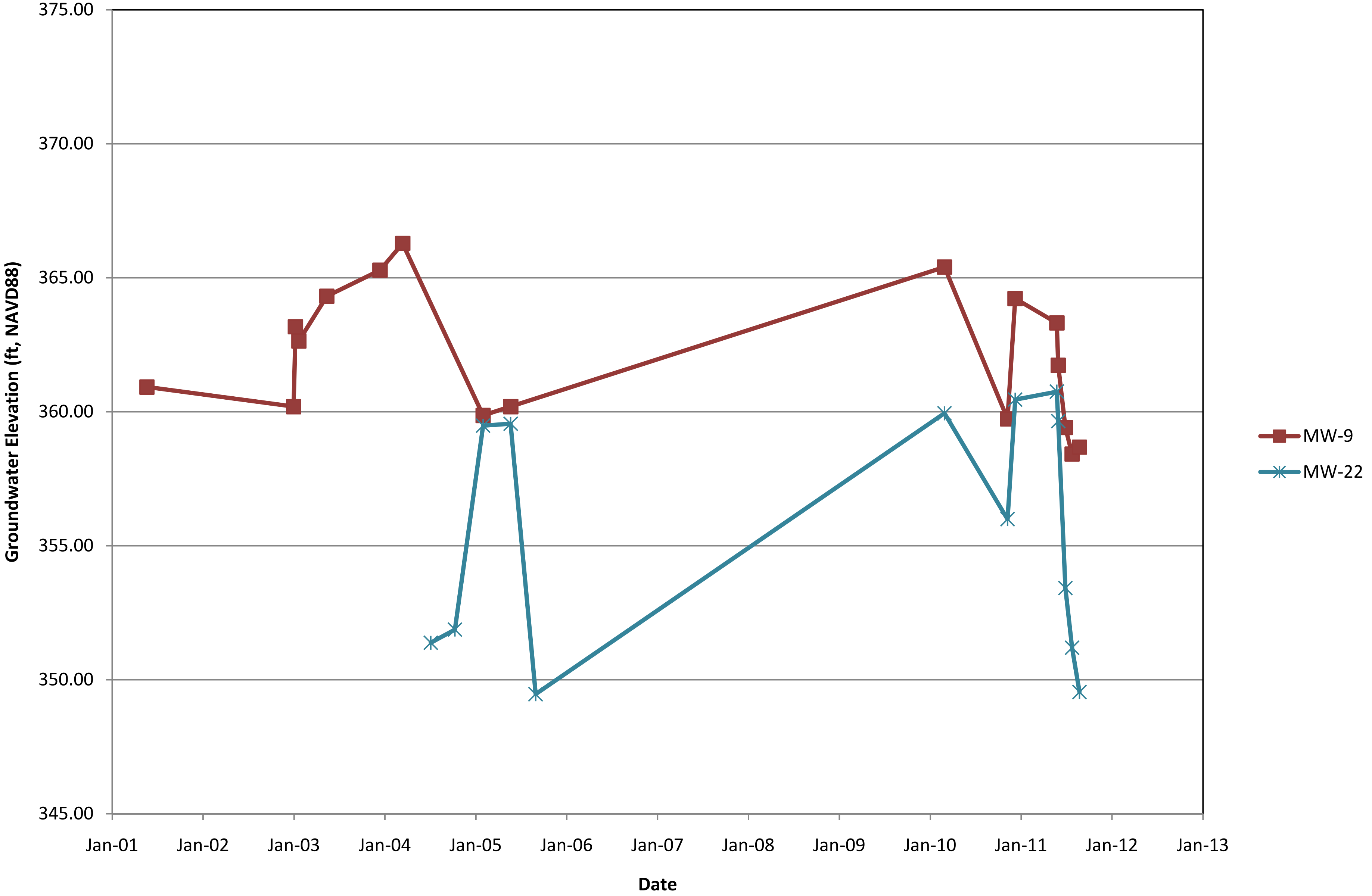


LANDAU ASSOCIATES

Pederson's Fryer Farm
Pierce County, Washington

Shallow Water Bearing Zone Hydrographs: Excluding Area A

Figure
4-12

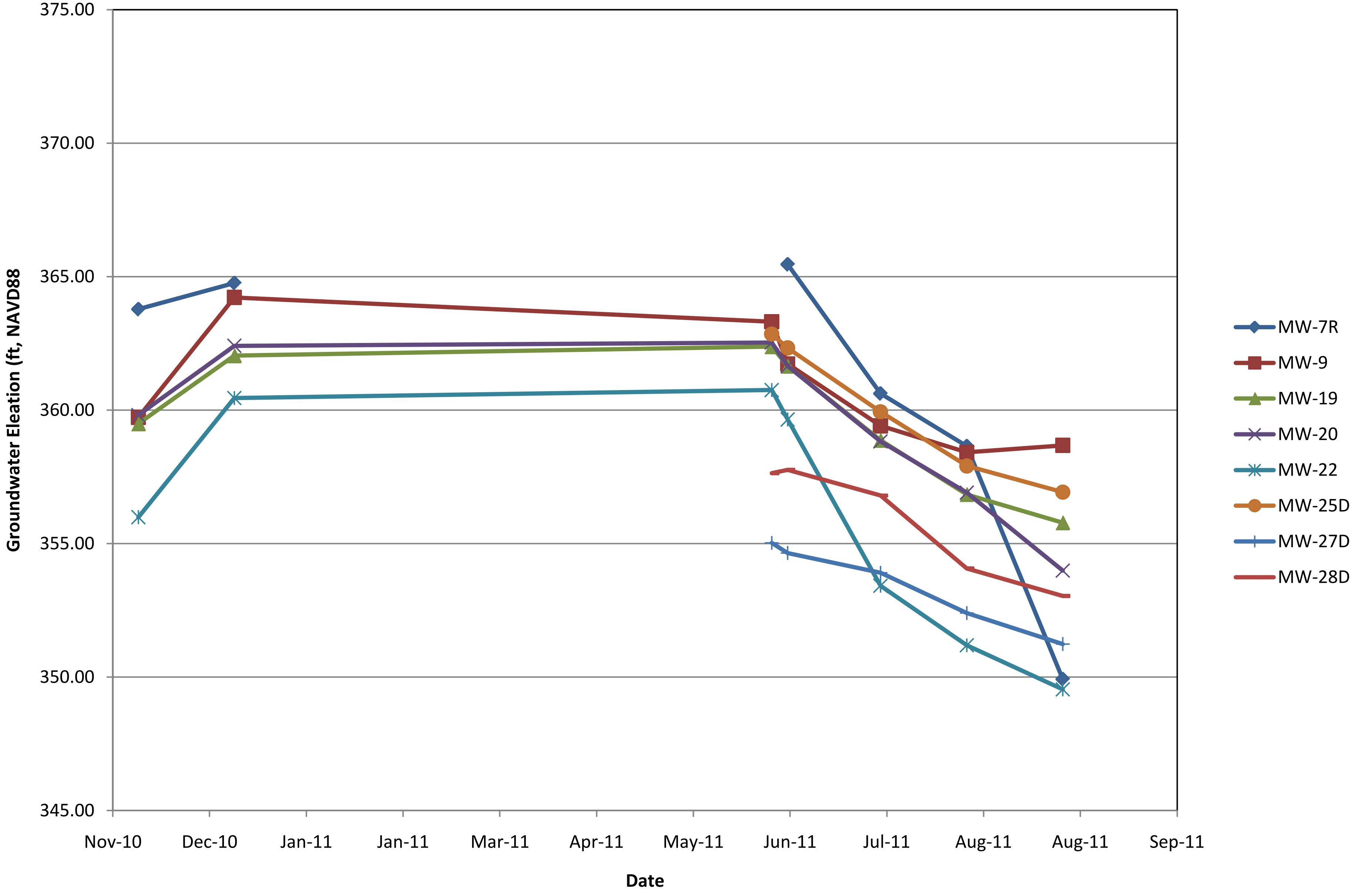


LANDAU ASSOCIATES

Pederson's Fryer Farms
Pierce County, Washington

Long-term Water Level Hydrographs
Deep Water Bearing Zone

Figure
4-13

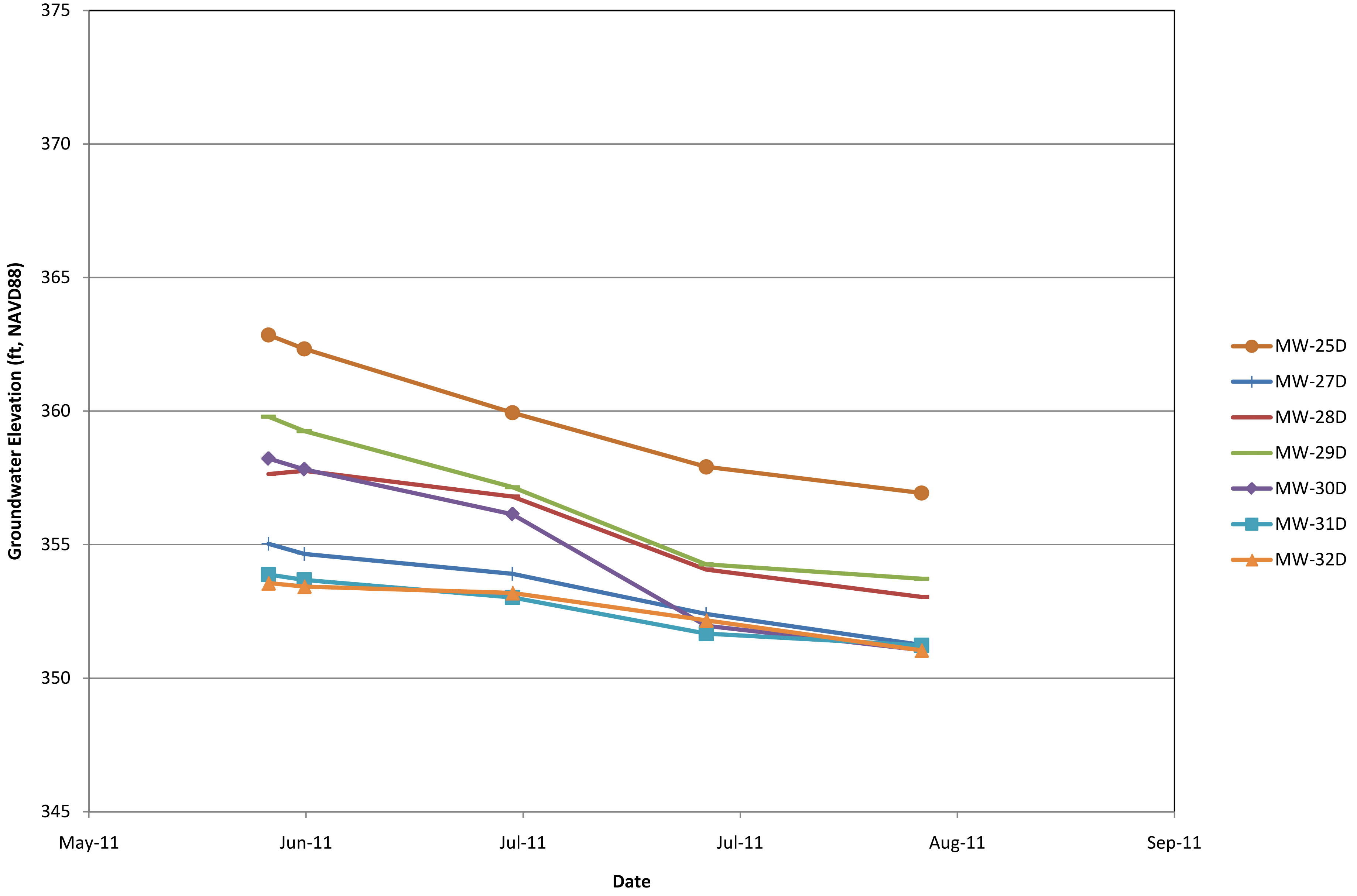


LANDAU ASSOCIATES

Pederson's Fryer Farms
Pierce County, Washington

Deep Water Bearing Zone
Hydrographs: Area A

Figure
4-14



LANDAU ASSOCIATES

Pederson's Fryer Farms
Pierce County, Washington

Deep Water Bearing Zone Hydrographs: Excluding Area A

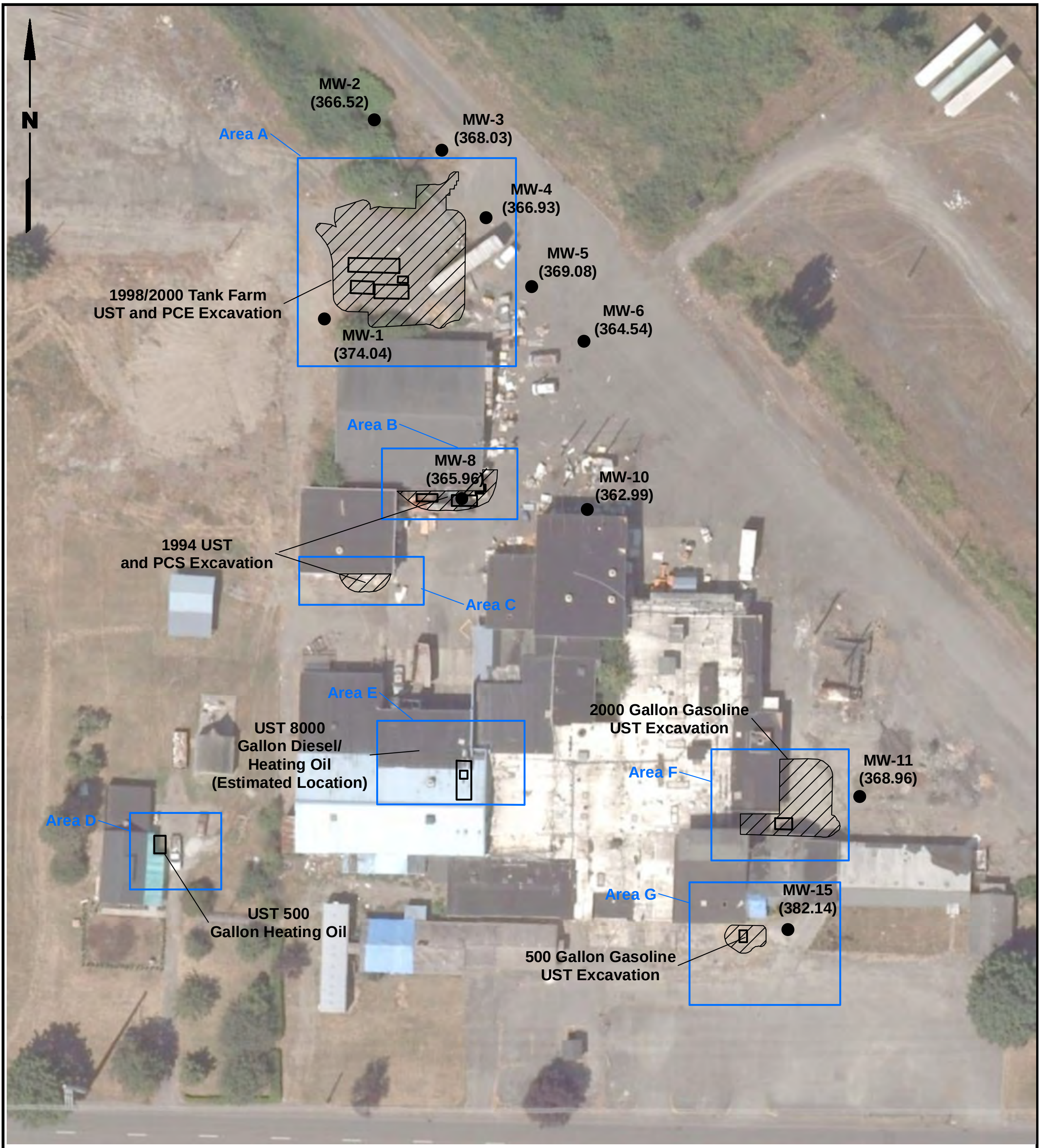
Figure
4-15

LANDAU ASSOCIATES

Pederson's Fryer Farms
Pierce County, Washington

Semi-continuous Water Level Hydrographs: MW-27D and MW-32D

Figure
4-16



Legend

● Monitoring Well

(366.58) Groundwater Elevation (ft, NAVD88)

☐ Area of Concern

▨ Former Excavation Area

Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

0 80 160

Scale in Feet

Data Source: Pierce County GIS; Bing Maps Aerial

Y:\Projects\136006\MapDocs\MayJune Water Level Update\June2011 Shallow Well Water Levels.mxd 9/20/2011 NAD 1983 StatePlane Washington South FIPS 4602 Feet

LANDAU ASSOCIATES

Pederson's Fryer Farms
Pierce County, Washington

Groundwater Elevations - Shallow Wells June 2011

Figure
4-17

Legend

▭ Area of Concern

▨ Former Excavation Area

(364.22) Groundwater Elevation (ft, NAVD88)

— Groundwater Elevation Contour

Note
1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.
2. Water levels were collected May 27, 2011.
3. MW-9 not included since influenced by shallow & deep groundwater.

0 80 160

Scale in Feet

Data Source: Pierce County GIS; Bing Maps Aerial

Landau Associates

Pederson's Fryer Farms
Pierce County, Washington

Groundwater Elevations - Deep Wells
May 2011

Figure
4-18

Legend

☐ Area of Concern	(364.22) Groundwater Elevation (ft, NAVD88)
▨ Former Excavation Area	— Groundwater Elevation Contour

Note
1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.
2. Water levels were collected June 28-30, 2011.
3. MW-9 not included since influenced by shallow & deep groundwater.

0 80 160
Scale in Feet

Data Source: Pierce County GIS; Bing Maps Aerial

Landau Associates

Pederson's Fryer Farms
Pierce County, Washington

Groundwater Elevations - Deep Wells
June 2011

Figure
4-19

Legend

●	Monitoring Well
(364.22)	Groundwater Elevation (ft, NAVD88)
☐	Area of Concern
—	Groundwater Elevation Contour
▨	Former Excavation Area

Note
1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.
2. Water levels were collected July 27, 2011.
3. MW-9 not included since influenced by shallow & deep groundwater.

0 80 160

Scale in Feet

Data Source: Pierce County GIS; Bing Maps Aerial

LANDAU ASSOCIATES

Pederson's Fryer Farms
Pierce County, Washington

Groundwater Elevations - Deep Wells
July 2011

Figure
4-20

Legend

● Monitoring Well

☐ Area of Concern

▨ Former Excavation Area

(364.22) Groundwater Elevation (ft, NAVD88)

— Groundwater Elevation Contour

Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.
2. Water levels were collected August 28, 2011.
3. MW-9 not included since influenced by shallow & deep groundwater.

0 80 160

Scale in Feet

Data Source: Pierce County GIS; Bing Maps Aerial

Landau Associates

Pederson's Fryer Farms
Pierce County, Washington

Groundwater Elevations - Deep Wells
August 2011

Figure
4-21

TABLE 4-1
MONITORING WELL DETAILS
PEDERSON'S FRYER FARMS RI

	Aquifer Designation	Depth to Water (ft) (6/28 to 6/30/2011)	Measured Well Depth (ft)*	Computed Water Column Thickness in Well (ft) (Jun 2011)	Recorded Well Construction Depth (ft)	Screen Length (ft)
MW-1	S	31.62	34.9	3.28	35	20
MW-2	S	37.67	38.16	0.49	35	20
MW-3	S	33.79	34.35	0.56	35	20
MW-4	S	36.85	39.5**	#VALUE!	40	25
MW-5	S	36.23	39.6	3.37	40	25
MW-6	S	41.12	44.3	3.18	45	30
MW-8	S	43.94	47.9	3.96	45	30
MW-10	S	43.96	44.7	0.74	45	30
MW-11	S	38.03	38.9	0.87	40	25
MW-15	S	26.92	29.9	2.98	30	15
MW-26s	S	27.49	28.25	0.76	28	10
MW-33s	S	DRY	29.87	DRY	30	15
MW-34s	S	5.59	15.22	9.63	15	10
MW-35s	S	18.52	20.2	1.68	20	10
MW-7R	D	44.2	55.3	11.1	55	30
MW-9	D	47.39	49.1	1.71	50	35
MW-19	D	45.1	60.19	15.09	65	20
MW-20	D	46.74	61.85	15.11	65	20
MW-22	D	51.61	56.6	4.99	55	30
MW-25d	D	44.96	54.91	9.95	55	15
MW-27d	D	51.94	60.17	8.23	60	10
MW-28d	D	49.99	60	10.01	60	10
MW-29d	D	49.73	60.55	10.82	60	15
MW-30d	D	52.91	61.15	8.24	60	15
MW-31d	D	53.78	59.62	5.84	60	15
MW-32d	D	53.69	60.05	6.36	60	10

S = Shallow water bearing zone
D = Deep water bearing zone
* = Pre RI wells were measured in December 2010 and RI wells were measured in May 2011
** = Value was measured in September 2011

TABLE 4-2
SHALLOW WATER BEARING ZONE GROUNDWATER MEASUREMENTS
PEDERSON'S FRYER FARMS RI

Groundwater Elevation (ft, NAVD88)

Well	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-8	MW-10	MW-11	MW-15	MW-16	MW-26s	MW-33s	MW-34s	MW-35s
Top of PVC Elevation	405.66	404.19	401.82	403.78	405.31	405.66	409.90	406.95	406.99	409.06	408.99	405.52	408.88	406.26	407.59
3/1/2010	375.69	369.83	371.32	370.57	362.31	368.21	366.43	363.86	--	--	--	--	--	--	--
11/10/2010	376.77	372.24	--	370.88	374.33	369.59	366.85	363.80	369.29	384.19	366.11	--	--	--	--
12/10/2010	375.45	370.24	372.23	371.94	373.29	369.25	366.58	364.67	369.71	383.78	365.96	--	--	--	--
5/11/2011	375.22	370.54	370.49	370.47	372.55	368.07	366.59	364.08	369.91	383.51	D	379.05	379.36	401.79	390.47
6/1/2011	375.11	369.53	368.56	372.09	373.37	366.91	366.34	363.08	369.84	382.87	D	378.85	379.13	401.54	389.83
6/30/2011	374.04	366.52	368.03	366.93	369.08	364.54	365.96	362.99	368.96	382.14	D	378.03	Dry	400.67	389.07
7/27/2011	374.48	366.52	367.99	366.32	368.43	364.24	365.73	362.90	368.81	381.14	D	377.48	Dry	399.98	388.09
8/26/2011	375.45	366.45	368.06	367.98	367.91	361.95	365.11	362.81	368.74	380	D	377.4	Dry	399.05	Dry

Depth to Water (ft)

3/1/2010	29.97	34.36	30.50	33.21	43.00	37.45	43.47	43.09	--	--	--	--	--	--	--
11/1/2010	28.89	31.95	--	32.90	30.98	36.07	43.05	43.15	37.70	24.87	42.88	--	--	--	--
12/1/2010	30.21	33.95	29.59	31.84	32.02	36.41	43.32	42.28	37.28	25.28	43.03	--	--	--	--
5/1/2011	30.44	33.65	31.33	33.31	32.76	37.59	43.31	42.87	37.08	25.55	D	26.47	29.52	4.47	17.12
6/1/2011	30.55	34.66	33.26	31.69	31.94	38.75	43.56	43.87	37.15	26.19	D	26.67	29.75	4.72	17.76
6/30/2011	31.62	37.67	33.79	36.85	36.23	41.12	43.94	43.96	38.03	26.92	D	27.49	Dry	5.59	18.52
7/27/2011	31.18	37.67	33.83	37.46	36.88	41.42	44.17	44.05	38.18	27.92	D	28.04	Dry	6.28	19.50
8/26/2011	30.21	37.74	33.76	35.80	37.40	43.71	44.79	44.14	38.25	29.11	D	28.09	Dry	7.21	Dry

Water Level Fluctuation (ft)

	2.73	5.79	4.24	5.77	12.02	7.64	1.74	1.86	1.17	4.24	0.15	1.62	0.23	2.74	2.38

D = Decommissioned

- = Well not installed or not measured

TABLE 4-3
DEEP WATER BEARING ZONE GROUNDWATER LEVEL MEASUREMENTS
PEDERSON'S FRYER FARMS RI

Well	MW-7R	MW-9	MW-12	MW-13	MW-14	MW-17	MW-18	MW-19	MW-20	MW-21	MW-22	MW-25d	MW-27d	MW-28d	MW-29d	MW-30d	MW-31d	MW-32d
Top of PVC Elevation	404.82	406.8	406.11	406.36	407.11	405.22	406.11	404	405.6	405.00	405	404.9	405.85	406.79	406.88	409.05	406.8	406.88
Groundwater Level Elevation (ft, NAVD88)																		
3/1/2010	365.06	365.40	--	--	--	--	--	362.51	373.96	--	359.94	--	--	--	--	--	--	--
11/10/2010	363.78	359.73	357.40	--	358.13	363.23	364.48	359.49	359.81	366.63	355.99	--	--	--	--	--	--	--
12/10/2010	364.76	364.22	357.94	358.34	358.11	363.81	364.43	362.04	362.41	348.19	360.45	--	--	--	--	--	--	--
5/11/2011	--	363.31	D	D	D	D	D	362.38	362.53	D	360.75	362.85	355.03	357.64	359.79	358.22	353.88	353.56
6/1/2011	365.46	361.73	D	D	D	D	D	361.65	361.65	D	359.65	362.33	354.65	357.76	359.25	357.82	353.68	353.43
6/30/2011	360.62	359.41	D	D	D	D	D	358.87	358.83	D	353.42	359.94	353.91	356.80	357.15	356.14	353.02	353.19
7/27/2011	358.65	358.42	D	D	D	D	D	356.84	356.91	D	351.19	357.91	352.40	354.07	354.26	351.96	351.67	352.16
8/26/2011	349.92	358.7	D	D	D	D	D	355.8	354	D	349.5	356.93	351.24	353.04	353.72	351.05	351.23	351.04
Depth to Water (ft)																		
3/1/2010	39.76	41.40	--	--	--	--	--	41.46	31.61	--	45.09	--	--	--	--	--	--	--
11/10/2011	41.04	47.07	48.71	--	48.98	41.99	41.63	44.48	45.76	38.37	49.04	--	--	--	--	--	--	--
12/10/2011	40.06	42.58	48.17	48.02	49.00	41.41	41.68	41.93	43.16	56.81	44.58	--	--	--	--	--	--	--
5/11/2011	--	43.49	D	D	D	D	D	41.59	43.04	D	44.28	42.05	50.82	49.15	47.09	50.83	52.92	53.32
6/1/2011	39.36	45.07	D	D	D	D	D	42.32	43.92	D	45.38	42.57	51.2	49.03	47.63	51.23	53.12	53.45
6/30/2011	44.2	47.39	D	D	D	D	D	45.1	46.74	D	51.61	44.96	51.94	49.99	49.73	52.91	53.78	53.69
1/0/1900	46.17	48.38	D	D	D	D	D	47.13	48.66	D	53.84	46.99	53.45	52.72	52.62	57.09	55.13	54.72
8/26/2011	54.9	48.12	D	D	D	D	D	48.19	51.58	D	55.49	47.97	54.61	53.75	53.16	58	55.57	55.84
Water Level Fluctuation (ft)																		
	15.54	6.98	0.54	0.00	0.02	0.58	0.05	6.73	19.97	18.44	11.21	5.92	3.79	4.72	6.07	7.17	2.65	2.52

D = Decommisioned

- = Not measured or not installed.

5.0 NATURE AND EXTENT

Pre RI and current RI site investigation data indicate the presence of contamination in soil, shallow groundwater, and deep groundwater. This section presents the nature and extent of soil and groundwater contamination by area (e.g. Area A). Indoor air is currently being evaluated as part of supplemental RI work; these data will be presented in the FS report. The understanding of the nature and extent of contamination is based on data from the PFF database and from pre RI investigations documentation. The database includes soil data collected since 1996 and all groundwater data collected from all pre RI and RI wells between 2001 and June 30, 2011. Although not in the database and tables, final confirmation soil data from the 1994 Area B and Area C excavations were evaluated and are discussed in the text and shown in associated figures. All data from the database are included on a CD in Appendix F.

Numerous site investigations and subsequent soil removal actions complicate the evaluation of soil data and the interpretation of the current nature and extent of contamination. Consequently, the current extent of soil contamination is based on soil confirmation sampling results collected after soil excavations were completed for pre RI permanent well soil samples and RI soil investigations. The nature and extent of groundwater contamination is based on the entire data from the database with emphasis on RI sampling data. Pre RI wells were sampled between 2001 and 2005 and during the RI in December 2010 and February 2011 (select wells only). Quarterly RI groundwater sampling began for pre RI and RI wells after the RI wells were installed in May 2011 and some pre RI wells were decommissioned. Two complete rounds (early June and late June, 2011) of quarterly RI sampling data were evaluated for this report. All site data were evaluated against preliminary cleanup levels presented in Section 3.0.

5.1 CONSTITUENTS OF CONCERN

The constituents of concern at the PFF site are related to TPH and TPH additives. Sampling and analysis of site media was focused on TPH related constituents, including the required sampling for TPH releases (WAC 173-340-900 Table 830-1). A list of constituents of concern is presented in Section 3.

The primary constituents of concern in soil are DRO[15], ORO[2], GRO, and BTEX. DRO was sampled in over 334 soil samples and was typically detected in about half the samples. The maximum DRO concentration was 48,000 mg/kg, the maximum ORO concentration was 790 mg/kg, and the maximum GRO concentration was 19,000 mg/kg. While DRO and GRO were frequently detected above the CUL, ORO was not detected above the CUL. BTEX was sampled in 173 soil samples. The most

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[15] Since 1997, DRO and ORO are analyzed by method NWTPH-Dx. Prior to 1997, TPH analyses were analyzed by methods WTPH-G, WTPH-D, WTPH-HCID or 418.1.

frequently detected BTEX constituent in soil was xylene[16] (65 percent); the least frequently detected BTEX constituent was benzene (10 percent). All BTEX constituents were detected above the CUL at least once; benzene exceeded the CUL most frequently (15 times). BTEX analytes are considered constituents of concern in soil.

PAHs, including cPAHs, were sampled for 15 times; only total naphthalenes exceeded the CUL (3 times). PCBs were sampled 3 times and were not detected. RCRA metals[17] were sampled once and lead was sampled for an additional 15 times. The maximum lead concentration was 21 mg/kg. All metals data are below the CUL and consistent with background concentrations (Ecology 1994). With the exception of naphthalene, PAHs, metals and PCBs are not considered constituents of concern. Extractable petroleum hydrocarbons (EPH) were sampled twice during final soil confirmation sampling in the excavation at Area A. These data are considered redundant with comparable diesel sampling data and are not considered in the nature and extent evaluation. A statistical summary of soil data in the database is presented in Table 5-1.

The primary constituents of concern in shallow groundwater are DRO, ORO, GRO, benzene and xylene. In shallow groundwater, DRO, ORO, and GRO were sampled approximately 100 times. DRO was detected in 60 percent of the samples; ORO was detected in 13 percent; GRO was detected in 33 percent. The maximum DRO concentration was 86 mg/L while the maximum ORO concentration was 1.8 mg/L. The maximum GRO was 9.8 mg/L. Benzene was detected in 17 percent of the 78 shallow groundwater samples; the maximum concentration was 22 µg/L. With the exception of DRO, ORO, GRO, benzene and xylene, no other constituent (including TPH additives) exceeded its respective cleanup level. A statistical summary of shallow groundwater data in the database is presented in Table 5-2.

The primary constituents of concern in deep groundwater are DRO, ORO, and GRO. In deep groundwater, the constituents of concern were sampled up to 65 times. DRO was detected in 78 percent of the samples; ORO in 14 percent; GRO was detected in 62 percent. The maximum DRO concentration was 560 mg/L while the maximum ORO concentration was 1.2 mg/L. The maximum GRO concentration was 2.4 mg/L. Benzene was detected in 9 percent of the 32 deep groundwater samples but did not exceed the CUL of 5µg/L. Beyond DRO, ORO, and GRO, no other constituent exceeded its respective cleanup level (including TPH additives). A statistical summary of shallow groundwater data in the database is presented in Table 5-3.

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[16] Specifically m, p-Xylene.

[17] RCRA metals: arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver.

5.2 AREA A

The historical sources of contamination at Area A included one gasoline UST (8,000 gallons), two diesel USTs (6,000 and 12,000 gallons), and one heating oil UST (550 gallons), which were all removed in 1998. All associated product lines, vent lines, and dispensers were located within the 1998 tank removal excavation extents (EPI 2003a). During the 1998 UST removal, releases to soil were documented and additional soil excavation was performed in 2000. The final excavation was eventually filled with bioremediated soil. The approximate location of the original USTs and the final excavation area are shown on Figure 5A-1. The maximum depth of the excavation was approximately 27 ft BGS; the total depth of excavation is shown on Figure 4-5. A summary of Area A site history and remedial actions are presented in Section 2.3.1.

5.2.1 SOIL

After the 2000 excavation, approximately 110 final confirmation soil samples were collected and analyzed for DRO, ORO, cPAHs, and naphthalene; GRO was not analyzed. Twenty-eight of the confirmation soil samples exceeded the DRO CUL. The concentrations of these twenty-eight samples concentrations ranged from the CUL of 2,000 mg/kg to a maximum of 48,000 mg/kg, from a sample along the east sidewall at 12 ft BGS. None of the final confirmation sample concentrations for ORO exceeded the CUL. In general, the soil confirmation soil samples indicated that contamination extends below the bottom of the excavation at 27 ft BGS and beyond the east, south and west excavation sidewalls from 11 ft BGS to the excavation bottom. Soil confirmation sample results that exceeded the DRO CUL are posted on Figure 5A-1. The location of soil confirmation sample results where DRO was less than the CUL are shown on Figure 5A-2. A summary of all soil confirmation sampling results from 2000 are presented in Table 5A-1.

After backfilling the 2000 excavation, 11 monitoring wells were drilled in (MW-17 and MW-18) and around the excavation (MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, MW-7R, MW-19 and MW-20) in 2001 through 2004. Soil samples were collected from the well borings, typically below 27 ft BGS and sampled for DRO. A total of nine samples were collected from MW-17 and MW-18 below 29 ft BGS but only a single sample from MW-18 exceeded the DRO CUL. Samples collected from below 30 ft BGS at three of the remaining wells, MW-7R, MW-4 and MW-19, indicated that contamination had extended beyond the limits of the excavation to the east and west. Soil sampling data from pre RI Area A wells are presented in Table 5A-2. Detections of DRO above the CUL at these wells are shown on Figure 5A-1.

During the RI, five soil borings (A-1 through A-5) and three wells (MW-25D, MW-26S and MW-27D) were installed in, or near, the Area A excavation and sampled for soil at 5 to 10 ft intervals to a maximum depth of 60 ft BGS. These samples were analyzed for DRO and GRO[18]. The maximum concentration of both constituents was detected at 40 ft BGS depth at boring A-3 located about 20 ft east of the excavation. At this sample, DRO was 9,600 mg/kg; GRO was 2,400 mg/kg. Three other borings (A-1, A-2 and A-5) confirmed that TPH soil contamination was present outside the excavation; however, data from well MW-27D, located about 20 ft southwest of the excavation limits, did not exceed TPH CULs for any constituent. Results of the Area A RI soil sampling results for DRO, ORO, and GRO are presented on Figure 5A-3 and in Table 5A-3.

The borings and wells installed in the excavation (MW-25D, MW-26S and A-4) generally confirmed that the excavation backfill was not impacted above CUL. However, these same borings confirmed that soil near the base of the excavation extending down to a depth of 45 ft BGS is still impacted above CUL particularly for GRO. Results of the Area A RI soil sampling results for DRO, ORO, and GRO are presented on Figure 5A-3 and in Table 5A-3.

Select samples from RI soil borings (A-1 through A-5) and wells (MW-25D, MW-26S, and MW-27D) were analyzed for BTEX, lead, cPAHs, naphthalene, and PCBs. Six samples were collected for BTEX. The only soil sample with a BTEX constituent detected above CUL was MW-25D at 40 ft BGS where benzene was detected at 0.12 mg/kg. Lead was detected four times with the highest concentration being 8.4 mg/kg; the lead CUL is 250 mg/kg. Area A RI soil sampling data results are summarized in Table 5A-3.

CPAHs, naphthalene, and PCBs were analyzed for samples collected from A-4 at 30 ft and 40 ft BGS only. Some pre RI samples were analyzed for cPAHs and naphthalene, but not for PCBs. CPAH concentrations are calculated and evaluated using the toxicity equivalency (TEQ) methodology per WAC 173-340-708(8). The cPAH TEQ for the two A-4 samples were below the CUL for cPAH TEQ[19]. The pre RI samples with cPAH detections came from two southwestern excavation sidewall samples (11 ft BGS and 12 ft BGS) from the 2000 remedial excavation.

Naphthalene concentrations for the two A-4 samples were 24.7 mg/kg (30 ft BGS) and 50.7 mg/kg (40 ft BGS), which are above the naphthalene CUL of 5 mg/kg. Napthalene was detected twice in the pre RI samples from two southwestern excavation sidewall samples (11 ft BGS and 12 ft BGS) from the 2000 remedial excavation; concentrations were below the CUL. RI soil sample for PCB concentrations were below detectable limits; pre RI samples were not analyzed for PCBs.

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[18] ORO was also sampled for but not detected above the CUL.
[19] The cPAH TEQ CUL is 0.1mg/kg.

5.2.2 SHALLOW GROUNDWATER

Area A has seven shallow wells: Wells MW-1 through MW-6 (pre RI wells), and MW-26S (RI well). Historically, pre RI wells have only been sampled by NWTPH-Dx analysis (i.e., DRO and ORO). During the RI, all wells were sampled for GRO and select wells were sampled for BTEX. A summary of pre RI and RI Area A shallow groundwater data is presented in Table 5A-4.

DRO exceeded the CUL of 0.5 µg/L at all six pre RI wells during, or prior to, 2005. The maximum diesel concentrations were detected at MW-4 (86 mg/L) and MW-5 (80 mg/L), which are both to the east of the excavation. More recent sampling indicates that DRO concentrations have declined to below the CUL at all shallow zone wells except MW-26S. MW-26S is screened within the Area A excavation backfill at the base of the excavation. DRO was detected at 22 mg/L and 7.3 mg/L at MW-26S during the two June 2011 RI sampling events, whereas, other Area A shallow wells had concentrations that were below the CUL or below detectable limits. For pre RI wells, the relatively long period of data provides a record of temporal water quality trends. Based on data from pre RI wells, DRO concentrations in shallow groundwater outside the excavation are highly variable but have exhibited a long-term decreasing trend over time. A time series graph of DRO concentrations at select shallow zone wells is presented on Figure 5A-4. A plan view map of the maximum and most recent detected shallow well DRO concentrations is presented in Figure 5A-5.

ORO concentrations in shallow zone wells demonstrate similar trends to DRO, although ORO concentrations are much lower. ORO has only exceeded the CUL of 0.5 µg/L at four of the seven shallow wells: MW-2, MW-3, MW-6, and MW-26S. The maximum ORO concentration was 1.8 mg/L at MW-6 (2004), which has since decreased and is currently below the CUL. Similarly MW-2 and MW-3 are now below CUL. Therefore, the only shallow well currently exceeding the ORO CUL is MW-26S with the most recent concentration at 0.51 mg/L. A plan view map of the maximum and most recent detected shallow well ORO concentrations is presented in Figure 5A-6.

GRO has only been sampled in Area A shallow zone groundwater during the RI. GRO concentrations were detected at three wells, however, only exceeded the CUL of 0.8 µg/L at well MW-26S. This new RI well has been sampled twice. The first sample was collected in early June 2011 and exceeded the CUL at 1.2 mg/L. The second sample was collected in late June 2011 and was below the CUL at 0.54 mg/L. Benzene was sampled at all shallow zone wells at least once. Benzene was only detected at MW-26S at a maximum concentration of 0.6 µg/L below the CUL of 5 µg/L. A plan view map of the maximum and most recent detected shallow GRO and benzene concentrations is presented in Figure 5A-7.

5.2.3 DEEP GROUNDWATER

There are six existing deep wells (MW-7R, MW-19, MW-20, MW-22, MW-25D, and MW-27D), and two decommissioned deep wells (MW-17 and MW-18) that are located within or near the Area A excavation. There are also four recent Area A soil borings from which borehole samples were collected (A-1, A-2, A-3, and A-5). Similar to shallow zone wells, pre RI deep Area A wells have only been sampled for NWTPH-Dx analysis (i.e., DRO and ORO) prior to the RI. During the RI, all wells were sampled for GRO and select wells were sampled for BTEX. A summary of pre RI and RI Area A deep groundwater data is presented in Table 5A-5.

Area A DRO groundwater concentrations are consistently higher in the deep zone compared to the shallow zone. All of the deep zone Area A wells exceeded the DRO CUL during the most recent sampling event (late June 2011) except for well MW-22 located on Parcel 6 east of Pipeline Road. Historically, DRO concentrations have exceeded the CUL at this well during pre RI sampling. DRO concentrations tend to be highest in wells screened within or near the excavation and decrease with distance from the excavation. The maximum DRO concentration during RI sampling to date was 1,400 mg/L in the sample from boring A-5 located on the southern edge of the excavation. In general, borehole sample results are higher than well sampling results for most recent analyses. Based on data from pre RI wells, DRO concentrations in deep groundwater have been highly variable over time. Recent concentrations are lower than maximum results from pre RI sampling; however, the overall concentration variability makes it difficult to define a clear decreasing trend over time. A time series graph of DRO concentrations at select shallow zone wells is presented on Figure 5A-8. A plan view map of the maximum and most recent detected deep well DRO concentrations is presented in Figure 5A-9.

ORO concentrations in deep zone wells demonstrate similar trends observed for DRO though concentrations are much lower. All deep zone Area A wells exceeded the ORO CUL during RI groundwater sampling except for MW-25D and MW-22. As with the DRO concentration data, the ORO concentration data from the borehole samples exceed the well data with concentrations ranging from 1.1 mg/L (A-2) to 40 mg/L (A-5). A plan view map of the maximum and most recent detected deep well ORO concentrations is presented in Figure 5A-10.

GRO has only been sampled in Area A deep zone groundwater during the RI. GRO concentrations exceeded the CUL at three of existing deep wells (MW-20, MW-25D, and MW-27D), the two decommissioned wells, and two of the four borehole samples (A-2 and A-3, to the east of the excavation area). GRO concentrations are above the CUL with the most recent concentrations ranging from 0.87 mg/L to 1.3 mg/L. GRO was not detected at well MW-22D, which is furthest from the excavation and also had the lowest DRO concentrations. However, in contrast to DRO, there does not appear to be a distinct decreasing trend in concentrations with distance from the excavation. For example, the most recent sample at well MW-27D, located about 20 ft southwest of the excavation was 1.3 µg/L, while concentrations at MW-25D located within the excavation area was 0.87 µg/L. Benzene was sampled at all deep zone wells twice during the RI. Benzene was detected both times at MW-27D at a maximum concentration of 0.71 µg/L below the CUL of 5 µg/L. Benzene was also detected at MW-25D once at 0.13 µg/L. A plan view map of the maximum and most recent dete4ted deep well benzene and GRO concentrations is presented in Figure 5A-11.

5.2.4 SUMMARY

In conclusion, TPH contamination is present in soil, shallow groundwater, and deep groundwater in Area A. Soil data from pre RI final confirmation soil samples, pre RI wells, and RI wells indicate that TPH contamination above the CUL extends below and outside of the Area A excavation to the south, east, and west at various depths. Shallow groundwater data from pre RI and RI sampling events generally indicate that DRO and ORO concentrations have declined to below the CUL at all shallow zone wells except MW-26S. Additionally, RI groundwater data shows that GRO only exceeded the CUL at well MW-26S.

Area A DRO groundwater concentrations are consistently higher in the deep zone compared to the shallow zone. Deep groundwater data from pre RI and RI sampling events generally indicate that both DRO and ORO exceed the CUL at most Area A deep wells, although DRO concentrations are significantly higher. RI data shows that GRO exceeds the CUL below and outside of the Area A excavation in different directions and there does not appear to be a distinct decreasing trend in concentrations with distance from the excavation.

5.3 AREA B

The historical sources of petroleum contaminant at Area B included two gasoline pump islands, one 6,000 gallon gasoline UST, and one 3,000 gallon diesel UST. The tanks were removed in 1994 along with approximately 100 to 120 yd^3 of TPH contaminated soil. The excavation was about 15 ft deep (see Figure 4-9); it was apparently backfilled with clean soil. Confirmation soil samples and field observations at the time of excavation indicated that there was not a significant release to soil associated with the tanks but there was a gasoline related release associated with the pump islands. The location of the Area B soil excavation, tanks and pump islands are shown on Figure 5B-1. A summary of Area B site history and remedial actions are presented in Section 2.3.2.

5.3.1 SOIL

During the pump island excavation, there was a noticeable gasoline odor at 3 ft to 4 ft BGS. After completing the excavation, bottom and confirmation soil samples were collected. The samples beneath the two tanks did not detect TPH[20]. However, four of five samples in the vicinity of the pump islands detected GRO above the CUL of 30 mg/kg. The highest concentrations were 1,470 mg/kg (by Method HCID) at 14 ft BGS and 2,420 (by Method 418.1) at 14 ft BGS. Xylene also exceeded the CUL of 9 mg/kg at 14 ft BGS. In 1996, Agra drilled a soil boring in the pump island area and collected soil samples at 11 ft and 20 ft BGS. The 11 ft sample confirmed the presence of GRO contamination; the 20ft sample was clean. A summary of boring and soil confirmation sample data that exceeds the CUL are shown on Figure 5B-1. A summary of all soil samples from 1996 through 2011 associated with Area B are presented in Table 5B-1.

In 2001, well MW-8 was drilled through the excavation backfill south of the building where the tanks were located. Samples were collected every 5 ft from 10 ft to 35 ft BGS for DRO, GRO, ORO and BTEX. Relatively low level concentrations of DRO and ORO were detected up to 110 mg/kg, well below the CUL. No other constituents were detected. These data were consistent with the confirmation samples that suggested there was not a significant release from the tanks. Similar sampling was completed when drilling MW-9 and MW-10 located about 50 ft northeast and east of the excavation, respectively. There were no soil detections at these two wells.

During the RI, two borings were drilled in the vicinity of the former pump islands. Boring B-1 was drilled inside the building while boring B-2 was drilled at the eastern limits of the excavation. Samples were collected every 5 ft to a maximum depth of 15 ft BGS. A moderate TPH odor was noted at boring B-1 under the slab; a TPH odor was also noted at boring B-2 during drilling. GRO, DRO and ORO were analyzed at each location. These data confirmed the presence of GRO above the CUL beneath the building slab and in the pump island portion of the excavation. The maximum GRO concentration was 1,100 mg/kg. Benzene also exceeded the CUL at B-1; benzene, ethylbenzene, and xylene exceeded the CUL at B-2. These data are presented on Figure 5B-1.

5.3.2 GROUNDWATER

In 2001, well MW-8 was drilled through and installed in the Area B excavation. This shallow well has a 30 ft screen that extends from the bottom of the excavation at 15 ft to 45 ft BGS. This well was sampled for GRO, DRO and BTEX periodically during pre RI and RI period. DRO concentrations were initially as high as 12 mg/L during initial sampling in 2001, but have declined steadily and have

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[20] Samples were collected by Method HCID.

been below the CUL of 0.50 mg/L since 2005. The maximum ORO concentration was as high as 0.69 mg/L, but has been below the CUL since 2004. GRO and BTEX were never detected. A time series graph of DRO concentrations at MW-8 is presented on Figure 5B-2. A summary of all groundwater samples associated with Area B are presented in Table 5B-2.

In addition to MW-8, pre RI shallow well MW-10 was installed about 60 ft east of the Area B excavation. This well has been analyzed for GRO, DRO, ORO and BTEX. DRO and ORO were detected in a few samples in 2003 but not above the CUL. No other constituents were detected at this well. Two deep wells are located about 50 ft northeast of the pump island. GRO and DRO were detected above the CUL at MW-28D and DRO was also detected above the CUL at MW-9 historically, but concentrations have declined to below the CUL. These wells are considered downgradient of Area A due to groundwater mounding (e.g., see Figure 4-20). The deep water bearing zone is contaminated in Area A and it is assumed that the water quality impacts at MW-28D and MW-9 are probably associated with Area A. A summary of GRO and DRO impacts in the deep water bearing zone are presented on Figures 5A-9 and 5A-11, respectively.

5.3.3 SOIL STOCKPILE

The excavated soil from Area B and Area C (see Section 5.4) were stockpiled east of the site before being spread out. It was determined that the stockpile soil was clean and was left in place and eventually spread out nearby. A summary of soil stockpile management is presented in Section 2.1.

The approximate stockpile area was determined during the RI, based on aerial photographs. During the RI, four samples were collected from the former stockpile area. Samples were analyzed for DRO, ORO and PAHs. Minor ORO and PAH concentrations were detected but no results exceeded the CUL. The stockpile and sample locations are shown on Figure 2-1. Soil stockpile data is presented in Table 5B-3. These data are consistent with earlier determinations that the soil was clean.

5.3.4 SUMMARY

In conclusion, GRO and BTEX contamination is present in the soil at Area B. The pre RI soil data indicated that the former diesel and gasoline USTs did not have a significant release, but a pump island gasoline release did occur. Pump island associated gasoline contamination has been found northeast of the fuel islands in the former excavation area and beneath the adjacent building to the northwest. Some TPH shallow groundwater contamination was detected in pre RI investigations but concentrations have since decreased below CULs. No deep groundwater TPH contamination is attributed to Area B.

5.4 AREA C

The historical source of petroleum contaminant at Area C was a 300-gallon waste oil tank. The tank was removed in 1994 along with approximately 50 to 60 yd^3 of TPH contaminated soil. The excavation was about 15 ft deep (see Figure 4-9); it was apparently backfilled with clean soil. Confirmation soil samples and field observations at the time of excavation indicated that there was not a continuing release to soil associated with the tank. The location of the Area C soil excavation is shown on Figure 5C-1. A summary of Area C site history and remedial actions are presented in Section 2.3.3.

5.4.1 SOIL

During excavation, it was noted that some contamination was left in place on the north sidewall underneath the adjacent building. Confirmation samples were collected from the base and sidewalls of the excavation at two locations; TPH was analyzed by Method WTPH-418.1. Semivolatile organic compound (SVOC) and PCB analyses were also apparently collected, though the results were not reported (Saltbush 1994). Two north sidewall confirmation soil sample results exceeded the CUL. The maximum concentration was 39,000 mg/kg diesel. These data confirmed that soil contamination was left in place near the edge of the building.

During the 1996 Agra Phase I/Phase II ESA, one indoor soil boring was drilled just north of the former Area C UST. A soil sample was collected at 11 ft BGS and was analyzed for heating oil by method WTPH-D; heating oil was not detected. In 2001, EPI drilled, installed, sampled (at time of drilling), and decommissioned one temporary groundwater monitoring well (MW-7) in Area C. Soil samples were collected at depths between 7 and 25 ft BGS and were analyzed for GRO, DRO, ORO and BTEX. DRO and ORO were detected at 7 ft and 10 ft BGS, but concentrations were below the CUL. GRO and BTEX were not detected in any samples. Data from these borings suggest that remaining TPH contaminated soil is limited in extent. The approximate location of these borings is shown on Figure 5C-1.

During the RI, soil samples were collected from one boring (C-1) inside the building and wells south (MW-34S) and east (MW-31D) of the excavation. DRO and ORO were not detected at any of these locations. One PCB analysis and four PAH analyses were performed from samples at these borings; no constituents were detected. GRO was also analyzed at 5 and 10 ft BGS samples from MW-31D. GRO did exceed the CUL at 5 ft BGS. These sample locations and associated TPH concentrations area shown on Figure 5C-1. A summary of all soil data associated with Area C collected since 1996 are presented in Table 5B-2.

5.4.2 GROUNDWATER

A borehole sample was collected at temporary well MW-7, which was not documented to have had a screen. The MW-7 sample was only analyzed for volatile organic compounds by method SW80260A. The only detected analyte was 1,1-dichloroethane at 8 ug/L. 1,1-dichloroethane is not considered a constituent of concern and this reported detection is assumed to be a laboratory error. Shallow well MW-34S and deep well MW-34D were installed adjacent to the Area C excavation during the RI to evaluate groundwater impacts. Gasoline was detected at both wells but only once above the CUL. The maximum concentration was 0.56 mg/L at MW-31D. DRO was also detected in one out of two samples at MW-31D but below the CUL. ORO was not detected in either well.

Napthalenes and PAHs were also sampled at MW-34S and MW-31D. Napthalene was detected in shallow well MW-34S at 0.058 µg/L. Napthalenes were also detected in deep well MW-34D. The maximum concentration was 23 µg/L 1-methylnapthalene; this concentration is below the CUL of 160 µg/L. Some PAHs were also detected but not above the CUL. A summary of groundwater analyses in Area C wells is presented on Table 5C-2.

5.4.3 SUMMARY

Some residual contamination was left after removing the Area C waste oil UST in 1994. Follow up soil sampling by Agra in 1996, EPI in 2001, and during the RI indicate that the extent of contamination is probably limited to localized areas of the original excavation sidewall and do not extend appreciably under the existing building. GRO was detected above the CUL in shallow soil east of the excavation at MW-31D and GRO was detected in shallow groundwater below the CUL at MW-34S. Since the Area C UST was used for waste oil, it is unlikely that this GRO contamination is from the UST. These shallow GRO impacts are assumed to be localized and not significant. GRO and naphthalene were also detected in the deep zone at MW-31D. Given the relatively limited TPH impact associated with the Area C UST, it is assumed that these impacts are associated with Area A. MW-31D appears to be downgradient from Area A due to mounding in the deep zone (e.g., see Figure 4-20).

5.5 AREA D

Area D consists of a 500-gallon heating oil tank formerly associated with a residence on Parcel 2. The heating oil tank was closed in place in 1997 (Langseth 1997). The tank has not been removed and no investigations had been conducted until 2010. A summary of Area D site history and remedial actions are presented in Section 2.3.4.

During the RI, boring D-1 was drilled at the northeast corner of the Area D UST that had previously been located by a geophysical survey (see Section 2.3.4). During drilling, field screening did not indicate the presence of heating oil contamination and groundwater was not encountered. Soil samples were collected at 7.5 ft BGS and 12.5 ft BGS and were analyzed for DRO and ORO. The only detection occurred at 7.5 ft BGS and was 77 mg/kg ORO which is well below the CUL of 2,000 mg/kg. Soil data for Area D is presented in Table 5D-1. The location of boring D-1 is shown on Figure 2-1.

There was no indication that the Area D tank has leaked and resulted in a release to soil and groundwater. No further action is planned for this UST.

5.6 AREA E

Area E consists of an 8,000-gallon diesel/heating oil UST located beneath the eastern portion of the main building. The exact location of this tank was not known at the beginning of the RI. An RI task included locating and decommissioning this tank. A summary of Area E site history and remedial actions are presented in Section 2.3.5.

5.6.1 SOIL

Agra performed an initial investigation of Area E in 1996. Three indoor soil borings were drilled using a hollow stem auger. The soil borings were drilled down to 16.5 ft BGS (sample collected at bottom), 12 ft BGS (sample collected at 11.5 ft BGS), and 16 ft BGS (sample collected at bottom). All samples were analyzed for TPH (by Method WTPH-HCID); results were below detectable limits. In 1997, the tank was closed in place. No additional investigations were conducted until 2011.

In May 2011, six indoor soil borings were drilled (E-1, E-2, E-3, E-5, E-6, and E-7) using a direct push probe. Three soil borings were drilled around the UST (E-2 to the east, E-1 to the west, and E-3 to the south) and three were drilled along the former UST piping (E-5, E-6, and E-7). Boring E-3 south of the UST hit refusal at 4 ft BGS; a soil sample was collected from a depth of 3.5 ft BGS. The total depths for the other five RI soil borings ranged from 9.5 ft BGS to 12 ft BGS. Soil samples were collected at various depths. The only soil sample that exceeded the soil CUL was at 9.5 ft BGS at soil boring E-5 (along the piping). The E-5 sample detected ORO at 12,000 mg/kg (CUL 2,000 mg/kg) and total naphthalene at 12.6 mg/kg (CUL 5 mg/kg). Lower detections of DRO and ORO were also found in soil samples at E-2 (8.5-9 ft BGS), and E-5 (9.5-10 ft BGS).

The Area E UST was decommissioned over the period of May, June, and July 2011. After inerting and cleaning, a hole was cut in the bottom of the UST to allow drilling and sampling below the tank. When the hole was cut, TPH impacted groundwater entered the tank and was pumped out. One boring was drilled beneath the tank through the cut hole (E-4) and a second boring was drilled south of the tank (E-3a)] to depths of 25 ft and 30 ft BGS, respectively. Soil sampling results from E-4 indicated the presence of DRO with a maximum concentration of 56 mg/kg at 15 ft BGS. Sampling results from E-

3a indicated the DRO and ORO with detections at 10 ft, 15 ft, and 25 ft BGS, but no detections at 20 ft BGS. At boring E-3a, the highest concentrations of DRO and ORO were found at 10 ft BGS and were 1,300 mg/kg and 99 mg/kg, respectively. A summary of Area A shallow groundwater data is presented in Table 5E-1. The location of Area E soil borings are shown on Figure 5E-1.

5.6.2 GROUNDWATER

A groundwater grab sample was collected from the bottom of boring E-2 and analyzed for DRO and ORO. The DRO concentration was above the CUL at 4.0 mg/L (CUL of 0.5 mg/L). ORO was also detected in the sample but below the CUL. A summary of Area E groundwater data is presented on Table 5E-2. The location of boring E-2 is shown on Figures 5A-5 and 5A-6.

5.6.3 SUMMARY

Observations during decommissioning of the Area E UST indicate a release occurred; however, soil contamination in the vicinity of the tank appears to be minor. Some shallow groundwater contamination was also present based on a single grab sample collected adjacent to the UST. Localized soil contamination associated with the UST piping was also present.

5.7 AREA F

The historical source of petroleum contamination at Area F was a 2,000-gallon gasoline UST. The UST was removed in 2000 along with 910 yd^3 of TPH contaminated soil. The maximum extent of the excavation was about 25 ft BGS (see Figure 4-8) however, the extent of excavation was limited by the tank proximity to two buildings. The excavated soil was treated and placed back in the excavation. Confirmation soil samples and field observations at the time of excavation indicated that there was residual soil contamination left in place after the tank removal and excavation. During the 2000 excavation, EPI observed the product line to be within the excavation, whereas, the vent pipe was observed to extend just southeast of the excavation extents (EPI 2003 IRA vol I). The location of the Area F UST, soil excavation, and nearby buildings is shown on Figure 5F-1. A summary of Area F site history and remedial actions are presented in Section 2.3.6.

5.7.1 SOIL

Thirty-nine final confirmation soil samples were collected during the 2000 excavation[21]. All of the samples were analyzed for GRO and BTEX. Nine of the samples exceeded the CUL for GRO. Six of the samples also exceeded the CUL for at least one BTEX constituent. The confirmation soil sample concentration exceedances occurred along the south, west and north sidewalls of the excavation between 3 and 13 ft BGS. With the maximum concentration of 3,000 mg/kg, GRO was detected along the west sidewall beneath the building foundation. Confirmation soil samples from the base of the excavation did not detect TPH contamination. A summary of final confirmation soil sample results are shown on Figure 5F-1. Area F final confirmation soil sample results are presented in Table 5F-1. All other Area F soil sample results from monitoring wells and soil borings are presented in Table 5F-2.

In 2001, monitoring well MW-11 was drilled approximately 15 ft east of the excavation. Soil samples were collected every 5 ft to a depth of 25 ft and analyzed for GRO and BTEX. No constituents were detected. These data are consistent with confirmation soil sampling results that indicate the east sidewall of the excavation is clean. The location of well MW-11 is shown on Figure 5F-1.

During the RI, additional soil samples were collected from two outdoor soil borings (F-1 and F-2), one shallow indoor soil boring (F-3), one shallow well (MW-35S), and one deep well (MW-29D). Borings F-1, F-2 and MW-29D were all located directly east of the excavation. GRO and BTEX constituents were not detected above the CUL. These data are consistent with confirmation soil sample results that indicate that the eastern side of the excavation is clean. The location of Area F RI borings and wells are shown on Figure 5F-1 along with GRO and BTEX sample results.

At boring F-3, located just beneath the building slab, relatively high GRO and BTEX concentrations were detected at 1.5 ft and 4.5 ft BGS. At 1.5 ft BGS, GRO were detected at 19,000 mg/kg and benzene was detected at 18 mg/kg. At 4.5 ft BGS the GRO concentration decreased to 1,900 mg/kg and benzene decreased to 2.5 mg/kg. Other BTEX constituent concentrations were also detected above the CUL at both depths. At the 11.5 ft BGS sample, GRO concentrations had decreased to below the CUL; BTEX was not analyzed in this sample. Boring F-3 is located near the area where the high GRO concentrations were detected in the excavation sidewall beneath the north building foundation. High concentrations in both the confirmation sampling results and boring F-3 indicate that GRO soil contamination persists beneath the building.

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[21] Associated analytical lab results indicate that two additional samples were taken, although EPI documentation neglected to include the reference location of such data; therefore it is not presented here.

GRO and benzene concentrations of 110 mg/kg and 0.06 mg/kg also were detected at 10 ft BGS at MW-35S. These data suggest minor recontamination of excavation backfill, possibly from contamination remaining under the building.

Decommissioned wells MW-12, MW-13 and MW-14 are located north and east of the Area F excavation. MW-12 is located about 20 ft north; MW-13 is located about 30 ft northeast and MW-14 is located about 50 ft east. These pre RI wells were drilled in 2001. Soil samples were collected at these wells between 10 and 40 ft BGS and analyzed for GRO and BTEX. There were no detections in any samples. The location of these wells relative to the Area F excavation is shown on Figure 2-1. The soil sample results area presented in Table 5F-2.

5.7.2 GROUNDWATER

In 2003, benzene, xylene and GRO were detected at shallow well MW-11. During the RI, DRO, GRO and BTEX were analyzed but not detected at MW-11 during both June 2011 sampling events. However, at well MW-35S, screened within the former excavation, GRO, DRO, ORO and all four BTEX constituents exceeded the CUL for groundwater. The maximum DRO and GRO concentrations were 0.78 mg/L and 9.8 mg/L, respectively. The maximum benzene concentration was 22 µg/L. These results indicate that there is residual gasoline contamination present that is associated with the original Area F release. The screen intervals of MW-11 and MW-35S relative to the Area F excavation are shown on Figure 4.8. Groundwater sample results for Area F are presented in Table 5F-3.

Decommissioned shallow zone wells MW-12, MW-13 and MW-14 were sampled two to four times prior to the RI for GRO and BTEX. There were no detections during any of these sampling events. MW-12 and MW-13 were sampled once during the RI prior to decommissioning. Both wells were sampled for DRO, ORO, GRO and BTEX. There were no detections at either well. MW-14 was dry during the RI sampling event. The location of these wells relative to the Area F excavation is shown on Figure 2-1. The groundwater sample results area presented in Table 5F-3.

DRO, GRO and BTEX were also analyzed for in deep well MW-29D and were not detected. This well is located about 10 ft northeast of the Area F excavation and should be downgradient of the excavation due to mounding present in this area (see Section 4). These data are also presented in Table 5F-3.

5.7.3 SUMMARY

The Area F excavation appears to be contaminated with GRO along the north, east and south sidewalls. The most significant contamination appears to occur beneath the building in the northeast part of the excavation. The bottom of the excavation appears to be clean. Shallow groundwater GRO contamination is present within the excavation at MW-33S. The occurrence of contamination in this well is assumed to be associated with the shallow soil contamination. The source of contamination at Area F is likely associated with residual contamination that was not removed from the original excavation primarily due to adjacent buildings and concerns about undermining building foundations.

5.8 AREA G

The historical source of petroleum contamination at Area G was a 500-gallon gasoline UST. The UST was removed in 2000 along with 145 yd^3 of TPH contaminated soil. During the 2000 excavation, EPI did not document the presence of associated piping or vent lines (EPI 2003a). The maximum extent of the excavation was about 14 ft BGS (see Figure 4-8). The excavated soil was treated and placed back in the excavation. Confirmation soil samples at the time of excavation indicated that there is minor soil contamination left in place associated with the tank. The location of the Area G UST and soil excavation is shown on Figure 5G-1. A summary of Area G site history and remedial actions are presented in Section 2.3.7.

5.8.1 SOIL

Twenty-eight final confirmation soil samples were collected during the 2000 excavation. Only one sample exceeded the GRO and benzene CULs with concentrations of 183 mg/kg and 4.0 mg/kg, respectively; this sample was collected at 12 ft BGS along the north sidewall of the excavation beneath the building foundation. In 2001, well MW-15 was drilled about 15 ft east of the excavation. Soil samples were collected every 5 ft down to a depth of 20 ft BGS and analyzed for GRO and benzene. GRO was detected above the CUL at the 10 ft BGS sample. Approximately 60 ft east of the Area G excavation, well MW-16 was drilled. Soil samples were collected at 15 and 30 ft BGS and analyzed for GRO and BTEX; no constituents were detected. Final confirmation soil sample results and MW-15 soil sample results are shown on Figure 5G-1. Area G final confirmation soil sample results are presented in Table 5G-1; all other Area G soil sample results are presented in Table 5G-2. The location of decommissioned well MW-16 relative to the Area G excavation is shown on Figure 2-1.

During the RI, additional soil samples were collected from one outdoor soil boring (G-1), one shallow well (MW-33S), and one deep well (MW-30D) in Area G. At the G-1 soil boring, GRO was detected at 15 ft, 20 ft, and 25 ft BGS; only the 15 ft sample was above the GRO CUL at 1,200 mg/kg. BTEX was also detected at the G-1 15 ft BGS sample, where benzene (4.3 mg/kg) and ethylbenzene (28 mg/kg) concentrations were above the CUL. MW-33S samples were analyzed for TPH-G and BTEX, but all concentrations were below detectable limits. Field observations did not detect any evidence of TPH contamination (see boring log – Appendix E). At MW-30D, GRO was detected at 10 ft, 15 ft, and 20 ft BGS with concentrations above the CUL at 10 ft BGS (110 mg/kg) and 15 ft BGS (49 mg/kg); the 15 ft sample had a benezene concentration of 0.19 mg/kg above the CUL. A summary of RI soil sampling results is presented on Figure 5G-1.

5.8.2 GROUNDWATER

In 2003, GRO was detected at shallow well MW-15 at a maximum concentration of 5.4 µg/L. During the RI, GRO was detected between 2.1 and 0.64 µg/L at MW-15. All four BTEX constituents also exceeded the CUL in at least one groundwater sample at this well during the RI. Well MW-33S is screened within a few feet of the former excavation but was dry during both June 2011 groundwater sampling events. The screen intervals of MW-15 and MW-33S relative to the Area G excavation are shown on Figure 4.8. Groundwater sample results for Area G are presented in Table 5G-3.

Shallow zone well MW-16 located approximately 60 ft east of the excavation was sampled four times prior to the RI for GRO and BTEX. None of these constituents were detected. This well was dry during attempts to sample during the RI. The well was decommissioned in May 2011. The location of MW-16 relative to the Area G excavation is shown on Figure 2-1. Groundwater sample results for MW-16 are presented in Table 5G-3.

DRO, GRO and BTEX were also analyzed for in deep well MW-30D and were not detected. This well is located about 15 ft northeast of the Area G excavation near shallow well MW-15. It is not clear if this well is downgradient of Area G due to mounding present in this area (see Section 4). These data are also presented in Table 5G-33.

5.8.3 SUMMARY

The Area G excavation appears to be clean with the exception of the area to the northeast. Confirmation soil samples from the excavation and results from RI boring MW-33S indicate that significant contamination in the immediate area of the excavation is not present. However, GRO and BTEX constituents were detected in soil at a pre RI confirmation soil sample, at well MW-15, at RI boring G-1 and RI well MW-30D. All of these samples were collected from locations northeast of the excavation indicating that residual GRO contamination is present in this area. The source of this contamination is unknown, but could be related to tank piping (the location of which is undocumented) or could possibly be associated with Area F. GRO related contamination is also present in groundwater at well MW-15. The lack of groundwater at MW-33S, located closer to the former tank, suggests that the excavation may not be the source of groundwater contamination at MW-15. It is possible that the source of soil contamination northeast of the excavation is also the source of groundwater contamination at MW-15. The lack of GRO and BTEX at MW-16 located east of well MW-15 documents clean conditions east of the excavation.

5.9 LNAPL AND OTHER MONITORING WELL OBSERVATIONS

Light non-aqueous phase liquid (LNAPL) has been detected and measured at the site. Other notable observations have been made at select wells that may be indicative of unique subsurface conditions or impacts. A summary of LNAPL observations, the current extent and apparent current thickness of LNAPL at the site, and an evaluation of other notable monitoring well observations are discussed below.

5.9.1 LNAPL PRODUCT MONITORING

During pre RI groundwater investigations, LNAPL was only detected within the former Area A excavation at MW-17 and east of the excavation at MW-20 (EPI 2006). EPI detected LNAPL at MW-17 fourteen times between 2001 and 2005; LNAPL was detected at MW-20 once in August 2005, EPI’s final groundwater monitoring event. The maximum LNAPL (product) thickness measurements from MW-17 and MW-20 were 1.34 ft and 0.04 ft, respectively (EPI 2005). The thickest measurements were made in August 2001 and August 2005, respectively. A summary of pre RI and RI LNAPL thickness measurements at the two wells are presented in Table 5-4.

A total of seven RI water level measurement events were conducted between November 2010 and August 2011. During the events, an oil interface probe was used to detect and measure product. Prior to decommissioning well MW-17, measurements were made in November 2010 and December 2010 when water levels are relatively high. In November, a hydrocarbon odor was noted at MW-17, but no product was detected and no sheen was observed. In December 2010, both a hydrocarbon odor and a slight sheen were observed at MW-17, but product was again not detected. Well MW-20 has been monitored for product during all seven RI water level collection events. Of the seven events, MW-20 was only observed to have sheen in December 2010, June 2011 (early), and June 2011 (late). Of these three events where sheen was noted at MW-20, product was only detected briefly in the early June 2011 but was not measurable. A summary of LNAPL measurements made during the RI are presented in Table 5-4.

RI field observations indicate that MW-1, MW-7R, MW-15, MW-18, MW-19, and MW-34S had measurable product of approximately 0.01 ft to 0.02 ft. All of these wells are associated with Area A except MW-15 (Area G) and MW-34S (Area C). Of these six wells, only MW-1 had measurable product more than once. MW-1 is the only Area A well with measurable product that is screened in the shallow zone. Other wells were observed to have intermittent product detections (i.e., the oil interface probe would beep but the result was not consistent or reproducible) at the respective water levels; therefore, those detections were noted but are interpreted as insignificant. All well inspection notes from RI water level/product measurements and groundwater sampling events are shown in Table 5-4.

5.9.2 AREA A LNAPL RECOVERY EVENTS

At the request of Ecology and TPCHD, EPI conducted site visits in June, July, and August 2005 with the purpose of monitoring and recovering LNAPL at MW-17 (EPI 2005). A total of seven site visits were conducted with varying numbers of days between each visit. Product was detected and recovered during each site visit. The product thickness appeared to increase as the water level dropped (EPI 2005). A total of approximately 11.3 gallons of LNAPL was recovered during the LNAPL monitoring period (EPI 2005).

In July 2011, Landau Associates conducted a free product (i.e. LNAPL product) recovery pilot test to collect data for the FS. The pilot test was performed at deep monitoring well MW-25D, which is screened beneath the Area A excavation. The pilot test consisted of operating a dual phase free product recovery system using a submersible Grundfos Redi-flo 2 pump and a vacuum extraction system. A 6,000-gallon Adjustavalve Poly Tank (Baker tank) was staged to collect extracted groundwater. The test was performed according to procedures in the RI/FS work plan with two exceptions: a 2-inch well was used rather than a 4-inch well and the duration of the test was reduced to 8 hours due to the limited quantity of product detected during the RI.

During the pilot test, product and water level measurements were recorded at surrounding wells MW-7R, MW-19, MW-20, and MW-27D. The water level decreased in all wells except MW-27D. The observed hydrocarbon odor decreased at MW-7R and MW-19 and remained strong at wells MW-20 and MW-27D. Additionally, a final product and water level measurement was taken from the Baker tank. No product was detected in the Baker tank, but a strong hydrocarbon odor and sheen was observed. Therefore, it appeared that there was no recoverable product during the pilot test. A more extensive evaluation of the pilot test will be provided in the FS report.

5.9.3 LNAPL TRUE THICKNESS DISCUSSION

Data from monitoring and free product recovery events indicate that the presence of LNAPL was greater during pre RI investigations than during RI investigations. Both pre RI and RI investigations appear to indicate that product thickness measurements in wells increase as water levels go down. The measured thickness of LNAPL in a well is an apparent thickness that is typically more than the true thickness in the formation. The difference between the true and apparent thickness is attributed to the affect of the capillary fringe above the water table (which exists in the formation but not within the well) and the difference in physical properties of water, air, and LNAPL (Testa and Paczkowski 1989). The apparent LNAPL thickness observed during current RI investigation is 0.01 ft to 0.02 ft. Therefore, the true thickness would theoretically be below measurable levels (i.e. less than 0.01 ft) by field methods.

The only location where LNAPL was detected greater than 0.04 ft is at former well MW-17. The screen interval at this well extended from within the Area A excavation into the deep water bearing zone (see Figure 4-5). This configuration may have acted like a sump where relatively minor amounts of residual free product collected in the bottom of the Area A excavation, flowed into the MW-17 screen, and collected in the well. This is a plausible explanation given the screen configuration of this well. If MW-17 acted as a sump, the measured LNAPL thickness would likely be much greater than the true thickness in the formation. The lack of measurable LNAPL at well MW-25D (located next to former well MW-17 but screened discretely within the deep water bearing zone (see Figure 4-5) supports this interpretation. The observation that very thin amounts of LNAPL are measurable intermittently at a number of Area A deep water bearing zone wells suggests that LNAPL may exist in a broad smear zone associated with Area A and that a sheen or minor amounts of LNAPL is observed as the water table fluctuates.

The occurrence of minor amounts of LNAPL intermittently at shallow water bearing zone well MW-1 is consistent with soil sampling data that indicate that the Area A excavation did not remove all residual TPH contamination. However, the lack of measureable LNAPL at well MW-26S screened at the base of the Area A excavation (see Figure 4.5) suggests that the amount of mobile LNAPL in and adjacent to the excavation is not significant. Similarly, the occurrence of minor amounts of LNAPL at wells MW-34S and MW-15 are consistent with soil data that indicate that additional TPH contaminated soil are present at Area C and Area G[22], respectively.

The limited presence of measureable LNAPL during the RI and the lack of recoverable LNAPL during the free product recovery test indicate that there are no significant amounts of mobile LNAPL at the site. The lack of mobile LNAPL is attributed in part to the heterogeneous, very dense, and poorly graded silty soil. This type of soil condition should result in high levels of residual saturation and minimize the potential for LNAPL migration.

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[22] The presence of GRO in groundwater at well MW-15 may be attributed to Area F as opposed to Area G. This well is located near both areas. A discussion of the nature and extent of contamination at these two areas is presented in Sections 5.7 and 5.8 respectively.

5.9.4 OTHER NOTABLE MONITORING WELL OBSERVATIONS

During RI water level collection events, three wells were noted to have non-hydrocarbon odors: MW-4, MW-5, and MW-9. MW-4 and MW-5 are shallow wells east of the Area A excavation, and MW-9 is a deep well south to southeast of Area A, but north of the former poultry processing wastewater treatment plant (Agra 1996).

MW-4 has been observed to have a sweet odor. Visual observations made at MW-4 during the RI include ponded surface water at the monument, red ferrous flocs in groundwater samples, and related red residue on the water level indicator probe. MW-5 has been observed to have a burnt plastic odor a number of times and a sweet odor one time (most recently in August 2011). Visual observations made at MW-5 during the RI include ponded surface water at the monument, turbidity (occasional), and a one-time notice of white bugs on the water level indicator probe (August 2011). DRO was detected in groundwater at both wells (see Section 5.2.2).

MW-9 has been observed to have a sewage/organic odor. The odor was first noted in early June 2011, once the water level had dropped. During the early June 2011 groundwater sampling event, sample collection was attempted using a Waterra pump. However, despite the measured water level and apparent water column thickness, no water could be pumped. The Waterra tubing was pulled from the well to assess the problem. After pulling up approximately 10 ft of the tubing, a brown, gelatinous residue was observed on the tubing all the way down to the bottom where the Wattera foot valve was fastened. The tubing was cleaned and returned to the well and no sample was collected. Similarly, no sample could be collected during the late June 2011 sampling event. During the RI, deep well MW-28D was installed adjacent to MW-9 (see Figure 5A-9), however these two deep wells are screened differently. MW-9 has a 35 ft screen, with a screen interval that is mostly above the deep water bearing zone water table. MW-28D has a 10 ft screen with the top of the screen lower than the bottom of the MW-9 screen. The relative screen interval of these two wells is shown on Figure 4-9. Unlike MW-9, MW-28D does not have any unusual odor or in-well residue or slime. The lack of a similar impact at MW-28D suggests that the source of residue at MW-9 is localized and in the shallow water bearing zone. DRO was detected in groundwater at MW-9 (see Section 5.2.3).

The source of odors and apparent biological residue at these wells is not clear. All of these wells are located east or southeast of the Area A excavation and have well screens that intersect the shallow zone. It is possible that the observations are related to high levels of nutrient loading[23]. The source of nutrient loading could be due in part to TPH contamination that is a source of organic carbon that

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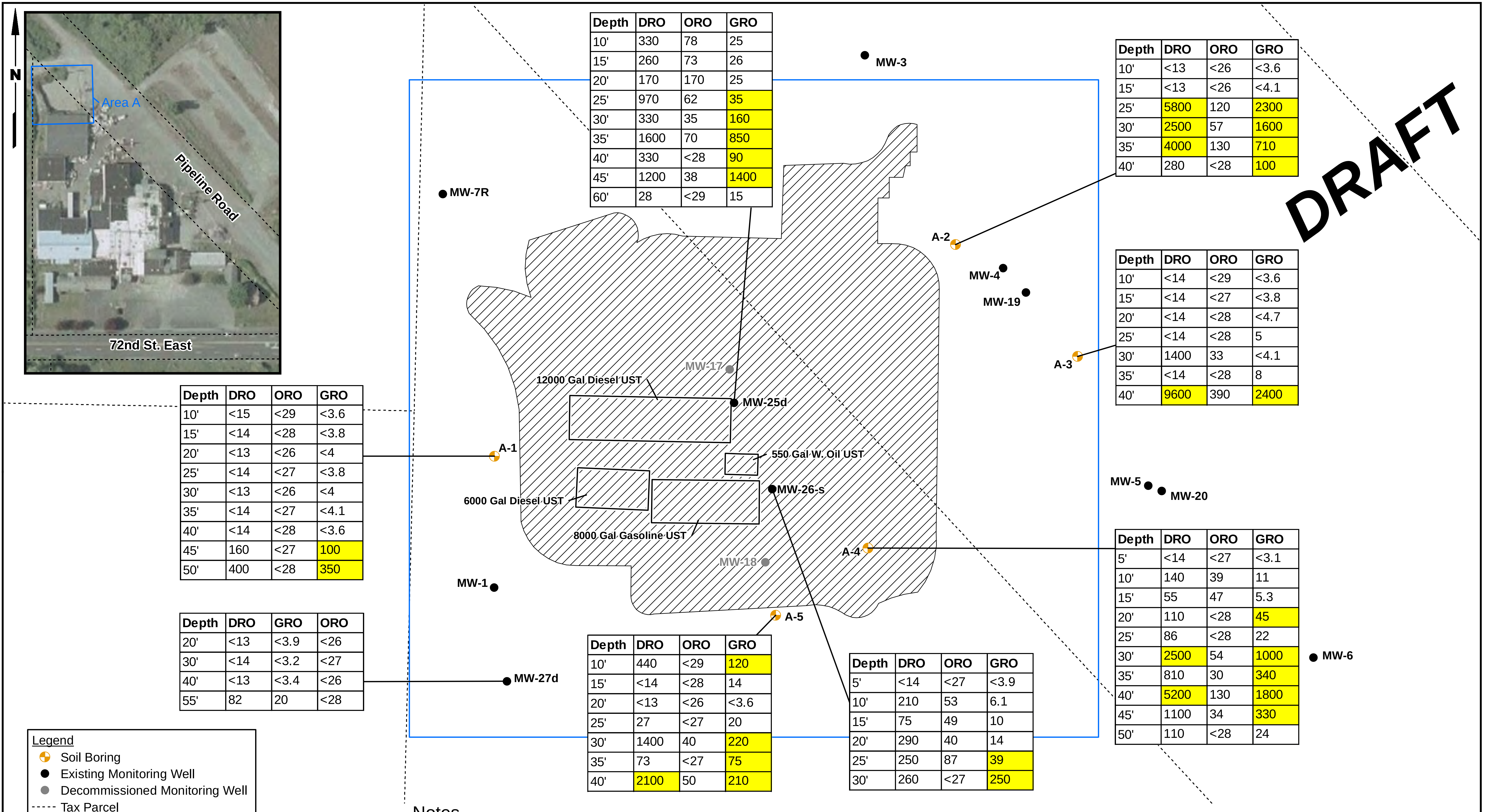
[23] MW-9 had the highest concentration of nitrate at the site (see Table 6-1). Nitrate was also elevated at MW-4; nitrate was not sampled for at MW-5. Nitrate could be associated with nutrient loading.

stimulates bacterial growth. However, the observed odors are distinctly different than hydrocarbon odors observed at other wells. Another potential source of nutrient loading is historical wastewater discharges from the former wastewater treatment plant. The site wastewater treatment plant was located directly south of MW-9; however, it is not known how discharges from the plant might have gotten to the subsurface. The plant was connected to the City of Tacoma sanitary sewer at some point in its history.



Depth	DRO	ORO	GRO
10'	330	78	25
15'	260	73	26
20'	170	170	25
25'	970	62	35
30'	330	35	160
35'	1600	70	850
40'	330	<28	90
45'	1200	38	1400
60'	28	<29	15

Depth	DRO	ORO	GRO
10'	<13	<26	<3.6
15'	<13	<26	<4.1
25'	5800	120	2300
30'	2500	57	1600
35'	4000	130	710
40'	280	<28	100

Depth	DRO	ORO	GRO
10'	<14	<29	<3.6
15'	<14	<27	<3.8
20'	<14	<28	<4.7
25'	<14	<28	5
30'	1400	33	<4.1
35'	<14	<28	8
40'	9600	390	2400

Depth	DRO	ORO	GRO
10'	<15	<29	<3.6
15'	<14	<28	<3.8
20'	<13	<26	<4
25'	<14	<27	<3.8
30'	<13	<26	<4
35'	<14	<27	<4.1
40'	<14	<28	<3.6
45'	160	<27	100
50'	400	<28	350

Depth	DRO	ORO	GRO
5'	<14	<27	<3.1
10'	140	39	11
15'	55	47	5.3
20'	110	<28	45
25'	86	<28	22
30'	2500	54	1000
35'	810	30	340
40'	5200	130	1800
45'	1100	34	330
50'	110	<28	24

Depth	DRO	GRO	ORO
20'	<13	<3.9	<26
30'	<14	<3.2	<27
40'	<13	<3.4	<26
55'	82	20	<28

Depth	DRO	ORO	GRO
10'	440	<29	120
15'	<14	<28	14
20'	<13	<26	<3.6
25'	27	<27	20
30'	1400	40	220
35'	73	<27	75
40'	2100	50	210

Depth	DRO	ORO	GRO
5'	<14	<27	<3.9
10'	210	53	6.1
15'	75	49	10
20'	290	40	14
25'	250	87	39
30'	260	<27	250

Legend

◐	Soil Boring
●	Existing Monitoring Well
●	Decommissioned Monitoring Well
----	Tax Parcel
☐	Area of Concern
▨	Former Excavation Area
🟨	Above MTCA Method A CUL
ND	Not Detected

Notes

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.
2. DRO - Diesel Range Organics, ORO - Oil Range Organics, GRO - Gasoline Range Organics. All concentrations shown in mg/kg.
3. Soil samples were collected in May 2011 (LAI).

0 10 20
Scale in Feet

Data Source: Pierce County GIS, Bing Maps Aerial Imagery 2010

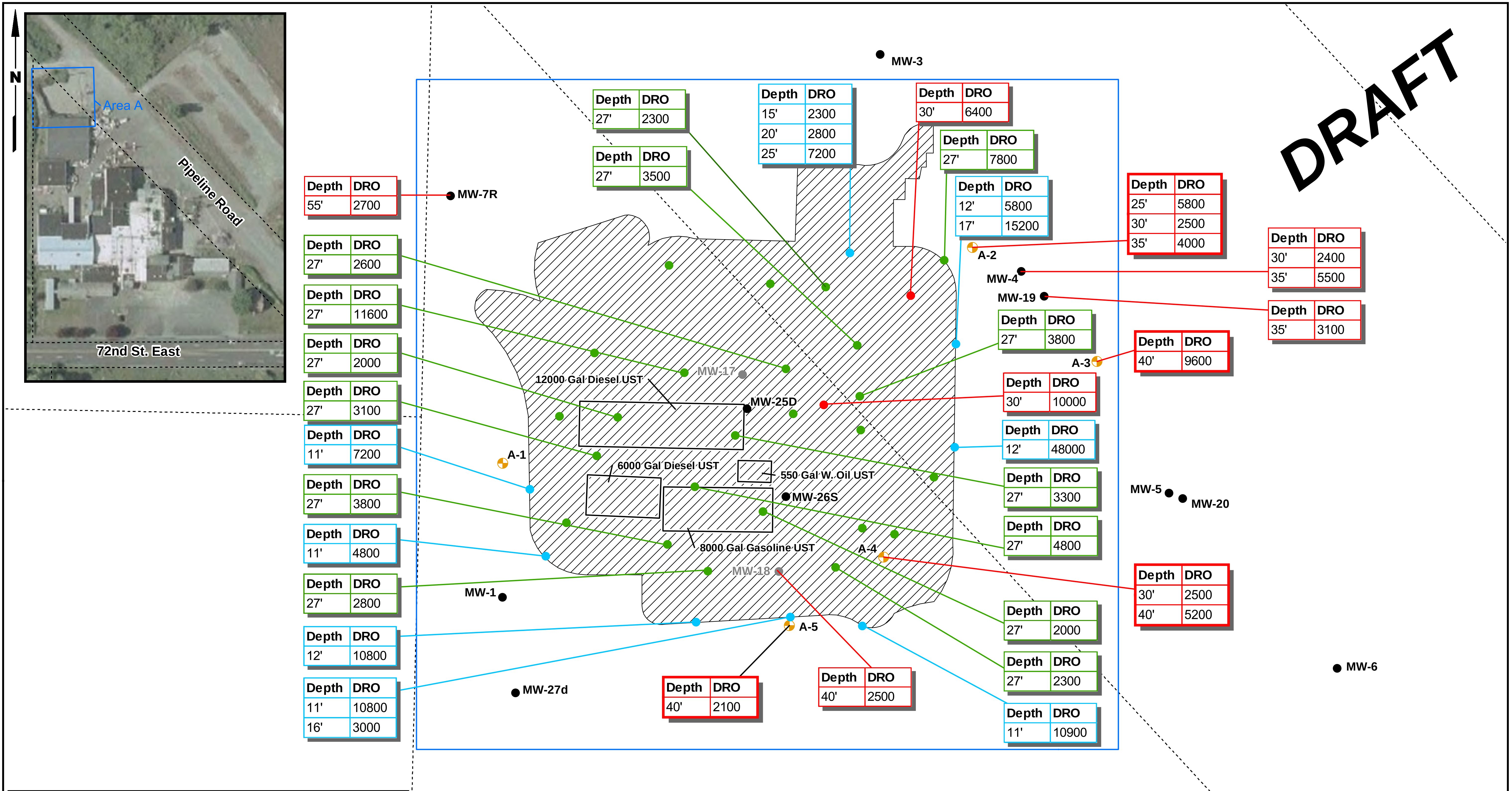
Pederson's Fryer Farms
Pierce County, Washington

May 2011 Area A
Soil Quality Results

Figure
5A-1

LANDAU ASSOCIATES

Y:\Projects\136006\MapDocs\RI Report\Fig5A-1-AreaALarge.mxd 9/26/2011 NAD 1983 StatePlane Washington South FIPS 4602 Feet



Legend

- ◐ Soil Boring
- ● Existing Monitoring Well
- ● Decommissioned Monitoring Well
- ----- Tax Parcel
- ☐ Area of Concern
- ▨ Former Excavation Area

Confirmation Soil Samples

- ● Depth<27ft
- ● Depth=27ft
- ● Depth>27
- ☐ May 2011 Results

Notes

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.
2. DRO - Diesel Range Organics. All concentrations shown in mg/kg. Only concentrations ≥ 2000 mg/kg are shown.
3. Current MTCA Method A Soil CULs for Unrestricted Land Uses in 2000 mg/kg.
4. Soil confirmation samples were collected in October 2000 during the northern tank farm excavation (EPI). Only TPH-Dx was analyzed.
5. Soil samples of monitoring wells MW-4, MW-7R, MW-18, and MW-19 were collected in June/July 2004 (EPI). Only TPH-Dx was analyzed.
6. Soil samples from A-2, A-3, A-4, and A-5 were collected in May 2011 (LAI). Soil samples were analyzed for several parameters including TPH-Dx.

0 20
Scale in Feet

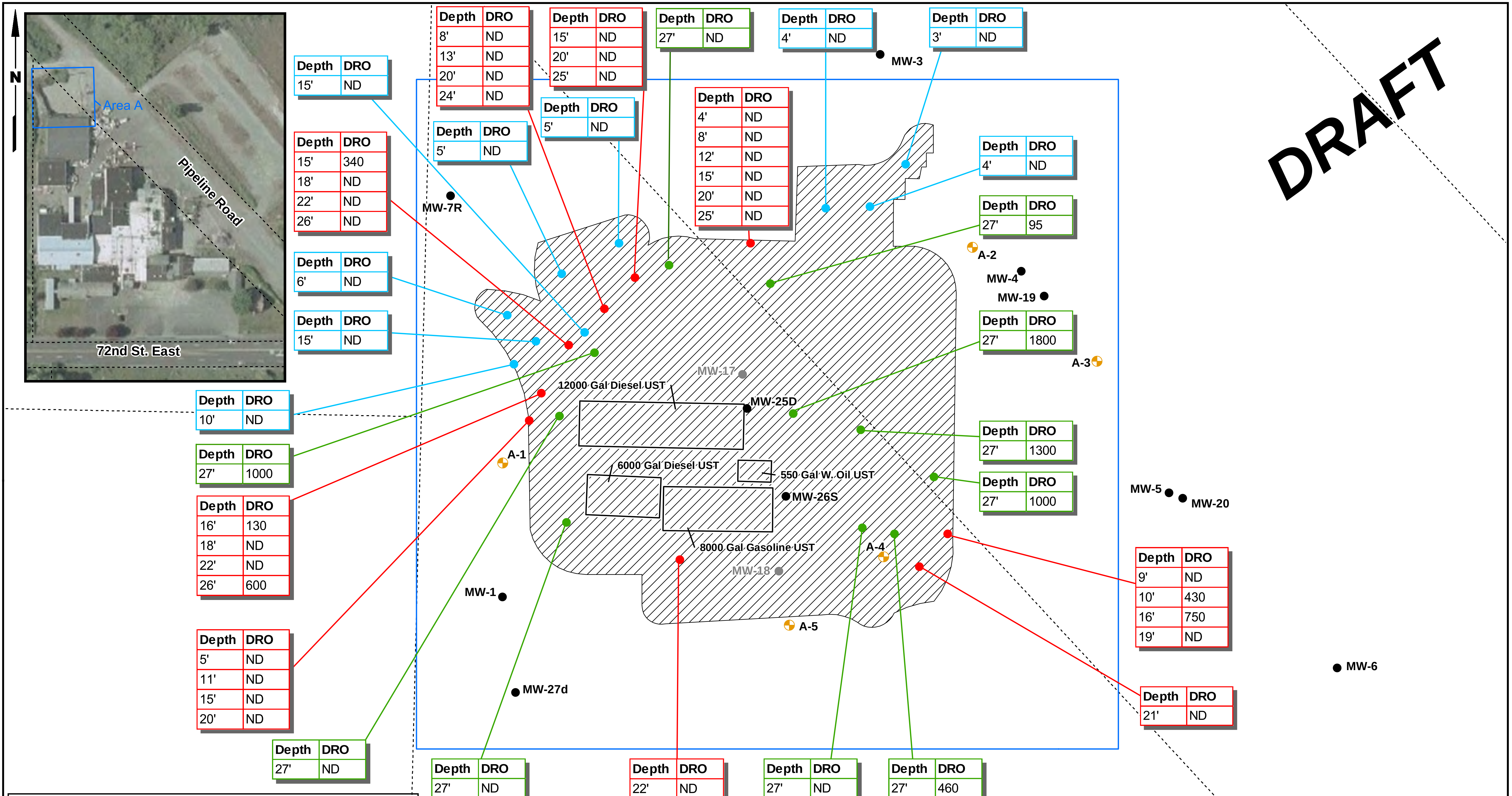
Data Source: Pierce County GIS, Bing Maps Aerial Imagery 2010.

LANDAU ASSOCIATES

Pederson's Fryer Farms
Pierce County, Washington

Confirmation Soil Samples: Area A Diesel Concentrations Above MTCA CUL

Figure
5A-2



Legend

- ◐ Soil Boring
- ● Existing Monitoring Well
- ● Decommissioned Monitoring Well
- ---- Tax Parcel
- ☐ Area of Concern
- ▨ Former Excavation Area

Confirmation Soil Samples

- ● Depth≤15
- ● Depth<27 and >15
- ● Depth=27ft

Notes

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.
2. DRO - Diesel Range Organics. All concentrations shown in mg/kg. Only concentrations ≥ 2000 mg/kg are shown.
3. Current MTCA Method A Soil CULs for Unrestricted Land Uses in 2000 mg/kg.
4. Soil confirmation samples were collected in October 2000 during the northern tank farm excavation (EPI). Only TPH-Dx was analyzed.
5. Soil samples of monitoring wells MW-4, MW-7R, MW-18, and MW-19 were collected in June/July 2004 (EPI). Only TPH-Dx was analyzed.
6. Soil samples from A-2, A-3, A-4, and A-5 were collected in May 2011 (LAI). Soil samples were analyzed for several parameters including TPH-Dx.

0 20

Scale in Feet

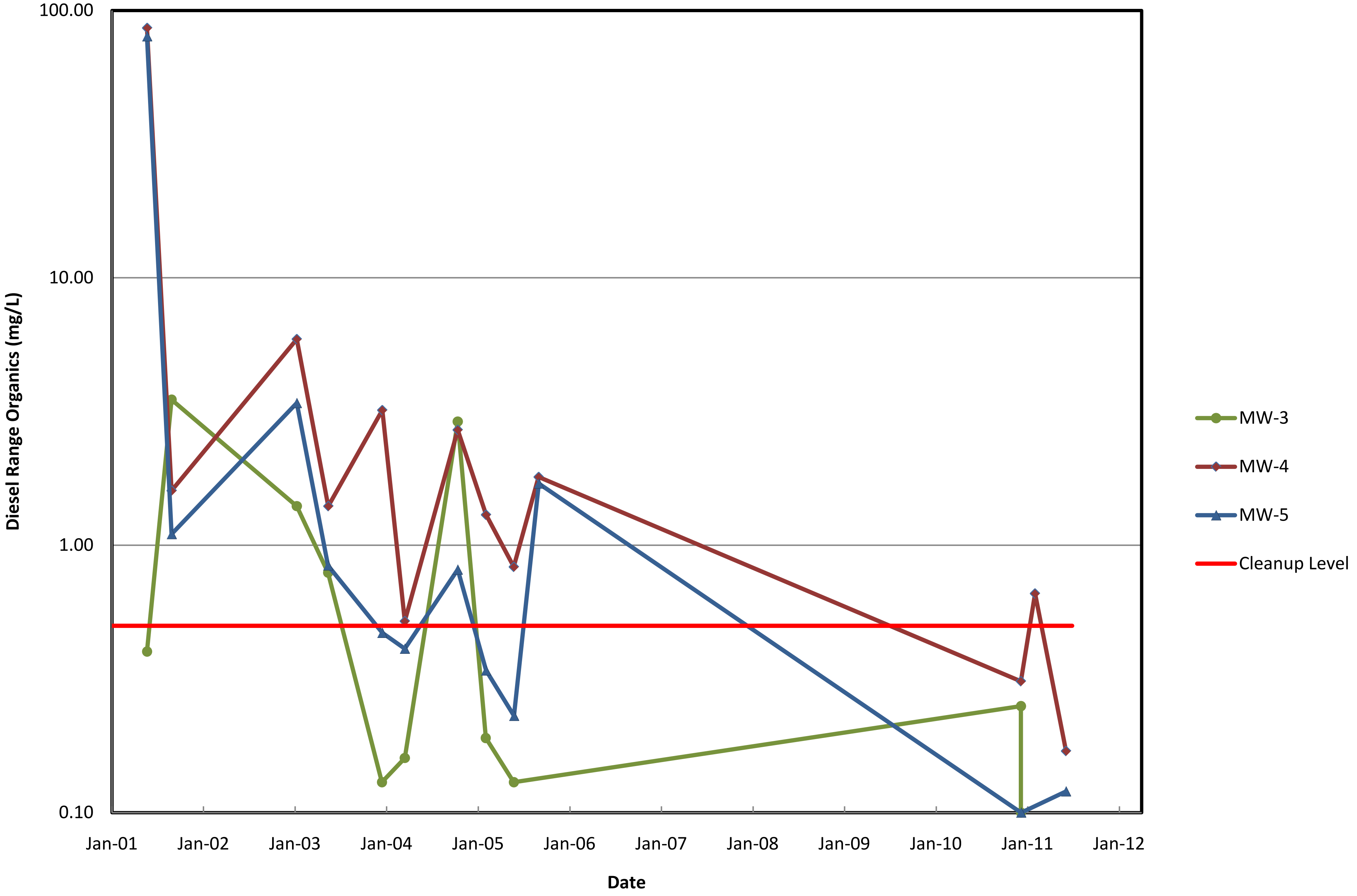
Data Source: Pierce County GIS, Bing Maps Aerial Imagery 2010.

LANDAU ASSOCIATES

Pederson's Fryer Farms
Pierce County, Washington

Confirmation
Soil Samples: Area A Diesel
Concentrations Below MTCA CUL

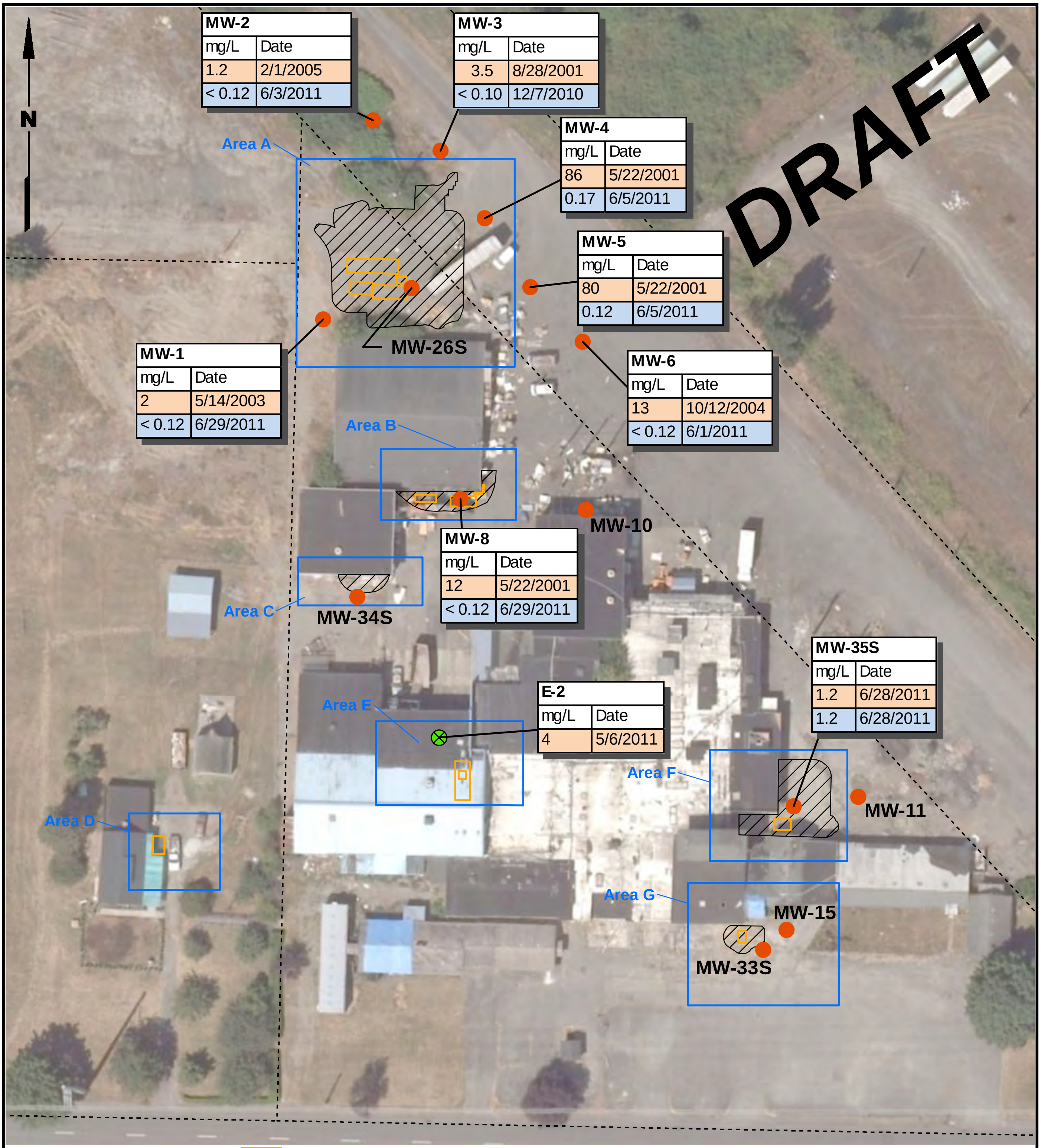
Figure
5A-3



Pederson's Fryer Farms
Pierce County, Washington

Area A DRO Concentrations in Select Shallow Zone Wells

Figure
5A-4



Y:\Projects\136006\MapDocs\TPH Concentrations\5A-5-ShallowWells-DRO.mxd 9/22/2011 NAD 1983 StatePlane Washington South FIPS 4602 Feet

● Shallow Monitoring Well

☐ UST Location

⊗ Soil Borings

---- Tax Parcel

☐ Area of Concern

▨ Former Excavation Area

🟧 Maximum

🟦 Most Recent

0 80 160

Scale in Feet

Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.
2. Data is shown only for wells with historical data concentrations that exceed the groundwater CUL of 0.5 mg/L at least once.

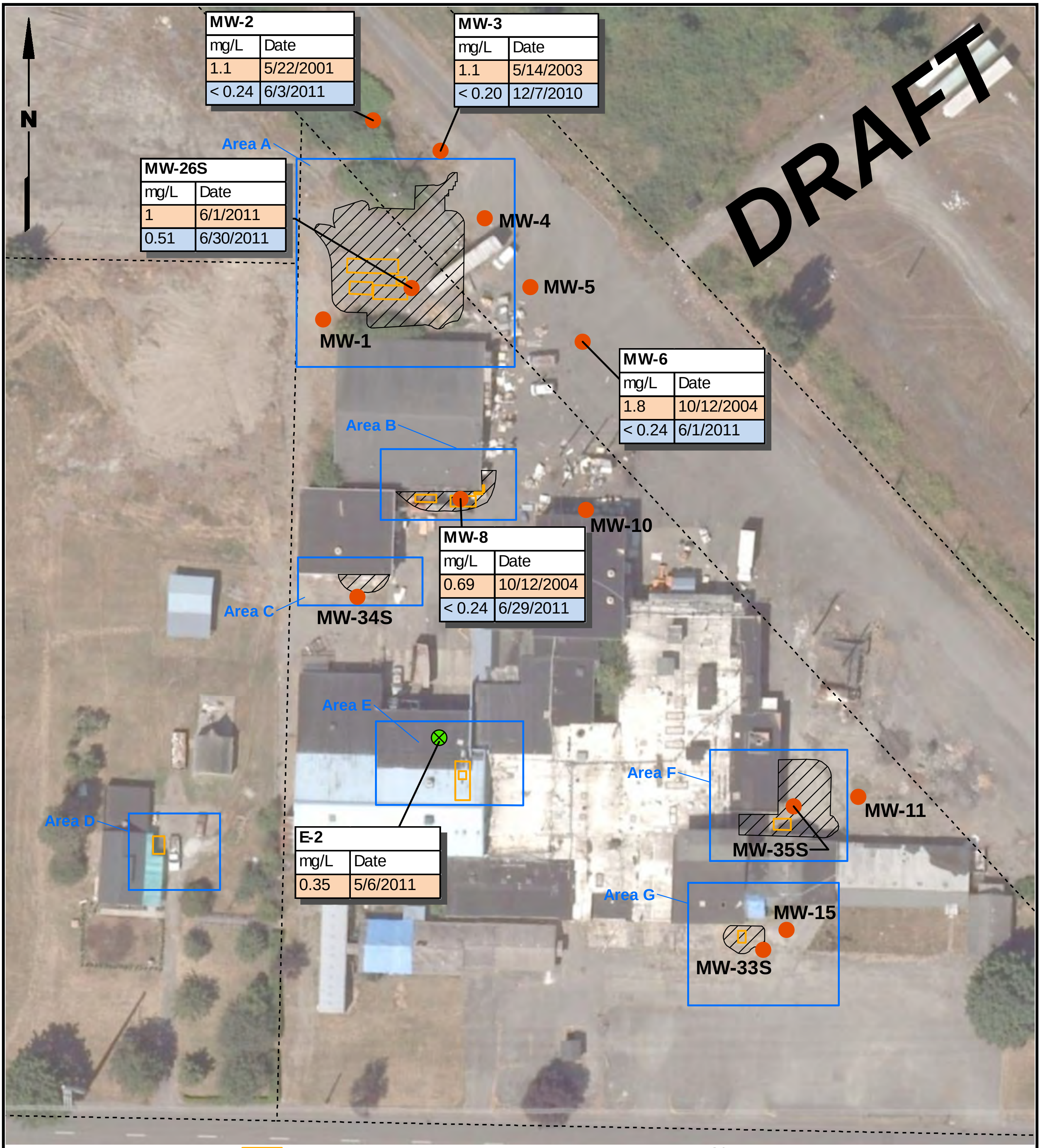
Data Source: Pierce County GIS; Bing Maps Aerial

Landau Associates

Pederson's Fryer Farms
Pierce County, Washington

Shallow Groundwater Zone
DRO Concentrations
Maximum and Most Recent

Figure
5A-5



MW-2	
mg/L	Date
1.1	5/22/2001
< 0.24	6/3/2011

MW-3	
mg/L	Date
1.1	5/14/2003
< 0.20	12/7/2010

MW-26S	
mg/L	Date
1	6/1/2011
0.51	6/30/2011

MW-6	
mg/L	Date
1.8	10/12/2004
< 0.24	6/1/2011

MW-8	
mg/L	Date
0.69	10/12/2004
< 0.24	6/29/2011

E-2	
mg/L	Date
0.35	5/6/2011

● Shallow Monitoring Well
☐ UST Location
⊗ Soil Borings
- - - - Tax Parcel
☐ Area of Concern
▨ Former Excavation Area
■ Maximum
■ Most Recent

0 80 160
Scale in Feet

Note
1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.
2. Data is shown only for wells with historical data concentrations that exceed the groundwater CUL of 0.5 mg/L at least once.

Data Source: Pierce County GIS; Bing Maps Aerial

Y:\Projects\136006\MapDocs\TPH Concentrations\5A-6-ShallowWells-ORO.mxd 9/26/2011 NAD 1983 StatePlane Washington South FIPS 4602 Feet

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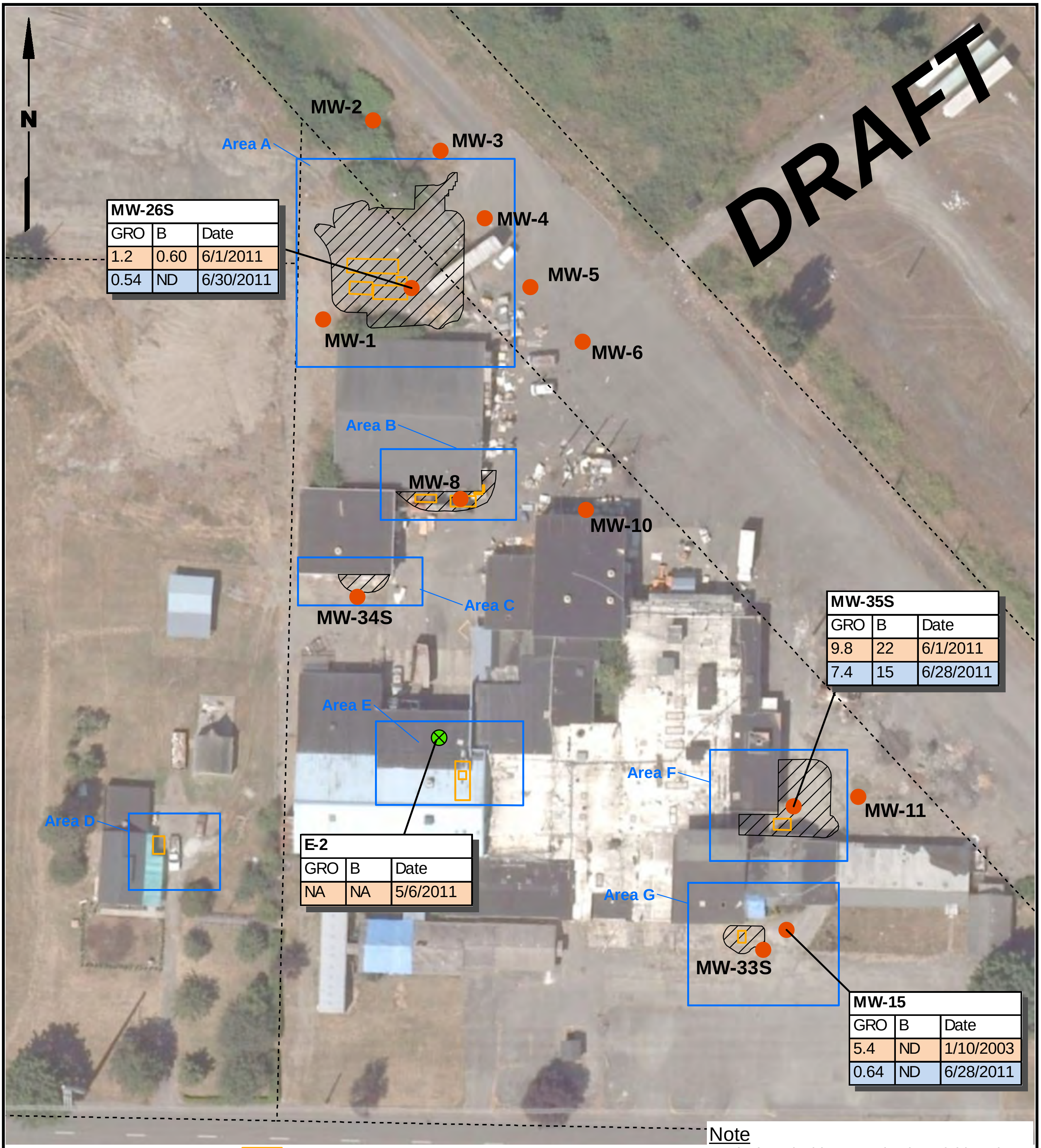
Pederson's Fryer Farms
Pierce County, Washington

Shallow Groundwater Zone ORO Concentrations Maximum and Most Recent

Figure
5A-6



MW-26S

GRO	B	Date
1.2	0.60	6/1/2011
0.54	ND	6/30/2011

MW-35S

GRO	B	Date
9.8	22	6/1/2011
7.4	15	6/28/2011

E-2

GRO	B	Date
NA	NA	5/6/2011

MW-15

GRO	B	Date
5.4	ND	1/10/2003
0.64	ND	6/28/2011

Y:\Projects\136006\MapDocs\TPH Concentrations\5A-7-ShallowWells-GRO.mxd 9/26/2011 NAD 1983 StatePlane Washington South FIPS 4602 Feet

● Shallow Monitoring Well

☐ UST Location

⊗ Soil Borings

---- Tax Parcel

☐ Area of Concern

▨ Former Excavation Area

🟧 Maximum

🟦 Most Recent

0 80 160

Scale in Feet

Data Source: Pierce County GIS; Bing Maps Aerial

Note
1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.
2. Data is shown only for wells with historical data concentrations that exceed the groundwater CUL of 0.8 mg/L at least once.
3. GRO = Gasoline Range Organics,
B = Benzene, ND = Not Detected,
NA = Not Analyzed
4. Results shown in mg/L.

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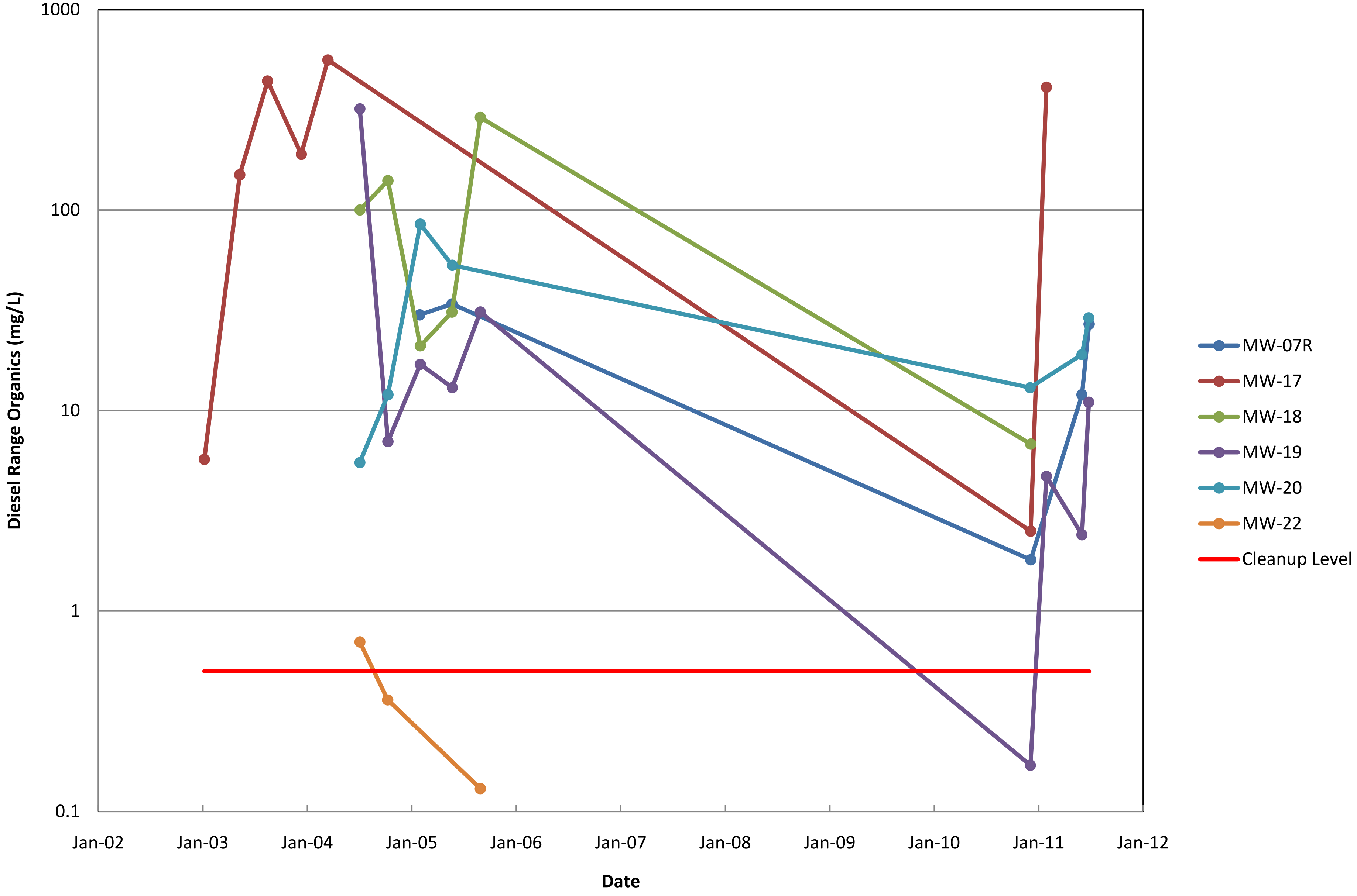
Pederson's Fryer Farms
Pierce County, Washington

Shallow Groundwater Zone
GRO and Benzene Concentrations
Maximum and Most Recent

Figure
5A-7

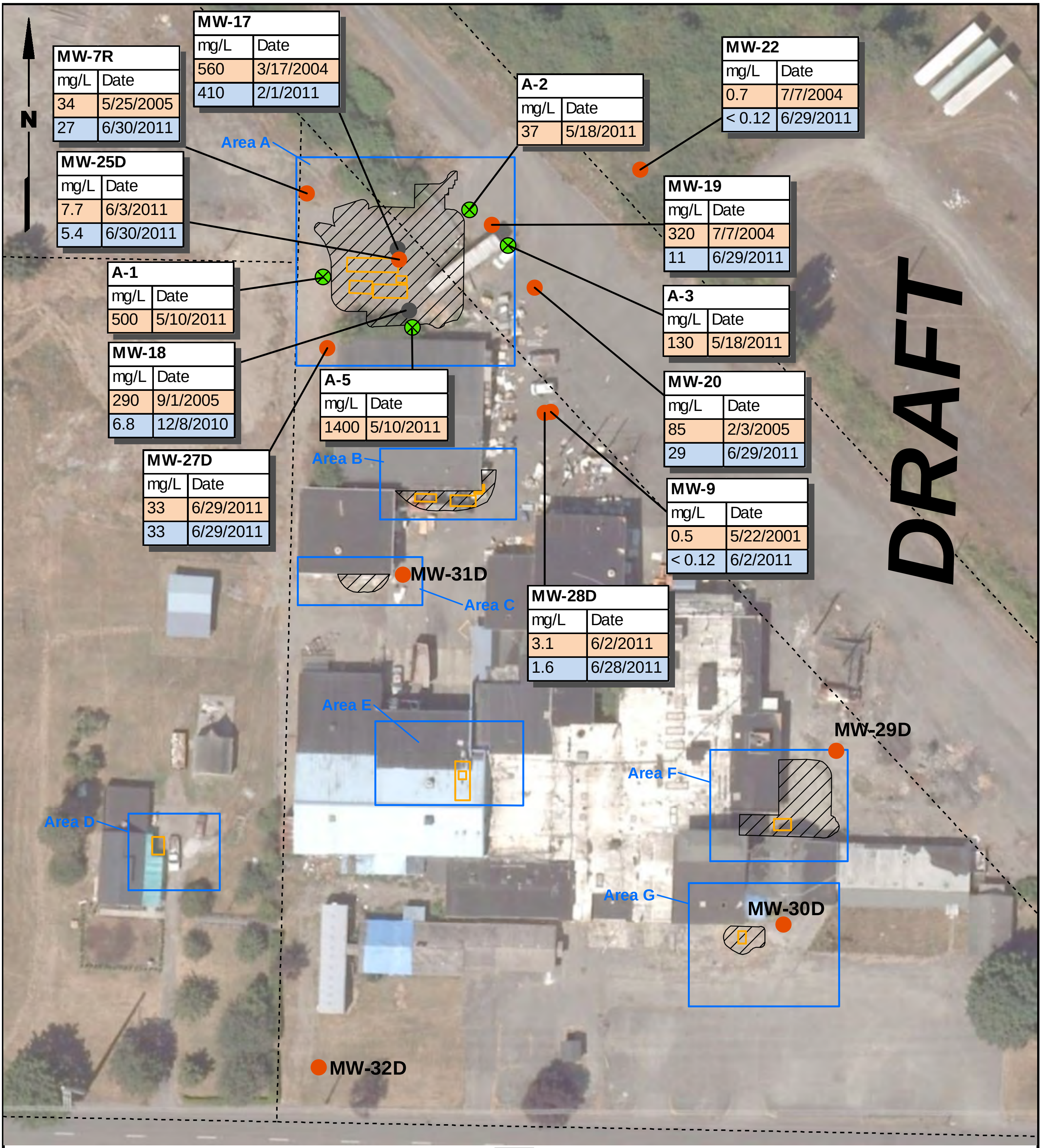


LANDAU ASSOCIATES

Pederson's Fryer Farms
Pierce County, Washington

Area A DRO Concentrations in Select Deep Zone Wells

Figure
5A-8



- ● Deep Monitoring Well
- ● Deep Monitoring Well, Decommissioned May 2011; MW-18
- ⊗ Soil Borings
- ----- Tax Parcel
- ☐ Area of Concern
- ▨ Former Excavation Area
- ☐ UST Locations

🟧 Maximum

🟦 Most Recent

0 80 160

Scale in Feet

Data Source: Pierce County GIS; Bing Maps Aerial

Note
1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.
2. Data is shown only for wells with historical data concentrations that exceed the groundwater CUL of 0.5 mg/L at least once.

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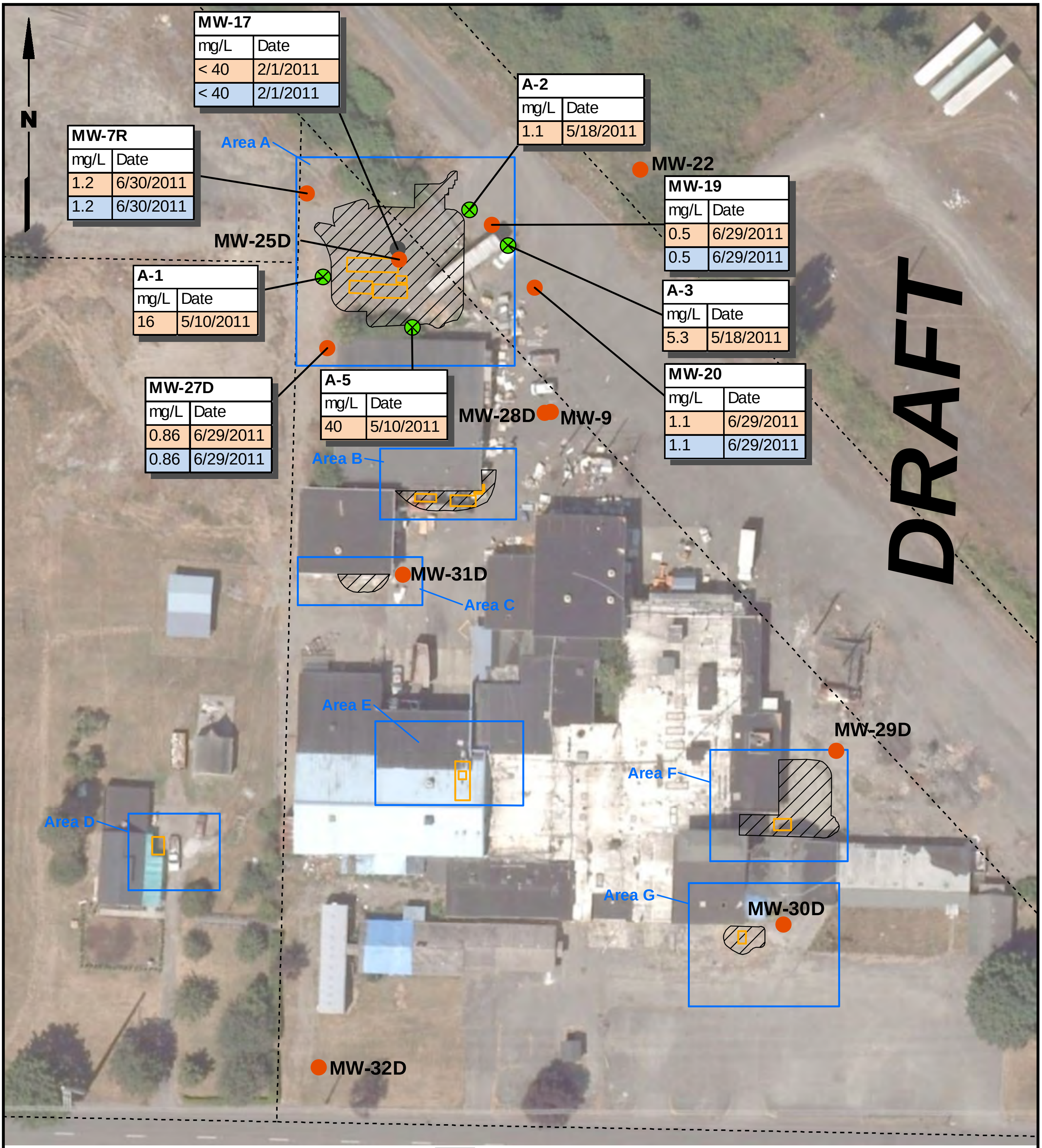
Pederson's Fryer Farms
Pierce County, Washington

**Deep Groundwater Zone
DRO Concentrations
Maximum and Most Recent**

Figure
5A-9

Y:\Projects\136006\MapDocs\TPH Concentrations\5A-9-DeepWells-DRO.mxd 9/26/2011 NAD 1983 StatePlane Washington South FIPS 4602 Feet



●	Deep Monitoring Well
●	Deep Monitoring Well, Decommissioned May 2011
⊗	Soil Borings
-----	Tax Parcel
□	Area of Concern
▨	Former Excavation Area
□	UST Locations

🟧	Maximum
🟦	Most Recent

0 80 160

Scale in Feet

Data Source: Pierce County GIS; Bing Maps Aerial

Note
1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.
2. Data is shown only for wells with historical data concentrations that exceed the groundwater CUL of 0.5 mg/L at least once.

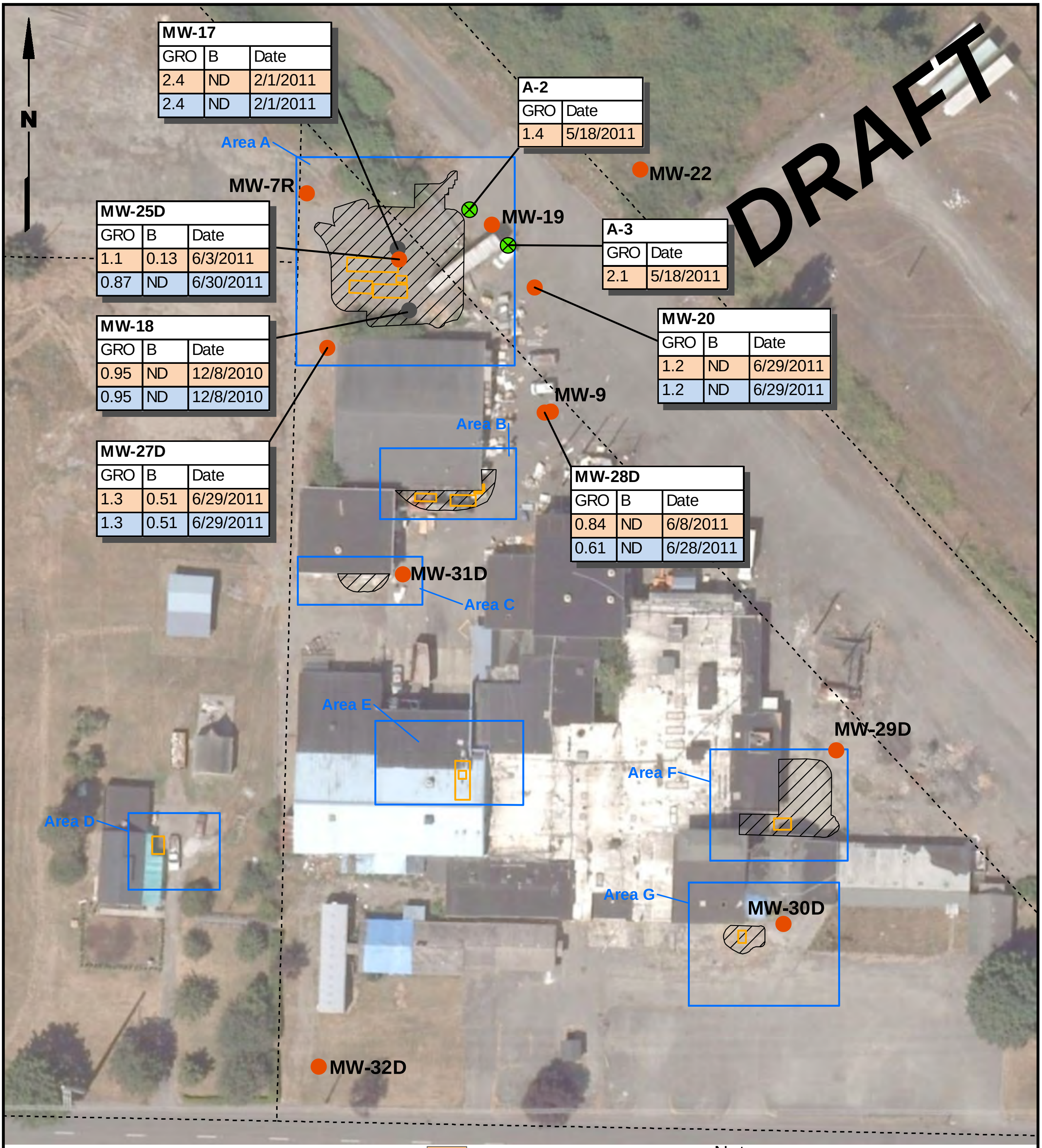
Y:\Projects\136006\MapDocs\TPH Concentrations\5A-10-DeepWells-ORO.mxd 9/22/2011 NAD 1983 StatePlane Washington South FIPS 4602 Feet

LANDAU ASSOCIATES

Pederson's Fryer Farms
Pierce County, Washington

Deep Groundwater Zone
ORO Concentrations
Maximum and Most Recent

Figure
5A-10



MW-17

GRO	B	Date
2.4	ND	2/1/2011
2.4	ND	2/1/2011

A-2

GRO	Date
1.4	5/18/2011

MW-25D

GRO	B	Date
1.1	0.13	6/3/2011
0.87	ND	6/30/2011

A-3

GRO	Date
2.1	5/18/2011

MW-20

GRO	B	Date
1.2	ND	6/29/2011
1.2	ND	6/29/2011

MW-18

GRO	B	Date
0.95	ND	12/8/2010
0.95	ND	12/8/2010

MW-27D

GRO	B	Date
1.3	0.51	6/29/2011
1.3	0.51	6/29/2011

MW-28D

GRO	B	Date
0.84	ND	6/8/2011
0.61	ND	6/28/2011

- ● Deep Monitoring Well
- ● Deep Monitoring Well, Decommissioned May 2011
- ⊗ Soil Borings
- ----- Tax Parcel
- ☐ Area of Concern
- ▨ Former Excavation Area
- ☐ UST Location

- 🟧 Maximum
- 🟦 Most Recent

0 80 160

Scale in Feet

Data Source: Pierce County GIS; Bing Maps Aerial

Note
1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.
2. Data is shown only for wells with historical data concentrations that exceed the groundwater CUL of 0.8 mg/L at least once.
3. DRO = Gasoline Range Organics, B = Benzene, ND = Not Detected.
4. Results shown in mg/L.

Y:\Projects\136006\MapDocs\TPH Concentrations\5A-11-DeepWells-GRO.mxd 9/22/2011 NAD 1983 StatePlane Washington South FIPS 4602 Feet

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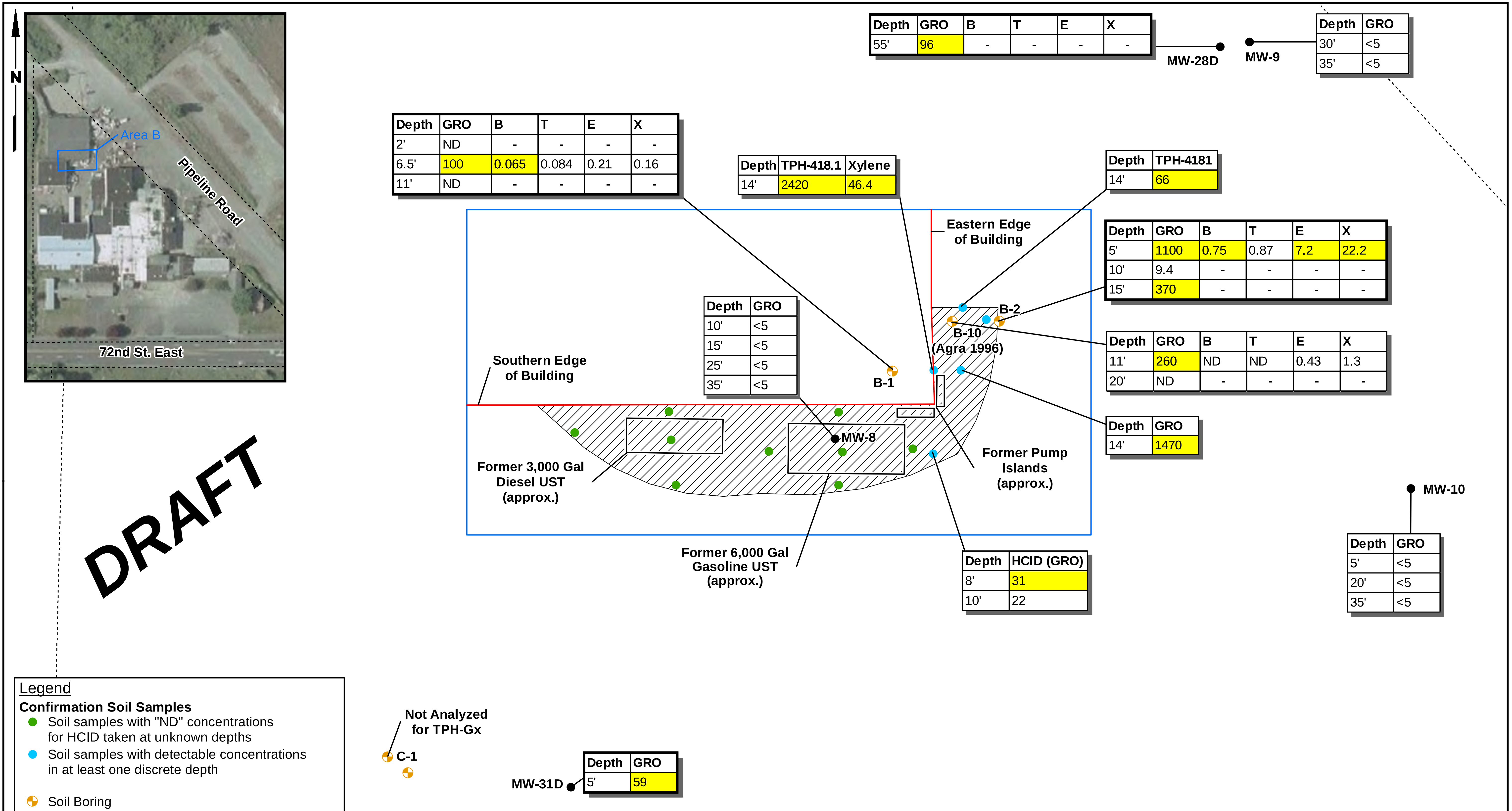
Pederson's Fryer Farms
Pierce County, Washington

Deep Groundwater Zone GRO and Benzene Concentrations Maximum and Most Recent

Figure
5A-11



Depth	GRO	B	T	E	X
55'	96	-	-	-	-

Depth	GRO
30'	<5
35'	<5

Depth	GRO	B	T	E	X
2'	ND	-	-	-	-
6.5'	100	0.065	0.084	0.21	0.16
11'	ND	-	-	-	-

Depth	TPH-418.1	Xylene
14'	2420	46.4

Depth	TPH-4181
14'	66

Depth	GRO	B	T	E	X
5'	1100	0.75	0.87	7.2	22.2
10'	9.4	-	-	-	-
15'	370	-	-	-	-

Depth	GRO
10'	<5
15'	<5
25'	<5
35'	<5

Depth	GRO	B	T	E	X
11'	260	ND	ND	0.43	1.3
20'	ND	-	-	-	-

Depth	GRO
14'	1470

Depth	GRO
5'	<5
20'	<5
35'	<5

Depth	HCID (GRO)
8'	31
10'	22

Depth	GRO
5'	59

Legend

Confirmation Soil Samples

- ● Soil samples with "ND" concentrations for HCID taken at unknown depths
- ● Soil samples with detectable concentrations in at least one discrete depth

⊕	Soil Boring
●	Monitoring Well
----	Tax Parcel
☐	Area of Concern
▨	Former Excavation Area
🟨	Above MTCA Method A CUL
☐	May 2011 Results
ND	Not Detected
-	Not Analyzed

Notes

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.
2. GRO - Gasoline Range Organics, B - Benzene, T - Toluene, E - Ethylbenzene, X-Xylene (total); all concentrations shown in mg/kg.
3. Current MTCA TPH-Gx Method A Soil CULs for unrestricted Land Uses are 30mg/kg or 100 mg/kg depending on BTEX concentrations; MTCA CULs for BTEX are 0.03, 7.0, 6.0, and 9.0mg/kg for respectively. Method HCID used to identify the type of TPH present in sample.
4. Method TPH-418.1 was used to identify total recoverable petroleum hydrocarbons (could include diesel, oil, and/or gasoline). Soil confirmation samples were collected during 1994 excavation by Saltbrush.
5. B-1 and B-2 soil samples were collected in May 2011 and were evaluated for TPH-Gx, TPH-Dx, and BTEX (LAI).

0 20
Scale in Feet

Data Source: Pierce County GIS, Bing Maps Aerial Imagery 2010.

Y:\Projects\136006\MapDocs\RI Report\Fig5B-1-AreaB.mxd 9/26/2011 NAD 1983 StatePlane Washington South FIPS 4602 Feet

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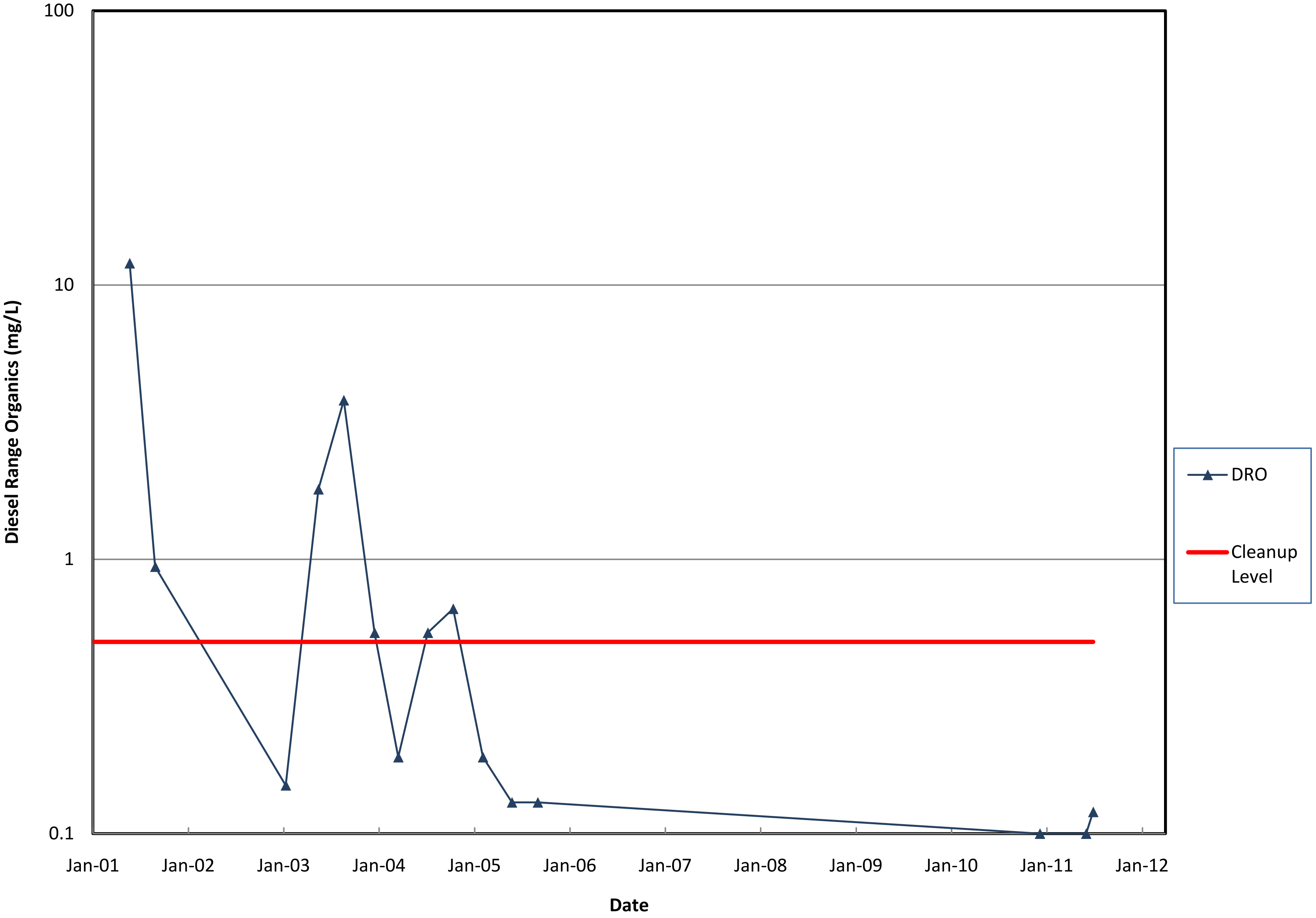
Pederson's Fryer Farms
Pierce County, Washington

Confirmation
Soil Samples: Area B

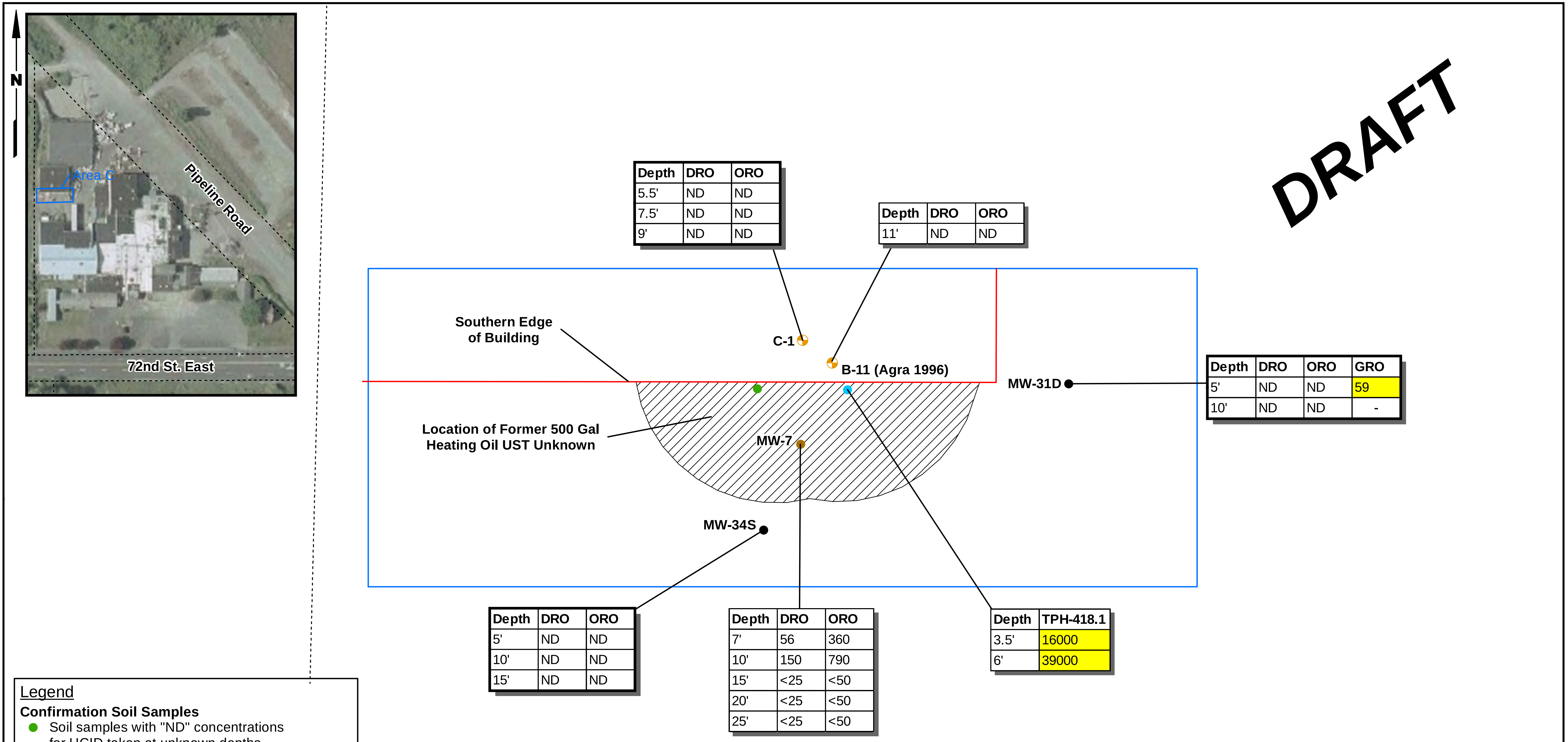
Figure
5B-1



Pederson's Fryer Farms
Pierce County, Washington

DRO Concentrations at Area B
Shallow Well MW-8

Figure
5B-2



C-1:

Depth	DRO	ORO
5.5'	ND	ND
7.5'	ND	ND
9'	ND	ND

Depth	DRO	ORO
11'	ND	ND

MW-31D:

Depth	DRO	ORO	GRO
5'	ND	ND	59
10'	ND	ND	-

MW-34S:

Depth	DRO	ORO
5'	ND	ND
10'	ND	ND
15'	ND	ND

MW-7:

Depth	DRO	ORO
7'	56	360
10'	150	790
15'	<25	<50
20'	<25	<50
25'	<25	<50

Depth	TPH-418.1
3.5'	16000
6'	39000

Legend

Confirmation Soil Samples

- ● Soil samples with "ND" concentrations for HCID taken at unknown depths
- ● Soil samples with detectable concentrations in at least one discrete depth

- ◍ Soil Boring
- ● Monitoring Well
- ● Temporary Monitoring Well
- ---- Tax Parcel
- ☐ Area of Concern
- ▨ Former Excavation Area
- 🟨 Above MTCA Method A CUL
- ☐ May 2011 Results

ND Not Detected
\- Not Analyzed

Notes

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.
2. DRO - Diesel Range Organics, ORO - Oil Range Organics, GRO - Gasoline Range Organics.
3. Current MTCA TPH-Gx Method A Soil CULs for GRO, DRO, and ORO are 30mg/kg (since no BTEX data), 2000 mg/kg, and 2000 mg/kg, respectively.
4. Method TPH-418.1 was used to identify total recoverable petroleum hydrocarbons (could include diesel, oil, and/or gasoline. Soil confirmation samples were collected during 1994 excavation (Saltbrush).
5. MW-31d, MW-34s, and C-1 soil samples were collected in May 2011 by (LAI). Soil samples were generally analyzed for TPH-Dx. However, field screening indicated TPH-Gx should be analyzed at MW-31d.

0 10
Scale in Feet

Data Source: Pierce County GIS, Bing Maps Aerial Imagery 2010.

Y:\Projects\136006\MapDocs\RI Report\Fig5C-1-AreaC.mxd 9/26/2011 NAD 1983 StatePlane Washington South FIPS 4602 Feet

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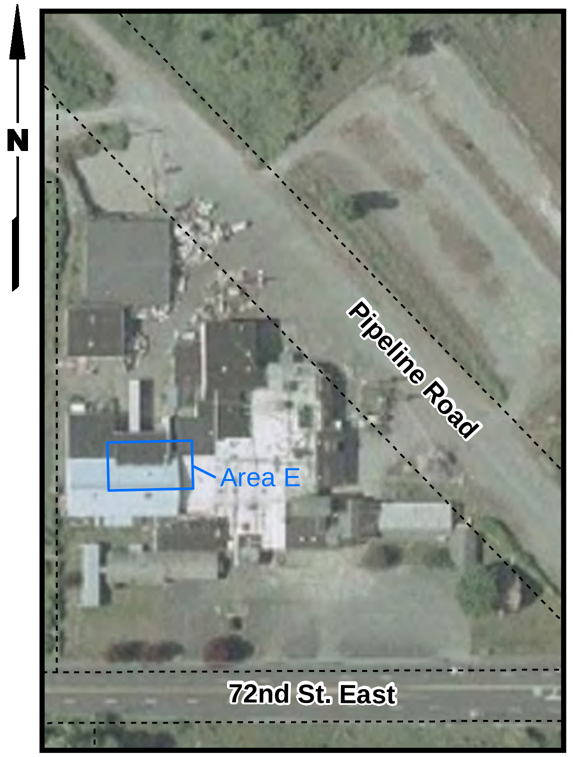
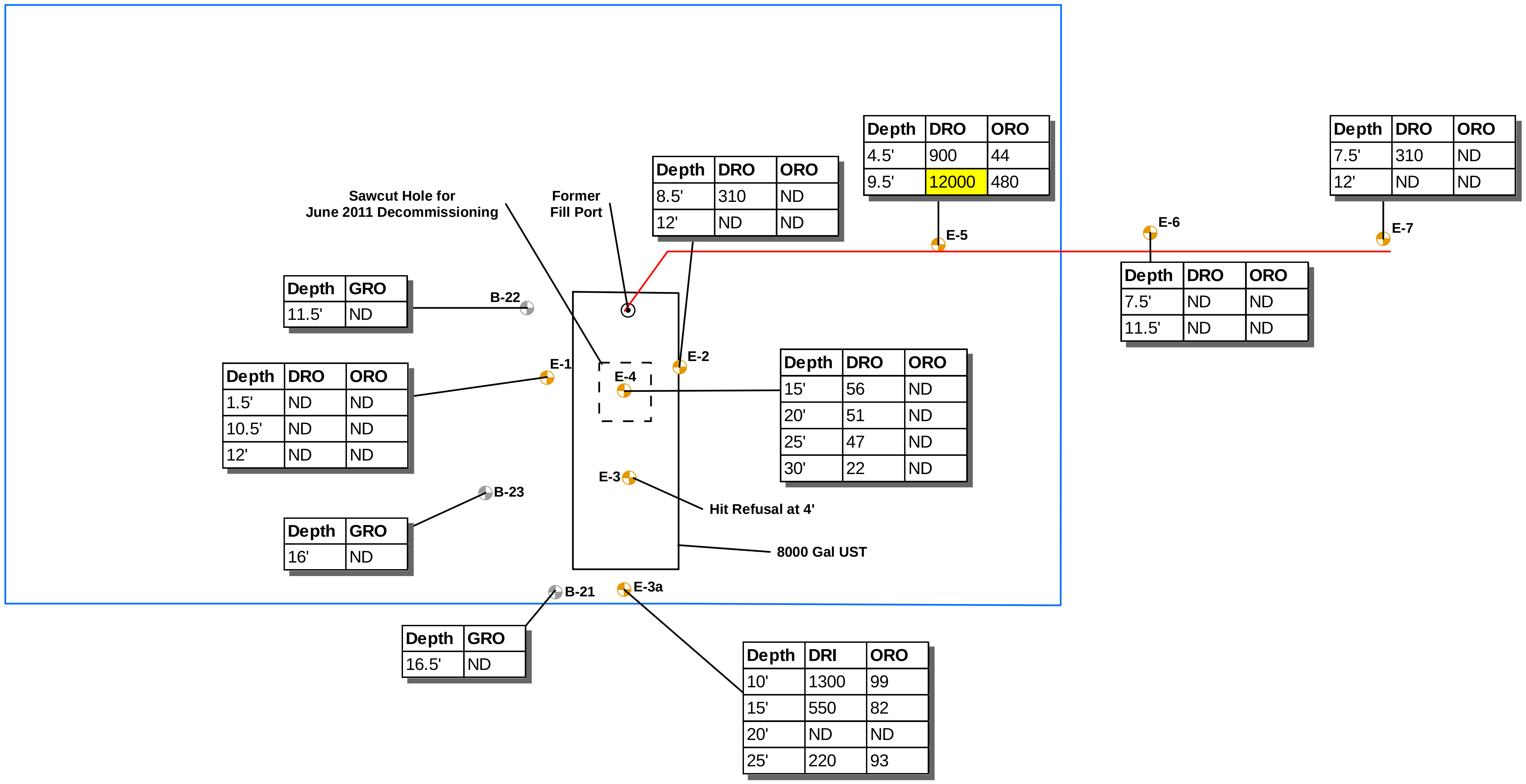
Pederson's Fryer Farms
Pierce County, Washington

Confirmation Soil Samples: Area C

Figure
5C-1





Depth	DRO	ORO
4.5'	900	44
9.5'	12000	480

Depth	DRO	ORO
7.5'	310	ND
12'	ND	ND

Depth	DRO	ORO
8.5'	310	ND
12'	ND	ND

Depth	DRO	ORO
7.5'	ND	ND
11.5'	ND	ND

Depth	GRO
11.5'	ND

Depth	DRO	ORO
15'	56	ND
20'	51	ND
25'	47	ND
30'	22	ND

Depth	DRO	ORO
1.5'	ND	ND
10.5'	ND	ND
12'	ND	ND

Depth	GRO
16'	ND

Depth	GRO
16.5'	ND

Depth	DRI	ORO
10'	1300	99
15'	550	82
20'	ND	ND
25'	220	93

Y:\Projects\136006\MapDocs\RI Report\Fig8-AreaE.mxd 9/19/2011 NAD 1983 StatePlane Washington South FIPS 4602 Feet

Legend

- ◐ 1996 Soil Borings
- ⊙ Former Fill Port
- ◐ May/June 2011 Borings
- ----- Tax Parcel
- — UST Piping
- ☐ Area of Concern
- ▨ Former Excavation Area
- 🟨 Above MTCA Method A CUL

ND Not Detected

Notes

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.
2. DRO - Diesel Range Organics, ORO - Oil Range Organics. All concentrations shown in mg/kg.
3. Current MTCA TPH-Dx Method A Soil CULs for Unrestricted Land Uses in 2000 mg/kg.
4. Soil samples from B-21, B-22, and B-23 were collected in November 1996 as part of a Phase I and II ESA (Agra).
5. Soil samples from E-1 through E-7 were collected in May and June 2011 (LAI).

0 20
Scale in Feet

Data Source: Pierce County GIS, Bing Maps Aerial Imagery 2010.

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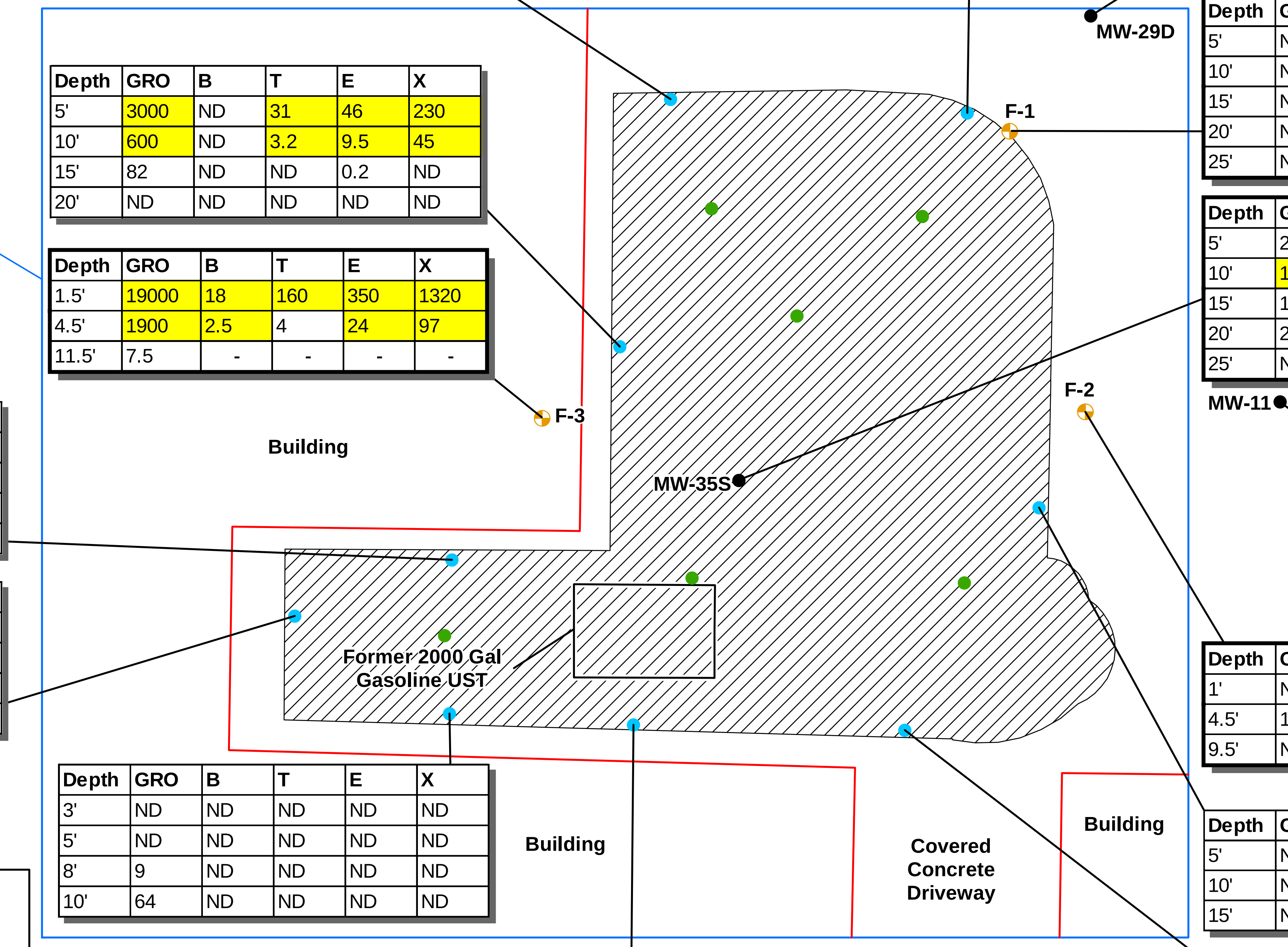
Pederson's Fryer Farms
Pierce County, Washington

Confirmation
Soil Samples: Area E

Figure
5E-1



Depth	GRO	B	T	E	X
3'	120	1.3	0.2	1.0	8.6
5'	ND	ND	ND	ND	ND
10'	ND	ND	ND	ND	ND
15'	ND	ND	ND	ND	ND

Depth	GRO	B	T	E	X
3'	60	ND	0.1	0.4	2
5'	ND	ND	ND	ND	ND
10'	ND	ND	ND	ND	ND
15'	ND	ND	ND	ND	ND

Depth	GRO	B	T	E	X
10'	ND	ND	ND	ND	ND
15'	ND	-	-	-	-
20'	ND	-	-	-	-
25'	ND	-	-	-	-

Depth	GRO	B	T	E	X
5'	ND	-	-	-	-
10'	ND	-	-	-	-
15'	ND	-	-	-	-
20'	ND	-	-	-	-
25'	ND	-	-	-	-

Depth	GRO	B	T	E	X
5'	28	-	-	-	-
10'	110	0.06	0.18	0.63	1.1
15'	10	-	-	-	-
20'	23	-	-	-	-
25'	ND	-	-	-	-

Depth	GRO	B	T	E	X
5'	3000	ND	31	46	230
10'	600	ND	3.2	9.5	45
15'	82	ND	ND	0.2	ND
20'	ND	ND	ND	ND	ND

Depth	GRO	B	T	E	X
1.5'	19000	18	160	350	1320
4.5'	1900	2.5	4	24	97
11.5'	7.5	-	-	-	-

Depth	GRO	B	T	E	X
3'	ND	ND	ND	ND	ND
5'	ND	ND	ND	ND	ND
8'	ND	ND	ND	ND	ND
10'	300	0.1	0.4	1.4	3.1

Depth	GRO	B	T	E	X
5'	ND	ND	ND	ND	ND
10'	ND	ND	ND	ND	ND
12'	ND	ND	ND	ND	ND
15'	ND	ND	ND	ND	ND
20'	ND	ND	ND	ND	ND
25'	ND	ND	ND	ND	ND

Depth	GRO	B	T	E	X
3'	ND	ND	ND	ND	ND
5'	ND	ND	ND	ND	ND
8'	ND	ND	ND	ND	ND
10'	180	ND	ND	0.5	ND

Depth	GRO	B	T	E	X
1'	ND	-	-	-	-
4.5'	16	-	-	-	-
9.5'	ND	-	-	-	-

Depth	GRO	B	T	E	X
3'	ND	ND	ND	ND	ND
5'	ND	ND	ND	ND	ND
8'	9	ND	ND	ND	ND
10'	64	ND	ND	ND	ND

Depth	GRO	B	T	E	X
5'	ND	ND	ND	ND	0.05
10'	ND	ND	ND	ND	ND
15'	ND	ND	ND	ND	ND

Depth	GRO	B	T	E	X
3'	300	ND	2.5	4.3	30
8'	390	ND	3.4	6.1	30

Depth	GRO	B	T	E	X
3'	64	ND	0.1	0.4	1.2
7'	190	ND	ND	ND	ND
13'	230	ND	0.2	1.2	3.3

Legend

Confirmation Soil Samples

- ● Soil samples taken between 14 & 20 ft BGS with "ND" concentrations
- ● Soil samples with detects in at least one discrete depth
- ◐ Soil Boring
- ● Existing Monitoring Well
- ----- Tax Parcel
- ☐ Area of Concern
- ▨ Former Excavation Area
- 🟨 Above MTCA Method A CUL
- ☐ May 2011 Results

ND Not Detected
\- Not Analyzed

Notes

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.
2. GRO - Gasoline Range Organics, B - Benzene, T - Toluene, E - Ethylbenzene, X - Total Xylene; all concentrations shown in mg/kg.
3. Current TPH-Gx MTCA Method A Soil CULs for Unrestricted Land Uses are 30mg/kg or 100 mg/kg depending on BTEX concentrations; MTCA CULs for BTEX are 0.03, 7.0, 6.0, and 9.0mg/kg respectively.
4. F-1, F-2, F-3, MW-29D, and MW-35S soil samples were collected in May 2011 (LAI). Monitoring well MW-11 soil samples are from May 2001. Confirmation soil samples were taken during excavation in August-October 2000 (EPI).

0 10 20
Scale in Feet

Data Source: Pierce County GIS, Bing Maps Aerial Imagery 2010.

Y:\Projects\136006\MapDocs\RI Report\Fig5F-1-AreaFLarge.mxd 9/27/2011 NAD 1983 StatePlane Washington South FIPS 4602 Feet

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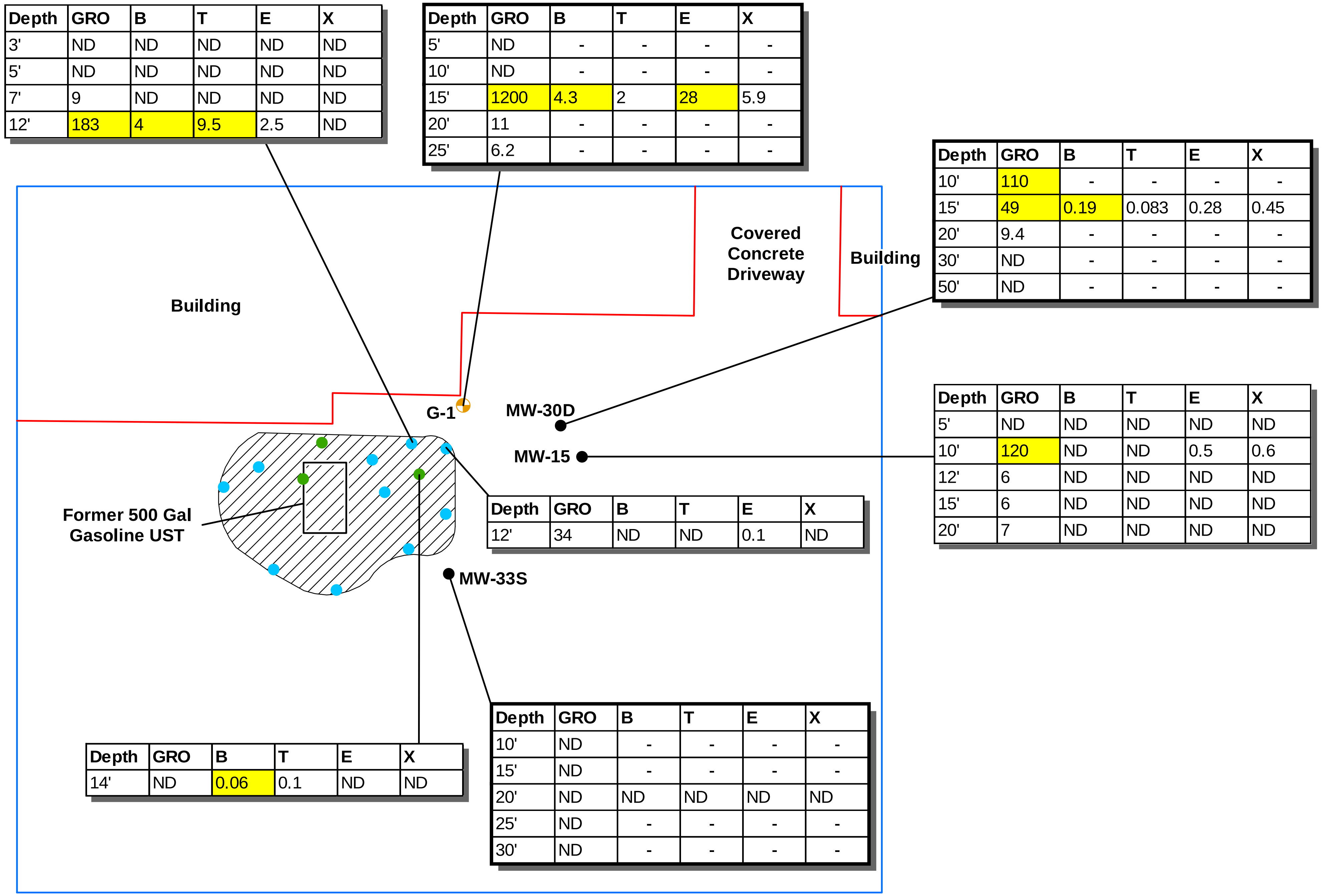
Pederson's Fryer Farms
Pierce County, Washington

Confirmation
Soil Samples: Area F

Figure
5F-1



Depth	GRO	B	T	E	X
3'	ND	ND	ND	ND	ND
5'	ND	ND	ND	ND	ND
7'	9	ND	ND	ND	ND
12'	183	4	9.5	2.5	ND

Depth	GRO	B	T	E	X
5'	ND	-	-	-	-
10'	ND	-	-	-	-
15'	1200	4.3	2	28	5.9
20'	11	-	-	-	-
25'	6.2	-	-	-	-

Depth	GRO	B	T	E	X
10'	110	-	-	-	-
15'	49	0.19	0.083	0.28	0.45
20'	9.4	-	-	-	-
30'	ND	-	-	-	-
50'	ND	-	-	-	-

Depth	GRO	B	T	E	X
5'	ND	ND	ND	ND	ND
10'	120	ND	ND	0.5	0.6
12'	6	ND	ND	ND	ND
15'	6	ND	ND	ND	ND
20'	7	ND	ND	ND	ND

Depth	GRO	B	T	E	X
12'	34	ND	ND	0.1	ND

Depth	GRO	B	T	E	X
14'	ND	0.06	0.1	ND	ND

Depth	GRO	B	T	E	X
10'	ND	-	-	-	-
15'	ND	-	-	-	-
20'	ND	ND	ND	ND	ND
25'	ND	-	-	-	-
30'	ND	-	-	-	-

Legend

Confirmation Soil Samples

- ● Soil sample to depths of 11 or 12 ft BGS
- ● Soil sample to depths of 14 ft BGS
- *All were "ND" unless shown otherwise

- ◐ Soil Boring
- ● Existing Monitoring Well
- ----- Tax Parcel
- ☐ Area of Concern
- ▨ Former Excavation Area
- 🟨 Above MTCA Method A CUL
- ☐ May 2011 Results

ND Not Detected
\- Not Analyzed

Notes
1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.
2. GRO - Gasoline Range Organics, B - Benzene, T - Toluene, E - Ethylbenzene, X - Total Xylene; all concentrations are shown in mg/kg.
3. Current TPH-Gx MTCA Method A Soil CULs for Unrestricted Land Uses are 30mg/kg or 100 mg/kg depending on BTEX concentrations; MTCA CULs for BTEX are 0.03, 7.0, 6.0, and 9.0mg/kg respectively.
4. MW-33S, MW-30D, and G-1 soil samples were collected in May 2011. MW-15 soil samples are from May 2001. Confirmation soil samples were taken during excavation in August-October 2000 (EPI).

0 10 20
Scale in Feet

Data Source: Pierce County GIS, Bing Maps Aerial Imagery 2010.

LANDAU ASSOCIATES

Pederson's Fryer Farms
Pierce County, Washington

Confirmation
Soil Samples: Area G

Figure
5G-1

Y:\Projects\136006\MapDocs\RI Report\Fig5G-1-AreaGLarge.mxd 9/27/2011 NAD 1983 StatePlane Washington South FIPS 4602 Feet

TABLE 5-1
SOILSTATISTICS
PEDERSON'S FRYER FARMS RI

	Number of Samples	Number of Detects	Frequency of Detection	Minimum Reporting Limit	Maximum Reporting Limit	Minimum Detection	Maximum Detection	Number of Exceedances
TPH (mg/kg)								
Diesel Range Organics	334	161	48%	13	25	15	48000	51
Lube Oil	325	44	14%	26	2500	30	790	0
Gasoline Range Organics	253	113	45%	3.1	10	5	19000	83
EPH (mg/kg)								
>C10-C12 Aliphatics	2	2	100%	All Detects	All Detects	240	2200	---
>C10-C12 Aromatics	2	2	100%	All Detects	All Detects	82	860	---
>C12-C16 Aliphatics	2	2	100%	All Detects	All Detects	1100	10000	---
>C12-C16 Aromatics	2	2	100%	All Detects	All Detects	590	5600	---
>C16-C21 Aliphatics	2	2	100%	All Detects	All Detects	1400	12000	---
>C16-C21 Aromatics	2	2	100%	All Detects	All Detects	1600	14000	---
>C21-C34 Aliphatics	2	2	100%	All Detects	All Detects	270	2800	---
>C21-C34 Aromatics	2	2	100%	All Detects	All Detects	280	2800	---
C8-C10 Aliphatics	2	2	100%	All Detects	All Detects	43	400	---
Total Aliphatics	2	2	100%	All Detects	All Detects	3100	27000	---
Total Aromatics	2	2	100%	All Detects	All Detects	2600	26000	---
BTEX (mg/kg)								
Benzene	173	17	10%	0.017	10	0.029	18	15
Ethylbenzene	173	43	25%	0.044	0.52	0.06	350	14
m, p-Xylene	17	11	65%	0.087	1	0.12	900	3
o-Xylene	17	6	35%	0.087	4.1	0.1	420	2
Toluene	173	30	17%	0.044	10	0.083	160	5
Xylenes, Total	156	42	27%	0.05	30	0.06	230	14
TOTAL METALS (mg/kg)								
Arsenic	1	1	100%	All Detects	All Detects	1.71	1.71	0
Barium	1	1	100%	All Detects	All Detects	28.4	28.4	----
Cadmium	1	0	0%	0.5	0.5	No Detects	No Detects	0
Chromium	1	1	100%	All Detects	All Detects	18	18	0
Lead	15	14	93%	5	5	1.56	21	0
Mercury	1	0	0%	0.1	0.1	No Detects	No Detects	0
Selenium	1	0	0%	0.5	0.5	No Detects	No Detects	----
Silver	1	0	0%	0.5	0.5	No Detects	No Detects	----
PAHs (mg/kg)								
1-Methylnaphthalene	13	5	38%	0.0032	0.0036	0.29	19	----
2-Methylnaphthalene	13	5	38%	0.0021	0.0024	0.22	28	----
Naphthalene	15	6	40%	0.0021	0.023	0.015	3.7	----
Total Naphthalenes	15	7	47%	0.0021	0.0024	0.525	50.7	3
Acenaphthene	15	3	20%	0.0021	0.023	0.032	0.48	----
Acenaphthylene	15	2	13%	0.0021	0.023	0.08	0.16	----
Anthracene	15	2	13%	0.0021	0.023	0.14	0.26	----
Benzo(a)anthracene	15	0	0%	0.0027	0.05	No Detects	No Detects	----
Benzo(a)pyrene	15	0	0%	0.0032	0.05	No Detects	No Detects	----
Benzo(b)fluoranthene	15	0	0%	0.0021	0.05	No Detects	No Detects	----
Benzo(k)fluoranthene	15	0	0%	0.0027	0.05	No Detects	No Detects	----
Chrysene	15	5	33%	0.0027	0.05	0.003	0.2	----
Dibenzo(a,h)anthracene	15	0	0%	0.0043	0.05	No Detects	No Detects	----
Indeno(1,2,3-cd)pyrene	15	0	0%	0.0043	0.05	No Detects	No Detects	----
Benzo(g,h,i)perylene	15	0	0%	0.0027	0.05	No Detects	No Detects	----
Dibenzofuran	13	0	0%	0.011	0.11	No Detects	No Detects	----
Fluoranthene	15	1	7%	0.0021	0.05	0.0034	0.0034	----
Fluorene	15	7	47%	0.0021	0.0024	0.086	2.7	----
Phenanthrene	15	8	53%	0.0021	0.0024	0.0031	7.2	----
Pyrene	15	9	60%	0.0021	0.0024	0.0023	0.45	----
cPAH TEQ	15	5	33%	0.0021	0.05	0.00003	0.002	0
PCBs (mg/kg)								
PCB-1016	3	0	0%	0.01	0.011	No Detects	No Detects	----
PCB-1221	3	0	0%	0.01	0.011	No Detects	No Detects	----
PCB-1232	3	0	0%	0.01	0.011	No Detects	No Detects	----
PCB-1242	3	0	0%	0.01	0.011	No Detects	No Detects	----
PCB-1248	3	0	0%	0.01	0.011	No Detects	No Detects	----
PCB-1254	3	0	0%	0.01	0.011	No Detects	No Detects	----
PCB-1260	3	0	0%	0.01	0.011	No Detects	No Detects	----
Total PCBs	3	0	0%	0.01	0.011	No Detects	No Detects	0

TABLE 5-2
SHALLOW GROUNDWATER STATISTICS
PEDERSON'S FRYER FARMS RI

	Number of Samples	Number of Detects	Frequency of Detection	Minimum Reporting Limit	Maximum Reporting Limit	Minimum Detection	Maximum Detection	Number of Exceedances
TPH (mg/L)								
Diesel Range Organics	102	61	60%	0.1	25	0.12	86	39
Lube Oil	102	13	13%	0.2	50	0.29	1.8	7
Gasoline Range Organics	83	27	33%	0.05	0.25	0.07	9.8	13
BTEX/VOCs (ug/L)								
1,2-Dichloroethane	1	0	0%	0.1	0.1	No Detects	No Detects	0
Benzene	78	13	17%	0.25	10	0.12	22	4
Ethylbenzene	78	18	23%	0.25	5	0.76	560	0
Ethylene Dibromide	2	0	0%	0.01	5	No Detects	No Detects	0
m, p-Xylene	25	6	24%	0.5	10	0.5	1300	1
Methyl tert butyl ether	10	0	0%	0.1	15	No Detects	No Detects	0
Naphthalene	1	1	100%	All Detects	All Detects	3.9	3.9	----
o-Xylene	25	5	20%	0.25	5	0.3	82	0
Toluene	78	15	19%	0.25	10	0.3	94	0
Xylenes, Total	53	12	23%	3	10	2	270	0
METALS, DISS (mg/L)								
Lead	1	0	0%	0.4	0.4	No Detects	No Detects	0
Manganese	3	3	100%	All Detects	All Detects	350	2200	----
PAH-SIM (ug/L)								
1-Methylnaphthalene	2	0	0%	0.047	0.047	No Detects	No Detects	----
2-Methylnaphthalene	2	0	0%	0.061	0.061	No Detects	No Detects	----
Naphthalene	2	2	100%	All Detects	All Detects	0.058	0.25	----
Total Naphthalenes	2	2	100%	All Detects	All Detects	0.058	0.25	0
Acenaphthene	2	0	0%	0.047	0.047	No Detects	No Detects	----
Acenaphthylene	2	0	0%	0.047	0.047	No Detects	No Detects	----
Anthracene	2	0	0%	0.047	0.047	No Detects	No Detects	----
Benzo(a)anthracene	2	0	0%	0.047	0.047	No Detects	No Detects	----
Benzo(a)pyrene	2	0	0%	0.094	0.094	No Detects	No Detects	----
Benzo(b)fluoranthene	2	0	0%	0.047	0.047	No Detects	No Detects	----
Benzo(k)fluoranthene	2	0	0%	0.047	0.047	No Detects	No Detects	----
Chrysene	2	0	0%	0.047	0.047	No Detects	No Detects	----
Dibenzo(a,h)anthracene	2	0	0%	0.047	0.047	No Detects	No Detects	----
Indeno(1,2,3-cd)pyrene	2	0	0%	0.047	0.047	No Detects	No Detects	----
Benzo(g,h,i)perylene	2	0	0%	0.047	0.047	No Detects	No Detects	----
Fluoranthene	2	0	0%	0.047	0.047	No Detects	No Detects	----
Fluorene	2	0	0%	0.047	0.047	No Detects	No Detects	----
Phenanthrene	2	0	0%	0.047	0.047	No Detects	No Detects	----
Pyrene	2	0	0%	0.047	0.047	No Detects	No Detects	----
cPAH TEQ	2	0	0%	0	0	No Detects	No Detects	0
CONVENTIONALS (mg/L)								
Alkalinity	2	2	100%	All Detects	All Detects	47	60	----
Nitrate	13	3	23%	0.9	0.9	1	1.8	0
Sulfate	12	10	83%	1.2	1.2	2.7	12	0
Total Organic Carbon	2	2	100%	All Detects	All Detects	2	17	----

TABLE 5-3
DEEP GROUNDWATER STATISTICS
PEDERSON'S FRYER FARMS RI

	Number of Samples	Number of Detects	Frequency of Detection	Minimum Reporting Limit	Maximum Reporting Limit	Minimum Detection	Maximum Detection	Number of Exceedances
TPH (mg/L)								
Diesel Range Organics	65	51	78%	0.1	0.13	0.13	560	40
Lube Oil	65	9	14%	0.2	40	0.26	1.2	5
Gasoline Range Organics	39	24	62%	0.05	0.1	0.054	2.4	8
BTEX/VOCs (ug/L)								
1,2-Dichloroethane	3	0	0%	0.1	0.1	No Detects	No Detects	0
Benzene	32	3	9%	0.1	1	0.13	0.71	0
Ethylbenzene	32	1	3%	0.1	1	0.28	0.28	0
Ethylene Dibromide	3	0	0%	0.01	0.01	No Detects	No Detects	0
m, p-Xylene	25	3	12%	0.2	1	1.1	1.4	0
Methyl tert butyl ether	7	0	0%	0.1	1	No Detects	No Detects	0
Naphthalene	3	2	67%	0.4	0.4	0.62	3	----
o-Xylene	25	1	4%	0.1	1	0.34	0.34	0
Toluene	32	1	3%	0.1	1	0.25	0.25	0
Xylenes, Total	7	0	0%	3	3	No Detects	No Detects	0
METALS, DISS (mg/L)								
Lead	1	0	0%	0.4	0.4	No Detects	No Detects	0
Manganese	2	2	100%	All Detects	All Detects	2900	3000	----
PAH-SIM (ug/L)								
1-Methylnaphthalene	3	3	100%	All Detects	All Detects	0.82	67	----
2-Methylnaphthalene	3	3	100%	All Detects	All Detects	0.48	18	----
Naphthalene	3	3	100%	All Detects	All Detects	0.11	2	----
Total Naphthalenes	3	3	100%	All Detects	All Detects	1.41	86.1	0
Acenaphthene	3	3	100%	All Detects	All Detects	0.062	3.5	----
Acenaphthylene	3	2	67%	0.047	0.047	0.32	1.4	----
Anthracene	3	2	67%	0.047	0.047	0.057	1.1	----
Benzo(a)anthracene	3	1	33%	0.047	0.047	0.095	0.095	----
Benzo(a)pyrene	3	0	0%	0.094	0.094	No Detects	No Detects	----
Benzo(b)fluoranthene	3	1	33%	0.047	0.047	0.072	0.072	----
Benzo(k)fluoranthene	3	0	0%	0.047	0.047	No Detects	No Detects	----
Chrysene	3	1	33%	0.047	0.047	0.25	0.25	----
Dibenzo(a,h)anthracene	3	0	0%	0.047	0.047	No Detects	No Detects	----
Indeno(1,2,3-cd)pyrene	3	0	0%	0.047	0.047	No Detects	No Detects	----
Benzo(g,h,i)perylene	3	0	0%	0.047	0.047	No Detects	No Detects	----
Fluoranthene	3	1	33%	0.047	0.047	0.33	0.33	----
Fluorene	3	3	100%	All Detects	All Detects	0.15	8.2	----
Phenanthrene	3	2	67%	0.047	0.047	0.92	15	----
Pyrene	3	1	33%	0.047	0.047	1.4	1.4	----
cPAH TEQ	3	1	33%	0	0	0.0192	0.0192	0
CONVENTIONALS (mg/L)								
Alkalinity	2	2	100%	All Detects	All Detects	140	140	----
Nitrate	17	7	41%	0.1	0.9	0.97	4.7	0
Sulfate	18	12	67%	1.2	1.2	2.8	16	0
Total Organic Carbon	3	3	100%	All Detects	All Detects	3.4	6.7	----

TABLE 5-4
LNAPL THICKNESS - MW-17 AND MW-20
PEDERSON'S FRYER FARMS RI

Dates	LNAPL Thickness (ft) MW-17	MW-20	Description
1/10/2003	ND	DNE (a)	EPI groundwater monitoring events
1/23/2003	ND	DNE	
5/14/2003	0.01	DNE	
8/19/2003	1.34	DNE	
12/15/2003	0.01	DNE	
3/15/2004	0.08	DNE	
7/6/2004	0.89	ND	
10/11/2004	0.23	ND	
2/3/2005	ND	ND	
5/23/2005	0.08	ND	
6/10/2005	0.23	NM (b)	LNAPL extraction study period
6/21/2005	0.11	NM	
7/1/2005	0.15	NM	
7/8/2005	0.15	NM	
8/1/2005	0.37	NM	
8/10/2005	0.13	NM	
8/31/2005	0.65	0.04	Final EPI groundwater monitoring event
11/4/2010	ND	ND	LAI groundwater monitoring events
12/8/2010	ND	ND	
5/27/2011	DNE (c)	ND	
6/5/2011	DNE	ND	
6/29/2011	DNE	ND	
7/27/2011	DNE	ND	
8/26/2011	DNE	ND	

ND = not detected

DNE = does not exist

EPI = Environmental Partners, Inc.

LAI = Landau Associates, Inc.

(a) MW-20 was installed in 6/30/2004

(b) MW-20 was not measured during the MW-17 product recovery study period

(c) MW-17 was decommissioned on 5/25/2011

TABLE 5-5
WELL INSPECTION NOTES
PEDERSON'S FRYER FARMS RI

Well ID	Aquifer	November 4, 2010 Water Level Collection Event		December 2010 Groundwater Sampling Event	
		DTW (ft)	Comments/ Observations	DTW (ft)	Comments/ Observations
MW-1	S	28.89	slight odor, NS	30.21	small brown particles, turbid, diesel odor, light sheen
MW-2	S	31.95	NO/NS	33.95	NO/NS, clear
MW-3	S	--	could not find well	29.59	no notes taken
MW-4	S	32.90	NO/NS	31.84	low odor, NS, red/brown, ferrous flocs
MW-5	S	30.98	slight odor, sheen	32.02	clear, NO/NS
MW-6	S	36.07	NO/NS	36.41	clear, NO/NS
MW-7R	D	41.04	NO/NS	40.06	clear, light sheen and light diesel odor
MW-8	S	43.05	NO/NS, sediment on probe	43.32	NO/NS, clear, brown floating particles
MW-9	D	47.07	NO/NS, all three bolts missing	42.58	NO/NS, clear, brown floating particles
MW-10	S	43.15	--	42.28	diesel odor, NS, clear, brown particles
MW-11	S	37.70	well was buried under gravel in parking lot	37.28	NO, slight sheen, clear, small white particles
MW-12	D	48.71	well was buried under gravel in parking lot, needs new monument	48.17	NO/NS, clear
MW-13	D	--	well buried under gravel parking lot, could not find well	48.02	NO/NS, brown, some floating debris
MW-14	D	48.98	well buried under gravel parking lot, needs new cap and monument	49	no water taken; insufficient amount for sample
MW-15	S	24.87	potentially up to 0.02 ft of product, layer was too thin to get conclusive reading from probe, strong petroleum odor	25.28	very strong diesel odor, sheen, cloudy
MW-16	S	42.88	NO/NS	43.03	no water taken; insufficient amount for sample
MW-17	D	41.99	HC odor, NS	41.41	diesel odor, light sheen, clear, light sheen
MW-18	D	41.63	potentially up to 0.02 ft of product, but layer was too thin to get conclusive	41.68	diesel odor, light sheen, clear, light sheen
MW-19	D	44.48	slight odor, NS	41.93	NO/NS, clear
MW-20	D	45.76	NO/NS	43.16	diesel odor, light sheen, clear
MW-21	D	38.37	NO/NS, oil/water interface probe beeped inconsistently	56.81	NO/NS, clear
MW-22	D	49.04	NO, NS	44.58	NO/NS, clear

Aquifer designation: S = Shallow; D = Deep
DTW = Depth to Water
-- = No data or notes
NO/NS = no odor/ no sheen

TABLE 5-5
WELL INSPECTION NOTES
PEDERSON'S FRYER FARMS RI

		May 27, 2011 Water Level Collection Event		June 1-3, 2011 Groundwater Sampling Event	
Well ID	Aquifer	DTW (ft)	Comments/ Observations	DTW (ft)	Comments/ Observations
MW-1	S	30.44	NO, monument full of H2O, product @ 30.43' bgs.	30.55	NO, NS. well dry; let recharge ~1.5hr. on return product @ 30.45', DTW = 30.46
MW-2	S	33.65	from top of PVC	34.66	NO, installed waterra. went dry; wait to recharge; conductivity and DO taken after already dry. after ~2hrs recharge DTW = 34.91
MW-3	S	31.33	burnt plastic odor	33.26	product detected @ 33.26 (briefly). insufficient water to sample; could not withdraw water with waterra
MW-4	S	33.31	product detected but depth inconclusive - thin film?	31.69	NO/NS, yellowish, low turbidity w/ red-brown flocs. collected 2 NWTPH-Dx samples due to turbidity. collected MNA2 since MW-3 was dry
MW-5	S	32.76	light burnt plastic odor, has tubing, monument full of H2O. cap replaced	31.94	NO/NS, installed waterra. Light brown, cloudy/turbid, slight burnt plastic odor. sampled a 2nd NWTPH-Dx due to high turbidity
MW-6	S	37.59	NO, monument full of H2O. no lock on cap upon arrival - locked on leaving.	38.75	NO/NS, fairly turbid
MW-7R	D	--	--	39.36	slight HC odor, sheen, clear, low turbidity w/ small brown particles
MW-8	S	43.31	--	43.56	NO/NS, product detected briefly @ 43.56'. suspended brown particles
MW-9	D	43.49	monument needs one bolt.	45.07	NO/NS, product detected @ 45.07'. organic odor, suspended brown particles, some bubbles
MW-10	S	42.87	monument full of H2O, in an area where stormwater pond has strong odor	43.87	NO/NS, clear, larvae floating on top of sample. too dry to sample, 8" H2O in bailer
MW-11	S	37.08	replaced cap (was loose)	37.15	NO/NS, had H2O beneath monument, brown, turbid, ran dry during sampling, allowed for recharge and finished sampling 1hr later @ DTW = 37.19
MW-15	S	25.55	HC odor	26.19	strong HC odor, NS, no product detected. well went dry during sampling, recharged w/in 5-10 minutes and sampling was completed
MW-19	D	41.59	NO, monument full of H2O	42.32	HC odor, sheen, product detected @ 42.31, gray and cloudy. Took 2 Dx samples due to high turbidity
MW-20	D	43.04	HC odor (moderate), monument full of H2O	43.92	moderate HC odor, heavy sheen, product briefly @ same depth as H2O. installed foot valve.
MW-22	D	44.28	--	45.38	NO/NS, installed waterra and replaced tubing, brown to white suspended particles, but generally low turbidity
MW-25D	D	42.05	HC odor, no product detected	42.57	HC odor, sheen, somewhat turbid. no product detected
MW-26S	S	26.47	HC odor, had sheen, no product detected. bailed 2.5 gal. final DTW = 26.59	26.67	HC odor, heavy sheen, very turbid. lead sample could not move through 0.45µm in-line filter. an unfiltered 500mL plastic bottle w/ nitric pres. was filled
MW-27D	D	50.82	HC odor, no product	51.2	HC odor, some sheen, grey, cloudy
MW-28D	D	49.15	slight HC odor, built up water @ monument	49.03	moderate to strong HC odor, some sheen on samples, product detected briefly @ 49.03
MW-29D	D	47.09	has PVC riser, see photo	47.63	NO/NS, somewhat turbid, very minimal floating white particles
MW-30D	D	50.83	--	51.23	NO/NS, slightly turbid.

TABLE 5-5
WELL INSPECTION NOTES
PEDERSON'S FRYER FARMS RI

Well ID	Aquifer	May 2011 Water Level Collection Event		June 1-3, 2011 Groundwater Sampling Event	
		DTW (ft)	Comments/ Observations	DTW (ft)	Comments/ Observations
MW-31D	D	52.92	~20' to NE is a catch basin w/ standing water @ ~ 1' bgs. ~ 30' E of is another catch basin w/ standing water @ ~ 2' bgs	53.12	slight HC odor, no sheen observed. Few floating white particles (PVC shavings from well?)
MW-32D	D	53.32	--	53.45	NO/NS, slightly turbid, light brown
MW-33S	S	29.52	bailed 2"	29.75	product detected briefly @ 29.75', then did not detect it @ same depth. Could not sample - insufficient water. Plastic bailer was used but could not bring up water
MW-34S	S	4.47	4.48' bgs - product. adjacent storm water structures investigated; film on water surface, product detected at a depth of <0.01	4.72	NO/NS, water seem somewhat bubbly. 2 bottles taken for NWTPH-Dx due to turbidity
MW-35S	S	17.12	moderate HC odor. bailed 1.5-2 gal H2O @ 10:20	17.76	HC odor, turbid to very turbid and bubbly (may indicate sheen), product detected briefly @ 17.76', then failed to detect again

Aquifer designation: S = Shallow; D = Deep
DTW = Depth to Water
-- = No data or notes
NO/NS = no odor/ no sheen

TABLE 5-5
WELL INSPECTION NOTES
PEDERSON'S FRYER FARMS RI

		June 28-30, 2011 Groundwater Sampling Event		July 27, 2011 Water Level Collection Event	
Well ID	**Aquifer**	**DTW (ft)**	**Comments/ Observations**	**DTW (ft)**	**Comments/ Observations**
MW-1	S	31.62	NO/NS, slightly turbid, grayish-brown. allowed 2hrs for recharge btwn purging and sampling due to well drying	31.18	NO, double checked, new DTW is higher than old
MW-2	S	37.67	NO. insufficient water, no samples collected	37.67	NO
MW-3	S	33.79	NO. insufficient water, no samples collected	33.83	NO
MW-4	S	36.85	odor uncertain. Insufficient water, no samples collected	37.46	NO
MW-5	S	36.23	monument full of H2O. NO. insufficient water, no samples collected	36.88	NO
MW-6	S	41.12	NO/NS. Insufficient water, no samples collected	41.42	NO
MW-7R	D	44.2	HC odor, heavy sheen, product detected briefly @ 44.19', brown, low turbidity. allowed 2hrs for recharge btwn purging and sampling due to well drying	46.17	NO
MW-8	S	43.94	NO/NS, brown, cloudy w/ brown suspended particles. allowed 1.25hrs for recharge btwn purging and sampling	44.17	NO
MW-9	D	47.39	light sweet odor on probe - not HC. Not sampled - well filled with viscous, gelatinous brown substance dotted w/ larvae - unable to retrieve water	48.38	Sewage odor
MW-10	S	43.96	NO/NS. dry, no samples collected	44.05	NO
MW-11	S	38.03	NO/NS, brown, v. turbid. water build-up under monument. Insufficient water to purge or sample	38.18	NO
MW-15	S	26.92	strong HC odor, NS, light grey, lightly turbid, bubbly. went dry intermittently during purging and sampling, had to allow time for recharge. replaced tubing - too short	27.92	Light odor, product detected briefly but could not be reproduced
MW-19	D	45.1	slight HC odor, NS, cloudy to grey, last 2 samples v. turbid. water in monument.	47.13	Light odor
MW-20	D	46.74	HC odor, sheen, grey, v. slightly turbid	48.66	Light odor
MW-22	D	51.61	NO/NS, cloudy brown	53.84	NO
MW-25D	D	44.96	HC odor, sheen, cloudy, slightly turbid. replaced tubing - damaged	46.99	Light odor
MW-26S	S	27.49	HC odor, sheen, gray/brown, somewhat turbid, light brown particles. went dry intermittently during purging and sampling, sampling occurred over 2hrs to allow recharge	28.04	NO
MW-27D	D	51.94	HC odor, sheen, cloudy, turbid	53.45	Light odor
MW-28D	D	49.99	HC odor, slight sheen, slightly turbid, grey	52.72	NO
MW-29D	D	49.73	NO/NS, light brown, low turbidity, slightly bubbly	52.62	NO
MW-30D	D	52.91	NO/NS, moderately turbid	57.09	NO - double checked
MW-31D	D	53.78	mild HC odor, NS, turbid. product detected briefly @ 53.78'. waterra lost in well, replaced w/ new waterra	55.13	NO
MW-32D	D	53.69	--	54.72	NO
MW-33S	S	DRY	NO. dry - no samples collected	Dry	NO

		June 28-30, 2011 Groundwater Sampling Event	July 27, 2011 Water Level Collection Event

TABLE 5-5
WELL INSPECTION NOTES
PEDERSON'S FRYER FARMS RI

Well ID	Aquifer	DTW (ft)	Comments/ Observations	DTW (ft)	Comments/ Observations
MW-34S	S	5.59	NO/NS, cloudy, turbid. shallow storm pond adjacent to well contains water	6.28	NO
MW-35S	S	18.52	strong HC odor, NS, grey-brown, turbid, bubbles. product detected v. briefly @ 18.52'. well went dry during sampling, waited 10-20min to allow for recharge btwn samples	19.5	Slight odor

Aquifer designation: S = Shallow; D = Deep
DTW = Depth to Water
-- = No data or notes
NO/NS = no odor/ no sheen

TABLE 5-5
WELL INSPECTION NOTES
PEDERSON'S FRYER FARMS RI

Well ID	Aquifer	August 26, 2011 Water Level Collection Event	
		DTW (ft)	Comments/ Observations
MW-1	S	30.21	NO/NS, bolts striped
MW-2	S	37.74	NO/NS
MW-3	S	33.76	NO/NS, needs new cap
MW-4	S	35.8	Sweet odor, brown/red residue on probe. Needs 2 new bolts
MW-5	S	37.4	Slight sweet odor, white 2mm bugs on probe
MW-6	S	43.71	NO/NS, lock stuck – need bolt cutters and new lock
MW-7R	D	54.9	NO/NS
MW-8	S	44.79	NO/NS
MW-9	D	48.12	Wastewater sweet odor, NS, has no bolts
MW-10	S	44.14	NO/NS, bolts are striped
MW-11	S	38.25	NO/NS, monument full of H2O
MW-15	S	29.11	NO/NS, unusual – usually strong HC odor
MW-19	D	48.19	Low HC odor/NS, needs 1 new bolt
MW-20	D	51.58	HC odor/NS
MW-22	D	55.49	NO/NS
MW-25D	D	47.97	HC odor/NS
MW-26S	S	28.09	NO/NS
MW-27D	D	54.61	HC odor, NS, brown/red residue
MW-28D	D	53.75	NO/NS
MW-29D	D	53.16	NO/NS
MW-30D	D	58	NO/NS
MW-31D	D	55.57	NO/NS
MW-32D	D	55.84	NO/NS
MW-33S	S	Dry	NO/NS, Probe hit bottom of the well, dry but damp (beeped at 29.52’)
MW-34S	S	7.21	NO/NS
MW-35S	S	Dry	NO/NS

Aquifer designation: S = Shallow; D = Deep
DTW = Depth to Water
-- = No data or notes
NO/NS = no odor/ no sheen

TABLE 5A-1
AREA A 2000 EXCAVATION - FINAL CONFIRMATION SOIL SAMPLE RESULTS
PEDERSON'S FRYER FARMS RI

	Soil Screening Criteria (a)	EPIEX-BOT-22-30	EPIEX-BOT-53-30	EPIEX-BOT-55-13	EPIEX-BOT-59-14	EPIEX-BOT-61-19	EPIEX-BOT-68-14	EPIEX-BOT-69-17	EPIEX-BOT-70-21
		9/1/2000	9/5/2000	9/5/2000	9/5/2000	9/6/2000	9/6/2000	9/6/2000	9/6/2000
TOTAL PETROLEUM HYDROCARBONS (mg/kg)									
Diesel Range Organics	2000	**10000**	**6400**	**1200**	20 U	20 U	20 U	**188**	20 U
Lube Oil	2000	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U
PAHs (mg/kg)									
Naphthalene	5								
Acenaphthylene	--								
Acenaphthene	--								
Fluorene	--								
Phenanthrene	--								
Anthracene	--								
Fluoranthene	--								
Pyrene	--								
Benzo(a)anthracene	--								
Chrysene	--								
Benzo(b)fluoranthene	--								
Benzo(k)fluoranthene	--								
Benzo(a)pyrene	--								
Indeno(1,2,3-cd)pyrene	--								
Dibenzo(a,h)anthracene	--								
Benzo(g,h,i)perylene	--								
cPAH TEQ	0.1(b)								
EPH (mg/kg)									
>C10-C12 Aliphatics	--								
>C10-C12 Aromatics	--								
>C12-C16 Aliphatics	--								
>C12-C16 Aromatics	--								
>C16-C21 Aliphatics	--								
>C16-C21 Aromatics	--								
>C21-C34 Aliphatics	--								
>C21-C34 Aromatics	--								
C8-C10 Aliphatics	--								
Total Aliphatics	--								
Total Aromatics	--								

TABLE 5A-1
AREA A 2000 EXCAVATION - FINAL CONFIRMATION SOIL SAMPLE RESULTS
PEDERSON'S FRYER FARMS RI

	Soil Screening Criteria (a)	EPIEX-BOT-78-27 9/6/2000	EPIEX-BOT-79-27 9/6/2000	EPIEX-BOT-80-27 9/6/2000	EPIEX-BOT-86-27 9/7/2000	EPIEX-BOT-90-27 9/7/2000	EPIEX-BOT-94-27 9/7/2000	EPIEX-BOT-95-27 9/7/2000	EPIEX-BOT-97-27 9/7/2000
TOTAL PETROLEUM HYDROCARBONS (mg/kg)									
Diesel Range Organics	2000	20 U	**400**	**7800**	**1000**	**3800**	**3500**	**1600**	**2300**
Lube Oil	2000	40 U	40 U	40 U	40 U	40 U	40 U	40	40 U
PAHs (mg/kg)									
Naphthalene	5								
Acenaphthylene	--								
Acenaphthene	--								
Fluorene	--								
Phenanthrene	--								
Anthracene	--								
Fluoranthene	--								
Pyrene	--								
Benzo(a)anthracene	--								
Chrysene	--								
Benzo(b)fluoranthene	--								
Benzo(k)fluoranthene	--								
Benzo(a)pyrene	--								
Indeno(1,2,3-cd)pyrene	--								
Dibenzo(a,h)anthracene	--								
Benzo(g,h,i)perylene	--								
cPAH TEQ	0.1(b)								
EPH (mg/kg)									
>C10-C12 Aliphatics	--								
>C10-C12 Aromatics	--								
>C12-C16 Aliphatics	--								
>C12-C16 Aromatics	--								
>C16-C21 Aliphatics	--								
>C16-C21 Aromatics	--								
>C21-C34 Aliphatics	--								
>C21-C34 Aromatics	--								
C8-C10 Aliphatics	--								
Total Aliphatics	--								
Total Aromatics	--								

TABLE 5A-1
AREA A 2000 EXCAVATION - FINAL CONFIRMATION SOIL SAMPLE RESULTS
PEDERSON'S FRYER FARMS RI

	Soil Screening Criteria (a)	EPIEX-BOT-104-27 9/7/2000	EPIEX-BOT-105-27 9/7/2000	EPIEX-BOT-107-25 9/8/2000	EPIEX-BOT-109-27 9/8/2000	EPIEX-BOT-110-27 9/8/2000	EPIEX-BOT-111-27 9/8/2000	EPIEX-BOT-113-27 9/8/2000	EPIEX-BOT-115-27 9/8/2000
TOTAL PETROLEUM HYDROCARBONS (mg/kg)									
Diesel Range Organics	2000	**95**	20 U	20 U	**1300**	**2600**	20 U	**460**	**2300**
Lube Oil	2000	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U
PAHs (mg/kg)									
Naphthalene	5								
Acenaphthylene	--								
Acenaphthene	--								
Fluorene	--								
Phenanthrene	--								
Anthracene	--								
Fluoranthene	--								
Pyrene	--								
Benzo(a)anthracene	--								
Chrysene	--								
Benzo(b)fluoranthene	--								
Benzo(k)fluoranthene	--								
Benzo(a)pyrene	--								
Indeno(1,2,3-cd)pyrene	--								
Dibenzo(a,h)anthracene	--								
Benzo(g,h,i)perylene	--								
cPAH TEQ	0.1(b)								
EPH (mg/kg)									
>C10-C12 Aliphatics	--								
>C10-C12 Aromatics	--								
>C12-C16 Aliphatics	--								
>C12-C16 Aromatics	--								
>C16-C21 Aliphatics	--								
>C16-C21 Aromatics	--								
>C21-C34 Aliphatics	--								
>C21-C34 Aromatics	--								
C8-C10 Aliphatics	--								
Total Aliphatics	--								
Total Aromatics	--								

TABLE 5A-1
AREA A 2000 EXCAVATION - FINAL CONFIRMATION SOIL SAMPLE RESULTS
PEDERSON'S FRYER FARMS RI

	Soil Screening Criteria (a)	EPIEX-BOT-121-27 9/8/2000	EPIEX-BOT-123-27 9/8/2000	EPIEX-BOT-124-27 9/8/2000	EPIEX-BOT-126-27 9/12/2000	EPIEX-BOT-131-27 9/12/2000	EPIEX-BOT-134-27 9/12/2000	EPIEX-BOT-135-27 9/12/2000	EPIEX-BOT-137-27 9/12/2000
TOTAL PETROLEUM HYDROCARBONS (mg/kg)									
Diesel Range Organics	2000	**2000**	**1800**	**11600**	**2800**	**4800**	20 U	**3800**	**3300**
Lube Oil	2000	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U
PAHs (mg/kg)									
Naphthalene	5								
Acenaphthylene	--								
Acenaphthene	--								
Fluorene	--								
Phenanthrene	--								
Anthracene	--								
Fluoranthene	--								
Pyrene	--								
Benzo(a)anthracene	--								
Chrysene	--								
Benzo(b)fluoranthene	--								
Benzo(k)fluoranthene	--								
Benzo(a)pyrene	--								
Indeno(1,2,3-cd)pyrene	--								
Dibenzo(a,h)anthracene	--								
Benzo(g,h,i)perylene	--								
cPAH TEQ	0.1(b)								
EPH (mg/kg)									
>C10-C12 Aliphatics	--								
>C10-C12 Aromatics	--								
>C12-C16 Aliphatics	--								
>C12-C16 Aromatics	--								
>C16-C21 Aliphatics	--								
>C16-C21 Aromatics	--								
>C21-C34 Aliphatics	--								
>C21-C34 Aromatics	--								
C8-C10 Aliphatics	--								
Total Aliphatics	--								
Total Aromatics	--								

TABLE 5A-1
AREA A 2000 EXCAVATION - FINAL CONFIRMATION SOIL SAMPLE RESULTS
PEDERSON'S FRYER FARMS RI

	Soil Screening Criteria (a)	EPIEX-BOT-143-27 9/12/2000	EPIEX-BOT-145-27 9/12/2000	EPIEX-BOT-147-26 9/12/2000	EPIEX-BOT-151-22 9/12/2000	EPIEX-BOT-157-27 9/13/2000	EPIEX-BOT-158-27 9/13/2000	EPIEX-BOT-166-25 9/13/2000	EPIEX-BOT-167-25 9/13/2000
TOTAL PETROLEUM HYDROCARBONS (mg/kg)									
Diesel Range Organics	2000	**2000**	**3100**	20 U	20 U	**1000**	20 U	**600**	20 U
Lube Oil	2000	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U
PAHs (mg/kg)									
Naphthalene	5								
Acenaphthylene	--								
Acenaphthene	--								
Fluorene	--								
Phenanthrene	--								
Anthracene	--								
Fluoranthene	--								
Pyrene	--								
Benzo(a)anthracene	--								
Chrysene	--								
Benzo(b)fluoranthene	--								
Benzo(k)fluoranthene	--								
Benzo(a)pyrene	--								
Indeno(1,2,3-cd)pyrene	--								
Dibenzo(a,h)anthracene	--								
Benzo(g,h,i)perylene	--								
cPAH TEQ	0.1(b)								
EPH (mg/kg)									
>C10-C12 Aliphatics	--								
>C10-C12 Aromatics	--								
>C12-C16 Aliphatics	--								
>C12-C16 Aromatics	--								
>C16-C21 Aliphatics	--								
>C16-C21 Aromatics	--								
>C21-C34 Aliphatics	--								
>C21-C34 Aromatics	--								
C8-C10 Aliphatics	--								
Total Aliphatics	--								
Total Aromatics	--								

TABLE 5A-1
AREA A 2000 EXCAVATION - FINAL CONFIRMATION SOIL SAMPLE RESULTS
PEDERSON'S FRYER FARMS RI

	Soil Screening Criteria (a)	EPIEX-BOT-192-6 9/13/2000	EPIEX-BOT-193-4 10/2/2000	EPIEX-BOT-194-4 10/2/2000	EPIEX-BOT-195-3 10/2/2000	EPIEX-BOT-196-5 10/2/2000	EPIEX-BOT-197-5 10/2/2000	EPIEX-BOT-198-15 10/2/2000	EPIEX-SW-26-10 9/1/2000
TOTAL PETROLEUM HYDROCARBONS (mg/kg)									
Diesel Range Organics	2000	25 U	25 U	25 U	**67**	25 U	25 U	25 U	20 U
Lube Oil	2000	50 U	50 U	50 U	50 U	50 U	50 U	50 U	40 U
PAHs (mg/kg)									
Naphthalene	5								
Acenaphthylene	--								
Acenaphthene	--								
Fluorene	--								
Phenanthrene	--								
Anthracene	--								
Fluoranthene	--								
Pyrene	--								
Benzo(a)anthracene	--								
Chrysene	--								
Benzo(b)fluoranthene	--								
Benzo(k)fluoranthene	--								
Benzo(a)pyrene	--								
Indeno(1,2,3-cd)pyrene	--								
Dibenzo(a,h)anthracene	--								
Benzo(g,h,i)perylene	--								
cPAH TEQ	0.1(b)								
EPH (mg/kg)									
>C10-C12 Aliphatics	--								
>C10-C12 Aromatics	--								
>C12-C16 Aliphatics	--								
>C12-C16 Aromatics	--								
>C16-C21 Aliphatics	--								
>C16-C21 Aromatics	--								
>C21-C34 Aliphatics	--								
>C21-C34 Aromatics	--								
C8-C10 Aliphatics	--								
Total Aliphatics	--								
Total Aromatics	--								

TABLE 5A-1
AREA A 2000 EXCAVATION - FINAL CONFIRMATION SOIL SAMPLE RESULTS
PEDERSON'S FRYER FARMS RI

	Soil Screening Criteria (a)	EPIEX-SW-27-10 9/1/2000	EPIEX-SW-30-9 9/1/2000	EPIEX-SW-31-9 9/1/2000	EPIEX-SW-33-8 9/5/2000	EPIEX-SW-36-4 9/5/2000	EPIEX-SW-37-8 9/5/2000	EPIEX-SW-40-12 9/5/2000	EPIEX-SW-41-6 9/5/2000	EPIEX-SW-42-9 9/5/2000	EPIEX-SW-43-11 9/5/2000
TOTAL PETROLEUM HYDROCARBONS (mg/kg)											
Diesel Range Organics	2000	20 U	20 U	20 U	20 U	20 U	20 U	**10800**	**55**	20 U	**10900**
Lube Oil	2000	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40
PAHs (mg/kg)											
Naphthalene	5										
Acenaphthylene	--										
Acenaphthene	--										
Fluorene	--										
Phenanthrene	--										
Anthracene	--										
Fluoranthene	--										
Pyrene	--										
Benzo(a)anthracene	--										
Chrysene	--										
Benzo(b)fluoranthene	--										
Benzo(k)fluoranthene	--										
Benzo(a)pyrene	--										
Indeno(1,2,3-cd)pyrene	--										
Dibenzo(a,h)anthracene	--										
Benzo(g,h,i)perylene	--										
cPAH TEQ	0.1(b)										
EPH (mg/kg)											
>C10-C12 Aliphatics	--										
>C10-C12 Aromatics	--										
>C12-C16 Aliphatics	--										
>C12-C16 Aromatics	--										
>C16-C21 Aliphatics	--										
>C16-C21 Aromatics	--										
>C21-C34 Aliphatics	--										
>C21-C34 Aromatics	--										
C8-C10 Aliphatics	--										
Total Aliphatics	--										
Total Aromatics	--										

TABLE 5A-1
AREA A 2000 EXCAVATION - FINAL CONFIRMATION SOIL SAMPLE RESULTS
PEDERSON'S FRYER FARMS RI

	Soil Screening Criteria (a)	EPIEX-SW-44-17 9/5/2000	EPIEX-SW-47-11 9/5/2000	EPIEX-SW-48-10 9/5/2000	EPIEX-SW-48-10-Dup 9/5/2000	EPIEX-SW-56-12 9/5/2000	EPIEX-SW-57-12 9/5/2000	EPIEX-SW-58-10 9/5/2000	EPIEX-SW-60-18 9/6/2000
TOTAL PETROLEUM HYDROCARBONS (mg/kg)									
Diesel Range Organics	2000	20 U	**6000**	**430**	**500**	**5800**	20 U	20 U	20 U
Lube Oil	2000	U 40 U	40 U	40 U		40 U	40 U	40 U	40 U
PAHs (mg/kg)									
Naphthalene	5								
Acenaphthylene	--								
Acenaphthene	--								
Fluorene	--								
Phenanthrene	--								
Anthracene	--								
Fluoranthene	--								
Pyrene	--								
Benzo(a)anthracene	--								
Chrysene	--								
Benzo(b)fluoranthene	--								
Benzo(k)fluoranthene	--								
Benzo(a)pyrene	--								
Indeno(1,2,3-cd)pyrene	--								
Dibenzo(a,h)anthracene	--								
Benzo(g,h,i)perylene	--								
cPAH TEQ	0.1(b)								
EPH (mg/kg)									
>C10-C12 Aliphatics	--								
>C10-C12 Aromatics	--								
>C12-C16 Aliphatics	--								
>C12-C16 Aromatics	--								
>C16-C21 Aliphatics	--								
>C16-C21 Aromatics	--								
>C21-C34 Aliphatics	--								
>C21-C34 Aromatics	--								
C8-C10 Aliphatics	--								
Total Aliphatics	--								
Total Aromatics	--								

TABLE 5A-1
AREA A 2000 EXCAVATION - FINAL CONFIRMATION SOIL SAMPLE RESULTS
PEDERSON'S FRYER FARMS RI

	Soil Screening Criteria (a)	EPIEX-SW-63-17 9/6/2000	EPIEX-SW-72-14 9/6/2000	EPIEX-SW-73-16 9/6/2000	EPIEX-SW-74-16 9/6/2000	EPIEX-SW-75-19 9/6/2000	EPIEX-SW-76-16 9/6/2000	EPIEX-SW-77-19 9/6/2000	EPIEX-SW-81-20 9/6/2000	EPIEX-SW-82-25 9/6/2000
TOTAL PETROLEUM HYDROCARBONS (mg/kg)										
Diesel Range Organics	2000	**15200**	20 U	**3000**	20 U	20 U	**750**	20 U	**2800**	**7200**
Lube Oil	2000	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U
PAHs (mg/kg)										
Naphthalene	5									
Acenaphthylene	--									
Acenaphthene	--									
Fluorene	--									
Phenanthrene	--									
Anthracene	--									
Fluoranthene	--									
Pyrene	--									
Benzo(a)anthracene	--									
Chrysene	--									
Benzo(b)fluoranthene	--									
Benzo(k)fluoranthene	--									
Benzo(a)pyrene	--									
Indeno(1,2,3-cd)pyrene	--									
Dibenzo(a,h)anthracene	--									
Benzo(g,h,i)perylene	--									
cPAH TEQ	0.1(b)									
EPH (mg/kg)										
>C10-C12 Aliphatics	--									
>C10-C12 Aromatics	--									
>C12-C16 Aliphatics	--									
>C12-C16 Aromatics	--									
>C16-C21 Aliphatics	--									
>C16-C21 Aromatics	--									
>C21-C34 Aliphatics	--									
>C21-C34 Aromatics	--									
C8-C10 Aliphatics	--									
Total Aliphatics	--									
Total Aromatics	--									

TABLE 5A-1
AREA A 2000 EXCAVATION - FINAL CONFIRMATION SOIL SAMPLE RESULTS
PEDERSON'S FRYER FARMS RI

	Soil Screening Criteria (a)	EPIEX-SW-84-11 9/6/2000	EPIEX-SW-85-15 9/6/2000	EPIEX-SW-99-15 9/7/2000	EPIEX-SW-100-20 9/7/2000	EPIEX-SW-103-25 9/7/2000	EPIEX-SW-106-20 9/8/2000	EPIEX-SW-108-15 9/8/2000	EPIEX-SW-118-24 9/8/2000	EPIEX-SW-127-4 9/12/2000
TOTAL PETROLEUM HYDROCARBONS (mg/kg)										
Diesel Range Organics	2000	20 U	**2200**	20 U	20 U	20 U	20 U	20 U	**72**	20 U
Lube Oil	2000	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U
PAHs (mg/kg)										
Naphthalene	5									
Acenaphthylene	--									
Acenaphthene	--									
Fluorene	--									
Phenanthrene	--									
Anthracene	--									
Fluoranthene	--									
Pyrene	--									
Benzo(a)anthracene	--									
Chrysene	--									
Benzo(b)fluoranthene	--									
Benzo(k)fluoranthene	--									
Benzo(a)pyrene	--									
Indeno(1,2,3-cd)pyrene	--									
Dibenzo(a,h)anthracene	--									
Benzo(g,h,i)perylene	--									
cPAH TEQ	0.1(b)									
EPH (mg/kg)										
>C10-C12 Aliphatics	--									
>C10-C12 Aromatics	--									
>C12-C16 Aliphatics	--									
>C12-C16 Aromatics	--									
>C16-C21 Aliphatics	--									
>C16-C21 Aromatics	--									
>C21-C34 Aliphatics	--									
>C21-C34 Aromatics	--									
C8-C10 Aliphatics	--									
Total Aliphatics	--									
Total Aromatics	--									

TABLE 5A-1
AREA A 2000 EXCAVATION - FINAL CONFIRMATION SOIL SAMPLE RESULTS
PEDERSON'S FRYER FARMS RI

	Soil Screening Criteria (a)	EPIEX-SW-128-8 9/12/2000	EPIEX-SW-138-18 9/12/2000	EPIEX-SW-139-11 9/12/2000	EPIEX-SW-140-6 9/12/2000	EPIEX-SW-148-20 9/12/2000	EPIEX-SW-154-10 9/13/2000	EPIEX-SW-155-11 9/13/2000	EPIEX-SW-156-12 9/13/2000
TOTAL PETROLEUM HYDROCARBONS (mg/kg)									
Diesel Range Organics	2000	20 U	**183**	**4800**	20 U	20 U	**89**	**7200**	25 U
Lube Oil	2000	40 U	40 U	40 U	40 U	40 U	50 U	50 U	50 U
PAHs (mg/kg)									
Naphthalene	5							**1.1**	
Acenaphthylene	--							**0.16**	
Acenaphthene	--							**0.48**	
Fluorene	--							**1.7**	
Phenanthrene	--							**4.8**	
Anthracene	--							**0.26**	
Fluoranthene	--							0.05 U	
Pyrene	--							**0.45**	
Benzo(a)anthracene	--							0.05 U	
Chrysene	--							0.05 U	
Benzo(b)fluoranthene	--							0.05 U	
Benzo(k)fluoranthene	--							0.05 U	
Benzo(a)pyrene	--							0.05 U	
Indeno(1,2,3-cd)pyrene	--							0.05 U	
Dibenzo(a,h)anthracene	--							0.05 U	
Benzo(g,h,i)perylene	--							0.05 U	
cPAH TEQ	0.1(b)							0.05 U	
EPH (mg/kg)									
>C10-C12 Aliphatics	--							**240**	
>C10-C12 Aromatics	--							**82**	
>C12-C16 Aliphatics	--							**1100**	
>C12-C16 Aromatics	--							**590**	
>C16-C21 Aliphatics	--							**1400**	
>C16-C21 Aromatics	--							**1600**	
>C21-C34 Aliphatics	--							**270**	
>C21-C34 Aromatics	--							**280**	
C8-C10 Aliphatics	--							**43**	
Total Aliphatics	--							**3100**	
Total Aromatics	--							**2600**	

TABLE 5A-1
AREA A 2000 EXCAVATION - FINAL CONFIRMATION SOIL SAMPLE RESULTS
PEDERSON'S FRYER FARMS RI

	Soil Screening Criteria (a)	EPIEX-SW-161-13 9/13/2000	EPIEX-SW-162-22 9/13/2000	EPIEX-SW-163-18 9/13/2000	EPIEX-SW-164-22 9/13/2000	EPIEX-SW-165-18 9/13/2000	EPIEX-SW-169-16 9/13/2000	EPIEX-SW-170-15 9/13/2000	EPIEX-SW-171-15 9/13/2000
TOTAL PETROLEUM HYDROCARBONS (mg/kg)									
Diesel Range Organics	2000	25 U	20 U	20 U	20 U	20 U	**130**	**340**	25 U
Lube Oil	2000	50 U	40 U	40 U	40 U	40 U	50 U	50 U	50 U
PAHs (mg/kg)									
Naphthalene	5								
Acenaphthylene	--								
Acenaphthene	--								
Fluorene	--								
Phenanthrene	--								
Anthracene	--								
Fluoranthene	--								
Pyrene	--								
Benzo(a)anthracene	--								
Chrysene	--								
Benzo(b)fluoranthene	--								
Benzo(k)fluoranthene	--								
Benzo(a)pyrene	--								
Indeno(1,2,3-cd)pyrene	--								
Dibenzo(a,h)anthracene	--								
Benzo(g,h,i)perylene	--								
cPAH TEQ	0.1(b)								
EPH (mg/kg)									
>C10-C12 Aliphatics	--								
>C10-C12 Aromatics	--								
>C12-C16 Aliphatics	--								
>C12-C16 Aromatics	--								
>C16-C21 Aliphatics	--								
>C16-C21 Aromatics	--								
>C21-C34 Aliphatics	--								
>C21-C34 Aromatics	--								
C8-C10 Aliphatics	--								
Total Aliphatics	--								
Total Aromatics	--								

TABLE 5A-1
AREA A 2000 EXCAVATION - FINAL CONFIRMATION SOIL SAMPLE RESULTS
PEDERSON'S FRYER FARMS RI

	Soil Screening Criteria (a)	EPIEX-SW-173-10 9/13/2000	EPIEX-SW-176-5 9/13/2000
TOTAL PETROLEUM HYDROCARBONS (mg/kg)			
Diesel Range Organics	2000	25 U	25 U
Lube Oil	2000	50 U	50 U
PAHs (mg/kg)			
Naphthalene	5		
Acenaphthylene	--		
Acenaphthene	--		
Fluorene	--		
Phenanthrene	--		
Anthracene	--		
Fluoranthene	--		
Pyrene	--		
Benzo(a)anthracene	--		
Chrysene	--		
Benzo(b)fluoranthene	--		
Benzo(k)fluoranthene	--		
Benzo(a)pyrene	--		
Indeno(1,2,3-cd)pyrene	--		
Dibenzo(a,h)anthracene	--		
Benzo(g,h,i)perylene	--		
cPAH TEQ	0.1(b)		
EPH (mg/kg)			
>C10-C12 Aliphatics	--		
>C10-C12 Aromatics	--		
>C12-C16 Aliphatics	--		
>C12-C16 Aromatics	--		
>C16-C21 Aliphatics	--		
>C16-C21 Aromatics	--		
>C21-C34 Aliphatics	--		
>C21-C34 Aromatics	--		
C8-C10 Aliphatics	--		
Total Aliphatics	--		
Total Aromatics	--		

TABLE 5A-1
AREA A 2000 EXCAVATION - FINAL CONFIRMATION SOIL SAMPLE RESULTS
PEDERSON'S FRYER FARMS RI

	Soil Screening Criteria (a)	EPIEX-SW-177-11 9/13/2000	EPIEX-SW-178-15 9/13/2000	EPIEX-SW-179-20 9/13/2000	EPIEX-SW-180-8 9/13/2000	EPIEX-SW-183-12 9/13/2000	EPIEX-SW-184-10 9/13/2000	EPIEX-SW-185-12 9/13/2000	EPIEX-SW-186-15 9/13/2000	EPIEX-SW-187-25 9/13/2000
TOTAL PETROLEUM HYDROCARBONS (mg/kg)										
Diesel Range Organics	2000	25 U	25 U	25 U	25 U	25 U	25 U	**48000**	**810**	25 U
Lube Oil	2000	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
PAHs (mg/kg)										
Naphthalene	5							**1.8**		
Acenaphthylene	--							**0.08**		
Acenaphthene	--							**0.27**		
Fluorene	--							**0.83**		
Phenanthrene	--							**2.4**		
Anthracene	--							**0.14**		
Fluoranthene	--							0.05 U		
Pyrene	--							**0.21**		
Benzo(a)anthracene	--							0.05 U		
Chrysene	--							0.05 U		
Benzo(b)fluoranthene	--							0.05 U		
Benzo(k)fluoranthene	--							0.05 U		
Benzo(a)pyrene	--							0.05 U		
Indeno(1,2,3-cd)pyrene	--							0.05 U		
Dibenzo(a,h)anthracene	--							0.05 U		
Benzo(g,h,i)perylene	--							0.05 U		
cPAH TEQ	0.1(b)							0.05 U		
EPH (mg/kg)										
>C10-C12 Aliphatics	--							**2200**		
>C10-C12 Aromatics	--							**860**		
>C12-C16 Aliphatics	--							**10000**		
>C12-C16 Aromatics	--							**5600**		
>C16-C21 Aliphatics	--							**12000**		
>C16-C21 Aromatics	--							**14000**		
>C21-C34 Aliphatics	--							**2800**		
>C21-C34 Aromatics	--							**2800**		
C8-C10 Aliphatics	--							**400**		
Total Aliphatics	--							**27000**		
Total Aromatics	--							**26000**		

U = Indicates the compound was not detected at the reported concentration.
Bold = Detected compound.
Box = Exceedance of screening criteria
-- = Screening criteria is not available for the individual constituent.
(a) MTCA Method A CULs for Unrestricted Land Uses were used as screening criteria.
(b) Screening criteria based on toxicity equivalency methodology.

TABLE 5A-2
AREA A PRE RI MONITORING WELLS SOIL ANALYTICAL RESULTS
PEDERSON'S FRYER FARMS RI

	Soil Screening Criteria (a)	MW-01-11 4/23/2001	MW-01-16 4/23/2001	MW-01-20 4/23/2001	MW-01-25 4/23/2001	MW-01-30 4/23/2001	MW-02-15 4/23/2001	MW-02-20 4/23/2001
TOTAL PETROLEUM HYDROCARBONS (mg/kg)								
Diesel Range Organics	2000	25 U	**120**	25 U	25 U	25 U	25 U	25 U
Lube Oil	2000	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Gasoline and BTEX (mg/kg)								
Gasoline Range Organics	30/100 (b)							
Benzene	0.03							
Ethylbenzene	7							
Toluene	6							
Xylenes, Total	9 (c)							

TABLE 5A-2
AREA A PRE RI MONITORING WELLS SOIL ANALYTICAL RESULTS
PEDERSON'S FRYER FARMS RI

	Soil Screening Criteria (a)	MW-02-25 4/23/2001	MW-03-15 4/23/2001	MW-03-20 4/23/2001	MW-03-25 4/23/2001	MW-04-12 4/24/2001	MW-04-15 4/24/2001	MW-04-17 4/24/2001
TOTAL PETROLEUM HYDROCARBONS (mg/kg)								
Diesel Range Organics	2000	25 U	25 U	25 U	**59**	25 U	25 U	25 U
Lube Oil	2000	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Gasoline and BTEX (mg/kg)								
Gasoline Range Organics	30/100 (b)							
Benzene	0.03							
Ethylbenzene	7							
Toluene	6							
Xylenes, Total	9 (c)							

TABLE 5A-2
AREA A PRE RI MONITORING WELLS SOIL ANALYTICAL RESULTS
PEDERSON'S FRYER FARMS RI

	Soil Screening Criteria (a)	MW-04-20 4/24/2001	MW-04-25 4/24/2001	MW-04-30 4/24/2001	MW-04-35 4/24/2001	MW-05-10 4/24/2001	MW-05-20 4/24/2001	MW-05-25 4/24/2001
TOTAL PETROLEUM HYDROCARBONS (mg/kg)								
Diesel Range Organics	2000	25 U	**1100**	**2400**	**5500**	25 U	25 U	25 U
Lube Oil	2000	50 U	100 U	250 U	250 U	50 U	50 U	50 U
Gasoline and BTEX (mg/kg)								
Gasoline Range Organics	30/100 (b)							
Benzene	0.03							
Ethylbenzene	7							
Toluene	6							
Xylenes, Total	9 (c)							

TABLE 5A-2
AREA A PRE RI MONITORING WELLS SOIL ANALYTICAL RESULTS
PEDERSON'S FRYER FARMS RI

	Soil Screening Criteria (a)	MW-06-25 4/25/2001	MW-06-30 4/25/2001	MW-07R-30 6/29/2004	MW-07R-45 6/29/2004	MW-07R-50 6/29/2004	MW-07R-55 6/29/2004	MW-17-29 1/8/2003
TOTAL PETROLEUM HYDROCARBONS (mg/kg)								
Diesel Range Organics	2000	25 U	25 U	25 U	**790**	**990**	**2700**	**1300**
Lube Oil	2000	50 U	50 U	50 U	50 U	50 U	50 U	250 U
Gasoline and BTEX (mg/kg)								
Gasoline Range Organics	30/100 (b)	5 U	5 U					
Benzene	0.03	0.1 U	0.1 U					
Ethylbenzene	7	0.1 U	0.1 U					
Toluene	6	0.1 U	0.1 U					
Xylenes, Total	9 (c)	0.3 U	0.3 U					

TABLE 5A-2
AREA A PRE RI MONITORING WELLS SOIL ANALYTICAL RESULTS
PEDERSON'S FRYER FARMS RI

	Soil Screening Criteria (a)	MW-17-33 1/8/2003	MW-17-38 1/8/2003	MW-18-30 6/29/2004	MW-18-35 6/29/2004	MW-18-40 6/29/2004	MW-18-45 6/29/2004	MW-18-50 6/29/2004	MW-18-55 6/29/2004
TOTAL PETROLEUM HYDROCARBONS (mg/kg)									
Diesel Range Organics	2000	**510**	**1400**	**960**	**1200**	**2500**	**290**	**400**	25 U
Lube Oil	2000	50 U	250 U	50 U	50 U	50 U	50 U	50 U	50 U
Gasoline and BTEX (mg/kg)									
Gasoline Range Organics	30/100 (b)								
Benzene	0.03								
Ethylbenzene	7								
Toluene	6								
Xylenes, Total	9 (c)								

TABLE 5A-2
AREA A PRE RI MONITORING WELLS SOIL ANALYTICAL RESULTS
PEDERSON'S FRYER FARMS RI

	Soil Screening Criteria (a)	MW-19-12.5 6/30/2004	MW-19-15 6/30/2004	MW-19-30 6/30/2004	MW-19-35 6/30/2004	MW-19-40 6/30/2004	MW-19-50 6/30/2004	MW-19-60 6/30/2004	MW-20-40 6/30/2004
TOTAL PETROLEUM HYDROCARBONS (mg/kg)									
Diesel Range Organics	2000	25 U	25 U	**46**	**3100**	25 U	**350**	25 U	25 U
Lube Oil	2000	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Gasoline and BTEX (mg/kg)									
Gasoline Range Organics	30/100 (b)								
Benzene	0.03								
Ethylbenzene	7								
Toluene	6								
Xylenes, Total	9 (c)								

TABLE 5A-2
AREA A PRE RI MONITORING WELLS SOIL ANALYTICAL RESULTS
PEDERSON'S FRYER FARMS RI

	Soil Screening Criteria (a)	MW-20-45 7/1/2004	MW-20-50 7/1/2004	MW-20-60 7/1/2004
TOTAL PETROLEUM HYDROCARBONS (mg/kg)				
Diesel Range Organics	2000	**1900**	**1000**	25 U
Lube Oil	2000	50 U	50 U	50 U
Gasoline and BTEX (mg/kg)				
Gasoline Range Organics	30/100 (b)			
Benzene	0.03			
Ethylbenzene	7			
Toluene	6			
Xylenes, Total	9 (c)			

U = Indicates the compound was not detected at the reported concentration.
Bold = Detected compound.
Box = Exceedance of screening criteria.
(a) MTCA Method A CULs for Unrestricted Land Uses were used as screening criteria.
(b) Screening criteria is 30 mg/kg if benzene is present and 100 mg/kg if benzene is not present.
(c) Screening criteria cannot be exceeded by the sum of individual xylene concentrations.

TABLE 5A-3
AREA A RI MONITORING WELL AND SOIL BORING SOIL ANALYTICAL RESULTS
PEDERSON'S FRYER FARMS RI

	MTCA Method A Soil Cleanup Level for Unrestricted Land Uses (a)	A1 (10-10.5) 2611718 05/10/2011	A1 (15-15.5) 2611719 05/10/2011	A1 (20-20.5) 2611720 05/10/2011	A1 (25-25.5) 2611721 05/10/2011	A1 (30-30.5) 2611722 05/10/2011	A1 (35-35.5) 2611723 05/10/2011	A1 (40-40.5) 2611724 05/10/2011	A1 (45-45.5) 2611725 05/10/2011
TOTAL PETROLEUM HYDROCARBONS (mg/kg)									
NWTPH-Dx									
Diesel Range Organics	2000	15 U	14 U	13 U	14 U	13 U	14 U	14 U	**160**
Lube Oil	2000	29 U	28 U	26 U	27 U	26 U	27 U	28 U	27 U
NWTPH-Gx									
Gasoline Range Organics	30/100 (b)	3.6 U	3.8 U	4.0 U	3.8 U	4.0 U	4.1 U	3.6 U	**100**
BTEX (mg/kg)									
Method SW8021B									
Benzene	0.03								
Toluene	7								
Ethylbenzene	6								
m, p-Xylene									
o-Xylene									
Total Xylenes	9 (c)								
PAHs (mg/kg)									
Method 8270C									
Naphthalene									
2-Methylnaphthalene									
1-Methylnaphthalene									
Total Naphthalenes	5 (d)								
Acenaphthylene									
Acenaphthene									
Fluorene									
Phenanthrene									
Anthracene									
Fluoranthene									
Pyrene									
Benzo[a]anthracene									
Chrysene									
Benzo[b]fluoranthene									
Benzo[k]fluoranthene									
Benzo[a]pyrene									
Indeno[1,2,3-cd]pyrene									
Dibenz(a,h)anthracene									
Benzo[g,h,i]perylene									
Dibenzofuran									
cPAH TEQ	0.1 (e)								

TABLE 5A-3
AREA A RI MONITORING WELL AND SOIL BORING SOIL ANALYTICAL RESULTS
PEDERSON'S FRYER FARMS RI

	MTCA Method A Soil Cleanup Level for Unrestricted Land Uses (a)	A1 (10-10.5) 2611718 05/10/2011	A1 (15-15.5) 2611719 05/10/2011	A1 (20-20.5) 2611720 05/10/2011	A1 (25-25.5) 2611721 05/10/2011	A1 (30-30.5) 2611722 05/10/2011	A1 (35-35.5) 2611723 05/10/2011	A1 (40-40.5) 2611724 05/10/2011	A1 (45-45.5) 2611725 05/10/2011
TOTAL METALS (mg/kg)									
Method 6010B									
Lead	250								
PCBs (mg/kg)									
Method 8082									
PCB-1016									
PCB-1221									
PCB-1232									
PCB-1242									
PCB-1248									
PCB-1254									
PCB-1260									
Total PCBs	1								
CONVENTIONAL (%)									
Percent Solids		**83**	**88**	**94**	**90**	**94**	**88**	**89**	**90**
Percent Moisture		**17**	**12**	**6.3**	**10**	**5.9**	**12**	**11**	**9.6**

TABLE 5A-3
AREA A RI MONITORING WELL AND SOIL BORING SOIL ANALYTICAL RESULTS
PEDERSON'S FRYER FARMS RI

	MTCA Method A Soil Cleanup Level for Unrestricted Land Uses (a)	A1 (50-50.5) 2611726 05/10/2011	A2 (10-10.5) 262832 5/18/2011	A2 (15-15.5) 262833 5/18/2011	A2 (25-25.5) 262834 5/18/2011	Dup of A2 (25-25.5) A22 (25-25.5) 262838 5/18/2011	A2 (30-30.5) 262835 5/18/2011	A2 (35-35.5) 262836 5/18/2011	A2 (40-40.5) 262837 5/18/2011
TOTAL PETROLEUM HYDROCARBONS (mg/kg)									
NWTPH-Dx									
Diesel Range Organics	2000	**400**	13 U	13 U	**5800** J	**5500** J	**2500**	**4000** J	**280**
Lube Oil	2000	28 U	26 U	26 U	**120** J	**140** J	**57**	**130** J	28 U
NWTPH-Gx									
Gasoline Range Organics	30/100 (b)	**350**	3.6 U	4.1 U	**2300** J	**2400** J	**1600**	**710** J	**100**
BTEX (mg/kg)									
Method SW8021B									
Benzene	0.03	**0.029**						0.018 U	
Toluene	7	0.056 U						0.044 U	
Ethylbenzene	6	**0.10**						**0.11** J	
m, p-Xylene		0.11 U						**0.17** J	
o-Xylene		0.11 U						**0.10** J	
Total Xylenes	9 (c)	0.11 U						**0.27** J	
PAHs (mg/kg)									
Method 8270C									
Naphthalene									
2-Methylnaphthalene									
1-Methylnaphthalene									
Total Naphthalenes	5 (d)								
Acenaphthylene									
Acenaphthene									
Fluorene									
Phenanthrene									
Anthracene									
Fluoranthene									
Pyrene									
Benzo[a]anthracene									
Chrysene									
Benzo[b]fluoranthene									
Benzo[k]fluoranthene									
Benzo[a]pyrene									
Indeno[1,2,3-cd]pyrene									
Dibenz(a,h)anthracene									
Benzo[g,h,i]perylene									
Dibenzofuran									
cPAH TEQ	0.1 (e)								

TABLE 5A-3
AREA A RI MONITORING WELL AND SOIL BORING SOIL ANALYTICAL RESULTS
PEDERSON'S FRYER FARMS RI

	MTCA Method A Soil Cleanup Level for Unrestricted Land Uses (a)	A1 (50-50.5) 2611726 05/10/2011	A2 (10-10.5) 262832 5/18/2011	A2 (15-15.5) 262833 5/18/2011	A2 (25-25.5) 262834 5/18/2011	Dup of A2 (25-25.5) A22 (25-25.5) 262838 5/18/2011	A2 (30-30.5) 262835 5/18/2011	A2 (35-35.5) 262836 5/18/2011	A2 (40-40.5) 262837 5/18/2011
TOTAL METALS (mg/kg)									
Method 6010B									
Lead	250								
PCBs (mg/kg)									
Method 8082									
PCB-1016									
PCB-1221									
PCB-1232									
PCB-1242									
PCB-1248									
PCB-1254									
PCB-1260									
Total PCBs	1								
CONVENTIONAL (%)									
Percent Solids		**89**	**94**	**93**	**90**	**89**	**87**	**90**	**90**
Percent Moisture		**11**	**6.2**	**7**	**10**	**11**	**13**	**9.9**	**10**

TABLE 5A-3
AREA A RI MONITORING WELL AND SOIL BORING SOIL ANALYTICAL RESULTS
PEDERSON'S FRYER FARMS RI

	MTCA Method A Soil Cleanup Level for Unrestricted Land Uses (a)	A3 (10-10.5) 262839 5/18/2011	A3 (15-15.5) 2628310 5/18/2011	A3 (20-20.5) 2628311 5/18/2011	A3 (25-25.5) 2628312 5/18/2011	A3 (30-30.5) 2628313 5/18/2011	A3 (35-35.5) 2628314 5/18/2011	A3 (40-40.5) 2628315 5/18/2011	A4 (5-5.5) 262587 5/17/2011
TOTAL PETROLEUM HYDROCARBONS (mg/kg)									
NWTPH-Dx									
Diesel Range Organics	2000	14 U	14 U	14 U	14 U	**1400**	14 U	**9600** J	14 U
Lube Oil	2000	29 U	27 U	28 U	28 U	**33**	28 U	**390** J	27 U
NWTPH-Gx									
Gasoline Range Organics	30/100 (b)	3.6 U	3.8 U	4.7 U	**5.0**	4.1 U	**8.0**	**2400**	3.1 U
BTEX (mg/kg)									
Method SW8021B									
Benzene	0.03							0.21 U	
Toluene	7							0.52 U	
Ethylbenzene	6							0.52 U	
m, p-Xylene								1.0 U	
o-Xylene								1.0 U	
Total Xylenes	9 (c)							1.0 U	
PAHs (mg/kg)									
Method 8270C									
Naphthalene									
2-Methylnaphthalene									
1-Methylnaphthalene									
Total Naphthalenes	5 (d)								
Acenaphthylene									
Acenaphthene									
Fluorene									
Phenanthrene									
Anthracene									
Fluoranthene									
Pyrene									
Benzo[a]anthracene									
Chrysene									
Benzo[b]fluoranthene									
Benzo[k]fluoranthene									
Benzo[a]pyrene									
Indeno[1,2,3-cd]pyrene									
Dibenz(a,h)anthracene									
Benzo[g,h,i]perylene									
Dibenzofuran									
cPAH TEQ	0.1 (e)								

TABLE 5A-3
AREA A RI MONITORING WELL AND SOIL BORING SOIL ANALYTICAL RESULTS
PEDERSON'S FRYER FARMS RI

	MTCA Method A Soil Cleanup Level for Unrestricted Land Uses (a)	A3 (10-10.5) 262839 5/18/2011	A3 (15-15.5) 2628310 5/18/2011	A3 (20-20.5) 2628311 5/18/2011	A3 (25-25.5) 2628312 5/18/2011	A3 (30-30.5) 2628313 5/18/2011	A3 (35-35.5) 2628314 5/18/2011	A3 (40-40.5) 2628315 5/18/2011	A4 (5-5.5) 262587 5/17/2011
TOTAL METALS (mg/kg)									
Method 6010B									
Lead	250								
PCBs (mg/kg)									
Method 8082									
PCB-1016									
PCB-1221									
PCB-1232									
PCB-1242									
PCB-1248									
PCB-1254									
PCB-1260									
Total PCBs	1								
CONVENTIONAL (%)									
Percent Solids		**87**	**90**	**90**	**90**	**88**	**90**	**87**	**90**
Percent Moisture		**13**	**10**	**10**	**10**	**12**	**10**	**13**	**9.7**

TABLE 5A-3
AREA A RI MONITORING WELL AND SOIL BORING SOIL ANALYTICAL RESULTS
PEDERSON'S FRYER FARMS RI

	MTCA Method A Soil Cleanup Level for Unrestricted Land Uses (a)	A4 (10-10.5) 262588 5/17/2011	A4 (15-15.5) 262589 5/17/2011	A4 (20-20.5) 2625810 5/17/2011	A4 (25-25.5) 2625811 5/17/2011	A4 (30-30.5) 2625812 5/17/2011	A4 (35-35.5) 2625813 5/17/2011	A4 (40-40.5) 2625814 5/17/2011	A4 (45-45.5) 2625815 5/17/2011
TOTAL PETROLEUM HYDROCARBONS (mg/kg)									
NWTPH-Dx									
Diesel Range Organics	2000	**140**	**55**	**110**	**86**	**2500**	**810**	**5200** J	**1100**
Lube Oil	2000	**39**	**47**	28 U	28 U	**54**	**30**	**130** J	**34**
NWTPH-Gx									
Gasoline Range Organics	30/100 (b)	**11**	**5.3**	**45**	**22**	**1000**	**340** J	**1800**	**330**
BTEX (mg/kg)									
Method SW8021B									
Benzene	0.03					0.092 U		0.090 U	
Toluene	7					0.23 U		0.22 U	
Ethylbenzene	6					0.23 U		**0.45**	
m, p-Xylene						0.46 U		**1.7**	
o-Xylene						0.46 U		0.45 U	
Total Xylenes	9 (c)					0.46 U		**1.7**	
PAHs (mg/kg)									
Method 8270C									
Naphthalene						**2.7**		**3.7**	
2-Methylnaphthalene						**13**		**28**	
1-Methylnaphthalene						**9.0**		**19**	
Total Naphthalenes	5 (d)					**24.7**		**50.7**	
Acenaphthylene						0.022 U		0.022 U	
Acenaphthene						0.022 U		0.022 U	
Fluorene						**1.4**		**2.3**	
Phenanthrene						**2.7**		**4.5**	
Anthracene						0.022 U		0.022 U	
Fluoranthene						0.022 U		0.022 U	
Pyrene						**0.11**		**0.22**	
Benzo[a]anthracene						0.028 U		0.027 U	
Chrysene						**0.028**		**0.050**	
Benzo[b]fluoranthene						0.022 U		0.022 U	
Benzo[k]fluoranthene						0.028 U		0.027 U	
Benzo[a]pyrene						0.034 U		0.033 U	
Indeno[1,2,3-cd]pyrene						0.045 U		0.044 U	
Dibenz(a,h)anthracene						0.045 U		0.044 U	
Benzo[g,h,i]perylene						0.028 U		0.027 U	
Dibenzofuran						0.11 U		0.11 U	
cPAH TEQ	0.1 (e)					**0.00028**		**0.0005**	

TABLE 5A-3
AREA A RI MONITORING WELL AND SOIL BORING SOIL ANALYTICAL RESULTS
PEDERSON'S FRYER FARMS RI

	MTCA Method A	A4	A4	A4	A4	A4	A4	A4	A4
	Soil Cleanup Level	(10-10.5)	(15-15.5)	(20-20.5)	(25-25.5)	(30-30.5)	(35-35.5)	(40-40.5)	(45-45.5)
	for Unrestricted	262588	262589	2625810	2625811	2625812	2625813	2625814	2625815
	Land Uses (a)	5/17/2011	5/17/2011	5/17/2011	5/17/2011	5/17/2011	5/17/2011	5/17/2011	5/17/2011
TOTAL METALS (mg/kg)									
Method 6010B									
Lead	250					**2.3**		**1.8**	
PCBs (mg/kg)									
Method 8082									
PCB-1016						0.011 U		0.010 U	
PCB-1221						0.011 U		0.010 U	
PCB-1232						0.011 U		0.010 U	
PCB-1242						0.011 U		0.010 U	
PCB-1248						0.011 U		0.010 U	
PCB-1254						0.011 U		0.010 U	
PCB-1260						0.011 U		0.010 U	
Total PCBs	1					0.011 U			
CONVENTIONAL (%)									
Percent Solids		**86**	**86**	**87**	**88**	**87**	**85**	**89**	**90**
Percent Moisture		**14**	**14**	**13**	**12**	**13**	**15**	**11**	**10**

TABLE 5A-3
AREA A RI MONITORING WELL AND SOIL BORING SOIL ANALYTICAL RESULTS
PEDERSON'S FRYER FARMS RI

	MTCA Method A Soil Cleanup Level for Unrestricted Land Uses (a)	A4 (50-50.5) 2625816 5/17/2011	A5 (10-10.5) 2611711 05/10/2011	A5 (15-15.5) 2611712 05/10/2011	A5 (20-20.5) 2611713 05/10/2011	A5 (25-25.5) 2611714 05/10/2011	A5 (30-30.5) 2611715 05/10/2011	A5 (35-35.5) 2611716 05/10/2011	A5 (40-40.5) 2611717 05/10/2011
TOTAL PETROLEUM HYDROCARBONS (mg/kg)									
NWTPH-Dx									
Diesel Range Organics	2000	**110**	**440**	14 U	13 U	**27**	**1400**	**73**	**2100**
Lube Oil	2000	28 U	29 U	28 U	26 U	27 U	**40**	27 U	**50**
NWTPH-Gx									
Gasoline Range Organics	30/100 (b)	**24**	**120**	**14**	3.6 U	**20**	**220**	**75**	**210**
BTEX (mg/kg)									
Method SW8021B									
Benzene	0.03								0.019 U
Toluene	7								0.048 U
Ethylbenzene	6								**0.082**
m, p-Xylene									0.095 U
o-Xylene									0.095 U
Total Xylenes	9 (c)								0.095 U
PAHs (mg/kg)									
Method 8270C									
Naphthalene									
2-Methylnaphthalene									
1-Methylnaphthalene									
Total Naphthalenes	5 (d)								
Acenaphthylene									
Acenaphthene									
Fluorene									
Phenanthrene									
Anthracene									
Fluoranthene									
Pyrene									
Benzo[a]anthracene									
Chrysene									
Benzo[b]fluoranthene									
Benzo[k]fluoranthene									
Benzo[a]pyrene									
Indeno[1,2,3-cd]pyrene									
Dibenz(a,h)anthracene									
Benzo[g,h,i]perylene									
Dibenzofuran									
cPAH TEQ	0.1 (e)								

TABLE 5A-3
AREA A RI MONITORING WELL AND SOIL BORING SOIL ANALYTICAL RESULTS
PEDERSON'S FRYER FARMS RI

	MTCA Method A Soil Cleanup Level for Unrestricted Land Uses (a)	A4 (50-50.5) 2625816 5/17/2011	A5 (10-10.5) 2611711 05/10/2011	A5 (15-15.5) 2611712 05/10/2011	A5 (20-20.5) 2611713 05/10/2011	A5 (25-25.5) 2611714 05/10/2011	A5 (30-30.5) 2611715 05/10/2011	A5 (35-35.5) 2611716 05/10/2011	A5 (40-40.5) 2611717 05/10/2011
TOTAL METALS (mg/kg)									
Method 6010B									
Lead	250								
PCBs (mg/kg)									
Method 8082									
PCB-1016									
PCB-1221									
PCB-1232									
PCB-1242									
PCB-1248									
PCB-1254									
PCB-1260									
Total PCBs	1								
CONVENTIONAL (%)									
Percent Solids		**86**	**85**	**86**	**93**	**91**	**90**	**90**	**86**
Percent Moisture		**14**	**15**	**14**	**7.2**	**8.5**	**10**	**9.7**	**14**

TABLE 5A-3
AREA A RI MONITORING WELL AND SOIL BORING SOIL ANALYTICAL RESULTS
PEDERSON'S FRYER FARMS RI

	MTCA Method A Soil Cleanup Level for Unrestricted Land Uses (a)	MW-25D (10-10.5) 261773 05/13/2011	MW-25D (15-15.5) 261774 05/13/2011	MW-25D (20-20.5) 261775 05/13/2011	MW-25D (25-25.5) 261776 05/13/2011	MW-25D (30-30.5) 261777 05/13/2011	MW-25D (35-35.5) 261778 05/13/2011	MW-25D (40-40.5) 261779 05/13/2011	MW-25D (45-45.5) 2617710 05/13/2011
TOTAL PETROLEUM HYDROCARBONS (mg/kg)									
NWTPH-Dx									
Diesel Range Organics	2000	**330**	**260**	**170**	**970**	**330**	**1600**	**330**	**1200**
Lube Oil	2000	**78**	**73**	**170**	**62**	**35**	**70**	28 U	**38**
NWTPH-Gx									
Gasoline Range Organics	30/100 (b)	**25**	**26**	**25**	**35**	**160**	**850**	**90**	**1400**
BTEX (mg/kg)									
Method SW8021B									
Benzene	0.03								**0.12**
Toluene	7								**0.11**
Ethylbenzene	6								**0.55**
m, p-Xylene									**0.62**
o-Xylene									**0.24**
Total Xylenes	9 (c)								**0.86**
PAHs (mg/kg)									
Method 8270C									
Naphthalene									
2-Methylnaphthalene									
1-Methylnaphthalene									
Total Naphthalenes	5 (d)								
Acenaphthylene									
Acenaphthene									
Fluorene									
Phenanthrene									
Anthracene									
Fluoranthene									
Pyrene									
Benzo[a]anthracene									
Chrysene									
Benzo[b]fluoranthene									
Benzo[k]fluoranthene									
Benzo[a]pyrene									
Indeno[1,2,3-cd]pyrene									
Dibenz(a,h)anthracene									
Benzo[g,h,i]perylene									
Dibenzofuran									
cPAH TEQ	0.1 (e)								

TABLE 5A-3
AREA A RI MONITORING WELL AND SOIL BORING SOIL ANALYTICAL RESULTS
PEDERSON'S FRYER FARMS RI

	MTCA Method A Soil Cleanup Level for Unrestricted Land Uses (a)	MW-25D (10-10.5) 261773 05/13/2011	MW-25D (15-15.5) 261774 05/13/2011	MW-25D (20-20.5) 261775 05/13/2011	MW-25D (25-25.5) 261776 05/13/2011	MW-25D (30-30.5) 261777 05/13/2011	MW-25D (35-35.5) 261778 05/13/2011	MW-25D (40-40.5) 261779 05/13/2011	MW-25D (45-45.5) 2617710 05/13/2011
TOTAL METALS (mg/kg)									
Method 6010B									
Lead	250								
PCBs (mg/kg)									
Method 8082									
PCB-1016									
PCB-1221									
PCB-1232									
PCB-1242									
PCB-1248									
PCB-1254									
PCB-1260									
Total PCBs	1								
CONVENTIONAL (%)									
Percent Solids		**90**	**90**	**90**	**91**	**89**	**89**	**88**	**91**
Percent Moisture		**9.9**	**10**	**9.8**	**9.4**	**11**	**11**	**12**	**8.9**

TABLE 5A-3
AREA A RI MONITORING WELL AND SOIL BORING SOIL ANALYTICAL RESULTS
PEDERSON'S FRYER FARMS RI

	MTCA Method A Soil Cleanup Level for Unrestricted Land Uses (a)	MW-25D (60-60.5) 2617711 05/13/2011	MW-26S (5-5.5) 262292 05/16/2011	MW-26S (10-10.5) 262293 05/16/2011	MW-26S (15-15.5) 262294 05/16/2011	MW-26S (20-20.5) 262295 05/16/2011	MW-26S (25-25.5) 262296 05/16/2011	MW-26S (30-30.5) 262297 05/16/2011
TOTAL PETROLEUM HYDROCARBONS (mg/kg)								
NWTPH-Dx								
Diesel Range Organics	2000	**28**	14 U	**210**	**75**	**290**	**250**	**260**
Lube Oil	2000	29 U	27 U	**53**	**49**	**40**	**87**	27 U
NWTPH-Gx								
Gasoline Range Organics	30/100 (b)	**15**	3.9 U	**6.1**	**10**	**14**	**39**	**250** J
BTEX (mg/kg)								
Method SW8021B								
Benzene	0.03	J						**0.029**
Toluene	7	J						0.051 U
Ethylbenzene	6	J						0.051 U
m, p-Xylene		J						**0.12**
o-Xylene		J						0.10 U
Total Xylenes	9 (c)	J						**0.12**
PAHs (mg/kg)								
Method 8270C								
Naphthalene								
2-Methylnaphthalene								
1-Methylnaphthalene								
Total Naphthalenes	5 (d)							
Acenaphthylene								
Acenaphthene								
Fluorene								
Phenanthrene								
Anthracene								
Fluoranthene								
Pyrene								
Benzo[a]anthracene								
Chrysene								
Benzo[b]fluoranthene								
Benzo[k]fluoranthene								
Benzo[a]pyrene								
Indeno[1,2,3-cd]pyrene								
Dibenz(a,h)anthracene								
Benzo[g,h,i]perylene								
Dibenzofuran								
cPAH TEQ	0.1 (e)							

TABLE 5A-3
AREA A RI MONITORING WELL AND SOIL BORING SOIL ANALYTICAL RESULTS
PEDERSON'S FRYER FARMS RI

	MTCA Method A Soil Cleanup Level for Unrestricted Land Uses (a)	MW-25D (60-60.5) 2617711 05/13/2011	MW-26S (5-5.5) 262292 05/16/2011	MW-26S (10-10.5) 262293 05/16/2011	MW-26S (15-15.5) 262294 05/16/2011	MW-26S (20-20.5) 262295 05/16/2011	MW-26S (25-25.5) 262296 05/16/2011	MW-26S (30-30.5) 262297 05/16/2011
TOTAL METALS (mg/kg)								
Method 6010B								
Lead	250						**8.4**	**2.2**
PCBs (mg/kg)								
Method 8082								
PCB-1016								
PCB-1221								
PCB-1232								
PCB-1242								
PCB-1248								
PCB-1254								
PCB-1260								
Total PCBs	1							
CONVENTIONAL (%)								
Percent Solids		**84**	**90**	**92**	**90**	**88**	**8.4**	**89**
Percent Moisture		**16**	**10**	**8.3**	**9.7**	**12**	**90**	**11**

TABLE 5A-3
AREA A RI MONITORING WELL AND SOIL BORING SOIL ANALYTICAL RESULTS
PEDERSON'S FRYER FARMS RI

	MTCA Method A Soil Cleanup Level for Unrestricted Land Uses (a)	MW-27D (20-20.5) 261177 05/09/2011	MW-27D (30-30.5) 261175 05/09/2011	MW-27D (40-40.5) 261176 05/09/2011	MW-27D (55-55.5) 261173 05/09/2011
TOTAL PETROLEUM HYDROCARBONS (mg/kg)					
NWTPH-Dx					
Diesel Range Organics	2000	13 U	14 U	13 U	**82**
Lube Oil	2000	26 U	27 U	26 U	28 U
NWTPH-Gx					
Gasoline Range Organics	30/100 (b)	3.9 U	3.2 U	3.4 U	**20**
BTEX (mg/kg)					
Method SW8021B					
Benzene	0.03				
Toluene	7				
Ethylbenzene	6				
m, p-Xylene					
o-Xylene					
Total Xylenes	9 (c)				
PAHs (mg/kg)					
Method 8270C					
Naphthalene					
2-Methylnaphthalene					
1-Methylnaphthalene					
Total Naphthalenes	5 (d)				
Acenaphthylene					
Acenaphthene					
Fluorene					
Phenanthrene					
Anthracene					
Fluoranthene					
Pyrene					
Benzo[a]anthracene					
Chrysene					
Benzo[b]fluoranthene					
Benzo[k]fluoranthene					
Benzo[a]pyrene					
Indeno[1,2,3-cd]pyrene					
Dibenz(a,h)anthracene					
Benzo[g,h,i]perylene					
Dibenzofuran					
cPAH TEQ	0.1 (e)				

TABLE 5A-3
AREA A RI MONITORING WELL AND SOIL BORING SOIL ANALYTICAL RESULTS
PEDERSON'S FRYER FARMS RI

	MTCA Method A Soil Cleanup Level for Unrestricted Land Uses (a)	MW-27D (20-20.5) 261177 05/09/2011	MW-27D (30-30.5) 261175 05/09/2011	MW-27D (40-40.5) 261176 05/09/2011	MW-27D (55-55.5) 261173 05/09/2011
TOTAL METALS (mg/kg)					
Method 6010B					
Lead	250				
PCBs (mg/kg)					
Method 8082					
PCB-1016					
PCB-1221					
PCB-1232					
PCB-1242					
PCB-1248					
PCB-1254					
PCB-1260					
Total PCBs	1				
CONVENTIONAL (%)					
Percent Solids		**93**	**91**	**91**	**87**
Percent Moisture		**7.4**	**9.3**	**8.8**	**13**

U = Indicates the compound was undetected at the reported concentration.
J = Indicates the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
Bold = Detected compound.
Box = Exceedance of screening criteria.
(a) MTCA Method A CULs were used as screening criteria.
(b) Screening criteria is 0.8 ug/L if benzene is present and 1.0 ug/L if benzene is not present.
(c) Screening criteria cannot be exceeded by the sum of individual xylene concentrations.
(d) Screening criteria for naphthalenes is a total value for naphthalene, 1-methyl naphthalene, and 2-methyl naphthalene.
(e) TEQ = toxicity equivalency factor as described in WAC 173-340-708(8).

TABLE 5A-4
AREA A SHALLOW GROUNDWATER QUALITY RESULTS
PEDERSON'S FRYER FARMS RI

	Groundwater Screening Criteria (a)	MW-01 05/22/2001	MW-01 08/28/2001	MW-01 01/09/2003	MW-01 05/14/2003	MW-01 12/15/2003	MW-01 03/15/2004	MW-01 07/07/2004	MW-01 10/12/2004
TOTAL PETROLEUM HYDROCARBONS (mg/L)									
Diesel Range Organics	0.5	0.25 U	**0.36**	**0.51**	**2**	**0.19**	0.13 U	**0.39**	0.13 U
Lube Oil	0.5	0.5 U	**0.49**	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Gasoline	0.8/1.0 (b)								
BTEX/NAPHTHALENES (µg/L)									
Benzene	5								
Toluene	1000								
Ethylbenzene	700								
m, p-Xylene	1000 (c)								
o-Xylene	1000 (c)								
Xylenes, Total	1000 (c)								
DISSOLVED METALS (µg/L)									
Lead	15								
Manganese	--								
CONVENTIONALS (mg/L)									
Alkalinity	--								
Nitrate	--								
Sulfate	--								
Total Organic Carbon	--								

TABLE 5A-4
AREA A SHALLOW GROUNDWATER QUALITY RESULTS
PEDERSON'S FRYER FARMS RI

	Groundwater Screening Criteria (a)	MW-01 02/01/2005	MW-01 05/24/2005	MW-01 12/08/2010	MW-01 06/03/2011	MW-01 06/29/2011	MW-02 05/22/2001	MW-02 01/09/2003	MW-02 12/15/2003
TOTAL PETROLEUM HYDROCARBONS (mg/L)									
Diesel Range Organics	0.5	**0.23**	0.13 U	**0.14**	0.12 U	0.12 U	**0.73**	**0.57**	**0.24**
Lube Oil	0.5	0.25 U	0.25 U	0.2 U	0.24 U	0.24 U	**1.1**	0.25 U	0.25 U
Gasoline	0.8/1.0 (b)			0.1 U	0.05 U	0.05 U			
BTEX/NAPHTHALENES (µg/L)									
Benzene	5			0.25 U	0.5 U				
Toluene	1000			0.25 U	0.5 U				
Ethylbenzene	700			0.25 U	0.5 U				
m, p-Xylene	1000 (c)			0.5 U	1 U				
o-Xylene	1000 (c)			0.25 U	1 U				
Xylenes, Total	1000 (c)								
DISSOLVED METALS (µg/L)									
Lead	15								
Manganese	--								
CONVENTIONALS (mg/L)									
Alkalinity	--								
Nitrate	--				0.9 U				
Sulfate	--				**5.2**				
Total Organic Carbon	--								

TABLE 5A-4
AREA A SHALLOW GROUNDWATER QUALITY RESULTS
PEDERSON'S FRYER FARMS RI

	Groundwater Screening Criteria (a)	MW-02 03/15/2004	MW-02 02/01/2005	MW-02 05/24/2005	MW-02 12/07/2010	MW-02 06/03/2011	MW-03 05/22/2001	MW-03 08/28/2001	MW-03 01/09/2003
TOTAL PETROLEUM HYDROCARBONS (mg/L)									
Diesel Range Organics	0.5	0.13 U	**1.2**	0.13 U	0.1 U	0.12 U	**0.4**	**3.5**	**1.4**
Lube Oil	0.5	0.25 U	0.25 U	0.25 U	0.2 U	0.24 U	0.5 U	0.25 U	0.25 U
Gasoline	0.8/1.0 (b)				0.1 U				
BTEX/NAPHTHALENES (µg/L)									
Benzene	5				0.25 U	0.05 U			
Toluene	1000				**1.2**	0.5 U			
Ethylbenzene	700				0.25 U	0.5 U			
m, p-Xylene	1000 (c)				0.5 U	0.5 U			
o-Xylene	1000 (c)				0.25 U	1 U			
Xylenes, Total	1000 (c)								
DISSOLVED METALS (µg/L)									
Lead	15								
Manganese	--								
CONVENTIONALS (mg/L)									
Alkalinity	--								
Nitrate	--					**1.8**			
Sulfate	--					**9.3**			
Total Organic Carbon	--								

TABLE 5A-4
AREA A SHALLOW GROUNDWATER QUALITY RESULTS
PEDERSON'S FRYER FARMS RI

	Groundwater Screening Criteria (a)	MW-03 05/14/2003	MW-03 12/15/2003	MW-03 03/15/2004	MW-03 10/12/2004	MW-03 02/01/2005	MW-03 05/24/2005	MW-03 12/07/2010	MW-04 05/22/2001
TOTAL PETROLEUM HYDROCARBONS (mg/L)									
Diesel Range Organics	0.5	**0.79**	0.13 U	**0.16**	**2.9**	**0.19**	0.13 U	0.1 U	**86**
Lube Oil	0.5	**1.1**	0.25 U	0.25 U	**0.35**	0.25 U	0.25 U	0.2 U	5 U
Gasoline	0.8/1.0 (b)							0.1 U	
BTEX/NAPHTHALENES (µg/L)									
Benzene	5							0.25 U	
Toluene	1000							0.25 U	
Ethylbenzene	700							0.25 U	
m, p-Xylene	1000 (c)							0.5 U	
o-Xylene	1000 (c)							0.25 U	
Xylenes, Total	1000 (c)								
DISSOLVED METALS (µg/L)									
Lead	15								
Manganese	--								
CONVENTIONALS (mg/L)									
Alkalinity	--								
Nitrate	--								
Sulfate	--								
Total Organic Carbon	--								

TABLE 5A-4
AREA A SHALLOW GROUNDWATER QUALITY RESULTS
PEDERSON'S FRYER FARMS RI

	Groundwater Screening Criteria (a)	MW-04 08/28/2001	MW-04 01/09/2003	MW-04 05/15/2003	MW-04 12/16/2003	MW-04 03/15/2004	MW-04 10/12/2004	MW-04 02/02/2005	MW-04 05/24/2005
TOTAL PETROLEUM HYDROCARBONS (mg/L)									
Diesel Range Organics	0.5	**1.6**	**5.9**	**1.4**	**3.2**	**0.52**	**2.7**	**1.3**	**0.83**
Lube Oil	0.5	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Gasoline	0.8/1.0 (b)								
BTEX/NAPHTHALENES (µg/L)									
Benzene	5								
Toluene	1000								
Ethylbenzene	700								
m, p-Xylene	1000 (c)								
o-Xylene	1000 (c)								
Xylenes, Total	1000 (c)								
DISSOLVED METALS (µg/L)									
Lead	15								
Manganese	--								
CONVENTIONALS (mg/L)									
Alkalinity	--								
Nitrate	--								
Sulfate	--								
Total Organic Carbon	--								

TABLE 5A-4
AREA A SHALLOW GROUNDWATER QUALITY RESULTS
PEDERSON'S FRYER FARMS RI

	Groundwater Screening Criteria (a)	MW-04 08/31/2005	MW-04 09/01/2005	MW-04 12/07/2010	MW-04 02/01/2011	MW-04 06/05/2011	MW-05 05/22/2001	MW-05 08/28/2001	MW-05 01/09/2003
TOTAL PETROLEUM HYDROCARBONS (mg/L)									
Diesel Range Organics	0.5	**1.8**		**0.31**	**0.66**	**0.17**	**80**	**1.1**	**3.4**
Lube Oil	0.5		0.25 U	0.2 U	0.2 U	0.24 U	5 U	0.25 U	0.25 U
Gasoline	0.8/1.0 (b)			**0.11**	0.25 U	**0.07**			
BTEX/NAPHTHALENES (µg/L)									
Benzene	5			0.25 U	1 U				
Toluene	1000			0.25 U	1 U				
Ethylbenzene	700			0.25 U	1 U				
m, p-Xylene	1000 (c)			0.5 U	1 U				
o-Xylene	1000 (c)			0.25 U	1 U				
Xylenes, Total	1000 (c)								
DISSOLVED METALS (µg/L)									
Lead	15								
Manganese	--					**350**			
CONVENTIONALS (mg/L)									
Alkalinity	--					**47**			
Nitrate	--				**1.2**	**1**			
Sulfate	--				**6.1**	**4.2**			
Total Organic Carbon	--					**17**			

TABLE 5A-4
AREA A SHALLOW GROUNDWATER QUALITY RESULTS
PEDERSON'S FRYER FARMS RI

	Groundwater Screening Criteria (a)	MW-05 05/14/2003	MW-05 12/16/2003	MW-05 03/15/2004	MW-05 10/12/2004	MW-05 02/02/2005	MW-05 05/25/2005	MW-05 09/01/2005	MW-05 12/08/2010
TOTAL PETROLEUM HYDROCARBONS (mg/L)									
Diesel Range Organics	0.5	**0.84**	**0.47**	**0.41**	**0.81**	**0.34**	**0.23**	**1.7**	0.1 U
Lube Oil	0.5	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.28 U	0.2 U
Gasoline	0.8/1.0 (b)								0.1 U
BTEX/NAPHTHALENES (µg/L)									
Benzene	5								0.25 U
Toluene	1000								**0.3**
Ethylbenzene	700								0.25 U
m, p-Xylene	1000 (c)								**0.5**
o-Xylene	1000 (c)								**0.3**
Xylenes, Total	1000 (c)								
DISSOLVED METALS (µg/L)									
Lead	15								
Manganese	--								
CONVENTIONALS (mg/L)									
Alkalinity	--								
Nitrate	--								
Sulfate	--								
Total Organic Carbon	--								

TABLE 5A-4
AREA A SHALLOW GROUNDWATER QUALITY RESULTS
PEDERSON'S FRYER FARMS RI

	Groundwater Screening Criteria (a)	MW-05 06/05/2011	MW-06 05/22/2001	MW-06 08/28/2001	MW-06 01/09/2003	MW-06 05/15/2003	MW-06 12/16/2003	MW-06 03/16/2004	MW-06 10/12/2004
TOTAL PETROLEUM HYDROCARBONS (mg/L)									
Diesel Range Organics	0.5	**0.12**	0.25 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	**13**
Lube Oil	0.5	0.24 U	0.5 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	**1.8**
Gasoline	0.8/1.0 (b)	**0.07**							
BTEX/NAPHTHALENES (µg/L)									
Benzene	5								
Toluene	1000								
Ethylbenzene	700								
m, p-Xylene	1000 (c)								
o-Xylene	1000 (c)								
Xylenes, Total	1000 (c)								
DISSOLVED METALS (µg/L)									
Lead	15								
Manganese	--								
CONVENTIONALS (mg/L)									
Alkalinity	--								
Nitrate	--								
Sulfate	--								
Total Organic Carbon	--								

TABLE 5A-4
AREA A SHALLOW GROUNDWATER QUALITY RESULTS
PEDERSON'S FRYER FARMS RI

	Groundwater Screening Criteria (a)	MW-06 02/02/2005	MW-06 05/25/2005	MW-06 12/08/2010	MW-06 06/01/2011	MW-26S 06/01/2011	MW-26S 06/30/2011
TOTAL PETROLEUM HYDROCARBONS (mg/L)							
Diesel Range Organics	0.5	0.13 U	0.13 U	0.1 U	0.12 UJ	**22** J	**7.3**
Lube Oil	0.5	0.25 U	0.25 U	0.2 U	0.24 UJ	**1** J	**0.51**
Gasoline	0.8/1.0 (b)			0.1 U	0.05 U	**1.2**	**0.54**
BTEX/NAPHTHALENES (µg/L)							
Benzene	5			0.25 U	0.5 U	**0.6**	0.5 U
Toluene	1000			0.25 U	0.5 U	0.5 U	0.5 U
Ethylbenzene	700			0.25 U	0.5 U	**0.76**	0.5 U
m, p-Xylene	1000 (c)			0.5 U	1 U	**3.1**	1 U
o-Xylene	1000 (c)			0.25 U	1 U	1 U	1 U
Xylenes, Total	1000 (c)						
DISSOLVED METALS (µg/L)							
Lead	15					0.4 U	
Manganese	--					**2200**	
CONVENTIONALS (mg/L)							
Alkalinity	--						
Nitrate	--					0.9 U	0.9 U
Sulfate	--					**4.3**	**3.1**
Total Organic Carbon	--						

U = Indicates the compound was undetected at the reported concentration.
J = Indicates the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ = The analyte was not detected in the sample; the reported sample reporting limit is an estimate.
Bold = Detected compound.
Box = Exceedance of screening criteria.
-- = Screening criteria is not available for the individual constituent.
(a) MTCA Method A CULs were used as screening criteria.
(b) Screening criteria is 0.8 ug/L if benzene is present and 1.0 ug/L if benzene is not present.
(c) Screening criteria cannot be exceeded by the sum of individual xylene concentrations.
(d) Screening criteria for naphthalenes is a total value for naphthalene, 1-methyl naphthalene, and 2-methyl naphthalene.
(e) TEQ = toxicity equivalency factor as described in WAC 173-340-708(8).
(f) cPAH cleanup screening levels based on practical quantitation limit (PQL) for individual cPAHs.

TABLE 5A-5
AREA A DEEP GROUNDWATER QUALITY RESULTS
PEDERSON'S FRYER FARMS RI

	Groundwater Screening Criteria (a)	MW-07R 02/01/2005	MW-07R 05/25/2005	MW-07R 12/08/2010	MW-07R 06/05/2011	MW-07R 06/30/2011
TOTAL PETROLEUM HYDROCARBONS (mg/L)						
Diesel Range Organics	0.5	**30**	**34**	**1.8**	**12**	**27**
Lube Oil	0.5	1.3 U	1.3 U	0.2 U	**0.56**	**1.2**
Gasoline	0.8/1.0 (b)			0.1 U	**0.061**	**0.41**
BTEX/NAPHTHALENES (µg/L)						
Benzene	5			0.25 U	0.5 U	
Toluene	1000			0.25 U	0.5 U	
Ethylbenzene	700			0.25 U	0.5 U	
m, p-Xylene				0.5 U	1 U	
o-Xylene				0.25 U	1 U	
Xylenes, Total	1000 (c)					
1,2-Dichloroethane (EDC)	5					
Ethylene Dibromide (EDB)	0.01					
Naphthalene	160					
DISSOLVED METALS (µg/L)						
Lead	15					
Manganese	--					
PAHs (µg/L)						
Naphthalene	--					
2-Methylnaphthalene	--					
1-Methylnaphthalene	--					
Total Naphthalene	160 (d)					
Acenaphthylene	--					
Acenaphthene	--					
Fluorene	--					
Phenanthrene	--					
Anthracene	--					
Fluoranthene	--					
Pyrene	--					
Benzo(a)anthracene	--					
Chrysene	--					
Benzo(b)fluoranthene	--					
Benzo(k)fluoranthene	--					
Benzo(a)pyrene	--					
Indeno(1,2,3-cd)pyrene	--					
Dibenzo(a,h)anthracene	--					
Benzo(g,h,i)perylene	--					
cPAH TEQ (e)	0.1 (f)					
CONVENTIONALS (mg/L)						
Alkalinity	--					
Nitrate	--				0.9 U	
Sulfate	--				**3**	
Total Organic Carbon	--					

TABLE 5A-5
AREA A DEEP GROUNDWATER QUALITY RESULTS
PEDERSON'S FRYER FARMS RI

	Groundwater Screening Criteria (a)	MW-17 01/10/2003	MW-17 05/14/2003	MW-17 08/19/2003	MW-17 12/15/2003	MW-17 03/17/2004
TOTAL PETROLEUM HYDROCARBONS (mg/L)						
Diesel Range Organics	0.5	**5.7**	**150**	**440**	**190**	**560**
Lube Oil	0.5	0.25 U	25 U	13 U	5 U	13 U
Gasoline	0.8/1.0 (b)					
BTEX/NAPHTHALENES (µg/L)						
Benzene	5					
Toluene	1000					
Ethylbenzene	700					
m, p-Xylene						
o-Xylene						
Xylenes, Total	1000 (c)					
1,2-Dichloroethane (EDC)	5					
Ethylene Dibromide (EDB)	0.01					
Naphthalene	160					
DISSOLVED METALS (µg/L)						
Lead	15					
Manganese	--					
PAHs (µg/L)						
Naphthalene	--					
2-Methylnaphthalene	--					
1-Methylnaphthalene	--					
Total Naphthalene	160 (d)					
Acenaphthylene	--					
Acenaphthene	--					
Fluorene	--					
Phenanthrene	--					
Anthracene	--					
Fluoranthene	--					
Pyrene	--					
Benzo(a)anthracene	--					
Chrysene	--					
Benzo(b)fluoranthene	--					
Benzo(k)fluoranthene	--					
Benzo(a)pyrene	--					
Indeno(1,2,3-cd)pyrene	--					
Dibenzo(a,h)anthracene	--					
Benzo(g,h,i)perylene	--					
cPAH TEQ (e)	0.1 (f)					
CONVENTIONALS (mg/L)						
Alkalinity	--					
Nitrate	--					
Sulfate	--					
Total Organic Carbon	--					

TABLE 5A-5
AREA A DEEP GROUNDWATER QUALITY RESULTS
PEDERSON'S FRYER FARMS RI

	Groundwater Screening Criteria (a)	MW-17 12/08/2010	MW-17 02/01/2011	MW-18 07/07/2004	MW-18 10/13/2004	MW-18 02/03/2005
TOTAL PETROLEUM HYDROCARBONS (mg/L)						
Diesel Range Organics	0.5	**2.5**	**410**	**100**	**140**	**21**
Lube Oil	0.5	0.2 U	40 U	2.5 U	5 U	0.5 U
Gasoline	0.8/1.0 (b)	**0.35**	**2.4**			
BTEX/NAPHTHALENES (µg/L)						
Benzene	5	0.25 U	1 U			
Toluene	1000	0.25 U	1 U			
Ethylbenzene	700	0.25 U	1 U			
m, p-Xylene		0.5 U	1 U			
o-Xylene		0.25 U	1 U			
Xylenes, Total	1000 (c)					
1,2-Dichloroethane (EDC)	5					
Ethylene Dibromide (EDB)	0.01					
Naphthalene	160					
DISSOLVED METALS (µg/L)						
Lead	15					
Manganese	--					
PAHs (µg/L)						
Naphthalene	--					
2-Methylnaphthalene	--					
1-Methylnaphthalene	--					
Total Naphthalene	160 (d)					
Acenaphthylene	--					
Acenaphthene	--					
Fluorene	--					
Phenanthrene	--					
Anthracene	--					
Fluoranthene	--					
Pyrene	--					
Benzo(a)anthracene	--					
Chrysene	--					
Benzo(b)fluoranthene	--					
Benzo(k)fluoranthene	--					
Benzo(a)pyrene	--					
Indeno(1,2,3-cd)pyrene	--					
Dibenzo(a,h)anthracene	--					
Benzo(g,h,i)perylene	--					
cPAH TEQ (e)	0.1 (f)					
CONVENTIONALS (mg/L)						
Alkalinity	--					
Nitrate	--		0.1 U			
Sulfate	--		**6.8**			
Total Organic Carbon	--					

TABLE 5A-5
AREA A DEEP GROUNDWATER QUALITY RESULTS
PEDERSON'S FRYER FARMS RI

	Groundwater Screening Criteria (a)	MW-18 05/25/2005	MW-18 09/01/2005	MW-18 12/08/2010	MW-19 07/07/2004	MW-19 10/13/2004
TOTAL PETROLEUM HYDROCARBONS (mg/L)						
Diesel Range Organics	0.5	**31**	**290**	**6.8**	**320**	**7**
Lube Oil	0.5	1.3 U	6.3 U	1 U	13 U	0.25 U
Gasoline	0.8/1.0 (b)			**0.95**		
BTEX/NAPHTHALENES (µg/L)						
Benzene	5			0.25 U		
Toluene	1000			0.25 U		
Ethylbenzene	700			**0.28**		
m, p-Xylene				**1.3**		
o-Xylene				0.25 U		
Xylenes, Total	1000 (c)					
1,2-Dichloroethane (EDC)	5					
Ethylene Dibromide (EDB)	0.01					
Naphthalene	160					
DISSOLVED METALS (µg/L)						
Lead	15					
Manganese	--					
PAHs (µg/L)						
Naphthalene	--					
2-Methylnaphthalene	--					
1-Methylnaphthalene	--					
Total Naphthalene	160 (d)					
Acenaphthylene	--					
Acenaphthene	--					
Fluorene	--					
Phenanthrene	--					
Anthracene	--					
Fluoranthene	--					
Pyrene	--					
Benzo(a)anthracene	--					
Chrysene	--					
Benzo(b)fluoranthene	--					
Benzo(k)fluoranthene	--					
Benzo(a)pyrene	--					
Indeno(1,2,3-cd)pyrene	--					
Dibenzo(a,h)anthracene	--					
Benzo(g,h,i)perylene	--					
cPAH TEQ (e)	0.1 (f)					
CONVENTIONALS (mg/L)						
Alkalinity	--					
Nitrate	--					
Sulfate	--					
Total Organic Carbon	--					

TABLE 5A-5
AREA A DEEP GROUNDWATER QUALITY RESULTS
PEDERSON'S FRYER FARMS RI

	Groundwater Screening Criteria (a)	MW-19 02/03/2005	MW-19 05/26/2005	MW-19 09/01/2005	MW-19 12/07/2010	MW-19 02/01/2011
TOTAL PETROLEUM HYDROCARBONS (mg/L)						
Diesel Range Organics	0.5	**17**	**13**	**31**	**0.17**	**4.7**
Lube Oil	0.5	0.5 U	0.5 U	1.8 U	0.2 U	0.2 U
Gasoline	0.8/1.0 (b)				**0.56**	**0.35**
BTEX/NAPHTHALENES (µg/L)						
Benzene	5				0.25 U	1 U
Toluene	1000				0.25 U	1 U
Ethylbenzene	700				0.25 U	1 U
m, p-Xylene					0.5 U	1 U
o-Xylene					0.25 U	1 U
Xylenes, Total	1000 (c)					
1,2-Dichloroethane (EDC)	5					
Ethylene Dibromide (EDB)	0.01					
Naphthalene	160					
DISSOLVED METALS (µg/L)						
Lead	15					
Manganese	--					
PAHs (µg/L)						
Naphthalene	--					
2-Methylnaphthalene	--					
1-Methylnaphthalene	--					
Total Naphthalene	160 (d)					
Acenaphthylene	--					
Acenaphthene	--					
Fluorene	--					
Phenanthrene	--					
Anthracene	--					
Fluoranthene	--					
Pyrene	--					
Benzo(a)anthracene	--					
Chrysene	--					
Benzo(b)fluoranthene	--					
Benzo(k)fluoranthene	--					
Benzo(a)pyrene	--					
Indeno(1,2,3-cd)pyrene	--					
Dibenzo(a,h)anthracene	--					
Benzo(g,h,i)perylene	--					
cPAH TEQ (e)	0.1 (f)					
CONVENTIONALS (mg/L)						
Alkalinity	--					
Nitrate	--					0.1 U
Sulfate	--					**2.8**
Total Organic Carbon	--					

TABLE 5A-5
AREA A DEEP GROUNDWATER QUALITY RESULTS
PEDERSON'S FRYER FARMS RI

	Groundwater Screening Criteria (a)	MW-19 06/05/2011	MW-19 06/29/2011	MW-20 07/07/2004	MW-20 10/13/2004	MW-20 02/03/2005
TOTAL PETROLEUM HYDROCARBONS (mg/L)						
Diesel Range Organics	0.5	**2.4**	**11**	**5.5**	**12**	**85**
Lube Oil	0.5	0.25 U	**0.5**	0.25 U	0.5 U	2.5 U
Gasoline	0.8/1.0 (b)	**0.31**	**0.38**			
BTEX/NAPHTHALENES (µg/L)						
Benzene	5	0.5 U				
Toluene	1000	0.5 U				
Ethylbenzene	700	0.5 U				
m, p-Xylene		1 U				
o-Xylene		1 U				
Xylenes, Total	1000 (c)					
1,2-Dichloroethane (EDC)	5					
Ethylene Dibromide (EDB)	0.01					
Naphthalene	160					
DISSOLVED METALS (µg/L)						
Lead	15					
Manganese	--					
PAHs (µg/L)						
Naphthalene	--					
2-Methylnaphthalene	--					
1-Methylnaphthalene	--					
Total Naphthalene	160 (d)					
Acenaphthylene	--					
Acenaphthene	--					
Fluorene	--					
Phenanthrene	--					
Anthracene	--					
Fluoranthene	--					
Pyrene	--					
Benzo(a)anthracene	--					
Chrysene	--					
Benzo(b)fluoranthene	--					
Benzo(k)fluoranthene	--					
Benzo(a)pyrene	--					
Indeno(1,2,3-cd)pyrene	--					
Dibenzo(a,h)anthracene	--					
Benzo(g,h,i)perylene	--					
cPAH TEQ (e)	0.1 (f)					
CONVENTIONALS (mg/L)						
Alkalinity	--					
Nitrate	--	0.9 U				
Sulfate	--	**4.1**				
Total Organic Carbon	--					

TABLE 5A-5
AREA A DEEP GROUNDWATER QUALITY RESULTS
PEDERSON'S FRYER FARMS RI

	Groundwater Screening Criteria (a)	MW-20 05/26/2005	MW-20 08/31/2005	MW-20 12/06/2010	MW-20 06/05/2011	MW-20 06/29/2011
TOTAL PETROLEUM HYDROCARBONS (mg/L)						
Diesel Range Organics	0.5	**53**		**13**	**19**	**29**
Lube Oil	0.5	1.3 U	**LNAPL**	2 U	**0.73**	**1.1**
Gasoline	0.8/1.0 (b)			**0.75**	**0.77**	**1.2**
BTEX/NAPHTHALENES (µg/L)						
Benzene	5			0.25 U	0.5 U	
Toluene	1000			0.25 U	0.5 U	
Ethylbenzene	700			0.25 U	0.5 U	
m, p-Xylene				0.5 U	1 U	
o-Xylene				0.25 U	1 U	
Xylenes, Total	1000 (c)					
1,2-Dichloroethane (EDC)	5					
Ethylene Dibromide (EDB)	0.01					
Naphthalene	160					
DISSOLVED METALS (µg/L)						
Lead	15					
Manganese	--					
PAHs (µg/L)						
Naphthalene	--					
2-Methylnaphthalene	--					
1-Methylnaphthalene	--					
Total Naphthalene	160 (d)					
Acenaphthylene	--					
Acenaphthene	--					
Fluorene	--					
Phenanthrene	--					
Anthracene	--					
Fluoranthene	--					
Pyrene	--					
Benzo(a)anthracene	--					
Chrysene	--					
Benzo(b)fluoranthene	--					
Benzo(k)fluoranthene	--					
Benzo(a)pyrene	--					
Indeno(1,2,3-cd)pyrene	--					
Dibenzo(a,h)anthracene	--					
Benzo(g,h,i)perylene	--					
cPAH TEQ (e)	0.1 (f)					
CONVENTIONALS (mg/L)						
Alkalinity	--					
Nitrate	--				0.9 U	
Sulfate	--				1.2 U	
Total Organic Carbon	--					

TABLE 5A-5
AREA A DEEP GROUNDWATER QUALITY RESULTS
PEDERSON'S FRYER FARMS RI

	Groundwater Screening Criteria (a)	MW-22 07/07/2004	MW-22 10/12/2004	MW-22 02/02/2005	MW-22 05/24/2005	MW-22 09/01/2005
TOTAL PETROLEUM HYDROCARBONS (mg/L)						
Diesel Range Organics	0.5	**0.7**	**0.36**	0.13 U	0.13 U	**0.13**
Lube Oil	0.5	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Gasoline	0.8/1.0 (b)					
BTEX/NAPHTHALENES (µg/L)						
Benzene	5					
Toluene	1000					
Ethylbenzene	700					
m, p-Xylene						
o-Xylene						
Xylenes, Total	1000 (c)					
1,2-Dichloroethane (EDC)	5					
Ethylene Dibromide (EDB)	0.01					
Naphthalene	160					
DISSOLVED METALS (µg/L)						
Lead	15					
Manganese	--					
PAHs (µg/L)						
Naphthalene	--					
2-Methylnaphthalene	--					
1-Methylnaphthalene	--					
Total Naphthalene	160 (d)					
Acenaphthylene	--					
Acenaphthene	--					
Fluorene	--					
Phenanthrene	--					
Anthracene	--					
Fluoranthene	--					
Pyrene	--					
Benzo(a)anthracene	--					
Chrysene	--					
Benzo(b)fluoranthene	--					
Benzo(k)fluoranthene	--					
Benzo(a)pyrene	--					
Indeno(1,2,3-cd)pyrene	--					
Dibenzo(a,h)anthracene	--					
Benzo(g,h,i)perylene	--					
cPAH TEQ (e)	0.1 (f)					
CONVENTIONALS (mg/L)						
Alkalinity	--					
Nitrate	--					
Sulfate	--					
Total Organic Carbon	--					

TABLE 5A-5
AREA A DEEP GROUNDWATER QUALITY RESULTS
PEDERSON'S FRYER FARMS RI

	Groundwater Screening Criteria (a)	MW-22 12/07/2010	MW-22 06/03/2011	MW-22 06/29/2011	MW-25D 06/03/2011	MW-25D 06/15/2011
TOTAL PETROLEUM HYDROCARBONS (mg/L)						
Diesel Range Organics	0.5	0.1 U	0.12 U	0.12 U	**7.7**	
Lube Oil	0.5	0.2 U	0.24 U	0.24 U	**0.26**	
Gasoline	0.8/1.0 (b)	0.1 U	0.05 U	0.05 U	**1.1**	
BTEX/NAPHTHALENES (µg/L)						
Benzene	5	0.25 U	0.5 U		**0.13**	
Toluene	1000	**0.25**	0.5 U		0.1 U	
Ethylbenzene	700	0.25 U	0.5 U		0.1 U	
m, p-Xylene		0.5 U	1 U		**1.1**	
o-Xylene		**0.34**	1 U		0.1 U	
Xylenes, Total	1000 (c)					
1,2-Dichloroethane (EDC)	5				0.1 U	
Ethylene Dibromide (EDB)	0.01				0.01 U	
Naphthalene	160				**3**	
DISSOLVED METALS (µg/L)						
Lead	15					0.4 U
Manganese	--					**2900**
PAHs (µg/L)						
Naphthalene	--				**1.1**	
2-Methylnaphthalene	--				**18**	
1-Methylnaphthalene	--				**67**	
Total Naphthalene	160 (d)					
Acenaphthylene	--				**1.4**	
Acenaphthene	--				**3.5**	
Fluorene	--				**8.2**	
Phenanthrene	--				**15**	
Anthracene	--				**1.1**	
Fluoranthene	--				**0.33**	
Pyrene	--				**1.4**	
Benzo(a)anthracene	--				**0.095**	
Chrysene	--				**0.25**	
Benzo(b)fluoranthene	--				**0.072**	
Benzo(k)fluoranthene	--				0.047 U	
Benzo(a)pyrene	--				0.094 U	
Indeno(1,2,3-cd)pyrene	--				0.047 U	
Dibenzo(a,h)anthracene	--				0.047 U	
Benzo(g,h,i)perylene	--				0.047 U	
cPAH TEQ (e)	0.1 (f)				**0.0192**	
CONVENTIONALS (mg/L)						
Alkalinity	--				**140**	
Nitrate	--		**1.1**		0.9 U	
Sulfate	--		**6.1**		1.2 U	
Total Organic Carbon	--				**6.7**	

TABLE 5A-5
AREA A DEEP GROUNDWATER QUALITY RESULTS
PEDERSON'S FRYER FARMS RI

	Groundwater Screening Criteria (a)	MW-25D 06/30/2011	MW-27D 06/03/2011	MW-27D 06/29/2011
TOTAL PETROLEUM HYDROCARBONS (mg/L)				
Diesel Range Organics	0.5	**5.4**	**9.9**	**33**
Lube Oil	0.5	**0.27**	**0.28**	**0.86**
Gasoline	0.8/1.0 (b)	**0.87**	**1.3**	**1.3**
BTEX/NAPHTHALENES (µg/L)				
Benzene	5	0.5 U	**0.71**	**0.51**
Toluene	1000	0.5 U	0.5 U	0.5 U
Ethylbenzene	700	0.5 U	0.5 U	0.5 U
m, p-Xylene		**1.4**	1 U	1 U
o-Xylene		1 U	1 U	1 U
Xylenes, Total	1000 (c)			
1,2-Dichloroethane (EDC)	5			
Ethylene Dibromide (EDB)	0.01			
Naphthalene	160			
DISSOLVED METALS (µg/L)				
Lead	15			
Manganese	--		**3000**	
PAHs (µg/L)				
Naphthalene	--			
2-Methylnaphthalene	--			
1-Methylnaphthalene	--			
Total Naphthalene	160 (d)			
Acenaphthylene	--			
Acenaphthene	--			
Fluorene	--			
Phenanthrene	--			
Anthracene	--			
Fluoranthene	--			
Pyrene	--			
Benzo(a)anthracene	--			
Chrysene	--			
Benzo(b)fluoranthene	--			
Benzo(k)fluoranthene	--			
Benzo(a)pyrene	--			
Indeno(1,2,3-cd)pyrene	--			
Dibenzo(a,h)anthracene	--			
Benzo(g,h,i)perylene	--			
cPAH TEQ (e)	0.1 (f)			
CONVENTIONALS (mg/L)				
Alkalinity	--		**140**	
Nitrate	--	0.9 U	0.9 U	
Sulfate	--	1.2 U	**3**	
Total Organic Carbon	--		**3.4**	

U = Indicates the compound was undetected at the reported concentration.
Bold = Detected compound.
Box = Exceedance of screening criteria.
-- = Screening criteria is not available for the individual constituent.
LNAPL = LNAPL present so no sample collected.
(a) MTCA Method A CULs were used as screening criteria.
(b) Screening criteria is 0.8 ug/L if benzene is present and 1.0 ug/L if benzene is not present.
(c) Screening criteria cannot be exceeded by the sum of individual xylene concentrations.
(d) Screening criteria for naphthalenes is a total value for naphthalene, 1-methyl naphthalene, and 2-methyl naphthalene.
(e) TEQ = toxicity equivalency factor as described in WAC 173-340-708(8).
(f) cPAH cleanup screening levels based on practical quantitation limit (PQL) for individual cPAHs.

TABLE 5B-1
AREA B SOIL ANALYTICAL RESULTS
PEDERSON'S FRYER FARMS RI

	Soil Screening Criteria (a)	B-10-11 11/14/1996	B-10-20 11/14/1996	B1-11-12 5/5/2011	B1-2-3 5/5/2011	B1-6.5-7 5/5/2011	B2-5-5.5 5/10/2011	B2-10-10.5 5/10/2011	B2-15-15.5 5/10/2011	MW-08-10 4/25/2001
TOTAL PETROLEUM HYDROCARBONS (mg/kg)										
Diesel Range Organics	2000			15 U	16 U	**950**	**130**	15 U	**78**	**61**
Lube Oil	2000			29 U	31 U	30 U	30 U	29 U	27 U	50 U
Gasoline	30/100 (b)	**260**	ND	4 U	4.1 U	**100**	**1100**	**9.4**	**370**	5 U
BTEX (mg/kg)										
Benzene	0.03	ND	ND			**0.065**	**0.75**			0.1 U
Ethylbenzene	7	**0.43**	ND			**0.21**	**7.2**			0.1 U
Toluene	6	ND	ND			**0.084**	**0.87**			0.1 U
m, p-Xylene						**0.16**	**21**			
o-Xylene						0.096 U	**1.2**			
Xylenes, Total	9 (c)	**1.3**	ND				**21.87**			0.3 U
PAHs (mg/kg)										
Naphthalene	--					**0.18** J				
1-Methylnaphthalene	--					**0.42**				
2-Methylnaphthalene	--					**0.55**				
Total Naphthalenes	5 (d)					**1.15**				
Acenaphthylene	--					0.0023 U				
Acenaphthene	--					**0.032**				
Fluorene	--					**0.1**				
Phenanthrene	--					**0.19**				
Anthracene	--					0.0023 U				
Fluoranthene	--					0.0023 U				
Pyrene	--					**0.0065**				
Benzo(a)anthracene	--					0.0029 U				
Chrysene	--					0.0029 U				
Benzo(b)fluoranthene	--					0.0023 U				
Benzo(k)fluoranthene	--					0.0029 U				
Benzo(a)pyrene	--					0.0034 U				
Indeno(1,2,3-cd)pyrene	--					0.0046 U				
Dibenzo(a,h)anthracene	--					0.0046 U				
Benzo(g,h,i)perylene	--					0.0029 U				
Dibenzofuran	--					0.011 U				
cPAH TEQ	0.1 (e)					0.0023 U				
TOTAL METALS (mg/kg)										
Lead	250					**4.8**				

TABLE 5B-1
AREA B SOIL ANALYTICAL RESULTS
PEDERSON'S FRYER FARMS RI

	Soil Screening Criteria (a)	MW-08-15 4/25/2001	MW-08-25 4/25/2001	MW-08-35 4/25/2001	MW-09-30 4/26/2001	MW-09-35 4/26/2001	MW-10-5 4/27/2001	MW-10-20 4/27/2001	MW-10-35 4/27/2001
TOTAL PETROLEUM HYDROCARBONS (mg/kg)									
Diesel Range Organics	2000	25 U	**110**	25 U	25 U	25 U	25 U	25 U	25 U
Lube Oil	2000	**110**	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Gasoline	30/100 (b)	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BTEX (mg/kg)									
Benzene	0.03	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Ethylbenzene	7	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Toluene	6	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
m, p-Xylene									
o-Xylene									
Xylenes, Total	9 (c)	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
PAHs (mg/kg)									
Naphthalene	--								
1-Methylnaphthalene	--								
2-Methylnaphthalene	--								
Total Naphthalenes	5 (d)								
Acenaphthylene	--								
Acenaphthene	--								
Fluorene	--								
Phenanthrene	--								
Anthracene	--								
Fluoranthene	--								
Pyrene	--								
Benzo(a)anthracene	--								
Chrysene	--								
Benzo(b)fluoranthene	--								
Benzo(k)fluoranthene	--								
Benzo(a)pyrene	--								
Indeno(1,2,3-cd)pyrene	--								
Dibenzo(a,h)anthracene	--								
Benzo(g,h,i)perylene	--								
Dibenzofuran	--								
cPAH TEQ	0.1 (e)								
TOTAL METALS (mg/kg)									
Lead	250								

TABLE 5B-1
AREA B SOIL ANALYTICAL RESULTS
PEDERSON'S FRYER FARMS RI

	Soil Screening Criteria (a)	MW-28D-55-55.5 5/11/2011
TOTAL PETROLEUM HYDROCARBONS (mg/kg)		
Diesel Range Organics	2000	**81**
Lube Oil	2000	27 U
Gasoline	30/100 (b)	**96**
BTEX (mg/kg)		
Benzene	0.03	
Ethylbenzene	7	
Toluene	6	
m, p-Xylene		
o-Xylene		
Xylenes, Total	9 (c)	
PAHs (mg/kg)		
Naphthalene	--	
1-Methylnaphthalene	--	
2-Methylnaphthalene	--	
Total Naphthalenes	5 (d)	
Acenaphthylene	--	
Acenaphthene	--	
Fluorene	--	
Phenanthrene	--	
Anthracene	--	
Fluoranthene	--	
Pyrene	--	
Benzo(a)anthracene	--	
Chrysene	--	
Benzo(b)fluoranthene	--	
Benzo(k)fluoranthene	--	
Benzo(a)pyrene	--	
Indeno(1,2,3-cd)pyrene	--	
Dibenzo(a,h)anthracene	--	
Benzo(g,h,i)perylene	--	
Dibenzofuran	--	
cPAH TEQ	0.1 (e)	
TOTAL METALS (mg/kg)		
Lead	250	

U = Indicates the compound was not detected at the reported concentration.
ND = Not detected.
J = Indicates the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
Bold = Detected compound.
Box = Exceedance of screening criteria.
-- = Screening criteria is not available for the individual constituent.
(a) MTCA Method A CULs for Unrestricted Land Uses were used as screening criteria.
(b) Screening criteria is 30 mg/kg if benzene is present and 100 mg/kg if benzene is not present.
(c) Screening criteria cannot be exceeded by the sum of individual xylene concentrations.
(d) Screening criteria cannot be exceeded by the sum of Naphthalene, 2-Methylnaphthalene, and 1-Methylnaphthalene.
(e) Screening criteria based on toxicity equivalency methodology.

TABLE 5B-2
AREA B GROUNDWATER QUALITY RESULTS
PEDERSON'S FRYER FARMS RI

	Groundwater Screening Criteria (a)	MW-08 5/22/2001	MW-08 8/28/2001	MW-08 1/10/2003	MW-08 5/15/2003	MW-08 8/20/2003
TOTAL PETROLEUM HYDROCARBONS (mg/L)						
Diesel Range Organics	0.5	**12**	**0.94**	0.15 U	**1.8**	**3.8**
Lube Oil	0.5	0.5 U	0.25 U	0.25 U	0.25 U	**0.69**
Gasoline	0.8/1.0 (b)	0.2 U	0.05 U	0.05 U	0.05 U	0.05 U
BTEX (µg/L)						
Benzene	5	5 U	1 U	1 U	1 U	1 U
Toluene	1000	5 U	1 U	1 U	1 U	1 U
Ethylbenzene	700	5 U	1 U	1 U	1 U	1 U
m, p-Xylene						
o-Xylene						
Xylenes, Total	1000 (c)					
Methyl tert butyl ether (MTBE)	20		3 U			
1,2-Dichloroethane (EDC)	5					
Naphthalene	160					
PAHs (µg/L)						
Naphthalene	--					
2-Methylnaphthalene	--					
1-Methylnaphthalene	--					
Total Naphthalene	160 (d)					
Acenaphthylene	--					
Acenaphthene	--					
Fluorene	--					
Phenanthrene	--					
Anthracene	--					
Fluoranthene	--					
Pyrene	--					
Benzo(a)anthracene	--					
Chrysene	--					
Benzo(b)fluoranthene	--					
Benzo(k)fluoranthene	--					
Benzo(a)pyrene	--					
Indeno(1,2,3-cd)pyrene	--					
Dibenzo(a,h)anthracene	--					
Benzo(g,h,i)perylene	--					
cPAH TEQ (e)	0.1 (f)					
CONVENTIONALS (mg/L)						
Nitrate	--					
Sulfate	--					
Total Organic Carbon	--					

TABLE 5B-2
AREA B GROUNDWATER QUALITY RESULTS
PEDERSON'S FRYER FARMS RI

	Groundwater Screening Criteria (a)	MW-08 12/16/2003	MW-08 3/16/2004	MW-08 7/7/2004	MW-08 10/12/2004	MW-08 2/3/2005
TOTAL PETROLEUM HYDROCARBONS (mg/L)						
Diesel Range Organics	0.5	**0.54**	**0.19**	**0.54**	**0.66**	**0.19**
Lube Oil	0.5	**0.46**	0.25 U	0.25 U	**0.69**	0.25 U
Gasoline	0.8/1.0 (b)	0.05 U	**0.075**	0.05 U	0.05 U	0.05 U
BTEX (µg/L)						
Benzene	5	1 U	1 U	1 U	1 U	1 U
Toluene	1000	1 U	1 U	1 U	1 U	1 U
Ethylbenzene	700	1 U	1 U	1 U	1 U	1 U
m, p-Xylene						
o-Xylene						
Xylenes, Total	1000 (c)					
Methyl tert butyl ether (MTBE)	20					
1,2-Dichloroethane (EDC)	5					
Naphthalene	160					
PAHs (µg/L)						
Naphthalene	--					
2-Methylnaphthalene	--					
1-Methylnaphthalene	--					
Total Naphthalene	160 (d)					
Acenaphthylene	--					
Acenaphthene	--					
Fluorene	--					
Phenanthrene	--					
Anthracene	--					
Fluoranthene	--					
Pyrene	--					
Benzo(a)anthracene	--					
Chrysene	--					
Benzo(b)fluoranthene	--					
Benzo(k)fluoranthene	--					
Benzo(a)pyrene	--					
Indeno(1,2,3-cd)pyrene	--					
Dibenzo(a,h)anthracene	--					
Benzo(g,h,i)perylene	--					
cPAH TEQ (e)	0.1 (f)					
CONVENTIONALS (mg/L)						
Nitrate	--					
Sulfate	--					
Total Organic Carbon	--					

TABLE 5B-2
AREA B GROUNDWATER QUALITY RESULTS
PEDERSON'S FRYER FARMS RI

	Groundwater Screening Criteria (a)	MW-08 5/25/2005	MW-08 9/1/2005	MW-08 12/7/2010	MW-08 6/2/2011	MW-08 6/29/2011
TOTAL PETROLEUM HYDROCARBONS (mg/L)						
Diesel Range Organics	0.5	0.13 U	0.13 U	0.1 U	25 UJ	0.12 U
Lube Oil	0.5	0.25 U	0.25 U	0.2 U	50 UJ	0.24 U
Gasoline	0.8/1.0 (b)	0.05 U	0.05 U	0.1 U	0.05 U	0.05 U
BTEX (µg/L)						
Benzene	5	1 U	1 U	0.25 U	0.5 U	
Toluene	1000	1 U	1 U	0.25 U	0.5 U	
Ethylbenzene	700	1 U	1 U	0.25 U	0.5 U	
m, p-Xylene				0.5 U	1 U	
o-Xylene				0.25 U	1 U	
Xylenes, Total	1000 (c)					
Methyl tert butyl ether (MTBE)	20					
1,2-Dichloroethane (EDC)	5					
Naphthalene	160					
PAHs (µg/L)						
Naphthalene	--				**0.25**	
2-Methylnaphthalene	--				0.061 U	
1-Methylnaphthalene	--				0.047 U	
Total Naphthalene	160 (d)				**0.25**	
Acenaphthylene	--				0.047 U	
Acenaphthene	--				0.047 U	
Fluorene	--				0.047 U	
Phenanthrene	--				0.047 U	
Anthracene	--				0.047 U	
Fluoranthene	--				0.047 U	
Pyrene	--				0.047 U	
Benzo(a)anthracene	--				0.047 U	
Chrysene	--				0.047 U	
Benzo(b)fluoranthene	--				0.047 U	
Benzo(k)fluoranthene	--				0.047 U	
Benzo(a)pyrene	--				0.094 U	
Indeno(1,2,3-cd)pyrene	--				0.047 U	
Dibenzo(a,h)anthracene	--				0.047 U	
Benzo(g,h,i)perylene	--				0.047 U	
cPAH TEQ (e)	0.1 (f)				0.047 U	
CONVENTIONALS (mg/L)						
Nitrate	--				0.9 U	
Sulfate	--				**9.3**	
Total Organic Carbon	--					

TABLE 5B-2
AREA B GROUNDWATER QUALITY RESULTS
PEDERSON'S FRYER FARMS RI

	Groundwater Screening Criteria (a)	MW-09 5/22/2001	MW-09 1/9/2003	MW-09 5/15/2003	MW-09 12/16/2003	MW-09 3/16/2004
TOTAL PETROLEUM HYDROCARBONS (mg/L)						
Diesel Range Organics	0.5	**0.5**	**0.44**	**0.44**	**0.34**	**0.2**
Lube Oil	0.5	0.5 U	0.25 U	0.25 U	0.25 U	0.25 U
Gasoline	0.8/1.0 (b)	0.05 U	**0.071**	0.05 U	0.05 U	**0.079**
BTEX (µg/L)						
Benzene	5	1 U	1 U	1 U	1 U	1 U
Toluene	1000	1 U	1 U	1 U	1 U	1 U
Ethylbenzene	700	1 U	1 U	1 U	1 U	1 U
m, p-Xylene						
o-Xylene						
Xylenes, Total	1000 (c)					
Methyl tert butyl ether (MTBE)	20					
1,2-Dichloroethane (EDC)	5					
Naphthalene	160					
PAHs (µg/L)						
Naphthalene	--					
2-Methylnaphthalene	--					
1-Methylnaphthalene	--					
Total Naphthalene	160 (d)					
Acenaphthylene	--					
Acenaphthene	--					
Fluorene	--					
Phenanthrene	--					
Anthracene	--					
Fluoranthene	--					
Pyrene	--					
Benzo(a)anthracene	--					
Chrysene	--					
Benzo(b)fluoranthene	--					
Benzo(k)fluoranthene	--					
Benzo(a)pyrene	--					
Indeno(1,2,3-cd)pyrene	--					
Dibenzo(a,h)anthracene	--					
Benzo(g,h,i)perylene	--					
cPAH TEQ (e)	0.1 (f)					
CONVENTIONALS (mg/L)						
Nitrate	--					
Sulfate	--					
Total Organic Carbon	--					

TABLE 5B-2
AREA B GROUNDWATER QUALITY RESULTS
PEDERSON'S FRYER FARMS RI

	Groundwater Screening Criteria (a)	MW-09 2/2/2005	MW-09 5/25/2005	MW-09 12/7/2010	MW-09 6/2/2011	MW-10 5/22/2001
TOTAL PETROLEUM HYDROCARBONS (mg/L)						
Diesel Range Organics	0.5	0.13 U	**0.15**	0.1 U	0.12 UJ	0.25 U
Lube Oil	0.5	0.25 U	0.25 U	0.2 U	0.24 UJ	0.5 U
Gasoline	0.8/1.0 (b)	0.05 U	**0.054**	0.1 U	**0.14**	0.05 U
BTEX (µg/L)						
Benzene	5	1 U	1 U	0.25 U	0.5 U	1 U
Toluene	1000	1 U	1 U	0.25 U	0.5 U	1 U
Ethylbenzene	700	1 U	1 U	0.25 U	0.5 U	1 U
m, p-Xylene				0.5 U	1 U	
o-Xylene				0.25 U	1 U	
Xylenes, Total	1000 (c)					
Methyl tert butyl ether (MTBE)	20					
1,2-Dichloroethane (EDC)	5					
Naphthalene	160					
PAHs (µg/L)						
Naphthalene	--				**0.11**	
2-Methylnaphthalene	--				**0.48**	
1-Methylnaphthalene	--				**0.82**	
Total Naphthalene	160 (d)				**1.41**	
Acenaphthylene	--				0.047 U	
Acenaphthene	--				**0.062**	
Fluorene	--				**0.15**	
Phenanthrene	--				0.047 U	
Anthracene	--				0.047 U	
Fluoranthene	--				0.047 U	
Pyrene	--				0.047 U	
Benzo(a)anthracene	--				0.047 U	
Chrysene	--				0.047 U	
Benzo(b)fluoranthene	--				0.047 U	
Benzo(k)fluoranthene	--				0.047 U	
Benzo(a)pyrene	--				0.094 U	
Indeno(1,2,3-cd)pyrene	--				0.047 U	
Dibenzo(a,h)anthracene	--				0.047 U	
Benzo(g,h,i)perylene	--				0.047 U	
cPAH TEQ (e)	0.1 (f)				0.047 U	
CONVENTIONALS (mg/L)						
Nitrate	--				**4.7**	
Sulfate	--				**9.7**	
Total Organic Carbon	--				**3.5**	

TABLE 5B-2
AREA B GROUNDWATER QUALITY RESULTS
PEDERSON'S FRYER FARMS RI

	Groundwater Screening Criteria (a)	MW-10 1/10/2003	MW-10 5/15/2003	MW-10 12/16/2003	MW-10 3/16/2004	MW-10 12/7/2010
TOTAL PETROLEUM HYDROCARBONS (mg/L)						
Diesel Range Organics	0.5	0.13 U	**0.19**	**0.16**	0.13 U	0.1 U
Lube Oil	0.5	0.25 U	**0.34**	0.25 U	0.25 U	0.2 U
Gasoline	0.8/1.0 (b)	0.05 U	0.05 U	0.05 U	0.05 U	0.1 U
BTEX (µg/L)						
Benzene	5	1 U	1 U	1 U	1 U	0.25 U
Toluene	1000	1 U	1 U	1 U	1 U	0.25 U
Ethylbenzene	700	1 U	1 U	1 U	1 U	0.25 U
m, p-Xylene						0.5 U
o-Xylene						0.25 U
Xylenes, Total	1000 (c)					
Methyl tert butyl ether (MTBE)	20					
1,2-Dichloroethane (EDC)	5					
Naphthalene	160					
PAHs (µg/L)						
Naphthalene	--					
2-Methylnaphthalene	--					
1-Methylnaphthalene	--					
Total Naphthalene	160 (d)					
Acenaphthylene	--					
Acenaphthene	--					
Fluorene	--					
Phenanthrene	--					
Anthracene	--					
Fluoranthene	--					
Pyrene	--					
Benzo(a)anthracene	--					
Chrysene	--					
Benzo(b)fluoranthene	--					
Benzo(k)fluoranthene	--					
Benzo(a)pyrene	--					
Indeno(1,2,3-cd)pyrene	--					
Dibenzo(a,h)anthracene	--					
Benzo(g,h,i)perylene	--					
cPAH TEQ (e)	0.1 (f)					
CONVENTIONALS (mg/L)						
Nitrate	--					
Sulfate	--					
Total Organic Carbon	--					

TABLE 5B-2
AREA B GROUNDWATER QUALITY RESULTS
PEDERSON'S FRYER FARMS RI

	Groundwater Screening Criteria (a)	MW-28D 6/2/2011	MW-28D-Dup 6/2/2011	MW-28D 6/28/2011	MW-28D-Dup 6/28/2011
TOTAL PETROLEUM HYDROCARBONS (mg/L)					
Diesel Range Organics	0.5	**3.1** J	**4.5** J	**1.6**	**1.8**
Lube Oil	0.5	0.24 UJ	0.24 UJ	0.24 U	0.24 U
Gasoline	0.8/1.0 (b)	**0.84**	**0.73**	**0.61**	
BTEX (µg/L)					
Benzene	5	0.1 U	0.5 U	0.5 U	
Toluene	1000	0.1 U	0.5 U	0.5 U	
Ethylbenzene	700	0.1 U	0.5 U	0.5 U	
m, p-Xylene		0.2 U	1 U	1 U	
o-Xylene		0.1 U	1 U	1 U	
Xylenes, Total	1000 (c)				
Methyl tert butyl ether (MTBE)	20	0.1 U		1 U	
1,2-Dichloroethane (EDC)	5	0.1 U			
Naphthalene	160	**0.62**			
PAHs (µg/L)					
Naphthalene	--				
2-Methylnaphthalene	--				
1-Methylnaphthalene	--				
Total Naphthalene	160 (d)				
Acenaphthylene	--				
Acenaphthene	--				
Fluorene	--				
Phenanthrene	--				
Anthracene	--				
Fluoranthene	--				
Pyrene	--				
Benzo(a)anthracene	--				
Chrysene	--				
Benzo(b)fluoranthene	--				
Benzo(k)fluoranthene	--				
Benzo(a)pyrene	--				
Indeno(1,2,3-cd)pyrene	--				
Dibenzo(a,h)anthracene	--				
Benzo(g,h,i)perylene	--				
cPAH TEQ (e)	0.1 (f)				
CONVENTIONALS (mg/L)					
Nitrate	--	0.9 U	0.9 U	0.9 U	
Sulfate	--	1.2 U	1.2 U	1.2 U	
Total Organic Carbon	--				

U = Indicates the compound was not detected at the reported concentration.

J = Indicates the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

UJ = The analyte was not detected in the sample; the reported sample reporting limit is an estimate

Bold = Detected compound.

Box = Exceedance screening criteria.

-- = Screening criteria is not available for the individual constituent.

(a) MTCA Method A CULs were used as screening criteria.

(b) Screening criteria is 0.8 ug/L if benzene is present and 1.0 ug/L if benzene is not present.

(c) Screening criteria cannot be exceeded by the sum of individual xylene concentrations.

(d) Screening criteria for naphthalenes is a total value for naphthalene, 1-methyl naphthalene, and 2-methyl naphthalene.

(e) TEQ = toxicity equivalency factor as described in WAC 173-340-708(8).

(f) cPAH cleanup screening levels based on practical quantitation limit (PQL) for individual cPAHs.

TABLE 5B-3
AREA B AND C STOCKPILE SOIL ANALYTICAL RESULTS
PEDERSON'S FRYER FARMS RI

	MTCA Method A Soil Cleanup Level for Unrestricted Land Uses (a)	SS-01 26297-8 05/19/2011	SS-02 26297-9 05/19/2011	SS-03 26297-11 05/19/2011	SS-04 26297-10 05/19/2011
TOTAL PETROLEUM HYDROCARBONS (mg/kg)					
NWTPH-Dx					
Diesel Range Organics	2000	14 U	15 U	15 U	17 U
Lube Oil	2000	**29**	**49**	**82**	**120**
PAHs (mg/kg)					
Method 8270C					
Naphthalene		0.0023 U	0.0024 U	0.0023 U	0.0027 UJ
1-Methylnaphthalene		0.0034 U	0.0036 U	0.0034 U	0.0041 UJ
2-Methylnaphthalene		0.0023 U	0.0024 U	0.0023 U	0.0027 UJ
Total Napthalenes	5 (b)	0.0023 U	0.0024 U	0.0023 U	0.0027 UJ
Acenaphthylene		0.0023 U	0.0024 U	0.0023 U	0.0027 UJ
Acenaphthene		0.0023 U	0.0024 U	0.0023 U	0.0027 UJ
Fluorene		0.0023 U	0.0024 U	0.0023 U	0.0027 UJ
Phenanthrene		0.0023 U	**0.018**	0.0023 U	0.0027 UJ
Anthracene		0.0023 U	**0.0042**	0.0023 U	0.0027 UJ
Fluoranthene		0.0023 U	**0.019**	0.0023 U	0.0027 UJ
Pyrene		**0.0025**	**0.02**	**0.0025**	**0.0029 J**
Benzo(a)anthracene		0.0028 U	**0.009**	0.0029 U	0.0034 UJ
Chrysene		0.0028 U	**0.011**	0.0029 U	**0.0039 J**
Benzo(b)fluoranthene		0.0023 U	**0.01**	0.0023 U	**0.0035 J**
Benzo(k)fluoranthene		0.0028 U	**0.004**	0.0029 U	0.0034 UJ
Benzo(a)pyrene		0.0034 U	**0.01**	0.0034 U	0.0041 UJ
Indeno(1,2,3-cd)pyrene		0.0045 U	**0.0055**	0.0046 U	0.0055 UJ
Dibenzo(a,h)anthracene		0.0045 U	0.0048 U	0.0046 U	0.0055 UJ
Benzo(g,h,i)perylene		0.0028 U	**0.0082**	0.0029 U	**0.0034 J**
Dibenzofuran		0.011 U	0.012 U	0.011 U	0.014 UJ
cPAH TEQ	0.1 (c)	0.0023 U	**0.01296**	0.0023 U	**0.000389 J**
CONVENTIONALS (%)					
Percent Moisture		**15**	**16**	**16**	**27**
Percent Solids		**85**	**84**	**84**	**73**

U = Indicates the compound was not detected at the reported concentration.
J = Indicates the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ = The analyte was not detected in the sample; the reported sample reporting limit is an estimate.
Bold = Detected compound.
(a) Screening criteria
(b) Cleanup level cannot be exceeded by the sum of Naphthalene, 2-Methylnaphthalene, and 1-Methylnaphthalene.
(c) Cleanup level based on toxicity equivalency methodology.

TABLE 5C-1
AREA C SOIL ANALYTICAL RESULTS
PEDERSON'S FRYER FARMS RI

	Soil Screening Criteria (a)	B-11-11 11/14/1996	C1-5.5 5/5/2011	C1-7.5-8 5/5/2011	C1-9-9.5 5/5/2011	MW-07-7 4/27/2001	MW-07-10 4/27/2001
TOTAL PETROLEUM HYDROCARBONS (mg/kg)							
Diesel Range Organics	2000	ND	14 U	14 U	14 U	**56**	**150**
Lube Oil	2000		29 U	27 U	28 U	**360**	**790**
Gasoline	30/100 (b)					5 U	5 U
BTEX (mg/kg)							
Benzene	0.03					0.1 U	0.1 U
Ethylbenzene	7					0.1 U	0.1 U
Toluene	6					0.1 U	0.1 U
m, p-Xylene							
o-Xylene							
Xylenes, Total	9 (c)					0.3 U	0.3 U
PAHs (mg/kg)							
Naphthalene	--			0.0022 U			
1-Methylnaphthalene	--			0.0033 U			
2-Methylnaphthalene	--			0.0022 U			
Total Naphthalenes	5 (d)						
Acenaphthylene	--			0.0022 U			
Acenaphthene	--			0.0022 U			
Fluorene	--			0.0022 U			
Phenanthrene	--			0.0022 U			
Anthracene	--			0.0022 U			
Fluoranthene	--			0.0022 U			
Pyrene	--			0.0022 U			
Benzo(a)anthracene	--			0.0028 U			
Chrysene	--			0.0028 U			
Benzo(b)fluoranthene	--			0.0022 U			
Benzo(k)fluoranthene	--			0.0028 U			
Benzo(a)pyrene	--			0.0033 U			
Indeno(1,2,3-cd)pyrene	--			0.0044 U			
Dibenzo(a,h)anthracene	--			0.0044 U			
Benzo(g,h,i)perylene	--			0.0028 U			
Dibenzofuran	--			0.011 U			
cPAH TEQ	0.1 (e)			0.0022 U			
PCBs (mg/kg)							
PCB-1016	--			0.011 U			
PCB-1221	--			0.011 U			
PCB-1232	--			0.011 U			
PCB-1242	--			0.011 U			
PCB-1248	--			0.011 U			
PCB-1254	--			0.011 U			
PCB-1260	--			0.011 U			
Total PCBs	1			0.011 U			

TABLE 5C-1
AREA C SOIL ANALYTICAL RESULTS
PEDERSON'S FRYER FARMS RI

	Soil Screening Criteria (a)	MW-07-15 4/27/2001	MW-07-20 4/27/2001	MW-07-25 4/27/2001	MW-31D-5 5/12/2011	MW-31D-10-10.5 5/12/2011
TOTAL PETROLEUM HYDROCARBONS (mg/kg)						
Diesel Range Organics	2000	25 U	25 U	25 U	14 U	14 U
Lube Oil	2000	50 U	50 U	50 U	28 U	28 U
Gasoline	30/100 (b)	5 U	5 U	5 U	**59**	
BTEX (mg/kg)						
Benzene	0.03	0.1 U	0.1 U	0.1 U		
Ethylbenzene	7	0.1 U	0.1 U	0.1 U		
Toluene	6	0.1 U	0.1 U	0.1 U		
m, p-Xylene						
o-Xylene						
Xylenes, Total	9 (c)	0.3 U	0.3 U	0.3 U		
PAHs (mg/kg)						
Naphthalene	--				0.0022 U	
1-Methylnaphthalene	--				0.0033 U	
2-Methylnaphthalene	--				0.0022 U	
Total Naphthalenes	5 (d)					
Acenaphthylene	--				0.0022 U	
Acenaphthene	--				0.0022 U	
Fluorene	--				0.0022 U	
Phenanthrene	--				0.0022 U	
Anthracene	--				0.0022 U	
Fluoranthene	--				0.0022 U	
Pyrene	--				0.0022 U	
Benzo(a)anthracene	--				0.0028 U	
Chrysene	--				0.0028 U	
Benzo(b)fluoranthene	--				0.0022 U	
Benzo(k)fluoranthene	--				0.0028 U	
Benzo(a)pyrene	--				0.0033 U	
Indeno(1,2,3-cd)pyrene	--				0.0044 U	
Dibenzo(a,h)anthracene	--				0.0044 U	
Benzo(g,h,i)perylene	--				0.0028 U	
Dibenzofuran	--				0.011 U	
cPAH TEQ	0.1 (e)				0.0022 U	
PCBs (mg/kg)						
PCB-1016	--					
PCB-1221	--					
PCB-1232	--					
PCB-1242	--					
PCB-1248	--					
PCB-1254	--					
PCB-1260	--					
Total PCBs	1					

TABLE 5C-1
AREA C SOIL ANALYTICAL RESULTS
PEDERSON'S FRYER FARMS RI

	Soil Screening Criteria (a)	MW-34S-5 5/11/2011	MW-34S-10-10.5 5/11/2011	MW-34S-15-15.5 5/11/2011
TOTAL PETROLEUM HYDROCARBONS (mg/kg)				
Diesel Range Organics	2000	15 U	14 U	13 U
Lube Oil	2000	29 U	27 U	27 U
Gasoline	30/100 (b)			
BTEX (mg/kg)				
Benzene	0.03			
Ethylbenzene	7			
Toluene	6			
m, p-Xylene				
o-Xylene				
Xylenes, Total	9 (c)			
PAHs (mg/kg)				
Naphthalene	--	0.0023 U		0.0021 U
1-Methylnaphthalene	--	0.0035 U		0.0032 U
2-Methylnaphthalene	--	0.0023 U		0.0021 U
Total Naphthalenes	5 (d)			
Acenaphthylene	--	0.0023 U		0.0021 U
Acenaphthene	--	0.0023 U		0.0021 U
Fluorene	--	0.0023 U		0.0021 U
Phenanthrene	--	0.0023 U		0.0021 U
Anthracene	--	0.0023 U		0.0021 U
Fluoranthene	--	0.0023 U		0.0021 U
Pyrene	--	0.0023 U		0.0021 U
Benzo(a)anthracene	--	0.0029 U		0.0027 U
Chrysene	--	0.0029 U		0.0027 U
Benzo(b)fluoranthene	--	0.0023 U		0.0021 U
Benzo(k)fluoranthene	--	0.0029 U		0.0027 U
Benzo(a)pyrene	--	0.0035 U		0.0032 U
Indeno(1,2,3-cd)pyrene	--	0.0046 U		0.0043 U
Dibenzo(a,h)anthracene	--	0.0046 U		0.0043 U
Benzo(g,h,i)perylene	--	0.0029 U		0.0027 U
Dibenzofuran	--	0.012 U		0.011 U
cPAH TEQ	0.1 (e)	0.0023 U		0.0021 U
PCBs (mg/kg)				
PCB-1016	--			
PCB-1221	--			
PCB-1232	--			
PCB-1242	--			
PCB-1248	--			
PCB-1254	--			
PCB-1260	--			
Total PCBs	1			

ND = Not detected.
U - Indicates the compound was undetected at the reported concentration.
J = Indicates the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
Bold = Detected compound.
(a) MTCA Method A CULs for Unrestricted Land Uses were used as screening criteria.
(b) Screening criteria is 30 mg/kg if benzene is present and 100 mg/kg if benzene is not present.
(c) Screening criteria cannot be exceeded by the sum of individual xylene concentrations.
(d) Screening criteria cannot be exceeded by the sum of Naphthalene, 2-Methylnaphthalene, and 1-Methylnaphthalene.
(e) Screening criteria based on toxicity equivalency methodology.

TABLE 5C-2
AREA C GROUNDWATER QUALITY RESULTS
PEDERSON'S FRYER FARMS RI

	Groundwater Screening Criteria (a)	MW-07 4/27/2001	MW-07-Dup 4/27/2001	MW-31D 6/2/2011	MW-31D-Dup 6/2/2011	MW-31D 6/29/2011	MW-34S 6/1/2011	MW-34S 6/29/2011
TOTAL PETROLEUM HYDROCARBONS (mg/L)								
Diesel Range Organics	0.5			**0.44** J	**0.4** J	**0.42**	0.12 UJ	0.12 U
Lube Oil	0.5			0.24 UJ	0.24 UJ	0.24 U	0.24 UJ	0.24 U
Gasoline	0.8/1.0 (b)			**0.56**	**0.51**	**0.46**	**0.091**	**0.15**
PAHs (µg/L)								
Naphthalene	--			**2**	**1.7**		**0.058**	
2-Methylnaphthalene	--			**7.2**	**6.5**		0.061 U	
1-Methylnaphthalene	--			**23**	**21**		0.047 U	
Total Naphthalenes	160 (c)			**32.2**	**29.2**		**0.058**	
Acenaphthylene	--			**0.32**	**0.28**		0.047 U	
Acenaphthene	--			**1.4**	**1.2**		0.047 U	
Fluorene	--			**2.6**	**2.2**		0.047 U	
Phenanthrene	--			**0.92**	**0.75**		0.047 U	
Anthracene	--			**0.057**	**0.047**		0.047 U	
Fluoranthene	--			0.047 U	0.047 U		0.047 U	
Pyrene	--			0.047 U	0.047 U		0.047 U	
Benzo(a)anthracene	--			0.047 U	0.047 U		0.047 U	
Chrysene	--			0.047 U	0.047 U		0.047 U	
Benzo(b)fluoranthene	--			0.047 U	0.047 U		0.047 U	
Benzo(a)pyrene	--			0.094 U	0.094 U		0.094 U	
Indeno(1,2,3-cd)pyrene	--			0.047 U	0.047 U		0.047 U	
Dibenzo(a,h)anthracene	--			0.047 U	0.047 U		0.047 U	
Benzo(g,h,i)perylene	--			0.047 U	0.047 U		0.047 U	
cPAH TEQ	0.1 (e)			0.047 U	0.047 U		0.047 U	
CONVENTIONALS (mg/L)								
Nitrate	--			0.9 U	0.9 U		0.9 U	
Sulfate	--			1.2 U	1.2 U		**6.6**	
VOLATILES (µg/L)								
1,1,1,2-Tetrachloroethane	--	5 U	5 U					
1,1,1-Trichloroethane	200	5 U	5 U					
1,1,2,2-Tetrachloroethane	--	5 U	5 U					
1,1,2-Trichloroethane	--	5 U	5 U					
1,1-Dichloroethane	--	5 U	**8**					
1,1-Dichloroethene	--	5 U	5 U					
1,1-Dichloropropene	--	5 U	5 U					
1,2,3-Trichlorobenzene	--	5 U	5 U					

TABLE 5C-2
AREA C GROUNDWATER QUALITY RESULTS
PEDERSON'S FRYER FARMS RI

	Groundwater Screening Criteria (a)	MW-07	MW-07-Dup	MW-31D	MW-31D-Dup	MW-31D	MW-34S	MW-34S
		4/27/2001	4/27/2001	6/2/2011	6/2/2011	6/29/2011	6/1/2011	6/29/2011
1,2,3-Trichloropropane	--	5 U	5 U					
1,2,4-Trichlorobenzene	--	5 U	5 U					
1,2,4-Trimethylbenzene	--	5 U	5 U					
1,2-Dibromo-3-chloropropane	--	25 U	25 U					
1,2-Dichlorobenzene	--	5 U	5 U					
1,2-Dichloroethane (EDC)	5	5 U	5 U					
1,2-Dichloropropane	--	5 U	5 U					
1,3,5-Trimethylbenzene	--	5 U	5 U					
1,3-Dichlorobenzene	--	5 U	5 U					
1,3-Dichloropropane	--	5 U	5 U					
1,4-Dichlorobenzene	--	5 U	5 U					
2,2-Dichloropropane	--	5 U	5 U					
2-Butanone	--	25 U	25 U					
2-Chlorotoluene	--	5 U	5 U					
2-Hexanone	--	5 U	5 U					
4-Chlorotoluene	--	5 U	5 U					
4-Isopropyltoluene	--	5 U	5 U					
4-Methyl-2-Pentanone	--	25 U	25 U					
Acetone	--	150 U	150 U					
Acrylonitrile	--	25 U	25 U					
Benzene	5	5 U	5 U					
Bromobenzene	--	5 U	5 U					
Bromochloromethane	--	5 U	5 U					
Bromodichloromethane	--	5 U	5 U					
Bromoform	--	5 U	5 U					
Bromomethane	--	5 U	5 U					
Carbon Tetrachloride	--	5 U	5 U					
Chlorobenzene	--	5 U	5 U					
Chloroethane	--	5 U	5 U					
Chloroform	--	5 U	5 U					
Chloromethane	--	5 U	5 U					
cis-1,2-Dichloroethene	--	5 U	5 U					
cis-1,3-Dichloropropene	--	5 U	5 U					
Dibromochloromethane	--	5 U	5 U					
Dibromomethane	--	5 U	5 U					
Dichlorodifluoromethane	--	5 U	5 U					
Ethylbenzene	700	5 U	5 U					
Ethylene Dibromide (EDB)	0.01	5 U	5 U					
Hexachlorobutadiene	--	5 U	5 U					
Isopropylbenzene	--	5 U	5 U					
m, p-Xylene	--	10 U	10 U					

TABLE 5C-2
AREA C GROUNDWATER QUALITY RESULTS
PEDERSON'S FRYER FARMS RI

	Groundwater Screening Criteria (a)	MW-07 4/27/2001	MW-07-Dup 4/27/2001	MW-31D 6/2/2011	MW-31D-Dup 6/2/2011	MW-31D 6/29/2011	MW-34S 6/1/2011	MW-34S 6/29/2011
Methyl tert butyl ether	--	5 U	5 U					
Methylene Chloride	5	5 U	5 U					
Naphthalene	--	5 U	5 U					
n-Butylbenzene	--	5 U	5 U					
n-Propylbenzene	--	5 U	5 U					
o-Xylene	--	5 U	5 U					
sec-Butylbenzene	--	5 U	5 U					
Styrene	--	5 U	5 U					
tert-Butylbenzene	--	5 U	5 U					
Tetrachloroethene	5	5 U	5 U					
Toluene	1000	5 U	5 U					
trans-1,2-Dichloroethene	--	5 U	5 U					
trans-1,3-Dichloropropene	--	5 U	5 U					
Trichloroethene	5	5 U	5 U					
Trichlorofluoromethane	--	5 U	5 U					
Vinyl Chloride	0.2	5 U	5 U					

U = Indicates the compound was not detected at the reported concentration.

J = Indicates the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

UJ = The analyte was not detected in the sample; the reported sample reporting limit is an estimate.

Bold = Detected compound.

-- = Screening criteria is not available for the individual constituent.

(a) MTCA Method A CULs were used as screening criteria.

(b) Screening criteria is 0.8 ug/L if benzene is present and 1.0 ug/L if benzene is not present.

(c) Screening criteria for naphthalenes is a total value for naphthalene, 1-methyl naphthalene, and 2-methyl naphthalene.

(d) TEQ = toxicity equivalency factor as described in WAC 173-340-708(8).

(e) cPAH cleanup screening levels based on practical quantitation limit (PQL)

TABLE 5D-1
AREA D SOIL ANALYTICAL RESULTS
PEDERSON'S FRYER FARMS RI

	Soil Screening Criteria (a)	D1-7.5-8 5/13/2011	D1-12.5-13 5/13/2011
TOTAL PETROLEUM HYDROCARBONS (mg/kg)			
Diesel Range Organics	2000	14 U	13 U
Lube Oil	2000	**77**	27 U

U = Indicates the compound was not detected at the reported concentration.
Bold = Detected compound.
(a) MTCA Method A CULs for Unrestricted Land Uses were used as screening criteria.

TABLE 5E-1
AREA E SOIL ANALYTICAL RESULTS
PEDERSON'S FRYER FARMS RI

	Soil Screening Criteria (a)	B-21-16.5 11/16/1996	B-22-11.5 11/16/1996	B-23-16 11/16/1996	E1-1.5-2 5/6/2011	E1-10.5-11 5/6/2011	E2-8.5-9 5/6/2011	E2-12-12.2 5/6/2011	E3-3-3.5 5/6/2011	E3a-10-10.5 6/30/2011
HCID (mg/kg)										
Diesel Range Organics	2000	ND	ND	ND						
TOTAL PETROLEUM HYDROCARBONS (mg/kg)										
Diesel Range Organics	2000				15 U	14 U	**310**	13 U	15 U	**1300**
Lube Oil	2000				29 U	27 U	29 U	27 U	30 U	**99**
PAHs (mg/kg)										
Naphthalene	--				0.0023 U		**0.015**		0.0023 U	
1-Methylnaphthalene	--				0.0034 U		**0.29**		0.0035 U	
2-Methylnaphthalene	--				0.0023 U		**0.22**		0.0023 U	
Total Naphthalenes	5 (c)				0.0023 U		**0.525**		0.0023 U	
Acenaphthylene	--				0.0023 U		0.0023 U		0.0023 U	
Acenaphthene	--				0.0023 U		0.0023 U		0.0023 U	
Fluorene	--				0.0023 U		**0.086**		0.0023 U	
Phenanthrene	--				**0.0031**		**0.17**		0.0023 U	
Anthracene	--				0.0023 U		0.0023 U		0.0023 U	
Fluoranthene	--				**0.0034**		0.0023 U		0.0023 U	
Pyrene	--				**0.0049**		**0.013**		**0.0023**	
Benzo(a)anthracene	--				0.0028 U		0.0029 U		0.0029 U	
Chrysene	--				**0.003**		**0.0064**		0.0029 U	
Benzo(b)fluoranthene	--				0.0023 U		0.0023 U		0.0023 U	
Benzo(k)fluoranthene	--				0.0028 U		0.0029 U		0.0029 U	
Benzo(a)pyrene	--				0.0034 U		0.0035 U		0.0035 U	
Indeno(1,2,3-cd)pyrene	--				0.0046 U		0.0047 U		0.0046 U	
Dibenzo(a,h)anthracene	--				0.0046 U		0.0047 U		0.0046 U	
Benzo(g,h,i)perylene	--				0.0028 U		0.0029 U		0.0029 U	
Dibenzofuran	--				0.011 U		0.012 U		0.012 U	
cPAH TEQ	0.1 (d)				**0.00003**		**0.000064**		0.0023 U	

TABLE 5E-1
AREA E SOIL ANALYTICAL RESULTS
PEDERSON'S FRYER FARMS RI

	Soil Screening Criteria (a)	E3a-15-15.5 6/30/2011	E3a-20-20.5 6/30/2011	E3a-25-25.5 6/30/2011	E4-15-15.5 6/30/2011	E4-20-20.5 6/30/2011	E4-25-25.5 6/30/2011	E4-30-30.5 6/30/2011	E5-4.5-5 5/6/2011
HCID (mg/kg)									
Diesel Range Organics	2000								
TOTAL PETROLEUM HYDROCARBONS (mg/kg)									
Diesel Range Organics	2000	**550**	13 U	**220**	**56**	**51**	**47**	**22**	**900**
Lube Oil	2000	**82**	27 U	**93**	29 U	28 U	28 U	27 U	**44**
PAHs (mg/kg)									
Naphthalene	--								
1-Methylnaphthalene	--								
2-Methylnaphthalene	--								
Total Naphthalenes	5 (c)								
Acenaphthylene	--								
Acenaphthene	--								
Fluorene	--								
Phenanthrene	--								
Anthracene	--								
Fluoranthene	--								
Pyrene	--								
Benzo(a)anthracene	--								
Chrysene	--								
Benzo(b)fluoranthene	--								
Benzo(k)fluoranthene	--								
Benzo(a)pyrene	--								
Indeno(1,2,3-cd)pyrene	--								
Dibenzo(a,h)anthracene	--								
Benzo(g,h,i)perylene	--								
Dibenzofuran	--								
cPAH TEQ	0.1 (d)								

TABLE 5E-1
AREA E SOIL ANALYTICAL RESULTS
PEDERSON'S FRYER FARMS RI

	Soil Screening Criteria (a)	E5-9.5-10 5/6/2011	E6-7.5-8 5/5/2011	E6-11.5-12 5/5/2011	E7-7.5-8 5/5/2011	E7-12-12.5 5/5/2011
HCID (mg/kg)						
Diesel Range Organics	2000					
TOTAL PETROLEUM HYDROCARBONS (mg/kg)						
Diesel Range Organics	2000	**12000** J	14 U	14 U	14 U	14 U
Lube Oil	2000	**480** J	28 U	27 U	29 U	28 U
PAHs (mg/kg)						
Naphthalene	--	0.023 U	0.0023 U		0.0024 U	
1-Methylnaphthalene	--	**9.9**	0.0034 U		0.0036 U	
2-Methylnaphthalene	--	**2.7**	0.0023 U		0.0024 U	
Total Naphthalenes	5 (c)	**12.6**	0.0023 U		0.0024 U	
Acenaphthylene	--	0.023 U	0.0023 U		0.0024 U	
Acenaphthene	--	0.023 U	0.0023 U		0.0024 U	
Fluorene	--	**2.7**	0.0023 U		0.0024 U	
Phenanthrene	--	**7.2**	0.0023 U		0.0024 U	
Anthracene	--	0.023 U	0.0023 U		0.0024 U	
Fluoranthene	--	0.023 U	0.0023 U		0.0024 U	
Pyrene	--	**0.4**	0.0023 U		0.0024 U	
Benzo(a)anthracene	--	0.029 U	0.0029 U		0.003 U	
Chrysene	--	**0.2**	0.0029 U		0.003 U	
Benzo(b)fluoranthene	--	0.023 U	0.0023 U		0.0024 U	
Benzo(k)fluoranthene	--	0.029 U	0.0029 U		0.003 U	
Benzo(a)pyrene	--	0.034 U	0.0034 U		0.0036 U	
Indeno(1,2,3-cd)pyrene	--	0.046 U	0.0046 U		0.0048 U	
Dibenzo(a,h)anthracene	--	0.046 U	0.0046 U		0.0048 U	
Benzo(g,h,i)perylene	--	0.029 U	0.0029 U		0.003 U	
Dibenzofuran	--	0.11 U	0.011 U		0.012 U	
cPAH TEQ	0.1 (d)	0.002	0.0023 U		0.0024 U	

U = Indicates the compound was not detected at the reported concentration.
J = Indicates the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
ND = Not detected.
Bold = Detected compound.
Box = Exceedance of screening criteria.
-- = Screening criteria is not available for the individual constituent.
(a) MTCA Method A CULs for Unrestricted Land Uses were used as screening criteria.
(b) Screening criteria is 30 mg/kg if benzene is present and 100 mg/kg if benzene is not present.
(c) Screening criteria cannot be exceeded by the sum of Naphthalene, 2-Methylnaphthalene, and 1-Methylnaphthalene.
(d) Screening criteria based on toxicity equivalency methodology.

TABLE 5E-2
AREA C GROUNDWATER QUALITY RESULTS
PEDERSON'S FRYER FARMS RI

	Groundwater Screening Criteria (a)	E2 5/6/2011
TOTAL PETROLEUM HYDROCARBONS (mg/L)		
Diesel Range Organics	0.5	**4**
Lube Oil	0.5	**0.35**

Bold = Detected compound.
Box = Exceedance of screening criteria.
(a) MTCA Method A CULs were used as screening criteria.

TABLE 5F-1
AREA F 2000 EXCAVATION - FINAL CONFIRMATION SOIL SAMPLE RESULTS
PEDERSON'S FRYER FARMS RI

	Soil Screening Criteria (a)	UST1-EX-10-10 8/25/2000	UST1-EX-11-3 8/25/2000	UST1-EX-12-5 8/25/2000	UST1-EX-13-8 8/25/2000	UST1-EX-14-10 8/25/2000	UST1-EX-15-3 8/25/2000	UST1-EX-16-5 8/25/2000	UST1-EX-17-8 8/25/2000
GASOLINE/BTEX (mg/kg)									
Gasoline Range Organics	30/100 (b)	**180**	5 U	5 U	5 U	**300**	5 U	5 U	**9**
Benzene	0.03	0.2 U	0.1 U	0.1 U	0.1 U	**0.1**	0.1 U	0.1 U	0.1 U
Ethylbenzene	7	**0.5**	0.1 U	0.1 U	0.1 U	**1.4**	0.1 U	0.1 U	0.1 U
Toluene	6	0.2 U	0.1 U	0.1 U	0.1 U	**0.4**	0.1 U	0.1 U	0.1 U
Xylenes, Total	9 (c)	0.6 U	0.3 U	0.3 U	0.3 U	**3.1**	0.3 U	0.3 U	0.3 U
TOTAL METALS (mg/kg)									
Lead	250					**6**			

TABLE 5F-1
AREA F 2000 EXCAVATION - FINAL CONFIRMATION SOIL SAMPLE RESULTS
PEDERSON'S FRYER FARMS RI

	Soil Screening Criteria (a)	UST1-EX-18-10 8/25/2000	UST1-EX-20-14 8/25/2000	UST1-EX-22-13 8/25/2000	UST1-EX-23-3 8/25/2000	UST1-EX-24-7 8/25/2000	UST1-EX-25-3 8/25/2000	UST1-EX-26-8 8/25/2000
GASOLINE/BTEX (mg/kg)								
Gasoline Range Organics	30/100 (b)	**64**	5 U	**230**	**64**	**190**	**300**	**390**
Benzene	0.03	0.1 U	0.1 U	0.1 U	0.1 U	0.4 U	0.4 U	0.1 U
Ethylbenzene	7	0.1 U	0.1 U	**1.2**	**0.4**	0.4 U	**4.3**	**6.1**
Toluene	6	0.1 U	0.1 U	**0.2**	**0.1**	0.4 U	**2.5**	**3.4**
Xylenes, Total	9 (c)	0.3 U	0.3 U	**3.3**	**1.2**	1.2 U	**30**	**30**
TOTAL METALS (mg/kg)								
Lead	250							

TABLE 5F-1
AREA F 2000 EXCAVATION - FINAL CONFIRMATION SOIL SAMPLE RESULTS
PEDERSON'S FRYER FARMS RI

	Soil Screening Criteria (a)	UST1-EX-28-23	UST1-EX-29-21	UST1-EX-30-5	UST1-EX-31-10	UST1-EX-32-15	UST1-EX-33-20	UST1-EX-34-20
		8/28/2000	8/28/2000	8/28/2000	8/28/2000	8/28/2000	8/28/2000	8/28/2000
GASOLINE/BTEX (mg/kg)								
Gasoline Range Organics	30/100 (b)	5 U	10 U	**3000**	**600**	**82**	5 U	10 U
Benzene	0.03	0.1 U	0.05 U	1 U	0.4 U	0.1 U	0.1 U	0.05 U
Ethylbenzene	7	0.1 U	0.05 U	**46**	**9.5**	**0.2**	0.1 U	0.05 U
Toluene	6	0.1 U	0.05 U	**31**	**3.2**	0.1 U	0.1 U	0.05 U
Xylenes, Total	9 (c)	0.3 U	0.05 U	**230**	**45**	0.3 U	0.3 U	0.05 U
TOTAL METALS (mg/kg)								
Lead	250							

TABLE 5F-1
AREA F 2000 EXCAVATION - FINAL CONFIRMATION SOIL SAMPLE RESULTS
PEDERSON'S FRYER FARMS RI

	Soil Screening Criteria (a)	UST1-EX-35-20 8/29/2000	UST1-EX-36-15 8/29/2000	UST1-EX-37-10 8/29/2000	UST1-EX-38-5 8/29/2000	UST1-EX-39-3 8/29/2000	UST1-EX-40-20 8/29/2000	UST1-EX-41-10 8/29/2000
GASOLINE/BTEX (mg/kg)								
Gasoline Range Organics	30/100 (b)	10 U	10 U	10 U	10 U	**120**	10 U	
Benzene	0.03	0.05 U	0.05 U	0.05 U	0.05 U	**1.3**	0.05 U	0.05 U
Ethylbenzene	7	0.05 U	0.05 U	0.05 U	0.05 U	**1**	0.05 U	0.05 U
Toluene	6	0.05 U	0.05 U	0.05 U	0.05 U	**0.2**	0.05 U	0.05 U
Xylenes, Total	9 (c)	0.05 U	0.05 U	0.05 U	0.05 U	**8.6**	0.05 U	0.05 U
TOTAL METALS (mg/kg)								
Lead	250							

TABLE 5F-1
AREA F 2000 EXCAVATION - FINAL CONFIRMATION SOIL SAMPLE RESULTS
PEDERSON'S FRYER FARMS RI

	Soil Screening Criteria (a)	UST1-EX-41-15 8/29/2000	UST1-EX-42-15 8/29/2000	UST1-EX-43-5 8/29/2000	UST1-EX-44-3 8/29/2000	UST1-EX-45-15 8/29/2000	UST1-EX-46-10 8/29/2000	UST1-EX-46-15 8/29/2000
GASOLINE/BTEX (mg/kg)								
Gasoline Range Organics	30/100 (b)	10 U	10 U	10 U	**60**	10 U		10 U
Benzene	0.03		0.05 U	0.05 U	0.1 U	0.05 U	0.05 U	
Ethylbenzene	7		0.05 U	0.05 U	**0.4**	0.05 U	0.05 U	
Toluene	6		0.05 U	0.05 U	**0.1**	0.05 U	0.05 U	
Xylenes, Total	9 (c)		0.05 U	0.05 U	**2**	0.05 U	0.05 U	
TOTAL METALS (mg/kg)								
Lead	250							

TABLE 5F-1
AREA F 2000 EXCAVATION - FINAL CONFIRMATION SOIL SAMPLE RESULTS
PEDERSON'S FRYER FARMS RI

	Soil Screening Criteria (a)	UST1-EX-47-5 8/29/2000	UST1-EX-47-5-Dup 8/29/2000	UST1-EX-6-8 8/24/2000	UST1-EX-8-3 8/25/2000	UST1-EX-9-5 8/25/2000
GASOLINE/BTEX (mg/kg)						
Gasoline Range Organics	30/100 (b)	10 U	10 U	5 U	5 U	5 U
Benzene	0.03	0.05 U	0.05 U	0.1 U	0.1 U	0.1 U
Ethylbenzene	7	0.05 U	0.05 U	0.1 U	0.1 U	0.1 U
Toluene	6	0.05 U	0.05 U	0.1 U	0.1 U	0.1 U
Xylenes, Total	9 (c)	0.05 U	**0.05**	0.3 U	0.3 U	0.3 U
TOTAL METALS (mg/kg)						
Lead	250					

U = Indicates the compound was not detected at the reported concentration.
Bold = Detected compound.
Box = Exceedance of screening criteria.
(a) MTCA Method A CULs for Unrestricted Land Uses were used as screening criteria.
(b) Screening criteria is 30 mg/kg if benzene is present and 100 mg/kg if benzene is not present.
(c) Screening criteria cannot be exceeded by the sum of individual xylene concentrations.

TABLE 5F-2
AREA F PRE RI AND RI MONITORING WELL AND SOIL BORING SOIL ANALYTICAL RESULTS
PEDERSON'S FRYER FARMS RI

	Soil Screening Criteria (a)	F1-10-10.5	F1-15-15.5	F1-20-20.5	F1-25-25.5	F1-5-5.5	F2-1-1.5	F2-4.5-5	F2-4.5-5-Dup	F2-9.5-10
		5/17/2011	5/17/2011	5/17/2011	5/17/2011	5/17/2011	5/6/2011	5/6/2011	5/6/2011	5/6/2011
TOTAL PETROLEUM HYDROCARBONS (mg/kg)										
Diesel Range Organics	2000	15 U	14 U	13 U	14 U	15 U	**250**	**320**	**420**	13 U
Lube Oil	2000	30 U	28 U	27 U	28 U	30 U	**48**	**130** J	**240** J	27 U
Gasoline Range Organics	30/100 (b)	4.5 U	3.2 U	3.4 U	3.6 U	3.7 U	3.2 U	**16**		3.7 U
BTEX (mg/kg)										
Benzene	0.03									
Ethylbenzene	7									
Toluene	6									
m, p-Xylene										
o-Xylene										
Xylenes, Total	9 (c)									
TOTAL METALS (mg/kg)										
Lead	250									

TABLE 5F-2
AREA F PRE RI AND RI MONITORING WELL AND SOIL BORING SOIL ANALYTICAL RESULTS
PEDERSON'S FRYER FARMS RI

	Soil Screening Criteria (a)	F3-1.5-2 5/5/2011	F3-1.5-2-Dup 5/5/2011	F3-4.5-5 5/5/2011	F3-11.5-12 5/5/2011	MW-11-5 5/1/2001	MW-11-10 5/1/2001	MW-11-12 5/1/2001	MW-11-15 5/1/2001	MW-11-20 5/1/2001
TOTAL PETROLEUM HYDROCARBONS (mg/kg)										
Diesel Range Organics	2000	**1600**	**1700**	**110**	14 U					
Lube Oil	2000	**40**	**40**	30 U	28 U					
Gasoline Range Organics	30/100 (b)	**19000**	**15000**	**1900**	**7.5**	5 U	5 U	5 U	5 U	5 U
BTEX (mg/kg)										
Benzene	0.03	**18**	**16**	**2.5**		0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Ethylbenzene	7	**350** J	**230** J	**24**		0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Toluene	6	**160**	**120**	**4**		0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
m, p-Xylene		**900**	**710**	**77**						
o-Xylene		**420** J	**270** J	**20**						
Xylenes, Total	9 (c)	**1320**	**980**	**97**		0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
TOTAL METALS (mg/kg)										
Lead	250	**21**	**20**							

TABLE 5F-2
AREA F PRE RI AND RI MONITORING WELL AND SOIL BORING SOIL ANALYTICAL RESULTS
PEDERSON'S FRYER FARMS RI

	Soil Screening Criteria (a)	MW-11-25 5/1/2001	MW-12-10 4/27/2001	MW-12-25 4/27/2001	MW-12-40 4/27/2001	MW-13-10 4/30/2001	MW-13-20 4/30/2001	MW-13-30 4/30/2001	MW-14-5 4/30/2001	MW-14-20 4/30/2001
TOTAL PETROLEUM HYDROCARBONS (mg/kg)										
Diesel Range Organics	2000									
Lube Oil	2000									
Gasoline Range Organics	30/100 (b)	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BTEX (mg/kg)										
Benzene	0.03	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Ethylbenzene	7	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Toluene	6	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
m, p-Xylene										
o-Xylene										
Xylenes, Total	9 (c)	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
TOTAL METALS (mg/kg)										
Lead	250									

TABLE 5F-2
AREA F PRE RI AND RI MONITORING WELL AND SOIL BORING SOIL ANALYTICAL RESULTS
PEDERSON'S FRYER FARMS RI

	Soil Screening Criteria (a)	MW-14-35 4/30/2001	MW-29D-10-10.5 5/16/2011	MW-29D-15-15.5 5/16/2011	MW-29D-20-20.5 5/16/2011	MW-29D-25-25.5 5/16/2011	MW-35S-5-5.5 5/17/2011	MW-35S-10-10.5 5/17/2011
TOTAL PETROLEUM HYDROCARBONS (mg/kg)								
Diesel Range Organics	2000		14 U	14 U	13 U	13 U	**230**	**44**
Lube Oil	2000		29 U	28 U	27 U	27 U	**45**	29 U
Gasoline Range Organics	30/100 (b)	5 U	3.6 U	3.4 U	3.7 U	3.4 U	**28**	**110**
BTEX (mg/kg)								
Benzene	0.03	0.1 U	0.018 U					**0.06**
Ethylbenzene	7	0.1 U	0.046 U					**0.63**
Toluene	6	0.1 U	0.046 U					**0.18** J
m, p-Xylene			0.091 U					**0.91**
o-Xylene			0.091 U					**0.19**
Xylenes, Total	9 (c)	0.3 U						
TOTAL METALS (mg/kg)								
Lead	250							

TABLE 5F-2
AREA F PRE RI AND RI MONITORING WELL AND SOIL BORING SOIL ANALYTICAL RESULTS
PEDERSON'S FRYER FARMS RI

	Soil Screening Criteria (a)	MW-35S-15-15.5 5/17/2011	MW-35S-20-20.5 5/17/2011	MW-35S-25-25.5 5/17/2011
TOTAL PETROLEUM HYDROCARBONS (mg/kg)				
Diesel Range Organics	2000	**66**	**17**	14 U
Lube Oil	2000	**140**	**39**	29 U
Gasoline Range Organics	30/100 (b)	**10**	**23**	3.7 U
BTEX (mg/kg)				
Benzene	0.03			
Ethylbenzene	7			
Toluene	6			
m, p-Xylene				
o-Xylene				
Xylenes, Total	9 (c)			
TOTAL METALS (mg/kg)				
Lead	250			

U = Indicates the compound was not detected at the reported concentration.
J = Indicates the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
Bold = Detected compound.
Box = Exceedance of screening criteria.
(a) MTCA Method A CULs for Unrestricted Land Uses were used as screening criteria.
(b) Screening criteria is 30 mg/kg if benzene is present and 100 mg/kg if benzene is not present.
(c) Screening criteria cannot be exceeded by the sum of individual xylene concentrations.

TABLE 5F-3
AREA F GROUNDWATER QUALITY RESULTS
PEDERSON'S FRYER FARMS RI

	Groundwater Screening	MW-11	MW-11	MW-11	MW-11	MW-11
	Criteria (a)	5/23/2001	8/29/2001	1/10/2003	5/16/2003	12/17/2003
TOTAL PETROLEUM HYDROCARBONS (mg/L)						
Diesel Range Organics	0.5					
Lube Oil	0.5					
Gasoline Range Organics	0.8/1.0 (b)	0.05 U	0.05 U	**0.073**	0.05 U	**0.1**
BTEX/NAPHTHALENES (µg/L)						
Benzene	5	1 U	1 U	**6**	1 U	**4**
Toluene	1000	1 U	1 U	1 U	1 U	1 U
Ethylbenzene	700	1 U	1 U	1 U	1 U	1 U
m, p-Xylene						
o-Xylene						
Xylenes, Total	1000 (c)					
Methyl tert butyl ether (MTBE)	20		3 U	3 U		
1,2-Dichloroethane (EDC)	5					
Ethylene Dibromide (EDB)	0.01					
Naphthalene	160					
CONVENTIONALS (mg/L)						
Nitrate	--					
Sulfate	--					

TABLE 5F-3
AREA F GROUNDWATER QUALITY RESULTS
PEDERSON'S FRYER FARMS RI

	Groundwater Screening Criteria (a)	MW-11 3/16/2004	MW-11 2/3/2005	MW-11 5/26/2005	MW-11 12/7/2010	MW-11 6/1/2011
TOTAL PETROLEUM HYDROCARBONS (mg/L)						
Diesel Range Organics	0.5				0.1 U	0.12 UJ
Lube Oil	0.5				0.2 U	0.24 UJ
Gasoline Range Organics	0.8/1.0 (b)	0.05 U	0.05 U	0.05 U	0.1 U	0.05 U
BTEX/NAPHTHALENES (µg/L)						
Benzene	5	1 U	1 U	1 U	0.25 U	0.5 U
Toluene	1000	1 U	1 U	1 U	0.25 U	0.5 U
Ethylbenzene	700	1 U	1 U	1 U	0.25 U	0.5 U
m, p-Xylene					0.5 U	1 U
o-Xylene					0.25 U	1 U
Xylenes, Total	1000 (c)					
Methyl tert butyl ether (MTBE)	20					
1,2-Dichloroethane (EDC)	5					
Ethylene Dibromide (EDB)	0.01					
Naphthalene	160					
CONVENTIONALS (mg/L)						
Nitrate	--					0.9 U
Sulfate	--					**12**

TABLE 5F-3
AREA F GROUNDWATER QUALITY RESULTS
PEDERSON'S FRYER FARMS RI

	Groundwater Screening Criteria (a)	MW-12 5/22/2001	MW-12 5/16/2003	MW-12 12/17/2003	MW-12 3/16/2004	MW-12 12/7/2010
TOTAL PETROLEUM HYDROCARBONS (mg/L)						
Diesel Range Organics	0.5					0.1 U
Lube Oil	0.5					0.2 U
Gasoline Range Organics	0.8/1.0 (b)	0.05 U	0.05 U	0.05 U	0.05 U	0.1 U
BTEX/NAPHTHALENES (µg/L)						
Benzene	5	1 U	1 U	1 U	1 U	0.25 U
Toluene	1000	1 U	1 U	1 U	1 U	0.25 U
Ethylbenzene	700	1 U	1 U	1 U	1 U	0.25 U
m, p-Xylene						0.5 U
o-Xylene						0.25 U
Xylenes, Total	1000 (c)					
Methyl tert butyl ether (MTBE)	20					
1,2-Dichloroethane (EDC)	5					
Ethylene Dibromide (EDB)	0.01					
Naphthalene	160					
CONVENTIONALS (mg/L)						
Nitrate	--					
Sulfate	--					

TABLE 5F-3
AREA F GROUNDWATER QUALITY RESULTS
PEDERSON'S FRYER FARMS RI

	Groundwater Screening Criteria (a)	MW-13 5/23/2001	MW-13 5/16/2003	MW-13 12/17/2003	MW-13 3/16/2004	MW-13 12/7/2010
TOTAL PETROLEUM HYDROCARBONS (mg/L)						
Diesel Range Organics	0.5					0.1 U
Lube Oil	0.5					0.2 U
Gasoline Range Organics	0.8/1.0 (b)	0.05 U	0.05 U	0.05 U	0.05 U	0.1 U
BTEX/NAPHTHALENES (µg/L)						
Benzene	5	1 U	1 U	1 U	1 U	0.25 U
Toluene	1000	1 U	1 U	1 U	1 U	0.25 U
Ethylbenzene	700	1 U	1 U	1 U	1 U	0.25 U
m, p-Xylene						0.5 U
o-Xylene						0.25 U
Xylenes, Total	1000 (c)					
Methyl tert butyl ether (MTBE)	20					
1,2-Dichloroethane (EDC)	5					
Ethylene Dibromide (EDB)	0.01					
Naphthalene	160					
CONVENTIONALS (mg/L)						
Nitrate	--					
Sulfate	--					

TABLE 5F-3
AREA F GROUNDWATER QUALITY RESULTS
PEDERSON'S FRYER FARMS RI

	Groundwater Screening Criteria (a)	MW-14 5/16/2003	MW-14 3/17/2004	MW-29D 6/2/2011	MW-29D-Dup 6/2/2011	MW-29D 6/28/2011
TOTAL PETROLEUM HYDROCARBONS (mg/L)						
Diesel Range Organics	0.5			0.12 UJ		0.12 U
Lube Oil	0.5			0.24 UJ		0.25 U
Gasoline Range Organics	0.8/1.0 (b)	0.05 U	0.05 U	0.05 U		0.05 U
BTEX/NAPHTHALENES (µg/L)						
Benzene	5	1 U	1 U	0.1 U	0.1 U	0.5 U
Toluene	1000	1 U	1 U	0.1 U	0.1 U	0.5 U
Ethylbenzene	700	1 U	1 U	0.1 U	0.1 U	0.5 U
m, p-Xylene				0.2 U	0.2 U	1 U
o-Xylene				0.1 U	0.1 U	1 U
Xylenes, Total	1000 (c)					
Methyl tert butyl ether (MTBE)	20			0.1 U	0.1 U	1 U
1,2-Dichloroethane (EDC)	5			0.1 U	0.1 U	
Ethylene Dibromide (EDB)	0.01			0.01 U	0.01 U	
Naphthalene	160			0.4 U	0.4 U	
CONVENTIONALS (mg/L)						
Nitrate	--			**1.3**		**0.99**
Sulfate	--			**11**		**13**

TABLE 5F-3
AREA F GROUNDWATER QUALITY RESULTS
PEDERSON'S FRYER FARMS RI

	Groundwater Screening Criteria (a)	MW-35S 6/1/2011		MW-35S 6/28/2011	
TOTAL PETROLEUM HYDROCARBONS (mg/L)					
Diesel Range Organics	0.5	**0.78**	J	**1.2**	
Lube Oil	0.5	**0.29**	J	0.24	U
Gasoline Range Organics	0.8/1.0 (b)	**9.8**	J	**7.4**	J
BTEX/NAPHTHALENES (µg/L)					
Benzene	5	**22**		**15**	
Toluene	1000	**19**		**12**	
Ethylbenzene	700	**560**		**340**	
m, p-Xylene		**1300**		**720**	
o-Xylene		**82**		**58**	
Xylenes, Total	1000 (c)				
Methyl tert butyl ether (MTBE)	20			1	U
1,2-Dichloroethane (EDC)	5				
Ethylene Dibromide (EDB)	0.01				
Naphthalene	160				
CONVENTIONALS (mg/L)					
Nitrate	--	0.9	U	0.9	U
Sulfate	--	1.2	U	1.2	U

U = Indicates the compound was undetected at the reported concentration.

J = Indicates the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

UJ = The analyte was not detected in the sample; the reported sample reporting limit is an estimate.

Bold = Detected compound.

Box = Exceedance screening criteria.

-- = Screening criteria is not available for the individual constituent.

(a) MTCA Method A CULs were used as screening criteria.

(b) Screening criteria is 0.8 ug/L if benzene is present and 1.0 ug/L if benzene is not present

(c) Screening criteria cannot be exceeded by the sum of individual xylene concentrations.

TABLE 5G-1
AREA G 2000 EXCAVATION - FINAL CONFIRMATION SOIL SAMPLE RESULTS
PEDERSON'S FRYER FARMS RI

	Soil Screening Criteria (a)	UST2-EX-7-3 8/29/2000	UST2-EX-8-5 8/29/2000	UST2-EX-9-7 8/29/2000	UST2-EX-11-6 8/29/2000	UST2-EX-12-11 8/29/2000	UST2-EX-13-14 8/29/2000	UST2-EX-14-12 8/29/2000
GASOLINE/BTEX (mg/kg)								
Gasoline Range Organics	30/100 (b)	5 U	5 U	**9**	10 U	10 U	10 U	10
Benzene	0.03	0.1 U	0.1 U	0.1 U	0.05 U	0.05 U	**0.06**	0.05
Ethylbenzene	7	0.1 U	0.1 U	0.1 U	0.05 U	0.05 U	0.06 U	0.05
Toluene	6	0.1 U	0.1 U	0.1 U	0.05 U	0.05 U	**0.1**	0.05
Xylenes, Total	9 (c)	0.3 U	0.3 U	0.3 U	0.05 U	0.05 U	0.06 U	0.05
TOTAL METALS (mg/kg)								
Lead	250							

TABLE 5G-1
AREA G 2000 EXCAVATION - FINAL CONFIRMATION SOIL SAMPLE RESULTS
PEDERSON'S FRYER FARMS RI

	Soil Screening Criteria (a)		UST2-EX-15-12 8/29/2000	UST2-EX-16-9 8/29/2000	UST2-EX-17-12 8/29/2000	UST2-EX-18-8 8/30/2000	UST2-EX-19-11 8/30/2000	UST2-EX-21-11 8/30/2000
GASOLINE/BTEX (mg/kg)								
Gasoline Range Organics	30/100 (b)	U	**183**	10 U	10 U	10 U	10 U	5 U
Benzene	0.03	U	**4**	0.05 U	0.05 U	0.05 U	0.05 U	0.1 U
Ethylbenzene	7	U	**2.5**	0.05 U	0.05 U	0.05 U	0.05 U	0.1 U
Toluene	6	U	**9.5**	0.05 U	0.05 U	0.05 U	0.05 U	0.1 U
Xylenes, Total	9 (c)	U	**3.9**	0.05 U	0.05 U	0.05 U	0.05 U	0.3 U
TOTAL METALS (mg/kg)								
Lead	250		5 U					

TABLE 5G-1
AREA G 2000 EXCAVATION - FINAL CONFIRMATION SOIL SAMPLE RESULTS
PEDERSON'S FRYER FARMS RI

	Soil Screening Criteria (a)	UST2-EX-23-8 8/30/2000	UST2-EX-24-4 8/30/2000	UST2-EX-25-12 8/30/2000	UST2-EX-26-14 8/30/2000	UST2-EX-27-4 8/30/2000	UST2-EX-28-8 8/30/2000
GASOLINE/BTEX (mg/kg)							
Gasoline Range Organics	30/100 (b)	10 U	10 U	10 U	10 U	10 U	10 U
Benzene	0.03	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Ethylbenzene	7	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Toluene	6	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Xylenes, Total	9 (c)	0.05 U	0.05 U	0.05 U	0.05 U	**0.06**	0.05 U
TOTAL METALS (mg/kg)							
Lead	250						

TABLE 5G-1
AREA G 2000 EXCAVATION - FINAL CONFIRMATION SOIL SAMPLE RESULTS
PEDERSON'S FRYER FARMS RI

	Soil Screening Criteria (a)	UST2-EX-29-12 8/30/2000	UST2-EX-30-4 8/30/2000	UST2-EX-31-8 8/30/2000	UST2-EX-32-12 8/30/2000	UST2-EX-33-4 8/30/2000	UST2-EX-34-8 8/30/2000
GASOLINE/BTEX (mg/kg)							
Gasoline Range Organics	30/100 (b)	10 U	10 U	10 U	10 U	5 U	5 U
Benzene	0.03	0.05 U	0.05 U	0.05 U	0.05 U	0.1 U	0.1 U
Ethylbenzene	7	0.05 U	0.05 U	0.05 U	0.05 U	0.1 U	0.1 U
Toluene	6	0.05 U	0.05 U	0.05 U	0.05 U	0.1 U	0.1 U
Xylenes, Total	9 (c)	0.05 U	0.05 U	0.05 U	0.05 U	0.3 U	0.3 U
TOTAL METALS (mg/kg)							
Lead	250						

TABLE 5G-1
AREA G 2000 EXCAVATION - FINAL CONFIRMATION SOIL SAMPLE RESULTS
PEDERSON'S FRYER FARMS RI

	Soil Screening Criteria (a)	UST2-EX-35-12 8/30/2000	UST2-EX-36-14 8/30/2000	UST2-EX-37-12 8/30/2000
GASOLINE/BTEX (mg/kg)				
Gasoline Range Organics	30/100 (b)	5 U	5 U	**34**
Benzene	0.03	0.1 U	0.1 U	0.1 U
Ethylbenzene	7	0.1 U	0.1 U	**0.1**
Toluene	6	0.1 U	0.1 U	0.1 U
Xylenes, Total	9 (c)	0.3 U	0.3 U	0.3 U
TOTAL METALS (mg/kg)				
Lead	250			**4**

U = Indicates the compound was not detected at the reported concentration.
Bold = Detected compound.
Box = Exceedance of screening criteria.
(a) MTCA Method A CULs for Unrestricted Land Uses were used as screening criteria.
(b) Screening criteria is 30 mg/kg if benzene is present and 100 mg/kg if benzene is not present.
(c) Screening criteria cannot be exceeded by the sum of individual xylene concentrations.

TABLE 5G-2
AREA G PRE RI AND RI MONITORING WELL AND SOIL BORING SOIL ANALYTICAL RESULTS
PEDERSON'S FRYER FARMS RI

	Soil Screening Criteria (a)	G1-10-10.5 5/11/2011	G1-15-15.5 5/11/2011	G1-20-20.5 5/11/2011	G1-25-25.5 5/11/2011	G1-5-5.5 5/11/2011	MW-15-10 5/1/2001	MW-15-12 5/1/2001	MW-15-15 5/1/2001	MW-15-20 5/1/2001
TOTAL PETROLEUM HYDROCARBONS (mg/kg)										
Diesel Range Organics	2000	14 U	**430**	14 U	14 U	15 U				
Lube Oil	2000	28 U	28 U	27 U	28 U	29 U				
Gasoline Range Organics	30/100 (b)	4.2 U	**1200**	**11**	**6.2**	3.6 U	**120**	**6**	**6**	**7**
BTEX (mg/kg)										
Benzene	0.03		**4.3** J				0.1 U	0.1 U	0.1 U	0.1 U
Ethylbenzene	7		**2.8** J				**0.5**	0.1 U	0.1 U	0.1 U
Toluene	6		**2** J				0.1 U	0.1 U	0.1 U	0.1 U
m, p-Xylene			**5.9** J							
o-Xylene			4.1 UJ							
Xylenes, Total	9 (c)		**5.9**				**0.6**	0.3 U	0.3 U	0.3 U

TABLE 5G-2
AREA G PRE RI AND RI MONITORING WELL AND SOIL BORING SOIL ANALYTICAL RESULTS
PEDERSON'S FRYER FARMS RI

	Soil Screening Criteria (a)	MW-15-5	MW-16-15	MW-16-30	MW-30D-10-10.5	MW-30D-15-15.5	MW-30D-15-15.5-Dup	MW-30D-20-20.5
		5/1/2001	5/1/2001	5/1/2001	5/19/2011	5/19/2011	5/19/2011	5/19/2011
TOTAL PETROLEUM HYDROCARBONS (mg/kg)								
Diesel Range Organics	2000				**15**	15 U	14 U	14 U
Lube Oil	2000				27 U	29 U	28 U	28 U
Gasoline Range Organics	30/100 (b)	5 U	5 U	5 U	**110**	**49** J	**240** J	**9.4**
BTEX (mg/kg)								
Benzene	0.03	0.1 U	0.1 U	0.1 U		**0.19** J	**0.81** J	
Ethylbenzene	7	0.1 U	0.1 U	0.1 U		**0.28** J	**1.3** J	
Toluene	6	0.1 U	0.1 U	0.1 U		**0.083** J	0.049 UJ	
m, p-Xylene						**0.45** J	**1.7** J	
o-Xylene						0.1 UJ	**0.19** J	
Xylenes, Total	9 (c)	0.3 U	0.3 U	0.3 U		**0.55**	**1.89**	

TABLE 5G-2
AREA G PRE RI AND RI MONITORING WELL AND SOIL BORING SOIL ANALYTICAL RESULTS
PEDERSON'S FRYER FARMS RI

	Soil Screening Criteria (a)	MW-30D-30-30.5 5/19/2011	MW-30D-50-50.5 5/19/2011	MW-33S-10-10.5 5/12/2011	MW-33S-15-15.5 5/12/2011	MW-33S-20-20.5 5/12/2011	MW-33S-25-25.5 5/12/2011
TOTAL PETROLEUM HYDROCARBONS (mg/kg)							
Diesel Range Organics	2000	14 U	14 U	14 U	14 U	14 U	13 U
Lube Oil	2000	27 U	28 U	29 U	28 U	28 U	27 U
Gasoline Range Organics	30/100 (b)	5 U	4.2 U	3.4 U	4 U	3.5 U	3.6 U
BTEX (mg/kg)							
Benzene	0.03					0.017 U	
Ethylbenzene	7					0.044 U	
Toluene	6					0.044 U	
m, p-Xylene						0.087 U	
o-Xylene						0.087 U	
Xylenes, Total	9 (c)						

TABLE 5G-2
AREA G PRE RI AND RI MONITORING WELL AND SOIL BORING SOIL ANALYTICAL RESULTS
PEDERSON'S FRYER FARMS RI

	Soil Screening Criteria (a)	MW-33S-30-30.5 5/12/2011
TOTAL PETROLEUM HYDROCARBONS (mg/kg)		
Diesel Range Organics	2000	13 U
Lube Oil	2000	27 U
Gasoline Range Organics	30/100 (b)	3.5 U
BTEX (mg/kg)		
Benzene	0.03	
Ethylbenzene	7	
Toluene	6	
m, p-Xylene		
o-Xylene		
Xylenes, Total	9 (c)	

U = Indicates the compound was not detected at the reported concentration.
J = Indicates the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ = The analyte was not detected in the sample; the reported sample reporting limit is an estimate.
Bold = Detected compound.
Box = Exceedance of screening criteria.
(a) MTCA Method A CULs for Unrestricted Land Uses were used as screening criteria.
(b) Screening criteria is 30 mg/kg if benzene is present and 100 mg/kg if benzene is not present.
(c) Screening criteria cannot be exceeded by the sum of individual xylene concentrations.

TABLE 5G-3
AREA G GROUNDWATER QUALITY RESULTS
PEDERSON'S FRYER FARMS RI

	Groundwater Screening Criteria (a)	MW-15 5/23/2001	MW-15 8/29/2001	MW-15 1/10/2003	MW-15 5/16/2003
TOTAL PETROLEUM HYDROCARBONS (mg/L)					
Diesel Range Organics	0.5				
Lube Oil	0.5				
Gasoline Range Organics	0.8/1.0 (b)	**3**	**1**	**5.4**	**0.1**
BTEX/NAPHTHALENES (µg/L)					
Benzene	5	10 U	1 U	5 U	1 U
Toluene	1000	10 U	**1**	**94**	1 U
Ethylbenzene	700	**130**	**10**	**280**	**5**
m, p-Xylene					
o-Xylene					
Xylenes, Total	1000 (c)				
Methyl tert butyl ether (MTBE)	20		3 U	15 U	
1,2-Dichloroethane (EDC)	5				
Ethylene Dibromide (EDB)	0.01				
Naphthalene	160				
DISSOLVED METALS (µg/L)					
Manganese	--				
CONVENTIONALS (mg/L)					
Alkalinity	--				
Nitrate	--				
Sulfate	--				
Total Organic Carbon	--				
DISSOLVED GASES (mg/L)					
Methane	--				

TABLE 5G-3
AREA G GROUNDWATER QUALITY RESULTS
PEDERSON'S FRYER FARMS RI

	Groundwater Screening Criteria (a)	MW-15 8/20/2003	MW-15 12/17/2003	MW-15 3/17/2004	MW-15 7/7/2004
TOTAL PETROLEUM HYDROCARBONS (mg/L)					
Diesel Range Organics	0.5				
Lube Oil	0.5				
Gasoline Range Organics	0.8/1.0 (b)	**0.71**	**2.8**	**1.8**	**2.2**
BTEX/NAPHTHALENES (µg/L)					
Benzene	5	**1**	**8**	**4**	**4**
Toluene	1000	1 U	**30**	**8**	**6**
Ethylbenzene	700	**1**	**110**	**71**	**21**
m, p-Xylene					
o-Xylene					
Xylenes, Total	1000 (c)				
Methyl tert butyl ether (MTBE)	20				
1,2-Dichloroethane (EDC)	5				
Ethylene Dibromide (EDB)	0.01				
Naphthalene	160				
DISSOLVED METALS (µg/L)					
Manganese	--				
CONVENTIONALS (mg/L)					
Alkalinity	--				
Nitrate	--				
Sulfate	--				
Total Organic Carbon	--				
DISSOLVED GASES (mg/L)					
Methane	--				

TABLE 5G-3
AREA G GROUNDWATER QUALITY RESULTS
PEDERSON'S FRYER FARMS RI

	Groundwater Screening Criteria (a)	MW-15 10/13/2004	MW-15 2/3/2005	MW-15 5/26/2005	MW-15 9/1/2005
TOTAL PETROLEUM HYDROCARBONS (mg/L)					
Diesel Range Organics	0.5				
Lube Oil	0.5				
Gasoline Range Organics	0.8/1.0 (b)	**0.76**	**1.5**	**0.18**	**1.2**
BTEX/NAPHTHALENES (µg/L)					
Benzene	5	**1**	**5**	1 U	**3**
Toluene	1000	**2**	**8**	1 U	**1**
Ethylbenzene	700	**19**	**57**	**5**	**1**
m, p-Xylene					
o-Xylene					
Xylenes, Total	1000 (c)				
Methyl tert butyl ether (MTBE)	20				
1,2-Dichloroethane (EDC)	5				
Ethylene Dibromide (EDB)	0.01				
Naphthalene	160				
DISSOLVED METALS (µg/L)					
Manganese	--				
CONVENTIONALS (mg/L)					
Alkalinity	--				
Nitrate	--				
Sulfate	--				
Total Organic Carbon	--				
DISSOLVED GASES (mg/L)					
Methane	--				

TABLE 5G-3
AREA G GROUNDWATER QUALITY RESULTS
PEDERSON'S FRYER FARMS RI

	Groundwater Screening Criteria (a)	MW-15 12/8/2010	MW-15 6/2/2011	MW-15 6/28/2011	MW-15-Dup 6/28/2011
TOTAL PETROLEUM HYDROCARBONS (mg/L)					
Diesel Range Organics	0.5	0.1 U	**0.26** J	**0.25**	
Lube Oil	0.5	0.2 U	0.24 UJ	0.24 U	
Gasoline Range Organics	0.8/1.0 (b)	**2.1**	**0.88**	**0.64**	**0.59**
BTEX/NAPHTHALENES (µg/L)					
Benzene	5	0.25 U	**0.12**	0.5 U	0.5 U
Toluene	1000	**3.1**	**1.4**	**1.8**	**1.7**
Ethylbenzene	700	**6.3**	**5**	**4.4** J	**3** J
m, p-Xylene		**37**	**12**	1 U	1 U
o-Xylene		**0.73**	**0.46**	1 U	1 U
Xylenes, Total	1000 (c)				
Methyl tert butyl ether (MTBE)	20		0.1 U	1 U	1 U
1,2-Dichloroethane (EDC)	5		0.1 U		
Ethylene Dibromide (EDB)	0.01		0.01 U		
Naphthalene	160		**3.9**		
DISSOLVED METALS (µg/L)					
Manganese	--		**810**		
CONVENTIONALS (mg/L)					
Alkalinity	--		**60**		
Nitrate	--		0.9 U		
Sulfate	--		**2.7**		
Total Organic Carbon	--		**2**		
DISSOLVED GASES (mg/L)					
Methane	--		0.026 U		

TABLE 5G-3
AREA G GROUNDWATER QUALITY RESULTS
PEDERSON'S FRYER FARMS RI

	Groundwater Screening Criteria (a)	MW-16 5/23/2001	MW-16 5/16/2003	MW-16 12/17/2003	MW-16 3/17/2004
TOTAL PETROLEUM HYDROCARBONS (mg/L)					
Diesel Range Organics	0.5				
Lube Oil	0.5				
Gasoline Range Organics	0.8/1.0 (b)	0.05 U	0.05 U	0.05 U	0.05 U
BTEX/NAPHTHALENES (µg/L)					
Benzene	5	1 U	1 U	1 U	1 U
Toluene	1000	1 U	1 U	1 U	1 U
Ethylbenzene	700	1 U	1 U	1 U	1 U
m, p-Xylene					
o-Xylene					
Xylenes, Total	1000 (c)				
Methyl tert butyl ether (MTBE)	20				
1,2-Dichloroethane (EDC)	5				
Ethylene Dibromide (EDB)	0.01				
Naphthalene	160				
DISSOLVED METALS (µg/L)					
Manganese	--				
CONVENTIONALS (mg/L)					
Alkalinity	--				
Nitrate	--				
Sulfate	--				
Total Organic Carbon	--				
DISSOLVED GASES (mg/L)					
Methane	--				

TABLE 5G-3
AREA G GROUNDWATER QUALITY RESULTS
PEDERSON'S FRYER FARMS RI

	Groundwater Screening Criteria (a)	MW-16 2/3/2005	MW-16 5/26/2005	MW-30D 6/2/2011	MW-30D 6/28/2011
TOTAL PETROLEUM HYDROCARBONS (mg/L)					
Diesel Range Organics	0.5			0.12 UJ	0.12 U
Lube Oil	0.5			0.24 UJ	0.24 U
Gasoline Range Organics	0.8/1.0 (b)	0.05 U	0.05 U	0.05 U	0.05 U
BTEX/NAPHTHALENES (µg/L)					
Benzene	5	1 U	1 U	0.5 U	0.5 U
Toluene	1000	1 U	1 U	0.5 U	0.5 U
Ethylbenzene	700	1 U	1 U	0.5 U	0.5 U
m, p-Xylene				1 U	1 U
o-Xylene				1 U	1 U
Xylenes, Total	1000 (c)				
Methyl tert butyl ether (MTBE)	20				1 U
1,2-Dichloroethane (EDC)	5				
Ethylene Dibromide (EDB)	0.01				
Naphthalene	160				
DISSOLVED METALS (µg/L)					
Manganese	--				
CONVENTIONALS (mg/L)					
Alkalinity	--				
Nitrate	--			**1.1**	**0.97**
Sulfate	--			**10**	**10**
Total Organic Carbon	--				
DISSOLVED GASES (mg/L)					
Methane	--				

TABLE 5G-3
AREA G GROUNDWATER QUALITY RESULTS
PEDERSON'S FRYER FARMS RI

	Groundwater Screening Criteria (a)	MW-30D-Dup 6/28/2011
TOTAL PETROLEUM HYDROCARBONS (mg/L)		
Diesel Range Organics	0.5	
Lube Oil	0.5	
Gasoline Range Organics	0.8/1.0 (b)	
BTEX/NAPHTHALENES (µg/L)		
Benzene	5	
Toluene	1000	
Ethylbenzene	700	
m, p-Xylene		
o-Xylene		
Xylenes, Total	1000 (c)	
Methyl tert butyl ether (MTBE)	20	
1,2-Dichloroethane (EDC)	5	
Ethylene Dibromide (EDB)	0.01	
Naphthalene	160	
DISSOLVED METALS (µg/L)		
Manganese	--	
CONVENTIONALS (mg/L)		
Alkalinity	--	
Nitrate	--	**0.97**
Sulfate	--	**10**
Total Organic Carbon	--	
DISSOLVED GASES (mg/L)		
Methane	--	

U = Indicates the compound was undetected at the reported concentration.

J = Indicates the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

UJ = The analyte was not detected in the sample; the reported sample reporting limit is an estimate.

Bold = Detected compound.

Box = Exceedance screening criteria.

-- = Screening criteria is not available for the individual constituent.

(a) MTCA Method A CULs were used as screening criteria.

(b) Screening criteria is 0.8 ug/L if benzene is present and 1.0 ug/L if benzene is not present.

(c) Screening criteria cannot be exceeded by the sum of individual xylene concentrations.

6.0 CONTAMINATION FATE AND TRANSPORT

TPH releases have been confirmed at six of the seven UST areas. The remaining UST area, Area D, did not detect evidence of a release. With the possible exception of Area G, residual soil contamination is still attributed to the UST areas where an original release occurred. The remaining soil contamination results in localized shallow groundwater contamination at most of the UST areas. With the exception of Area A, the relatively low permeability of the ablation till has limited the migration of groundwater contamination from the shallow zone into the deep zone. The primary contaminant transport mechanism appears to be advection of dissolved phase TPH contamination.

6.1 SHALLOW WATER BEARING ZONE

Shallow monitoring wells are present within or near each of the five UST area excavations. With the exception of Area G well MW-33S[24], groundwater impacts have been detected at each of these UST areas (Area A, Area B, Area C and Area F). At Area G, well MW-15 has GRO contamination; however it is not clear if this contamination is associated with Area F or Area G releases. At Area E, a borehole sample and observations during recent UST decommissioning indicated the presence of shallow groundwater contamination. The UST at Area E (unlike Area A, B, C, and F) had not been decommissioned until the RI (May 2011). Therefore, the source of shallow groundwater contamination and residual soil contamination may be associated with historical and recent releases from the UST. In Areas B, C and G, where most of the TPH contaminated soil was removed, the resulting shallow groundwater contamination appears to be minimal. Current groundwater concentrations are higher at Areas E and F where it appears that significant soil contamination may be present beneath buildings.

The most significant shallow zone groundwater contamination is associated with Area A. DRO contamination has been detected at all Area A shallow zone wells located in all directions from the excavation, extending as far as 60 ft horizontally from the excavation (at MW-6). The more extensive shallow zone contamination at Area A is attributed to a number of factors. Area A had the most tanks and there was likely a much more significant historical release at this location relative to other UST areas. Additionally, after remedial excavations were performed, residual contamination remained along the excavation sidewalls and beneath the excavation bottom. The final factor is the concentrated infiltration effect associated with the 2000 excavation. The concentrated infiltration likely causes higher horizontal and vertical hydraulic gradients within the shallow zone that facilitates more rapid contaminant migration at Area A relative to other UST areas.

---

[24] Well MW-33S has always been dry during RI sampling events.

Horizontal contaminant migration in the shallow water bearing zone throughout the site is likely limited, even at Area A. The heterogeneous, poorly graded, very dense and silty nature of ablation till likely limits the potential for direct migration of LNAPL. These types of soil conditions are likely to cause high levels of residual saturation. Similarly, the lack of a distinct water table also likely limits the horizontal movement of LNAPL. The general lack of LNAPL at shallow zone wells (see Section 5.8) is consistent with the limited potential for horizontal shallow zone LNAPL migration.

Advection of dissolved phase TPH constituents is considered the most likely method of horizontal contaminant migration. The extent of the Area A excavation is characterized as a location of enhanced recharge where precipitation and surface water run-on preferentially infiltrate into the more permeable backfill soil. It is likely that during the winter, the concentrated infiltration creates seasonally significant horizontal gradients that contribute to the horizontal migration of TPH contamination away from the excavation. This same process may occur to a lesser extent at Area F where apparent mounding is present (Section 4.0).

6.2 DEEP WATER BEARING ZONE

The deep water bearing zone is impacted with TPH contamination over a relatively broad area in the vicinity of Area A. The farthest distance from the excavation that deep groundwater contamination is attributed to Area A is 130 ft away at well MW-31D. The source of contamination to the deep zone is likely both LNAPL and advection of dissolved phase constituents from the former Area A tank farm. The released product likely migrated vertically resulting in a smear zone that extends below the limits of the 2000 excavation. The distribution of this smear zone is likely heterogeneous, like the surrounding ablation till. Both confirmation soil sampling and field observations (see Table 5-5 and Appendix E) support this assessment. However, LNAPL field observations made during groundwater monitoring events (see Section 5.8) suggest that LNAPL free product migration to the deep water bearing zone is limited. As discussed in Section 6.1, ablation till soil conditions limit the potential for LNAPL migration. The one exception is well MW-17. This well is considered to have been a preferred pathway for LNAPL and groundwater migration from the Area A excavation into the deep water bearing zone.

Advection of dissolved phase constituents is the primary contaminant mechanism to and within the deep water bearing zone. The enhanced infiltration that occurs at Area A and causes mounding in the deep water bearing zone contributes to vertical movement of groundwater and contaminant migration by advection. The deep water bearing zone mound that is caused by the Area A excavation appears to cause residual TPH contamination to spread out radially in all directions. All of the current detections of TPH contamination in deep water bearing zone wells are attributed to advective contaminant migration from Area A. This includes well MW-22 that is located about 100 ft east of the excavation, MW-28D and

MW-9 located about 70 ft southeast of the excavation and MW-31D located about 130 ft south of the excavation.

The Area F excavation was also relatively large and extended down to a maximum of 24 ft BGS in places. There is also an apparent groundwater mound in the deep zone associated with this excavation. The two deep wells located near this excavation, MW-29D and MW-30D have not detected TPH contamination. The relative lack of contaminant migration associated with this excavation in comparison to Area A is attributed to the smaller size of the Area F excavation and likely, the smaller amount of contamination that was released at this location.

6.3 MONITORED NATURAL ATTENUATION

Groundwater contaminant migration rates are difficult to estimate at the site because groundwater gradients are seasonally variable (see Section 4.0) and because TPH tends to attenuate through biologically mediated processes particularly in aerobic aquifers (i.e., where dissolved oxygen is greater than 1 mg/L). Data was collected to document natural attenuation parameters of the shallow and deep water bearing zone. These data indicate that with a few exceptions, the shallow and deep water bearing zones are aerobic. These data will be evaluated in the FS. An initial summary of these data are presented in Table 6.1.

TABLE 6-1
NATURAL ATTENUATION PARAMETERS - GROUNDWATER ANALYTICAL RESULTS
PEDERSON'S FRYER FARMS RI

Aquifer	Area	Well ID	Lab ID	Date Collected	Dissolved Oxygen (mg/L)	Nitrate (mg/L) Method EPA300.0		Ferrous Iron (mg/L)	Sulfate (mg/L) Method EPA300.0		Methane (mg/L)	
S	A	MW-01	26582-4	6/3/2011	9.82	0.9	U	--	**5.2**		--	
S	A	MW-02	26582-1	6/3/2011	7.08	**1.8**		0.8	**9.3**		--	
S	A	MW-04	26596-4	6/5/2011	3.11	**1.0**		0	**4.2**		**0.0359**	
S	A	MW-26S	26524-1	6/1/2011	2.50	0.90	U	0	**4.3**		--	
				Median S - A	*5.10*	*0.95*		*0.00*	*4.75*		*0.04*	
S	B	MW-08	26533-8	6/2/2011	8.90	0.90	U	0	**9.3**		--	
S	F	MW-11	26524-2	6/1/2011	5.62	0.90	U	0	**12**		--	
S	F	MW-35S	26524-4	6/1/2011	2.73	0.90	U	2	1.2	U	--	
S	G	MW-15	26533-5	6/2/2011	5.47	0.90	U	2	**2.7**		0.0260	U
S	G	MW-34S	26524-6	6/1/2011	2.68	0.90	U	0	**6.6**			
				Median - All S	*5.28*	*0.90*		*0.00*	*4.98*		*0.04*	
D	A	MW-7R	26596-3	6/5/2011	2.04	0.90	U	0	**3.0**		--	
D	A	MW-19	26596-5	6/5/2011	5.79	0.90	U	2	**4.1**		--	
D	A	MW-20	26596-1	6/5/2011	1.81	0.90	U	2.4	1.2	U	--	
D	A	MW-22	26582-3	6/3/2011	7.55	**1.1**		0	**6.1**		--	
D	A	MW-25D	26582-2	6/3/2011/	0.88	0.90	U	2.5	1.2		**6.89**	
D	A	MW-27D	26582-5	6/3/2011	1.30	0.90	U	2	**3.0**		**4.91**	
				Median D - A	*1.93*	*0.90*		*2.00*	*3.00*		*5.90*	
D	A/B	MW-09	26533-12	6/2/2011	2.36	**4.7**		0	**9.7**		--	
D	A/B	MW-28D	26533-11	6/2/2011	0.78	0.90	U	2.5	1.2	U	--	
D	C	MW-31D	26533-2	6/2/2011	1.79	0.90	U	3	1.2	U	--	
D	F	MW-29D	26533-3	6/2/2011	6.17	**1.3**		0	**11**		--	
D	G	MW-30D	26533-7	6/2/2011	4.16	**1.1**		0	**10**		--	
D	--	MW-32D	26533-4	6/2/2011	4.49	**2.4**		0	**16**		--	
				Median All D	*3.26*	*1.20*		*0.00*	*9.85*			

U = Indicates the compound was undetected at the reported concentration.
Bold = Detected compound.

7.0 USE OF THIS REPORT

This remedial investigation report has been prepared for the exclusive use of Ecology for specific application to the Pederson's Fryer Farms site. No other party is entitled to rely on the information, conclusions, and recommendations included in this document without the express written consent of Landau Associates. Further, the reuse of information, conclusions, and recommendations provided herein for extensions of the project or for any other project, without review and authorization by Landau Associates, shall be at the user's sole risk. Landau Associates warrants that within the limitations of scope, schedule, and budget, our services have been provided in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions as this project. We make no other warranty, either express or implied.

This document has been prepared under the supervision and direction of the following key staff. Environmental

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APPENDIX A

Pre RI Documents

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APPENDIX E

Boring Logs

Soil Classification System

MAJOR DIVISIONS			GRAPHIC SYMBOL	USCS LETTER SYMBOL(1)	TYPICAL DESCRIPTIONS (2)(3)
COARSE-GRAINED SOIL (More than 50% of material is larger than No. 200 sieve size)	GRAVEL AND GRAVELLY SOIL (More than 50% of coarse fraction retained on No. 4 sieve)	CLEAN GRAVEL (Little or no fines)	▦	**GW**	Well-graded gravel; gravel/sand mixture(s); little or no fines
			▦	**GP**	Poorly graded gravel; gravel/sand mixture(s); little or no fines
		GRAVEL WITH FINES (Appreciable amount of fines)	▥	**GM**	Silty gravel; gravel/sand/silt mixture(s)
			▨	**GC**	Clayey gravel; gravel/sand/clay mixture(s)
	SAND AND SANDY SOIL (More than 50% of coarse fraction passed through No. 4 sieve)	CLEAN SAND (Little or no fines)	░	**SW**	Well-graded sand; gravelly sand; little or no fines
			░	**SP**	Poorly graded sand; gravelly sand; little or no fines
		SAND WITH FINES (Appreciable amount of fines)	▥	**SM**	Silty sand; sand/silt mixture(s)
			▨	**SC**	Clayey sand; sand/clay mixture(s)
FINE-GRAINED SOIL (More than 50% of material is smaller than No. 200 sieve size)	SILT AND CLAY (Liquid limit less than 50)		▥	**ML**	Inorganic silt and very fine sand; rock flour; silty or clayey fine sand or clayey silt with slight plasticity
			▨	**CL**	Inorganic clay of low to medium plasticity; gravelly clay; sandy clay; silty clay; lean clay
			▩	**OL**	Organic silt; organic, silty clay of low plasticity
	SILT AND CLAY (Liquid limit greater than 50)		▥	**MH**	Inorganic silt; micaceous or diatomaceous fine sand
			▨	**CH**	Inorganic clay of high plasticity; fat clay
			▩	**OH**	Organic clay of medium to high plasticity; organic silt
	HIGHLY ORGANIC SOIL		▩	**PT**	Peat; humus; swamp soil with high organic content

OTHER MATERIALS	GRAPHIC SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTIONS
PAVEMENT	■	**AC** or **PC**	Asphalt concrete pavement or Portland cement pavement
ROCK	▩	**RK**	Rock (See Rock Classification)
WOOD	▩	**WD**	Wood, lumber, wood chips
DEBRIS	▩	**DB**	Construction debris, garbage

NOTES:

1. USCS letter symbols correspond to symbols used by the Unified Soil Classification System and ASTM classification methods. Dual letter symbols (e.g., SP-SM for sand or gravel) indicate soil with an estimated 5-15% fines. Multiple letter symbols (e.g., ML/CL) indicate borderline or multiple soil classifications.
2. Soil descriptions are based on the general approach presented in the *Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)*, outlined in ASTM D 2488. Where laboratory index testing has been conducted, soil classifications are based on the *Standard Test Method for Classification of Soils for Engineering Purposes*, as outlined in ASTM D 2487.
3. Soil description terminology is based on visual estimates (in the absence of laboratory test data) of the percentages of each soil type and is defined as follows:

Primary Constituent:	> 50%	"GRAVEL," "SAND," "SILT," "CLAY," etc.
Secondary Constituents:	> 30% and ≤ 50%	"very gravelly," "very sandy," "very silty," etc.
	> 15% and ≤ 30%	"gravelly," "sandy," "silty," etc.
Additional Constituents:	> 5% and ≤ 15%	"with gravel," "with sand," "with silt," etc.
	≤ 5%	"trace gravel," "trace sand," "trace silt," etc., or not noted.

LANDAU ASSOCIATES

Perderson's Fryer Farms
Tacoma, Washington

Soil Classification System and Key

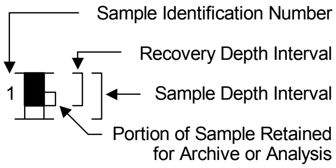
Figure
A-1
(1 of 2)

Drilling and Sampling Key

SAMPLER TYPE

Code	Description
a	3.25-inch O.D., 2.42-inch I.D. Split Spoon
b	2.00-inch O.D., 1.50-inch I.D. Split Spoon
c	Shelby Tube
d	Grab Sample
e	Single-Tube Core Barrel
f	Double-Tube Core Barrel
g	Other - See text if applicable
1	300-lb Hammer, 30-inch Drop
2	140-lb Hammer, 30-inch Drop
3	Pushed
4	Rotosonic
5	Air Rotary (Rock)
6	Wash Rotary (Rock)
7	Other - See text if applicable

SAMPLE NUMBER & INTERVAL



Field and Lab Test Data

Code	Description
PP = 1.0	Pocket Penetrometer, tsf
TV = 0.5	Torvane, tsf
PID = 100	Photoionization Detector VOC screening, ppm
W = 10	Moisture Content, %
D = 120	Dry Density, pcf
-200 = 60	Material smaller than No. 200 sieve, %
GS	Grain Size - See separate figure for data
AL	Atterberg Limits - See separate figure for data
VST	Vane Shear Test
GT	Other Geotechnical Testing
CA	Chemical Analysis

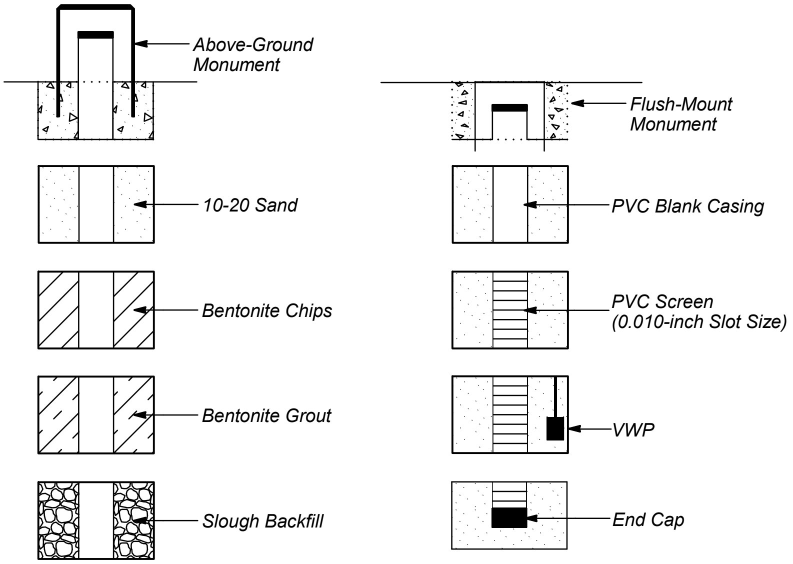
Groundwater

∇ Approximate water elevation at time of drilling (ATD).

▼ Approximate water elevation at other time(s). When multiple water levels are obtained other than ATD, only a representative range is shown. See text for additional information.

Note: Groundwater levels can fluctuate due to precipitation, seasonal conditions, and other factors.

Well Log Graphics



LANDAU ASSOCIATES

Perderson's Fryer Farms
Tacoma, Washington

Soil Classification System and Key

Figure
A-1
(2 of 2)

A-1

LAI Project No: 136006.010

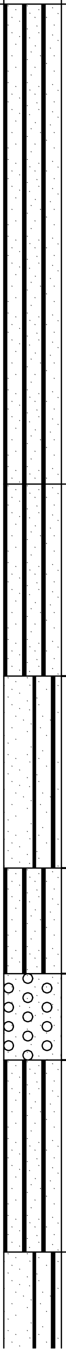
SAMPLE DATA / SOIL PROFILE

Drilling Method: Hollow-Stem Auger

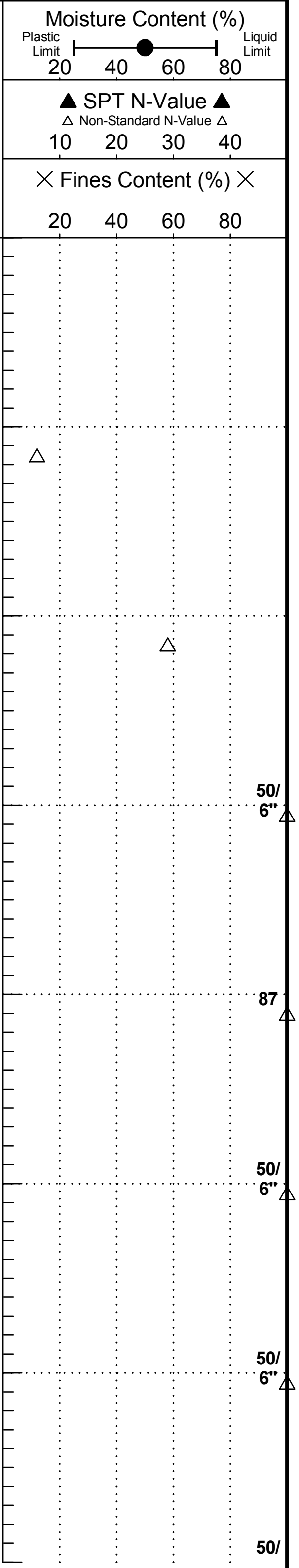
Ground Elevation (ft): Not Measured

Drilled By: Cascade Drilling Inc.

Logged By: LKM/PRR Date: 05/10/11



Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	USCS Symbol	Description	Groundwater
0					SM	Brown, very silty, fine SAND; no odor or sheen (very loose, damp) **(UNIT 1)**	
5	S-1	a1	6	0			
10	S-2	a1	29	0		- grades silty and medium dense **Soil sample: A1(10-10.5)20110510** - grades gray with brown mottling	
					SM	Brownish-gray, silty, fine to medium SAND with gravel; no odor or sheen (very dense, damp) **(UNIT 2)**	
15	S-3	a1	50/ 6"	0		**Soil sample: A1(15-1.5)20110510**	
					SP-SM	Brownish-gray, very gravelly, fine to medium SAND with silt; no odor or sheen (very dense, damp)	
20	S-4	a1	87	0		**Soil sample: A1(20-20.5)20110510**	
					SM	Brown, silty, fine to medium SAND with gravel; no odor or sheen (very dense, damp)	
25	S-5	a1	50/ 6"	0	GP	**Soil sample: A1(25-25.5)20110510** Brownish-gray, sandy GRAVEL; no odor or sheen (very dense, damp)	
					SM	Brownish-gray, silty, fine to medium SAND with gravel; no odor or sheen (very dense, damp)	
30	S-6	a1	50/ 6"	0		**Soil sample: A1(30-30.5)20110510**	
					SP-SM		
35							



Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

LANDAU ASSOCIATES

Perderson's Fryer Farms
Tacoma, Washington

Log of Boring A-1

Figure A-2
(1 of 2)

A-1

LAI Project No: 136006.010

SAMPLE DATA

SOIL PROFILE

Drilling Method: Hollow-Stem Auger
Ground Elevation (ft): Not Measured
Drilled By: Cascade Drilling Inc.
Logged By: LKM/PRR Date: 05/10/11

Moisture Content (%)
Plastic Limit ├──●──┤ Liquid Limit
20 40 60 80

▲ SPT N-Value ▲
△ Non-Standard N-Value △
10 20 30 40

× Fines Content (%) ×
20 40 60 80

Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	USCS Symbol	Description	Groundwater	SPT N-Value
35	S-7	a1	50/ 6"	0	SP-SM	Gray, gravelly, fine to medium SAND with silt; no odor or sheen (very dense, damp) **(UNIT 3)** **Soil sample: A1(35-35.5)20110510** - grades fine to coarse sand and with gravel		6" △
40	S-8	a1	50/ 6"	0		**Soil sample: A1(40-40.5)20110510**	▽ ATD	50/ 6" △
						- grades gravelly and wet; slight odor, no sheen		
45	S-9	a1	50/ 6"	3.2		**Soil sample: A1(45-45.5)20110510** **Groundwater sample: A1-20110510**		50/ 6" △
					GP-GM	Gray, sandy GRAVEL with silt; slight odor, no sheen (very dense, wet)		
50	S-10	a1	50/ 6"	34.4		**Soil sample: A1(50-50.5)20110510**		50/ 6" △

Boring Completed 05/10/11
Total Depth of Boring = 50.5 ft.

55
60
65
70

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

136006.01 9/19/11 N:\PROJECTS\136006.010.GPJ SOIL BORING LOG WITH GRAPH

LANDAU ASSOCIATES

Perderson's Fryer Farms
Tacoma, Washington

Log of Boring A-1

Figure
A-2
(2 of 2)

A-2

LAI Project No: 136006.010

SAMPLE DATA / SOIL PROFILE

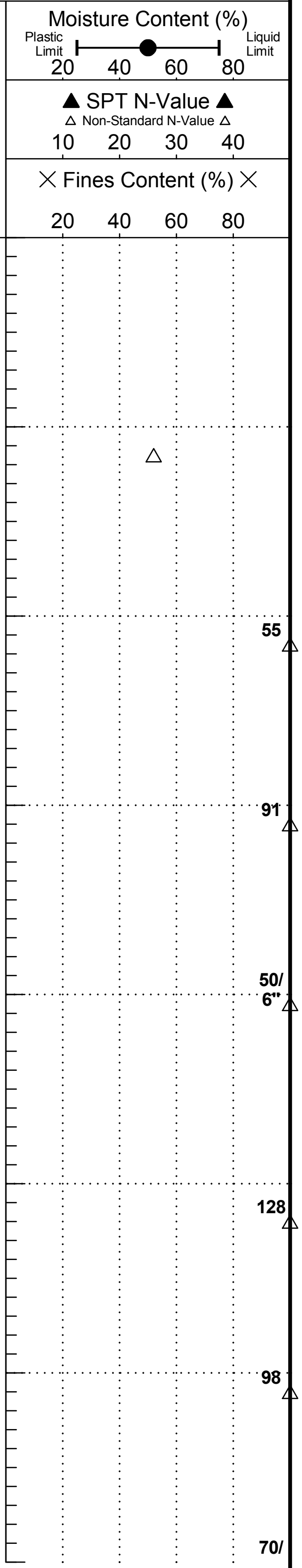
Drilling Method: Hollow-Stem Auger

Ground Elevation (ft): Not Measured

Drilled By: Cascade Drilling Inc.

Logged By: TJS Date: 05/18/11

Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	USCS Symbol	Description	Groundwater
0					SM	Brown with reddish-brown mottling, silty, fine to medium SAND with trace gravel; no odor or sheen (medium dense, damp) **(UNIT 1)**	
5	S-1	a1	26	0		**Soil sample: A2(5-5.5)20110518**	
					SP-SM	Brownish-gray, gravelly, fine to medium SAND with silt; no odor or sheen (dense, moist) **(UNIT 2)**	
10	S-2	a1	55	0		**Soil sample: A2(10-10.5)20110518**	
					GP-GM	Brownish-gray, sandy GRAVEL with silt; no odor or sheen (very dense, damp)	
15	S-3	a1	91	0		**Soil sample: A2(15-15.5)20110518**	
20	S-4	a1	50/ 6"				
					SP-SM	Gray, gravelly, fine to coarse SAND with silt; strong odor, sheen (very dense, wet) **(UNIT 3)**	ATD
25	S-5	i1	128	55.1		**Soil sample: A2(25-25.5)20110518**	
30	S-6	a1	98	28.8		- heavy sheen **Soil sample: A2(30-30.5)20110518**	
35							



Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

LANDAU ASSOCIATES

Perderson's Fryer Farms
Tacoma, Washington

Log of Boring A-2

Figure
A-3
(1 of 2)

A-2

LAI Project No: 136006.010

Drilling Method: Hollow-Stem Auger
Ground Elevation (ft): Not Measured
Drilled By: Cascade Drilling Inc.
Logged By: TJS Date: 05/18/11

SAMPLE DATA					SOIL PROFILE				Moisture Content (%) Plastic Limit / Liquid Limit 20 40 60 80; ▲ SPT N-Value ▲ △ Non-Standard N-Value △ 10 20 30 40; × Fines Content (%) × 20 40 60 80
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	Graphic Symbol	USCS Symbol		Groundwater	
35	S-7	a1	70/ 6"	60.5		SP-SM	Gray, gravelly, fine to coarse SAND with silt; strong odor, sheen (very dense, wet) **(UNIT 3)** **Soil sample: A2(35-35.5)20110518** **Groundwater sample: A2-20110518**		**6"** △
40	S-8	a1	60/ 6"	63.2			**Soil sample: A2(40-40.5)20110518**		**60/ 6"** △

Boring Completed 05/18/11
Total Depth of Boring = 40.5 ft.

45

50

55

60

65

70

Notes:
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2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Perderson's Fryer Farms Tacoma, Washington	Log of Boring A-2	Figure A-3 (2 of 2)

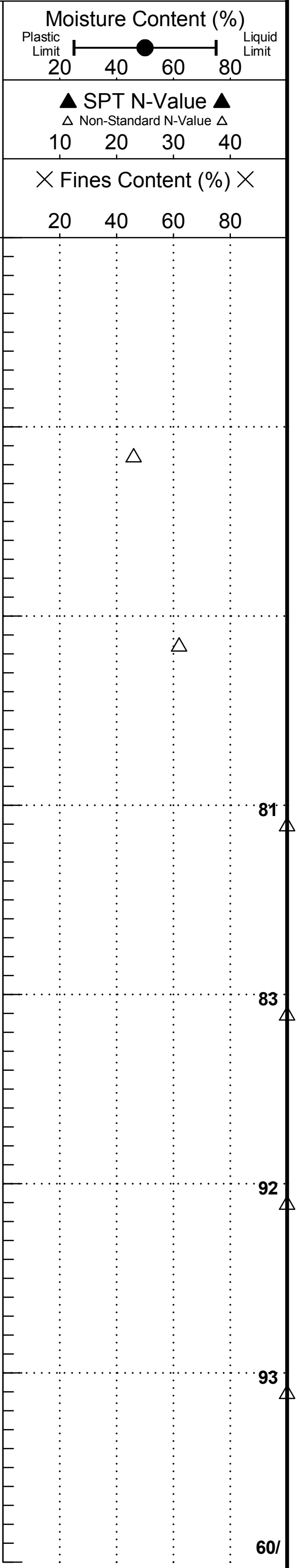
A-3

LAI Project No: 136006.010

Drilling Method: Hollow-Stem Auger
Ground Elevation (ft): Not Measured
Drilled By: Cascade Drilling Inc.
Logged By: TJS/JCS Date: 05/18/11

SAMPLE DATA / SOIL PROFILE

Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	USCS Symbol	Description	Groundwater
0					AC	Asphalt concrete pavement	
					SM	Brown with reddish brown mottling, silty, fine SAND; no odor or sheen (medium dense, damp) **(UNIT 1)**	
5	S-1	a1	23	0			
					SM	Brown, silty, fine to medium SAND with gravel; slight odor, no sheen (medium dense, damp)	
10	S-2	a1	31	0		**Soil sample: A3(10-10.5)20110518**	
					SP-SM	Grayish-brown, fine to medium SAND with gravel and silt; slight odor, no sheen (very dense, damp) **(UNIT 2)**	
15	S-3	a1	81	0		**Soil sample: A3(15-15.5)20110518**	
					GP-GM	Brown, sandy, fine to coarse GRAVEL with silt; no odor or sheen (very dense, damp)	
20	S-4	a1	83	0		**Soil sample: A3(20-20.5)20110518**	
					SM	Gray, silty, gravelly, fine to coarse SAND; hydrocarbon odor, slight sheen (very dense, damp)	
25	S-5	a1	92	0.1		**Soil sample: A3(25-25.5)20110518**	
							ATD
					SP-SM	Gray, gravelly, fine to medium SAND with silt; hydrocarbon odor, slight sheen (very dense, wet) **(UNIT 3)**	
30	S-6	a1	93	42.2		**Soil sample: A3(30-30.5)20110518**	
						- grades strong hydrocarbon odor	
35							



Notes: 1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Perderson's Fryer Farms
Tacoma, Washington

Log of Boring A-3

Figure
A-4
(1 of 2)

A-3

LAI Project No: 136006.010

SAMPLE DATA | **SOIL PROFILE**

Drilling Method: Hollow-Stem Auger

Ground Elevation (ft): Not Measured

Drilled By: Cascade Drilling Inc.

Logged By: TJS/JCS Date: 05/18/11

Moisture Content (%)
Plastic Limit ├──●──┤ Liquid Limit
20 40 60 80

▲ SPT N-Value ▲
△ Non-Standard N-Value △
10 20 30 40

× Fines Content (%) ×
20 40 60 80

Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	Graphic Symbol	USCS Symbol	Soil Profile	Groundwater	SPT N-Value
35	S-7	a1	60/ 6"	0.5		SP-SM	**Soil sample: A3(35-35.5)20110518** **Groundwater sample: A3-20110518**		**6"** △
						SP-SM	Gray, fine to coarse SAND with gravel and silt; strong hydrocarbon odor, sheen (very dense, wet)		
40	S-8	a1	60/ 6"	110			**Soil sample: A3(40-40.5)20110518**		**60/ 6"** △
45									
50									
55									
60									
65									
70									

Boring Completed 05/18/11
Total Depth of Boring = 40.5 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Perderson's Fryer Farms
Tacoma, Washington

Log of Boring A-3

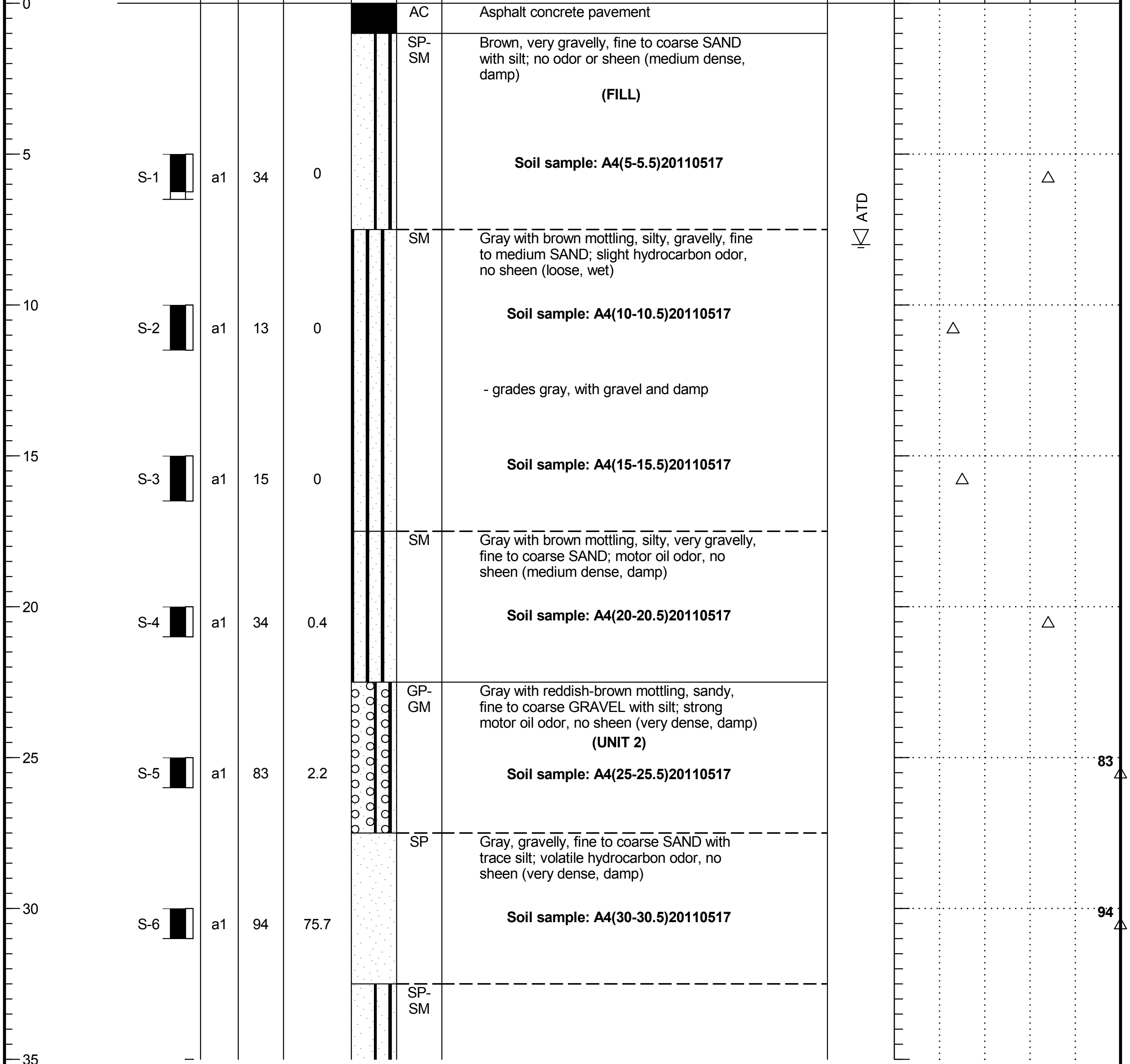
Figure
A-4
(2 of 2)

A-4

LAI Project No: 136006.010

SAMPLE DATA / SOIL PROFILE

Drilling Method: Hollow-Stem Auger
Ground Elevation (ft): Not Measured
Drilled By: Cascade Drilling Inc.
Logged By: LKM/TJS Date: 05/17/11



Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)
S-1	a1	34	0
S-2	a1	13	0
S-3	a1	15	0
S-4	a1	34	0.4
S-5	a1	83	2.2
S-6	a1	94	75.7

USCS Symbol	Description
AC	Asphalt concrete pavement
SP-SM	Brown, very gravelly, fine to coarse SAND with silt; no odor or sheen (medium dense, damp) **(FILL)** **Soil sample: A4(5-5.5)20110517**
SM	Gray with brown mottling, silty, gravelly, fine to medium SAND; slight hydrocarbon odor, no sheen (loose, wet) **Soil sample: A4(10-10.5)20110517** - grades gray, with gravel and damp **Soil sample: A4(15-15.5)20110517**
SM	Gray with brown mottling, silty, very gravelly, fine to coarse SAND; motor oil odor, no sheen (medium dense, damp) **Soil sample: A4(20-20.5)20110517**
GP-GM	Gray with reddish-brown mottling, sandy, fine to coarse GRAVEL with silt; strong motor oil odor, no sheen (very dense, damp) **(UNIT 2)** **Soil sample: A4(25-25.5)20110517**
SP	Gray, gravelly, fine to coarse SAND with trace silt; volatile hydrocarbon odor, no sheen (very dense, damp) **Soil sample: A4(30-30.5)20110517**
SP-SM	

Notes:
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136006.01 9/19/11 N:\PROJECTS\136006.010.GPJ SOIL BORING LOG WITH GRAPH

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Perderson's Fryer Farms
Tacoma, Washington

Log of Boring A-4

Figure
A-5
(1 of 2)

A-4

LAI Project No: 136006.010

SAMPLE DATA

SOIL PROFILE

Drilling Method: Hollow-Stem Auger
Ground Elevation (ft): Not Measured
Drilled By: Cascade Drilling Inc.
Logged By: LKM/TJS Date: 05/17/11

Moisture Content (%) Plastic Limit ⊢●⊣ Liquid Limit 20 40 60 80
▲ SPT N-Value ▲ △ Non-Standard N-Value △ 10 20 30 40
× Fines Content (%) × 20 40 60 80

Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	USCS Symbol	Description	Groundwater	SPT N-Value
35	S-7	a1	97	29.1	SP-SM	Gray with slight brown mottling, very gravelly, fine to coarse SAND with silt; volatile hydrocarbon odor, no sheen (very dense, damp)		97 △
					SP-SM	**Soil sample: A4(35-35.5)20110517** Gray with brown mottling, gravelly, fine to coarse SAND with silt; volatile hydrocarbon odor, no sheen (very dense, damp) **(UNIT 3)**		
40	S-8	a1	93	76.3		**Soil sample: A4(40-40.5)20110517**		93 △
45	S-9	a1	93	40.6		**Soil sample: A4(45-.5)20110517**	∇ ATD	93 △
					GP-GM	Gray, sandy, fine to coarse GRAVEL with silt; volatile hydrocarbon odor, no sheen (very dense, wet)		
50	S-10	a1	93	8.7		**Soil sample: A4(50-50.5)20110517**		93 △

Boring Completed 05/17/11
Total Depth of Boring = 51.0 ft.

55
60
65
70

Notes:
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2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

LANDAU ASSOCIATES

Perderson's Fryer Farms Tacoma, Washington	Log of Boring A-4	Figure A-5 (2 of 2)

A-5

LAI Project No: 136006.010

SAMPLE DATA

SOIL PROFILE

Drilling Method: Hollow-Stem Auger

Ground Elevation (ft): Not Measured

Drilled By: Cascade Drilling Inc.

Logged By: LKM/PRR Date: 05/10/11

Moisture Content (%) Plastic Limit — Liquid Limit 20 40 60 80

▲ SPT N-Value ▲ △ Non-Standard N-Value △ 10 20 30 40

× Fines Content (%) × 20 40 60 80

Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	SPT N-Value
S-1	a1	21	0	△
S-2	a1	17	1.5	△
S-3	a1	63	0.1	63 △
S-4	a1	77	0	77 △
S-5	a1	92	16.7	92 △
S-6	a1	92	35.8	92 △

SM — Brown, silty, fine SAND; no odor or sheen (medium dense, wet)

(UNIT 1)

SM — Brown, silty, fine to medium SAND with gravel; hydrocarbon odor, some sheen (medium dense, damp)

(UNIT 2)

Soil sample: A5(10-10.5)20110510

SM — Gray with brown mottling, silty, fine to coarse SAND with gravel; hydrocarbon odor, some sheen (medium dense, damp)

- grades dense; no odor, very slight sheen

Soil sample: A5(15-15.5)20110510

SP-SM — Brown, fine to coarse SAND with silt and gravel; no odor or sheen (very dense, damp)

Soil sample: A5(20-20.5)20110510

GP-GM — Gray, sandy GRAVEL with silt; no odor or sheen (very dense, damp)

Soil sample: A5(25-25.5)20110510

SP-SM — Gray, very gravelly, fine to coarse SAND with silt; slightly odorous, slight sheen (very dense, wet)

Soil sample: A5(30-30.5)20110510

Groundwater: ▽ ATD

GP-GM — Gray, sandy GRAVEL with silt; slight odor, sheen (very dense, wet)

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

136006.01 9/19/11 N:\PROJECTS\136006.010.GPJ SOIL BORING LOG WITH GRAPH

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Perderson's Fryer Farms
Tacoma, Washington

Log of Boring A-5

Figure A-6 (1 of 2)

A-5

LAI Project No: 136006.010

SAMPLE DATA | **SOIL PROFILE**

Drilling Method: Hollow-Stem Auger
Ground Elevation (ft): Not Measured
Drilled By: Cascade Drilling Inc.
Logged By: LKM/PRR Date: 05/10/11

Moisture Content (%) Plastic Limit ├──●──┤ Liquid Limit
20 40 60 80
▲ SPT N-Value ▲
△ Non-Standard N-Value △
10 20 30 40
× Fines Content (%) ×
20 40 60 80

Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	Graphic Symbol	USCS Symbol	Description	Groundwater	SPT N-Value
35	S-7	a1	92	4.3		GP-GM	Gray, sandy GRAVEL with silt; slight odor, sheen (very dense, wet) **Soil sample: A5(35-35.5)20110510** Groundwater sample: A5-20110510		92
						SP-SM	Gray, gravelly, fine to coarse SAND with silt; medium odor, sheen (very dense, wet)		
40	S-8	a1	50/ 6"	55.5			**Soil sample: A5(40-40.5)20110510**		50/ 6"

Boring Completed 05/10/11
Total Depth of Boring = 40.5 ft.

45

50

55

60

65

70

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

LANDAU ASSOCIATES

Perderson's Fryer Farms
Tacoma, Washington

Log of Boring A-5

Figure
A-6
(2 of 2)

B-1

SAMPLE DATA | SOIL PROFILE | GROUNDWATER

Drilling Method: Geoprobe™

Ground Elevation (ft): Not Measured

Drilled By: Cascade Drilling Inc.

Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	USCS Symbol	Description	Groundwater
0					PC	Portland concrete cement	
		d3		0	SM	Reddish-brown, silty, fine to medium SAND with gravel and organics; no odor or sheen (medium dense, damp)	Groundwater not encountered.
	S-1					**(FILL)**	
					ML	**Soil sample: B1(2-3)20110505**	
5	S-2	d3		1.2		Gray SILT grading to fine SAND with depth; no odor or sheen (medium dense, damp)	
					SM	**(UNIT 1)**	
	S-3			359		Gray, silty, fine to medium SAND with gravel; strong odor, no sheen (medium dense, damp)	
		d3				**Soil sample: B1(6.5-7)20110505**	
10						- grades moist; odor to 7.5 ft BGS	
		d3					
	S-4			0.2		**Soil sample: B1(11-12)20110505**	

Boring Completed 05/05/11
Total Depth of Boring = 12.0 ft.

15

20

25

30

35

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

B-2

LAI Project No: 136006.010

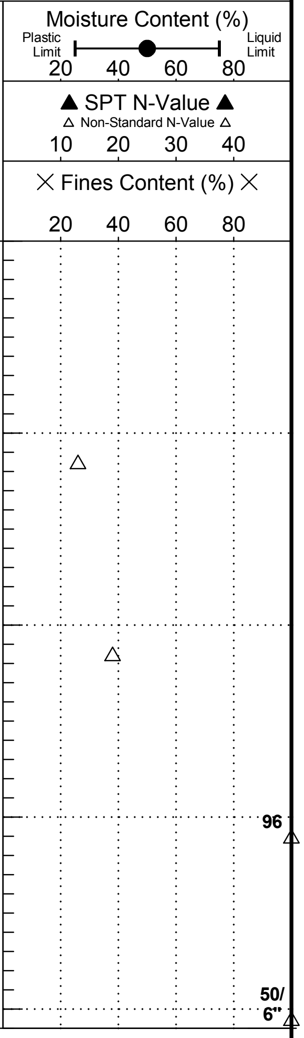
Drilling Method: Hollow-Stem Auger
Ground Elevation (ft): Not Measured
Drilled By: Cascade Drilling Inc.
Logged By: LKM/PRR Date: 05/10/11

SAMPLE DATA

Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)
5	S-1	a1	13	287
10	S-2	a1	19	2.9
15	S-3	a1	96	23.6
20	S-4	a1	50/ 6"	56.7

SOIL PROFILE

USCS Symbol	Description	Groundwater
AC	Asphalt concrete pavement	Groundwater Not Encountered
PC	Portland cement concrete	
SM	Gray with brown mottling, very silty, fine SAND; strong hydrocarbon odor, minor sheen (loose, damp) **(UNIT 1)** **Soil sample: B2(5-5.5)20110510**	
SM	Gray with brown mottling, silty fine to medium SAND with gravel; low hydrocarbon odor, very minor sheen (medium dense, damp) **Soil sample: B2(10-10.5)20110510**	
SM	Gray with brown mottling, silty, fine to medium SAND with gravel; medium hydrocarbon odor, very minor sheen (very dense, damp) **(UNIT 2)** **Soil sample: B2(15-15.5)20110510**	



Boring Completed 05/10/11
Total Depth of Boring = 20.5 ft.

Notes:
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2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

LANDAU ASSOCIATES

Perderson's Fryer Farms
Tacoma, Washington

Log of Boring B-2

Figure
A-8

C-1

SAMPLE DATA					SOIL PROFILE		GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	USCS Symbol	Drilling Method: Geoprobe™ Ground Elevation (ft): 408.85 Drilled By: Cascade Drilling Inc.	
0					PC	Portland concrete cement	Groundwater not encountered.
		e3		0	SM	Reddish-brown, silty, fine to coarse SAND with gravel and organics; no odor or sheen (medium dense, damp) **(UNIT 1)**	
					SM	- grades gray and fine to medium SAND with trace gravel	
5							
	S-1	e3		0		Mottled reddish-brown and gray, silty, fine to medium SAND with gravel; no odor or sheen (medium dense, damp) **Soil sample: C1(5.5-6)20110505**	
	S-2			0		- grades gray and with odor **Soil sample: C1(7.5-8)20110505**	
	S-3	e3					
10						- grades trace gravel and wet; no odor **Soil sample: C1(9-9.5)20110505**	

Boring Completed 05/05/11
Total Depth of Boring = 10.0 ft.

Depth scale: 15, 20, 25, 30, 35

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

LANDAU ASSOCIATES

Perderson's Fryer Farms Tacoma, Washington	Log of Boring C-1	Figure A-9

D-1

LAI Project No: 136006.010

Drilling Method: Hollow-Stem Auger
Ground Elevation (ft): Not Measured
Drilled By: Cascade Drilling Inc.
Logged By: TJS Date: 05/13/11

Moisture Content (%): Plastic Limit ├──●──┤ Liquid Limit; 20 40 60 80
▲ SPT N-Value ▲; △ Non-Standard N-Value △; 10 20 30 40
× Fines Content (%) ×; 20 40 60 80

SAMPLE DATA					SOIL PROFILE			
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	USCS Symbol		Groundwater	SPT N-Value
0	S-1	a1	46	0	SM	Brown, silty, gravelly, fine to medium SAND; no odor or sheen (dense, damp) **(FILL)**	Groundwater Not Encountered	△
7.5	S-2	a1	50/ 6"	0		- grades grayish-brown mottled, with gravel and very dense **Soil sample: D1(7.5-8)20110513**		**50/ 6"** △
10	S-3	a1	70/ 6"		SM	Grayish-brown, silty, fine to medium SAND with gravel; no odor or sheen (very dense, damp) **(UNIT 1)**		**70/ 6"** △
12.5	S-4	a1	50/ 6"			- grades gray with brown mottling **Soil sample: D1(12.5-13)20110513**		**50/ 6"** △
15	S-5	a1	50/ 6"					**50/ 6"** △

Boring Completed 05/13/11
Total Depth of Boring = 15.5 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Perderson's Fryer Farms
Tacoma, Washington

Log of Boring D-1

Figure
A-10

E-1

Drilling Method: Geoprobe™

Ground Elevation (ft): 408.74

Drilled By: Cascade Drilling Inc.

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	Graphic Symbol	USCS Symbol		Water Level
0				0		PC	Portland concrete cement	
				0		GP-GM	Grayish-brown, sandy GRAVEL with silt; no odor or sheen (dense, damp) **(FILL)**	
	S-1	e3		17.1		SM	Brownish-gray, silty, fine to medium SAND with gravel; strong odor, slight sheen (medium dense, moist) **(UNIT 1)** Soil sample: E1(1.5-2)20110506	
5		e3		0.2			- grades without sheen	▽ ATD
							- grades no odor	
		e3						
10	S-2			0.1		GP-GM	Brown, sandy GRAVEL with silt; slight odor, no sheen (dense, wet) **Soil sample: E1(10.5-11)20110506**	

Boring Completed 05/06/11
Total Depth of Boring = 11.0 ft.

15

20

25

30

35

Notes: 1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

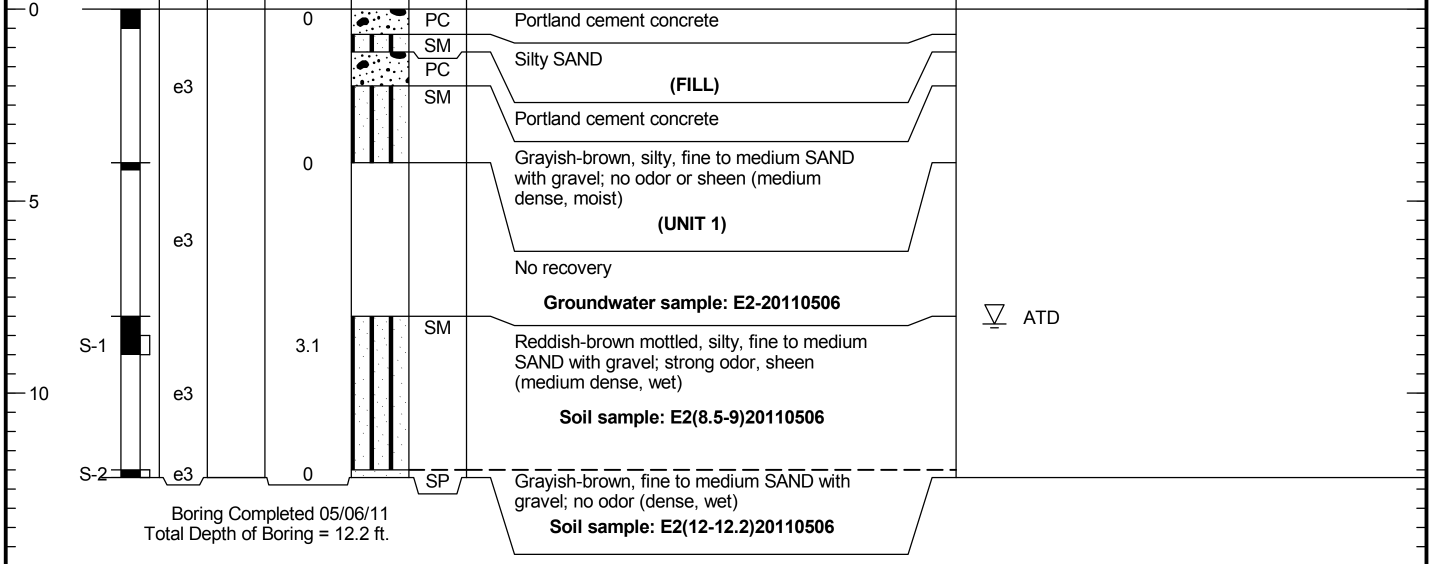
E-2

SAMPLE DATA | **SOIL PROFILE** | **GROUNDWATER**

Drilling Method: Geoprobe™

Ground Elevation (ft): 408.83

Drilled By: Cascade Drilling Inc.



Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	Graphic Symbol	USCS Symbol		Water Level
0				0		PC	Portland cement concrete	
						SM	Silty SAND **(FILL)**	
		e3				PC	Portland cement concrete	
						SM	Grayish-brown, silty, fine to medium SAND with gravel; no odor or sheen (medium dense, moist) **(UNIT 1)**	
				0			No recovery **Groundwater sample: E2-20110506**	
5		e3						
	S-1			3.1		SM	Reddish-brown mottled, silty, fine to medium SAND with gravel; strong odor, sheen (medium dense, wet) **Soil sample: E2(8.5-9)20110506**	ATD
10		e3						
	S-2	e3		0		SP	Grayish-brown, fine to medium SAND with gravel; no odor (dense, wet) **Soil sample: E2(12-12.2)20110506**	

Boring Completed 05/06/11
Total Depth of Boring = 12.2 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

Perderson's Fryer Farms
Tacoma, Washington

Log of Boring E-2

Figure
A-12

E-3

SAMPLE DATA					SOIL PROFILE		GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	USCS Symbol	Drilling Method: Geoprobe™ Ground Elevation (ft): 408.76 Drilled By: Cascade Drilling Inc.	
0	S-1	e3		0	PC	Portland cement concrete	Groundwater not encountered.
					SM	Silty SAND **(FILL)**	
					PC	Portland cement concrete	
					SM	Reddish-brown and red mottled, silty SAND with gravel; no odor or sheen (dense, moist) **(UNIT 1)** **Soil sample: E3(3-3.5)20110506**	
5							
10							
15							
20							
25							
30							
35							

Boring Completed 05/06/11
Total Depth of Boring = 4.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Perderson's Fryer Farms Tacoma, Washington	Log of Boring E-3	Figure A-13

E-3a

LAI Project No: 136006.010

SAMPLE DATA / SOIL PROFILE

Drilling Method: Hollow-Stem Auger
Ground Elevation (ft): Not Measured
Drilled By: Cascade Drilling Inc.
Logged By: DHF Date: 06/30/11

Moisture Content (%): Plastic Limit – Liquid Limit 20 40 60 80
▲ SPT N-Value ▲ (△ Non-Standard N-Value △) 10 20 30 40
× Fines Content (%) × 20 40 60 80

Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	USCS Symbol	Description	Groundwater	SPT N-Value
0						No recovery	Groundwater Not Encountered	
10	S-1	a1	5		ML	Brown, sandy SILT with gravel; no odor or sheen (very loose, moist) **(UNIT 1)** Soil sample: E3a(10-10.5)20110630		△
~12.5					GM	- grades gray, with trace gravel; strong diesel odor		
15	S-2	a1	50/ 4"			Gray, sandy, silty GRAVEL; medium odor (very dense, moist) **(UNIT 2)** **Soil sample: E3a(15-15.5)20110630**		50/ 4" △
20	S-3	a1	50/ 3"	0		- grades brown; no odor or sheen **Soil sample: E3a(20-20.5)20110630**		50/ 3" △
25	S-4	a1	50/ 4"	0		**Soil sample: E3a(25-25.5)20110630**		50/ 4" △

Boring Completed 06/30/11
Total Depth of Boring = 25.5 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Perderson's Fryer Farms
Tacoma, Washington

Log of Boring E-3a

Figure
A-14

E-4

LAI Project No: 136006.010

Drilling Method: Hollow-Stem Auger
Ground Elevation (ft): Not Measured
Drilled By: Cascade Drilling Inc.
Logged By: DHF Date: 06/30/11

SAMPLE DATA / SOIL PROFILE

Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	USCS Symbol	Soil Profile	Groundwater	SPT N-Value
0					PC	Portland cement concrete		
					SM	Silty, fine to medium SAND with gravel; no odor or sheen (medium dense, wet) **(FILL)**		
					PC	Portland cement concrete		
					SM	Silty, fine to medium SAND with gravel; no odor or sheen (medium dense, wet)		
5						Underground storage tank		
10							ATD	
						No recovery, strong diesel odor on sampler		
	S-1	a1	50/ 3"					50/ 3"
15	S-2	a1	50/ 3"	0	GM	Brown, silty, sandy, GRAVEL; medium diesel odor (very dense, wet) **(UNIT 2)** Soil sample: E4(15-15.5)20110630		50/ 3"
20	S-3	a1	50/ 3"	0		- grades slight diesel odor **Soil sample: E4(20-20.5)20110630**		50/ 3"
25	S-4	a1	50/ .2"	0		**Soil sample: E4(25-25.5)20110630**		50/ .2"
30	S-5	a1	50/ 3"	0		**Soil sample: E4(30-30.5)20110630**		50/ 3"
35								

Moisture Content (%): Plastic Limit — Liquid Limit; 20 40 60 80
▲ SPT N-Value ▲ △ Non-Standard N-Value △; 10 20 30 40
× Fines Content (%) ×; 20 40 60 80

Boring Completed 06/30/11
Total Depth of Boring = 30.5 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Perderson's Fryer Farms
Tacoma, Washington

Log of Boring E-4

E-5

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	Graphic Symbol	USCS Symbol	Drilling Method: Geoprobe™ Ground Elevation (ft): 409.32 Drilled By: Cascade Drilling Inc.	
0						PC	Portland concrete cement	
						GM	Brownish-gray, silty GRAVEL; no odor or sheen (loose, damp) **(FILL)**	Groundwater not encountered.
		e3		0		SM	Gray, silty, fine to medium SAND; no odor or sheen (medium dense, moist) **(UNIT 1)**	
5	S-1			5.1 3.7 3.7			- grades with trace gravel; strong odor, no sheen	
		e3					**Soil sample: E5(4.5-5)20110506**	
				15			- grades with sheen	
		e3					- slight sheen	
10				63 34.3			**Soil sample: E5(9.5-10)20110506**	

Boring Completed 05/06/11
Total Depth of Boring = 11.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Perderson's Fryer Farms Tacoma, Washington	Log of Boring E-5	Figure A-16

E-6

SAMPLE DATA | **SOIL PROFILE** | **GROUNDWATER**

Drilling Method: Geoprobe™

Ground Elevation (ft): 409.29

Drilled By: Cascade Drilling Inc.

Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	Graphic Symbol	USCS Symbol		Water Level
0						PC	Portland concrete cement	
		e3		0		SM	Reddish-brown, silty, fine to medium SAND with trace gravel; no odor or sheen (medium dense, damp) **(UNIT 1)**	
							- grades gray and with gravel	
5		e3		0				
	S-1						**Soil sample: E6(8.5-8)20110505**	
10		e3		0				∇ ATD
	S-2						**Soil sample: E6(11.5-12)20110505**	

Boring Completed 05/05/11
Total Depth of Boring = 12.0 ft.

15

20

25

30

35

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Perderson's Fryer Farms
Tacoma, Washington

Log of Boring E-6

Figure
A-17

E-7

SAMPLE DATA					SOIL PROFILE		GROUNDWATER

Drilling Method: Geoprobe™

Ground Elevation (ft): 409.40

Drilled By: Cascade Drilling Inc.

Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	USCS Symbol		Water Level
0					PC	Portland concrete cement	
					SP	Gray, fine to coarse SAND with gravel and trash debris (loose, damp) **(FILL)**	
		e3		0	SM	Reddish-brown, silty, fine to medium SAND with gravel (medium dense, moist)	
5					SM	Gray and reddish-brown mottled, silty, fine to medium SAND with trace gravel; no odor or sheen (medium dense, damp) **(UNIT 1)**	
		e3		0			
	S-1					**Soil sample: E7(7.5-8)20110505**	
						- grades brownish-gray	
10		e3		0			∇ ATD
	S-2	e3		0		- grades grayish-brown and with gravel **Soil sample: E7(12-12.5)20110505**	

Boring Completed 05/05/11
Total Depth of Boring = 12.5 ft.

15

20

25

30

35

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Perderson's Fryer Farms Tacoma, Washington	Log of Boring E-7	Figure A-18

F-1

LAI Project No: 136006.010

SAMPLE DATA

SOIL PROFILE

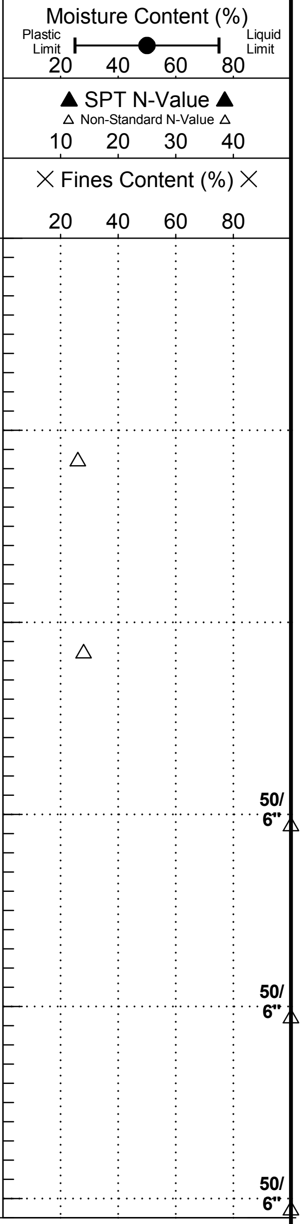
Drilling Method: Hollow-Stem Auger

Ground Elevation (ft): Not Measured

Drilled By: Cascade Drilling Inc.

Logged By: LKM/TJS Date: 05/17/11

Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	USCS Symbol		Groundwater
0					ML	Gray with brown mottling, sandy SILT; slight hydrocarbon odor, no sheen (stiff, damp) **(UNIT 1)**	
5	S-1	a1	13	0		**Soil sample: F1(5-5.5)20110517**	
						- grades very sandy and with trace gravel; no odor	ATD
10	S-2	a1	14	0		**Soil sample: F1(10-10.5)20110517**	
					SP-SM	Brownish-gray with brown mottling, very gravelly, fine to coarse SAND with silt; no odor or sheen (very dense, wet) **(UNIT 2)**	
15	S-3	a1	50/ 6"	0		**Soil sample: F1(15-15.5)20110517**	
20	S-4	a1	50/ 6"	0		**Soil sample: F1(20-20.5)20110517**	
					SM	Brown, silty, fine to medium SAND with gravel; no odor or sheen (very dense, wet)	
25	S-5	a1	50/ 6"	0		**Soil sample: F1(25-25.5)20110517**	
30							
35							



Boring Completed 05/17/11
Total Depth of Boring = 25.5 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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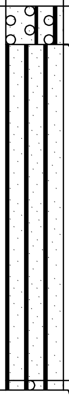
Perderson's Fryer Farms
Tacoma, Washington

Log of Boring F-1

Figure
A-19

F-2

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	Graphic Symbol	USCS Symbol	Drilling Method: Geoprobe™ Ground Elevation (ft): Not Measured Drilled By: Cascade Drilling Inc.	
0						GP-GM	Grayish-brown, sandy GRAVEL with silt and organics; no odor or sheen (medium dense, damp) **(UNIT 1)**	Groundwater not encountered.
	S-1	e3		0		SM	Gray, silty, fine to medium SAND with gravel; no odor or sheen (medium dense, damp) **Soil sample: F2(1-1.5)20110506**	
5	S-2	e3		0			- slight odor from 4.5 to 5 ft BGS **Soil sample: F2(4.5-5)20110506**	
		e3		0				
10	S-3					GM	**Soil sample: F2(9.5-10)20110506** Gray, sandy GRAVEL with silt; no odor or sheen (dense, damp) **(UNIT 2)**	
15								
20								
25								
30								
35								



Boring Completed 05/06/11
Total Depth of Boring = 10.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

LANDAU ASSOCIATES

Perderson's Fryer Farms Tacoma, Washington	Log of Boring F-2	Figure A-20

F-3

SAMPLE DATA					SOIL PROFILE		GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	USCS Symbol	Drilling Method: Geoprobe™ Ground Elevation (ft): 408.09 Drilled By: Cascade Drilling Inc.	
0					SM	Grayish-brown, gravelly, silty, fine to medium SAND; no odor or sheen (medium dense, damp) **(UNIT 1)**	
				1432			
	S-1	e3					Groundwater not encountered.
						- grades without gravel; strong hydrocarbon odor, sheen	
						Soil sample: F3(1.5-2)20110505	
5	S-2					- grades gray and with gravel	
		e3		284		**Soil sample: F3(4.5-5)20110505**	
				30.9			
						- grades silty	
10		e3					
	S-3			1		**Soil sample: F3(11.5-12)20110505**	
					SM	Gray, silty, fine to coarse SAND with gravel; no odor or sheen (medium dense, moist) **(UNIT 2)**	
		e3					
15							

Boring Completed 05/05/11
Total Depth of Boring = 16.0 ft.

20

25

30

35

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

LANDAU ASSOCIATES

Perderson's Fryer Farms Tacoma, Washington	Log of Boring F-3	Figure A-21

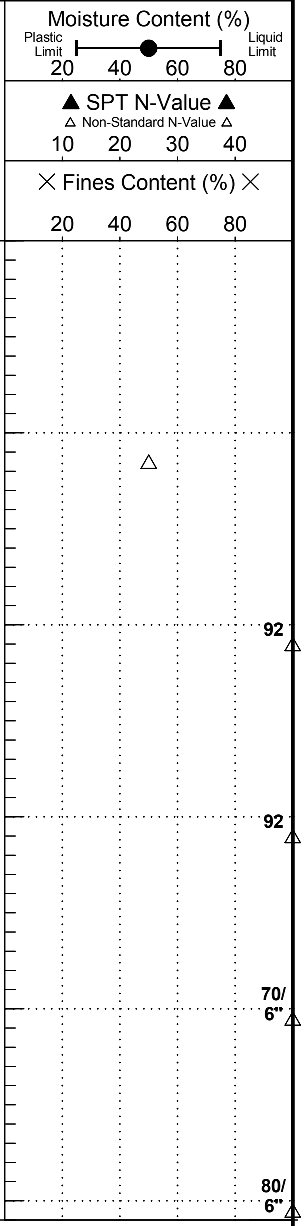
G-1

LAI Project No: 136006.010

Drilling Method: Hollow-Stem Auger
Ground Elevation (ft): Not Measured
Drilled By: Cascade Drilling Inc.
Logged By: TJS/PRR Date: 05/11/11

Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	USCS Symbol	Soil Profile	Groundwater
0					SM	Brown, silty, fine to medium SAND; no odor or sheen (medium dense, damp) **(UNIT 1)**	Groundwater Not Encountered
5	S-1	a1	25	0		**Soil sample: G1(5-5.5)20110511**	
					SM	Gray, silty, very gravelly, fine to medium SAND; no odor or sheen (very dense, moist) **(UNIT 2)**	
10	S-2	a1	92	0		**Soil sample: G1(10-10.5)20110511**	
						- strong gas odor, sheen	
15	S-3	a1	92	249		**Soil sample: G1(15-15.5)20110511**	
						- no odor, very slight sheen	
20	S-4	a1	70/ 6"	5.5		**Soil sample: G1(20-20.5)20110511**	
					GM	Gray, silty, sandy GRAVEL; slight odor, no sheen (very dense, moist)	
25	S-5	a1	80/ 6"	14.9		**Soil sample: G1(25-25.5)20110511**	

Boring Completed 05/11/11
Total Depth of Boring = 25.5 ft.



Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

LANDAU ASSOCIATES

Perderson's Fryer Farms
Tacoma, Washington

Log of Boring G-1

Figure A-22

Boring/Well Designation: MW-1

Client: Steinberg & Associates
Logged By: Alex McKenzie-Johnson
Date of Drilling: 04/23/01
Sheet: 1 of 2

Drilling Contractor: Cascade Drilling, Inc.
Method: Hollow Stem Auger
Drill Rig: CME 75
Borehole: 8 1/4" OD

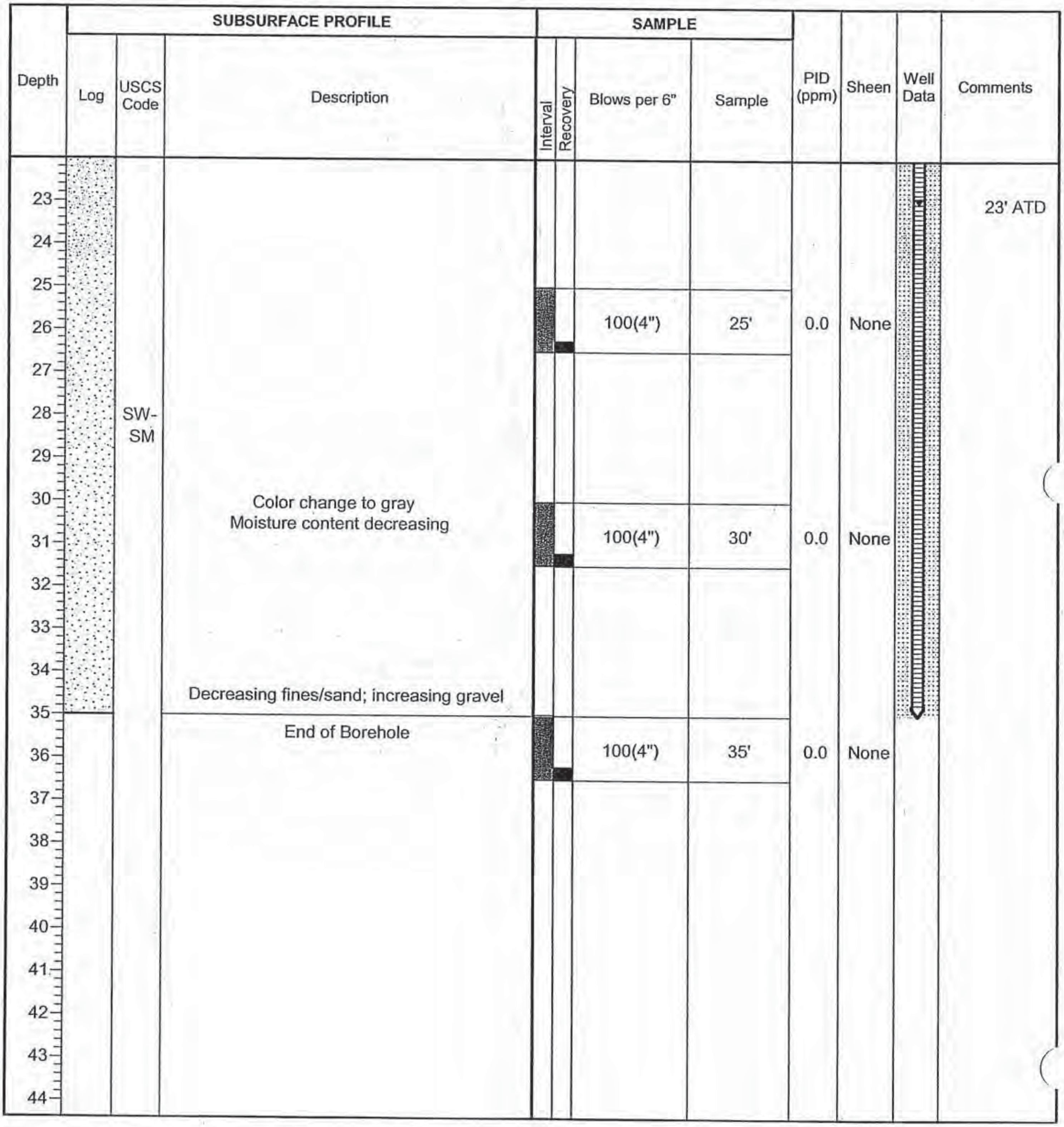
	SUBSURFACE PROFILE			SAMPLE							
Depth	Log	USCS Code	Description	Interval	Recovery	Blows per 6"	Sample	PID (ppm)	Sheen	Well Data	Comments
			Ground Surface								
0			***Gravel***								
1											
2			***Lean Clay*** Moist, tan and gray reddish (iron) streaks, stiff; mostly lean clay with trace sand; low dilatency, low plasticity.								
3											
4											
5		CL									
6						23-30-35	5'	8.5	None		
7			***Well Graded Sand with Silt and Gravel*** Very moist to wet, gray-tan, very dense; mostly fine to coarse sand with little to some gravel and little silt; gravel is sub-rounded to sub-angular; till-like material.								
8											
9						22-50(5")	9'	0.0	None		
10			Color change to gray Increase in sand to some								
11						15-23-25	10.5'	0.0	None		
12						24-20-30	12'	0.0	None		
13											
14											
15		SW-SM	Wet Gravel and sand to few								
16						100(6")	15'	0.0	None		
17											
18											
19											
20											
21						100(6")	20'		None		
22											

Project No.: 16407.0

Boring/Well Designation: MW-1

Client: Steinberg & Associates
Logged By: Alex McKenzie-Johnson
Date of Drilling: 04/23/01
Sheet: 2 of 2

Drilling Contractor: Cascade Drilling, Inc.
Method: Hollow Stem Auger
Drill Rig: CME 75
Borehole: 8 1/4" OD



Depth	SUBSURFACE PROFILE			SAMPLE				PID (ppm)	Sheen	Well Data	Comments
	Log	USCS Code	Description	Interval	Recovery	Blows per 6"	Sample				
23											23' ATD
24											
25											
26						100(4")	25'	0.0	None		
27											
28		SW-SM									
29											
30			Color change to gray Moisture content decreasing								
31						100(4")	30'	0.0	None		
32											
33											
34			Decreasing fines/sand; increasing gravel								
35			End of Borehole								
36						100(4")	35'	0.0	None		
37											
38											
39											
40											
41											
42											
43											
44											

Project No.: 16407.0

Boring/Well Designation: MW-2

Client: Steinberg & Associates
Logged By: Alex McKenzie-Johnson
Date of Drilling: 04/23/01
Sheet: 1 of 2

Drilling Contractor: Cascade Drilling, Inc.
Method: Hollow Stem Auger
Drill Rig: CME 75
Borehole: 8 1/4" OD

Depth	SUBSURFACE PROFILE: Log	SUBSURFACE PROFILE: USCS Code	SUBSURFACE PROFILE: Description	SAMPLE: Interval	SAMPLE: Recovery	SAMPLE: Blows per 6"	SAMPLE: Sample	PID (ppm)	Sheen	Well Data	Comments
-3											
-2											
-1			Ground Surface								
0			***Grass and Organic Soil***								
1											
2			***Sandy Silt*** Moist, tan with reddish (iron) streaks, hard; mostly silt with little medium to coarse sand; low plasticity and moderate dilatency.								
3											
4											
5											
6						22-50(6")	5'	0.0	None		
7											
8		ML	***Sandy Silt with Gravel*** Moist, tan with reddish (iron) streaks, hard; mostly silt with little sand and some fine to coarse gravel; fines have low plasticity and moderate dilatency; gravel is sub-angular to sub-rounded.								
9											
10											
11						50(6")	10'	0.0	None		
12											
13			***Well Graded Sand with Silt and Gravel*** Very moist to wet, gray-tan, very dense, mostly fine to coarse sand with little to some gravel and little silt; gravel is sub-rounded to sub-angular; till-like material.								
14											
15											
16		SW-SM				100(3")	15'	0.0	None		
17											
18											
19											

Project No.: 16407.0

Boring/Well Designation: MW-2

Client: Steinberg & Associates

Logged By: Alex McKenzie-Johnson

Date of Drilling: 04/23/01

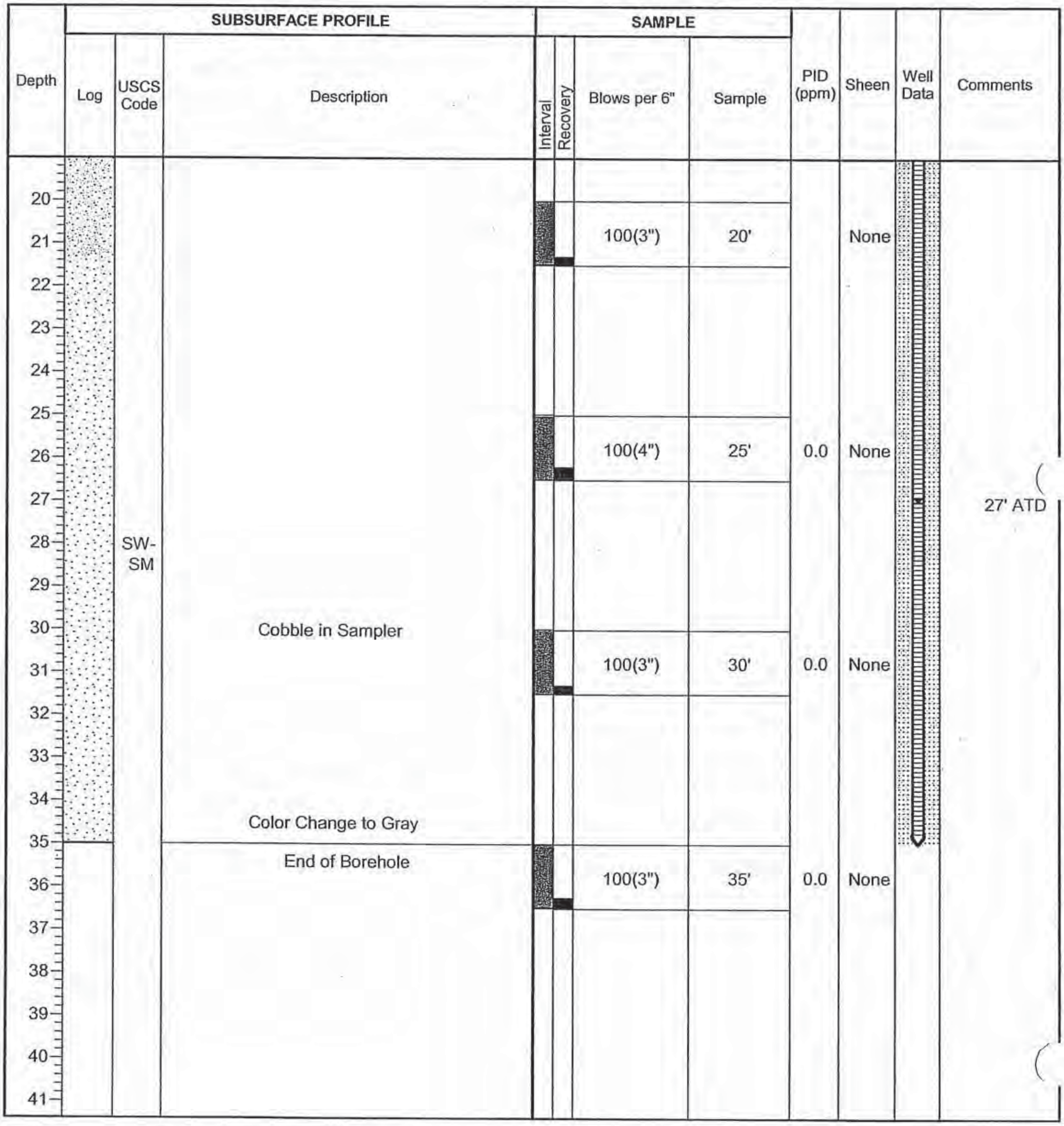
Sheet: 2 of 2

Drilling Contractor: Cascade Drilling, Inc.

Method: Hollow Stem Auger

Drill Rig: CME 75

Borehole: 8 1/4" OD



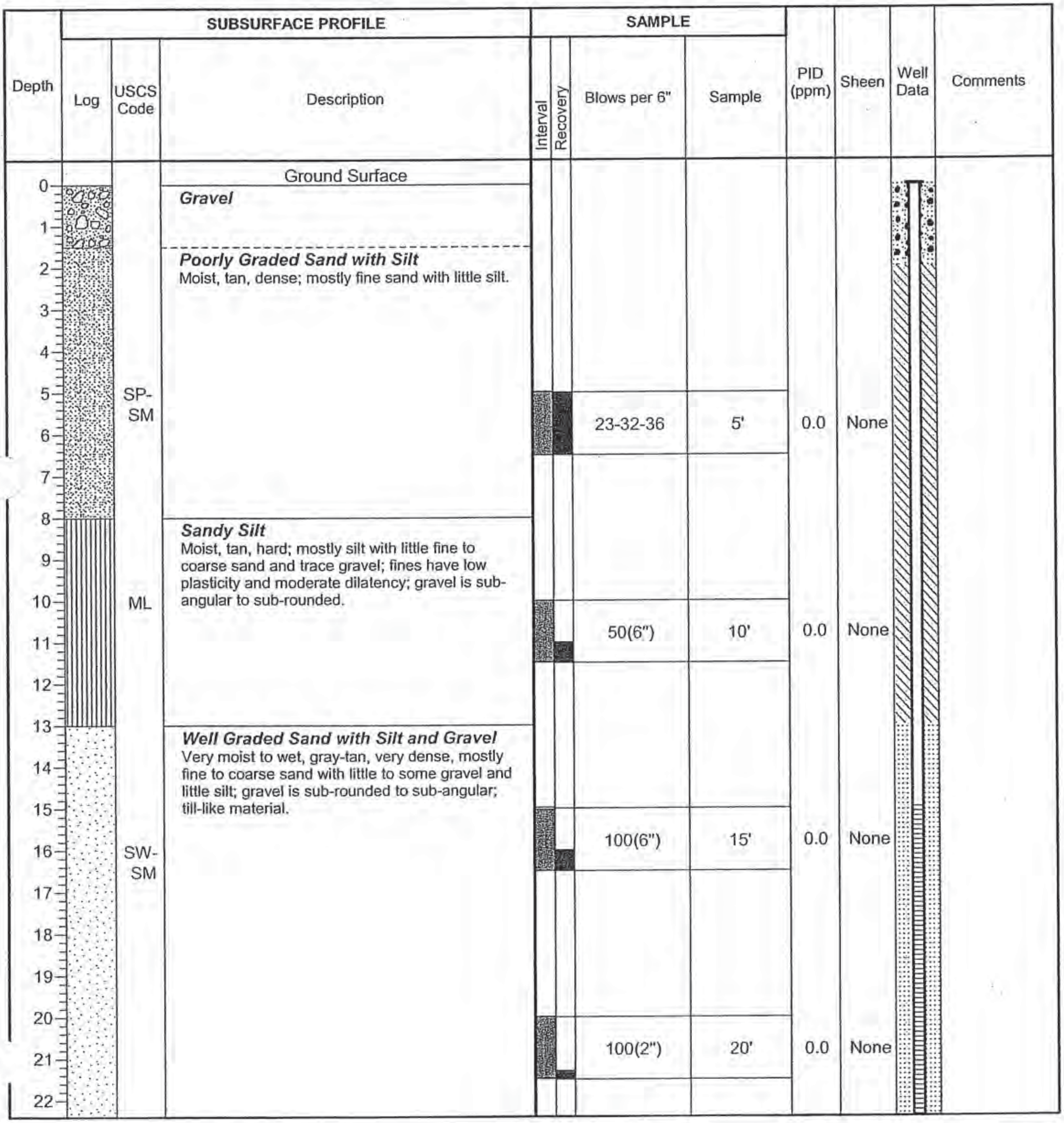
Depth	SUBSURFACE PROFILE			SAMPLE				PID (ppm)	Sheen	Well Data	Comments
	Log	USCS Code	Description	Interval	Recovery	Blows per 6"	Sample				
20						100(3")	20'		None		
25						100(4")	25'	0.0	None		
27											27' ATD
28		SW-SM									
30			Cobble in Sampler			100(3")	30'	0.0	None		
34			Color Change to Gray								
35			End of Borehole			100(3")	35'	0.0	None		

Project No.: 16407.0

Boring/Well Designation: MW-3

Client: Steinberg & Associates
Logged By: Alex McKenzie-Johnson
Date of Drilling: 04/23/01
Sheet: 1 of 2

Drilling Contractor: Cascade Drilling, Inc.
Method: Hollow Stem Auger
Drill Rig: CME 75
Borehole: 8 1/4" OD



Depth	USCS Code	Description	Blows per 6"	Sample	PID (ppm)	Sheen	Comments
0		Ground Surface ***Gravel***					
2	SP-SM	***Poorly Graded Sand with Silt*** Moist, tan, dense; mostly fine sand with little silt.					
5			23-32-36	5'	0.0	None	
8	ML	***Sandy Silt*** Moist, tan, hard; mostly silt with little fine to coarse sand and trace gravel; fines have low plasticity and moderate dilatency; gravel is sub-angular to sub-rounded.					
10			50(6")	10'	0.0	None	
13	SW-SM	***Well Graded Sand with Silt and Gravel*** Very moist to wet, gray-tan, very dense, mostly fine to coarse sand with little to some gravel and little silt; gravel is sub-rounded to sub-angular; till-like material.					
15			100(6")	15'	0.0	None	
20			100(2")	20'	0.0	None	

Project No.: 16407.0

Boring/Well Designation: MW-3

Client: Steinberg & Associates
Logged By: Alex McKenzie-Johnson
Date of Drilling: 04/23/01
Sheet: 2 of 2

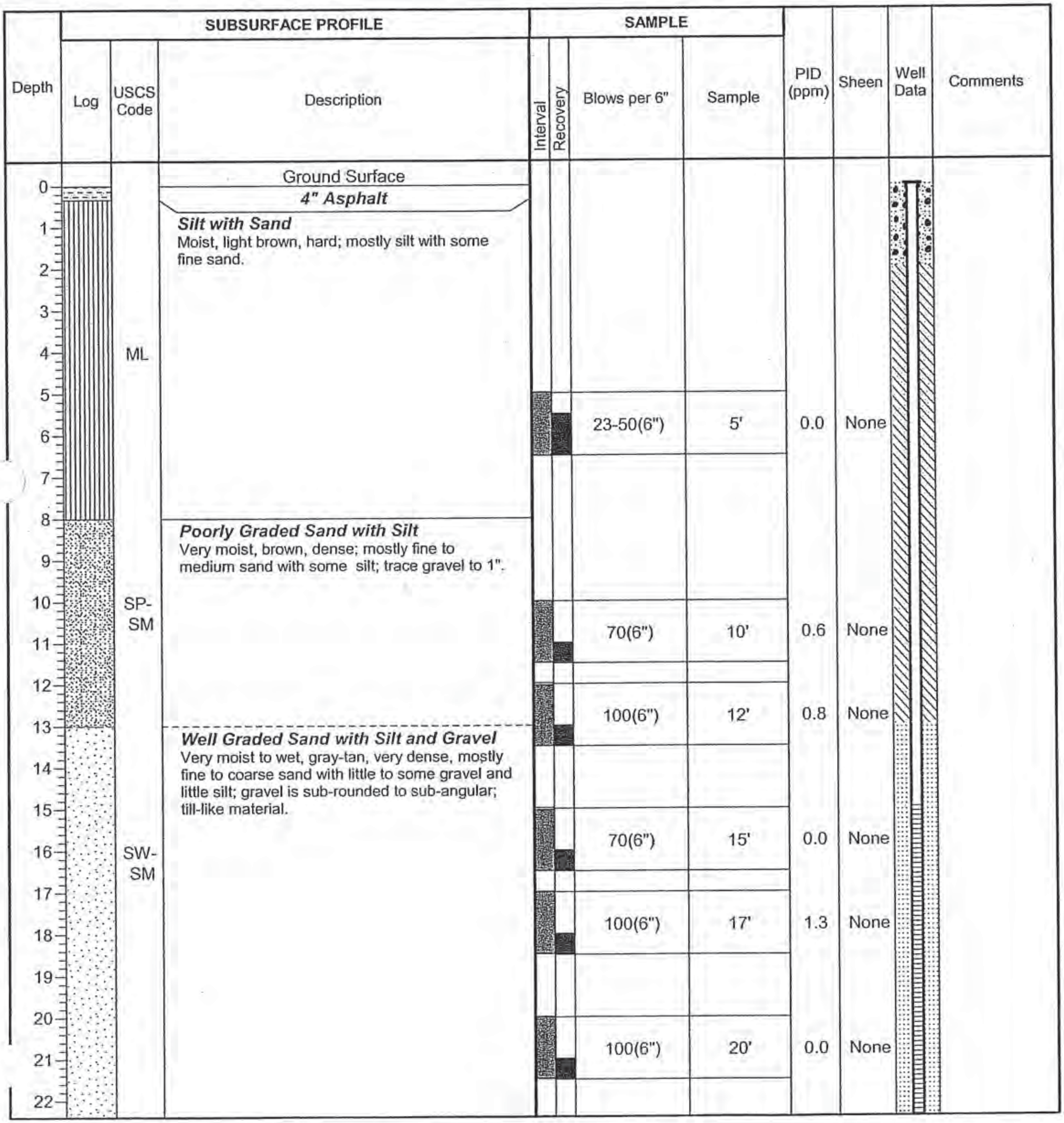
Drilling Contractor: Cascade Drilling, Inc.
Method: Hollow Stem Auger
Drill Rig: CME 75
Borehole: 8 1/4" OD

Depth	SUBSURFACE PROFILE			SAMPLE				PID (ppm)	Sheen	Well Data	Comments
	Log	USCS Code	Description	Interval	Recovery	Blows per 6"	Sample				
23											
24											
25											
26			Stained Gray/Petroleum Odor			100(3")	25'	2.6	Slight		
27											
28		SW-SM									
29											
30											30' ATD
31			Petroleum Odor			30-50(6")	30'		Slight		
32											
33											
34											
35			End of Borehole								
36						100(3")	35'	0.0	None		
37											
38											
39											
40											
41											
42											
43											
44											

Boring/Well Designation: MW-4

Client: Steinberg & Associates
Logged By: Alex Jones/Eric Koltes
Date of Drilling: 04/24/01
Sheet: 1 of 2

Drilling Contractor: Cascade Drilling, Inc.
Method: Hollow Stem Auger
Drill Rig: CME 75
Borehole: 8 1/4" OD



	SUBSURFACE PROFILE			SAMPLE							
Depth	Log	USCS Code	Description	Interval	Recovery	Blows per 6"	Sample	PID (ppm)	Sheen	Well Data	Comments
0			Ground Surface ***4" Asphalt***								
1			***Silt with Sand*** Moist, light brown, hard; mostly silt with some fine sand.								
2											
3											
4		ML									
5						23-50(6")	5'	0.0	None		
6											
7											
8			***Poorly Graded Sand with Silt*** Very moist, brown, dense; mostly fine to medium sand with some silt; trace gravel to 1".								
9											
10		SP-SM				70(6")	10'	0.6	None		
11											
12						100(6")	12'	0.8	None		
13			***Well Graded Sand with Silt and Gravel*** Very moist to wet, gray-tan, very dense, mostly fine to coarse sand with little to some gravel and little silt; gravel is sub-rounded to sub-angular; till-like material.								
14											
15						70(6")	15'	0.0	None		
16		SW-SM									
17						100(6")	17'	1.3	None		
18											
19											
20						100(6")	20'	0.0	None		
21											
22											

Project No.: 16407.0

Boring/Well Designation: MW-4

Client: Steinberg & Associates
Logged By: Alex Jones/Eric Koltes
Date of Drilling: 04/24/01
Sheet: 2 of 2

Drilling Contractor: Cascade Drilling, Inc.
Method: Hollow Stem Auger
Drill Rig: CME 75
Borehole: 8 1/4" OD

Depth	SUBSURFACE PROFILE			SAMPLE				PID (ppm)	Sheen	Well Data	Comments
	Log	USCS Code	Description	Interval	Recovery	Blows per 6"	Sample				
			Cobbles to 2.5"								
23											
24											24' ATD
25											
26			Becoming Wet			100(6")	25'	37.0	None		
27											
28		SW-SM									
29											
30											
31			Strong Diesel Odor			100(6")	30'	28.8	None		
32											
33											
34											
35											
36						100(6")	35'	14.5	None		
37											
38											
39											
40			End of Borehole								
41						100(6")		11.6	None		
42											
43											
44											

Project No.: 16407.0

Boring/Well Designation: MW-5

Client: Steinberg & Associates
Logged By: Alex Jones/Eric Koltes
Date of Drilling: 04/24/01
Sheet: 1 of 2

Drilling Contractor: Cascade Drilling, Inc.
Method: Hollow Stem Auger
Drill Rig: CME 75
Borehole: 8 1/4" OD

Depth	SUBSURFACE PROFILE			SAMPLE				PID (ppm)	Sheen	Well Data	Comments
	Log	USCS Code	Description	Interval	Recovery	Blows per 6"	Sample				
0			Ground Surface **_4" Asphalt_**								
1		ML	**_Silt with Sand_** Moist, light brown, hard; mostly silt with some fine sand.								
5						20-50(6")	5'	0.0	None		
8		SP-SM	**_Poorly Graded Sand with Silt_** Moist, brown, dense; mostly fine to medium sand with little silt and few coarse sand and gravel.								
10						100(6")	10'	0.0	None		
15			Rock in Sampler			100(4")	–				
20			**_Well Graded Sand with Silt and Gravel_** Very moist to wet, gray-tan, very dense, mostly fine to coarse sand with little to some gravel and little silt; gravel is sub-rounded to sub-angular; till-like material.			100(4")	20'	0.0	None		

Project No.: 16407.0

Boring/Well Designation: MW-5

Client: Steinberg & Associates
Logged By: Alex Jones/Eric Koltes
Date of Drilling: 04/24/01
Sheet: 2 of 2

Drilling Contractor: Cascade Drilling, Inc.
Method: Hollow Stem Auger
Drill Rig: CME 75
Borehole: 8 1/4" OD

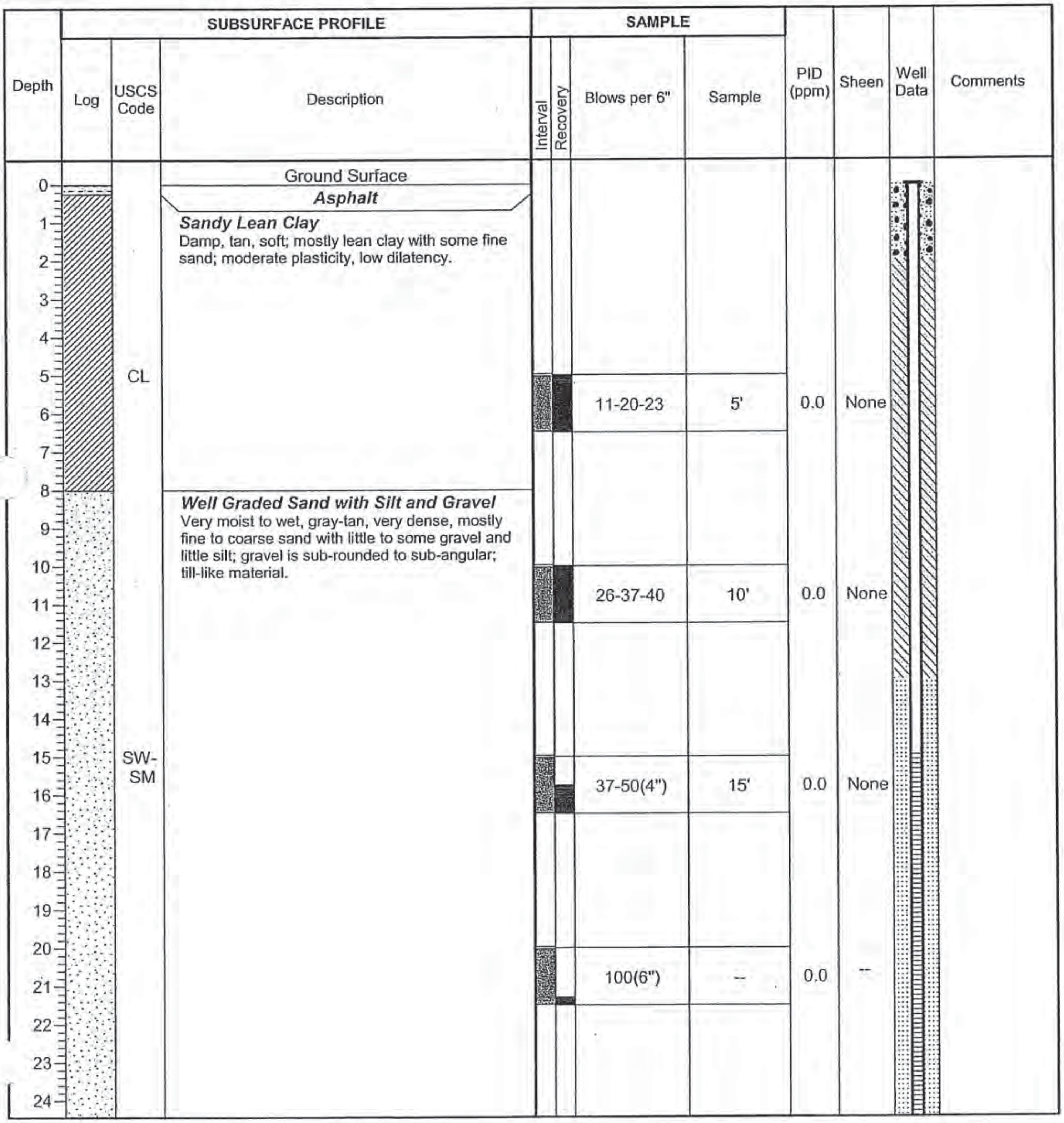
	SUBSURFACE PROFILE			SAMPLE							
Depth	Log	USCS Code	Description	Interval	Recovery	Blows per 6"	Sample	PID (ppm)	Sheen	Well Data	Comments
24											24' ATD
25											
26						100(6")	25'	0.0	None		
27											
28		SW-SM									
29											
30											
31						100(6")	30'	0.0	Very Slight		
32			Slight Petroleum Odor								
33											
34											
35											
36			Strong Petroleum Odor			100(6")	35'	0.0	Slight		
37											
38											
39											
40			End of Borehole								
41						100(6")	40'	0.0	Slight		
42											
43											
44											
45											
46											

Project No.: 16407.0

Boring/Well Designation: MW-6

Client: Steinberg & Associates
Logged By: Alex Jones/Alex McKenzie-Johnson
Date of Drilling: 04/25/01
Sheet: 1 of 2

Drilling Contractor: Cascade Drilling, Inc.
Method: Hollow Stem Auger
Drill Rig: B-61 (Mobile)
Borehole: 8 1/4" OD



Ground Surface

Asphalt

Sandy Lean Clay
Damp, tan, soft; mostly lean clay with some fine sand; moderate plasticity, low dilatency.

Well Graded Sand with Silt and Gravel
Very moist to wet, gray-tan, very dense, mostly fine to coarse sand with little to some gravel and little silt; gravel is sub-rounded to sub-angular; till-like material.

Blows per 6"	Sample	PID (ppm)	Sheen
11-20-23	5'	0.0	None
26-37-40	10'	0.0	None
37-50(4")	15'	0.0	None
100(6")	--	0.0	--

Project No.: 16407.0

Boring/Well Designation: MW-6

Client: Steinberg & Associates

Logged By: Alex Jones/Alex McKenzie-Johnson

Date of Drilling: 04/25/01

Sheet: 2 of 2

Drilling Contractor: Cascade Drilling, Inc.

Method: Hollow Stem Auger

Drill Rig: B-61 (Mobile)

Borehole: 8 1/4" OD

	SUBSURFACE PROFILE			SAMPLE							
Depth	Log	USCS Code	Description	Interval	Recovery	Blows per 6"	Sample	PID (ppm)	Sheen	Well Data	Comments
25			Increasing in Coarse Sands								
26				▨	■	80(6")	25'	0.0	None		
27											
28											
29											
30			Mostly Cobbles in Sampler								
31				▨	■	100(4")	--	--	None		
32											
33											
34											
35		SW-SM	Cobble in Sampler Shoe								
36				▨		100(5")	--	–	–		
37											
38											
39											39' ATD
40			Becoming Wet								
41				▨	■	100(5")	40'	0.0	None		
42											
43											
44			Decreasing Grain Size Increasing Silt								
45			End of Borehole								
46				▨	■	100(3")	45'	0.0	None		
47											
48											

Project No.: 16407.0

ENVIRONMENTAL PARTNERS INC

Boring/Well Designation: MW-7R

Client: Steinberg & Associates/PFF, LLC

Logged By: Alex Jones

Date of Drilling: 6-29-04

Location: Tacoma, WA

Drilling Contractor: Cascade Drilling, Inc.

Method: 50k Sonic

Drill Rig: Sonic Rig

Borehole: 6 in.

Depth	SUBSURFACE PROFILE			SAMPLE				PID (ppm)	Sheen	Well Data	Comments
	Log	USCS Code	Description	Interval	Recovery	Blows per 6"	Sample				
			Ground Surface								
0			***3" Gravel Surfacing***								
1			***Silty Sand with Gravel*** Slightly moist, brown, dense; mostly find to medium sand with some silt and some gravel; cobbles to 2".								
5		SM									
6							7.5'				
9							10'	2.4	N		
10			***Silt with Sand*** Moist, gray-brown, firm; mostly silt with little sand and few gravel; some organic material.								
14		ML					15'	3.3	N		
18			***Silty Sand with Gravel*** Moist, brown, very dense; mostly fine to coarse sand with some silt and some gravel; cobbles to 3".								
19							20'	1.5	N		
21		SM									
24							25'	0.3	N		
25											

Project No.: 16407.0

ENVIRONMENTAL PARTNERS INC

Boring/Well Designation: MW-7R

Client: Steinberg & Associates/PFF, LLC
Drilling Contractor: Cascade Drilling, Inc.
Logged By: Alex Jones
Method: 50k Sonic
Date of Drilling: 6-29-04
Drill Rig: Sonic Rig
Location: Tacoma, WA
Borehole: 6 in.

	SUBSURFACE PROFILE			SAMPLE							
Depth	Log	USCS Code	Description	Interval	Recovery	Blows per 6"	Sample	PID (ppm)	Sheen	Well Data	Comments
26 27											
28 29		SW-SM	***Well-Graded Sand w/ Silt and Gravel*** Moist, brown, very dense; mostly fine to coarse sand with little silt and some gravel; round cobbles to 3".				30'	0.1	N		
30 31 32		SM	***Silty Sand with Gravel*** Moist, brown, very dense; mostly sand with some silt and some gravel; cobbles to 3".								
33 34		SW-SM	***Well-Graded Sand w/ Silt and Gravel*** Moist, brown, very dense; mostly fine to coarse sand with little silt and some gravel; gravels graded from coarse to cobbles of 2-4".								
35 36 37											
38 39		SM	***Silty Sand with Gravel*** Moist, brown, very dense; mostly medium to coarse sand with some silt and some gravel; cobbles to 2".				40'	0.5	N		
40 41 42		SP	***Poorly-Graded Sand with Gravel*** Moist, gray-brown, very dense; mostly fine to medium sand with few silt and some gravel.				42.5'	1.2	N		
43 44							45'	37.2	N		Odor
45 46 47							47.5'	0.6	N		Slight Odor
48 49 50		SP-SM	***Poorly-Graded Sand w/ Silt and Gravel*** Very moist to wet, gray-brown, very dense; mostly fine to medium sand with little silt and some gravel; cobbles to 3".				50'	121	Y	▼	ATD Odor

Project No.: 16407.0

ENVIRONMENTAL PARTNERS INC

Boring/Well Designation: MW-7R

Client: Steinberg & Associates/PFF, LLC
Logged By: Alex Jones
Date of Drilling: 6-29-04
Location: Tacoma, WA

Drilling Contractor: Cascade Drilling, Inc.
Method: 50k Sonic
Drill Rig: Sonic Rig
Borehole: 6 in.

Depth	SUBSURFACE PROFILE			SAMPLE				PID (ppm)	Sheen	Well Data	Comments
	Log	USCS Code	Description	Interval	Recovery	Blows per 6"	Sample				
51							52.5'	90.6	Y		Odor
52											
53			***Silty Sand with Gravel*** Wet, gray-brown, very dense; mostly sand with some silt and some gravel; cobbles to 2".								
54		SM					55'	37.2	Y		Odor
55			End of Borehole								
56											
57											
58											
59											
60											
61											
62											
63											
64											
65											
66											
67											
68											
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70											
71											
72											
73											
74											
75											

Project No.: 16407.0

Boring/Well Designation: MW-8

Client: Steinberg & Associates
Logged By: Alex Jones/Alex McKenzie-Johnson
Date of Drilling: 04/25/01
Sheet: 1 of 2

Drilling Contractor: Cascade Drilling, Inc.
Method: Hollow Stem Auger
Drill Rig: B-61 (Mobile)
Borehole: 8 1/4" OD

Depth	SUBSURFACE PROFILE			SAMPLE				PID (ppm)	Sheen	Well Data	Comments
	Log	USCS Code	Description	Interval	Recovery	Blows per 6"	Sample				
0			Ground Surface								
0			***Asphalt***								
1		SW	***Well-Graded Sand with Gravel*** Moist, brown, loose; mostly fine to coarse sand with some gravel and trace fines; gravel is angular and appears to have been crushed; fill material.								
6						3-3-3	5'	0.0	None		
8		ML	***Silt with Sand*** Wet, tan, soft; mostly silt with little sand and trace gravel; gravel is sub-rounded; moderate petroleum hydrocarbon odor; fines are moderately plastic and moderately dilatent.								
11						3-3-8	10'	0.0	Slight		
12			Gray-Blue Staining								
14		SW-SM	***Well Graded Sand with Silt and Gravel*** Very moist to wet, gray-tan, very dense, mostly fine to coarse sand with little to some gravel and little silt; gravel is sub-rounded to sub-angular; till-like material.								
16						100(6")	15'	0.0	None		
21			Cobble in Sampler			50(6")	20'	0.0	None		
24											

Project No.: 16407.0

Boring/Well Designation: MW-8

Client: Steinberg & Associates
Logged By: Alex Jones/Alex McKenzie-Johnson
Date of Drilling: 04/25/01
Sheet: 2 of 2

Drilling Contractor: Cascade Drilling, Inc.
Method: Hollow Stem Auger
Drill Rig: B-61 (Mobile)
Borehole: 8 1/4" OD

Depth	SUBSURFACE PROFILE			SAMPLE				PID (ppm)	Sheen	Well Data	Comments
	Log	USCS Code	Description	Interval	Recovery	Blows per 6"	Sample				
25				▨	■	70(6")	25'	0.0	None		
30			Increasing Gravel Decreasing Fines	▨	■	50(6")	30'	0.0	None		
35		SW-SM	Slight Petroleum Odor	▨	■	50(6")	35'	0.0	Very Slight		35' ATD
40			Petroleum Odor	▨	■	40-50(6")	40'	0.0	None		
45			End of Borehole	▨		50(6")	--	--	--		No Recovery
48											

Project No.: 16407.0

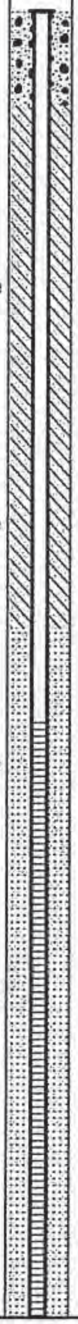
Boring/Well Designation: MW-9

Client: Steinberg & Associates
Logged By: Alex Jones/Alex McKenzie-Johnson
Date of Drilling: 04/25/01
Sheet: 1 of 2

Drilling Contractor: Cascade Drilling, Inc.
Method: Hollow Stem Auger
Drill Rig: B-61 (Mobile)
Borehole: 8 1/4" OD

Depth	USCS Code	Description (SUBSURFACE PROFILE)	Blows per 6" (SAMPLE)	Sample (SAMPLE)	PID (ppm)	Sheen	Comments
0		Ground Surface					
0		***Asphalt***					
1	ML	***Silt*** Very moist, tan, soft; mostly silt; moderate plasticity, moderate dilatency.					
6			6-7-10	5'	0.0	None	
8	SW-SM	***Well Graded Sand with Silt and Gravel*** Very moist to wet, gray-tan, very dense, mostly fine to coarse sand with little to some gravel and little silt; gravel is sub-rounded to sub-angular; till-like material.					
11			40-50(6")	10'	0.0	None	
16		Increasing Fine Sand Decrease in Silt	100(4")	15'	0.0	None	
20		Increase in Silt					
21			100(4")	20'	0.0	None	
26			30-50(2")	--	--	--	No Recove

Well Data:



Project No.: 16407.0

Boring/Well Designation: MW-9

Client: Steinberg & Associates
Logged By: Alex Jones/Alex McKenzie-Johnson
Date of Drilling: 04/25/01
Sheet: 2 of 2

Drilling Contractor: Cascade Drilling, Inc.
Method: Hollow Stem Auger
Drill Rig: B-61 (Mobile)
Borehole: 8 1/4" OD

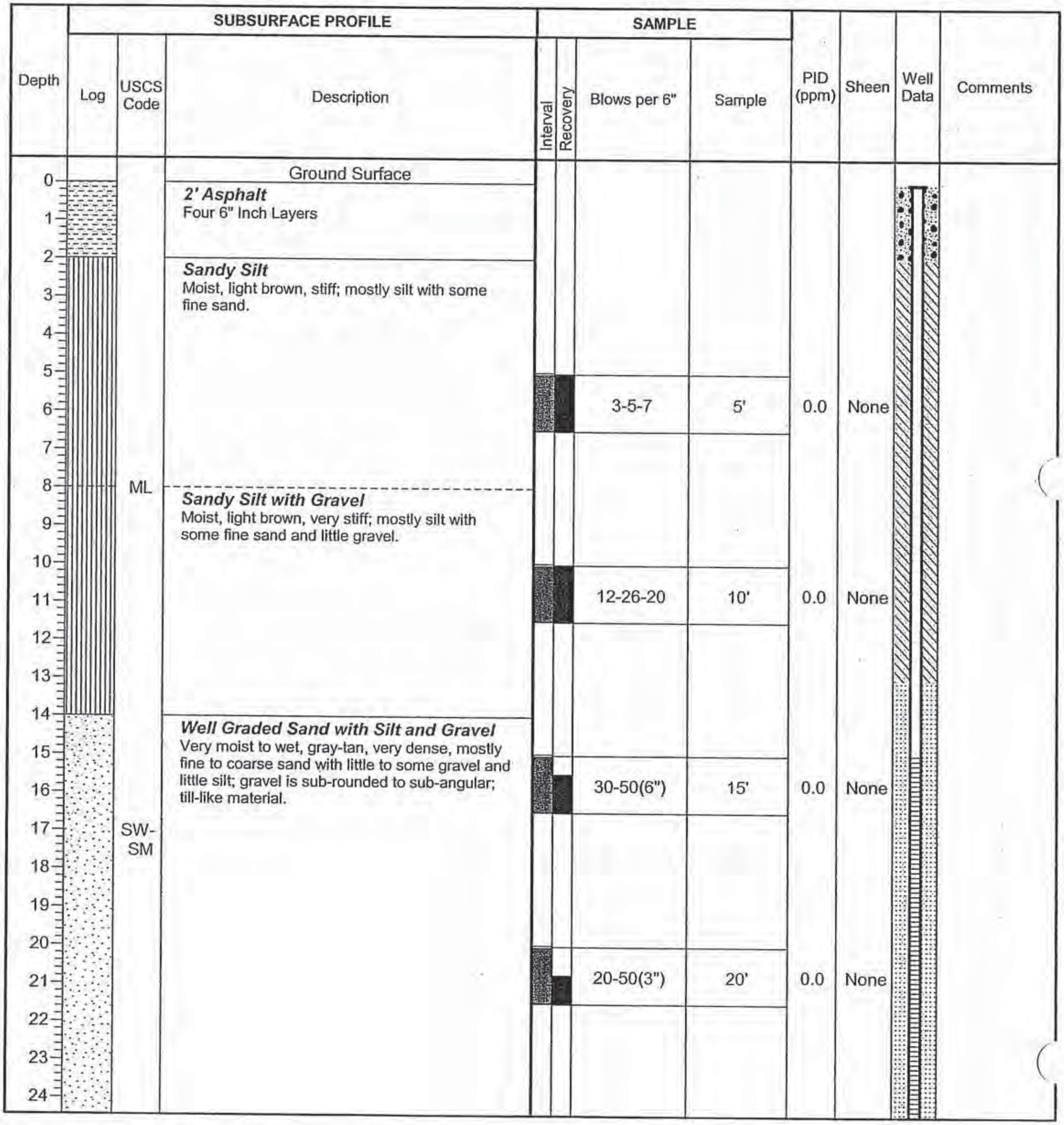
Depth	SUBSURFACE PROFILE			SAMPLE				PID (ppm)	Sheen	Well Data	Comments
	Log	USCS Code	Description	Interval	Recovery	Blows per 6"	Sample				
28											
29											
30						50(6")	--	0.0	--		
31											
32											
33											
34											
35						70(6")	--	--	--		
36											
37		SW-SM									
38											
39											
40			Becoming Wet			50(6")	40'	0.0	None		40' ATD
41											
42											
43											
44											
45			Increase in Coarse Sands			100(6")	45'	0.0	None		
46											
47											
48											
49											
50			End of Borehole								
51											
52											
53											
54											

Project No.: 16407.0

Boring/Well Designation: MW-10

Client: Steinberg & Associates
Logged By: Eric Koltes/ Alex McKenzie-Johnson
Date of Drilling: 04/27/01
Sheet: 1 of 2

Drilling Contractor: Cascade Drilling, Inc.
Method: Hollow Stem Auger
Drill Rig: B-61 (Mobile)
Borehole: 8 1/4" OD



Depth	SUBSURFACE PROFILE			SAMPLE				PID (ppm)	Sheen	Well Data	Comments
	Log	USCS Code	Description	Interval	Recovery	Blows per 6"	Sample				
0			Ground Surface								
0			***2' Asphalt*** Four 6" Inch Layers								
2			***Sandy Silt*** Moist, light brown, stiff; mostly silt with some fine sand.								
6						3-5-7	5'	0.0	None		
8		ML	***Sandy Silt with Gravel*** Moist, light brown, very stiff; mostly silt with some fine sand and little gravel.								
11						12-26-20	10'	0.0	None		
14			***Well Graded Sand with Silt and Gravel*** Very moist to wet, gray-tan, very dense, mostly fine to coarse sand with little to some gravel and little silt; gravel is sub-rounded to sub-angular; till-like material.								
16						30-50(6")	15'	0.0	None		
17		SW-SM									
21						20-50(3")	20'	0.0	None		

Project No.: 16407.0

Boring/Well Designation: MW-10

Client: Steinberg & Associates
Logged By: Eric Koltes/ Alex McKenzie-Johnson
Date of Drilling: 04/27/01
Sheet: 2 of 2

Drilling Contractor: Cascade Drilling, Inc.
Method: Hollow Stem Auger
Drill Rig: B-61 (Mobile)
Borehole: 8 1/4" OD

Depth	SUBSURFACE PROFILE			SAMPLE				PID (ppm)	Sheen	Well Data	Comments
	Log	USCS Code	Description	Interval	Recovery	Blows per 6"	Sample				
25						30-50(6")	25'	0.0	None		
30			Increase in Gravel			20-40-50	30'	0.0	None		
35		SW-SM	Becoming Very Moist			30-50(6")	35'	0.0	None		
40			Becoming Wet			30-50(4")	40'	0.0	None		40' ATD
45			End of Borehole			30-50(5")	--	--	--		No Recovery
48											

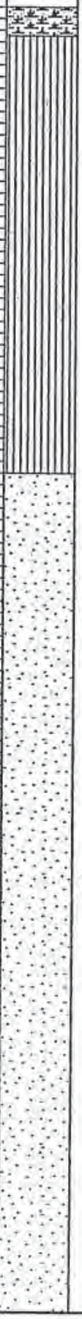
Project No.: 16407.0

Boring/Well Designation: MW-11

Client: Steinberg & Associates
Logged By: Alex Jones/Alex McKenzie-Johnson
Date of Drilling: 05/01/01
Sheet: 1 of 2

Drilling Contractor: Cascade Drilling, Inc.
Method: Hollow Stem Auger
Drill Rig: B-61 (Mobile)
Borehole: 8 1/4" OD

	SUBSURFACE PROFILE			SAMPLE							
Depth	Log	USCS Code	Description	Interval	Recovery	Blows per 6"	Sample	PID (ppm)	Sheen	Well Data	Comments
0			Ground Surface ***Grass/Gravel***								
1			***Silt with Sand*** Very moist, gray-brown, soft; mostly silt with little fine sand; moderate dilatency, low plasticity; slight petroleum odor.								
2											
3											
4											
5		ML									
6						2-4-5	5'	0.0	None		
7											
8											
9			***Well Graded Sand with Silt and Gravel*** Very moist to wet, gray-tan, very dense, mostly fine to coarse sand with little to some gravel and little silt; gravel is sub-rounded to sub-angular; till-like material.								
10											
11			Slight Petroleum Odor			13-15-15	10'	0.0	None		
12			Color Change to Tan								
13						50(6")	15'	0.0	None		
14											
15		SW-SM									
16			Becoming Wet Increase in Coarse Sands			50(6")	20'	0.0	None		
17											
18											
19											
20											
21						40-50(5")	25'	0.0	None		
22											



Project No.: 16407.0

Boring/Well Designation: MW-11

Client: Steinberg & Associates
Logged By: Alex Jones/Alex McKenzie-Johnson
Date of Drilling: 05/01/01
Sheet: 2 of 2

Drilling Contractor: Cascade Drilling, Inc.
Method: Hollow Stem Auger
Drill Rig: B-61 (Mobile)
Borehole: 8 1/4" OD

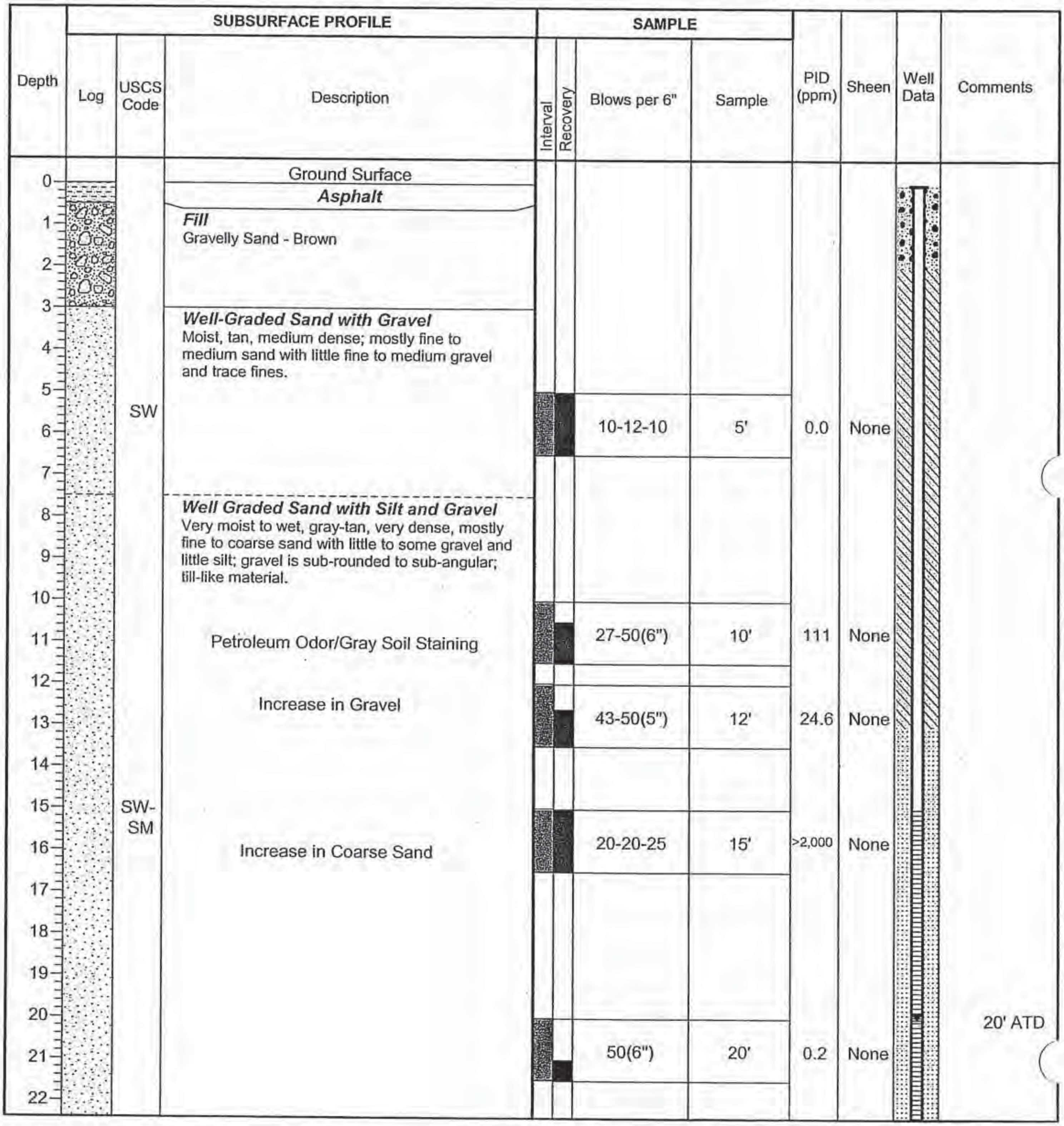
Depth	SUBSURFACE PROFILE			SAMPLE				PID (ppm)	Sheen	Well Data	Comments
	Log	USCS Code	Description	Interval	Recovery	Blows per 6"	Sample				
23			Increasing Gravel Size Sand and Gravel in Almost Equal Proportions								
25			Decrease in Silt								25' ATD
26						30-35-50(3")	30'	0.0	None		
28		SW-SM									
31			Large Fractured Cobble in Sampler			31-50(5")	35'	0.0	None		
35						50(6")	40'	0.0	None		
36			***Poorly Graded Sand with Gravel*** Wet, tan-brown, very dense; mostly coarse sand with little gravel and trace fines; gravel is sub-rounded.								
38		SP									
40			End of Borehole								
41						50(6")	45'	0.0	None		
42											
43											
44											

Project No.: 16407.0

Boring/Well Designation: MW-15

Client: Steinberg & Associates
Logged By: Alex Jones/Alex McKenzie-Johnson
Date of Drilling: 05/01/01
Sheet: 1 of 2

Drilling Contractor: Cascade Drilling, Inc.
Method: Hollow Stem Auger
Drill Rig: B-61 (Mobile)
Borehole: 8 1/4" OD



Depth	USCS Code	SUBSURFACE PROFILE Description	SAMPLE Blows per 6"	SAMPLE Sample	PID (ppm)	Sheen	Comments
0		Ground Surface **_Asphalt_**					
1		**_Fill_** Gravelly Sand - Brown					
3		**_Well-Graded Sand with Gravel_** Moist, tan, medium dense; mostly fine to medium sand with little fine to medium gravel and trace fines.					
6	SW		10-12-10	5'	0.0	None	
8		**_Well Graded Sand with Silt and Gravel_** Very moist to wet, gray-tan, very dense, mostly fine to coarse sand with little to some gravel and little silt; gravel is sub-rounded to sub-angular; till-like material.					
11		Petroleum Odor/Gray Soil Staining	27-50(6")	10'	111	None	
13		Increase in Gravel	43-50(5")	12'	24.6	None	
15	SW-SM						
16		Increase in Coarse Sand	20-20-25	15'	>2,000	None	
20							20' ATD
21			50(6")	20'	0.2	None	

Project No.: 16407.0

Boring/Well Designation: MW-15

Client: Steinberg & Associates
Logged By: Alex Jones/Alex McKenzie-Johnson
Date of Drilling: 05/01/01
Sheet: 2 of 2

Drilling Contractor: Cascade Drilling, Inc.
Method: Hollow Stem Auger
Drill Rig: B-61 (Mobile)
Borehole: 8 1/4" OD

Depth	SUBSURFACE PROFILE			SAMPLE				PID (ppm)	Sheen	Well Data	Comments
	Log	USCS Code	Description	Interval	Recovery	Blows per 6"	Sample				
23	▨										
24	▨										
25	▨	SW-SM		▨		50(3")	--	--	--		No Recovery
26	▨										
27	▨										
28	▨										
29	▨		Decreasing Fines/ Sand is Mostly Coarse Grained								
30			End of Borehole	▨	■	30-50(6")	30'	0.0	None		
31											
32											
33											
34											
35											
36											
37											
38											
39											
40											
41											
42											
43											
44											

Project No.: 16407.0

ENVIRONMENTAL PARTNERS INC

Boring/Well Designation: MW-19

Client: Steinberg & Associates/PFF, LLC
Logged By: Alex Jones
Date of Drilling: 6-30-04
Location: Tacoma, WA

Drilling Contractor: Cascade Drilling, Inc.
Method: 50k Sonic
Drill Rig: Sonic Rig
Borehole: 6 in.

Depth	SUBSURFACE PROFILE			SAMPLE				PID (ppm)	Sheen	Well Data	Comments
	Log	USCS Code	Description	Interval	Recovery	Blows per 6"	Sample				
			Ground Surface								
0 1 2		SW	***3" Asphalt Surfacing*** ***Well-Graded Sand with Gravel*** Dry, brown, loose; mostly fine to coarse sand with trace silt and some gravel; base coarse.				2.5'	1.2	N		
3 4		SM	***Silty Sand with Gravel*** Moist, brown, medium dense; mostly sand with some silt and some gravel.				5'	0.6	N		
5 6 7			***Silt*** Moist, brown, firm; mostly silt with trace fine sand; medium plasticity.				7.5'	0.2	N		
8 9		ML					10'	0.2	N		
10 11 12			***Silt with Gravel*** Moist, brown, firm to hard; mostly silt with little sand and some gravel; round cobbles to 1".				12.5'	0.2	N		
13 14			***Silty Sand with Gravel*** Moist, brown, very dense; mostly sand with some silt and some gravel; cobbles to 3".				15'	0.1	N		
15 16 17							17.5'	0.4	N		
18 19		SM					20'	0.2	N		
20 21 22							22.5'	0.1	N		
23 24 25							25'	0.2	N		

Project No.: 16407.0

ENVIRONMENTAL PARTNERS INC

Boring/Well Designation: MW-19

Client: Steinberg & Associates/PFF, LLC
Logged By: Alex Jones
Date of Drilling: 6-30-04
Location: Tacoma, WA

Drilling Contractor: Cascade Drilling, Inc.
Method: 50k Sonic
Drill Rig: Sonic Rig
Borehole: 6 in.

Depth	Log	USCS Code	SUBSURFACE PROFILE Description	SAMPLE Interval	Recovery	Blows per 6"	Sample	PID (ppm)	Sheen	Well Data	Comments
26 27							27.5'	0.2	N		
28 29 30		SM					30'	2.6	N		
31 32							32.5'	129	Y		Odor
33 34 35							35'	510	Y		Odor
36 37		GM	***Silty Gravel with Sand*** Moist, gray-brown, very dense; mostly fine to coarse gravel with some silt and some sand; cobbles to 3".				37.5	66.5	N		Slight Odor
38 39 40		ML	***Silt with Gravel*** Moist, gray-brown, hard; mostly silt with little sand and some gravel; cobbles to 3".				40'	60.2	N		Slight Odor
41 42			***Silty Sand with Gravel*** Moist, gray-brown, very dense; mostly sand with some silt and some gravel; cobbles to 3".				42.5'	0.5	N		
43 44 45							45'	0.7	N		
46 47							47.5'	14.5	N		ATD
48 49 50							50'	25.7	Slight		Slight Odor

Project No.: 16407.0

ENVIRONMENTAL PARTNERS INC

Boring/Well Designation: MW-19

Client: Steinberg & Associates/PFF, LLC
Logged By: Alex Jones
Date of Drilling: 6-30-04
Location: Tacoma, WA

Drilling Contractor: Cascade Drilling, Inc.
Method: 50k Sonic
Drill Rig: Sonic Rig
Borehole: 6 in.

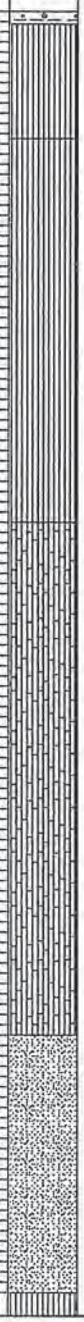
Depth	SUBSURFACE PROFILE			SAMPLE				PID (ppm)	Sheen	Well Data	Comments
	Log	USCS Code	Description	Interval	Recovery	Blows per 6"	Sample				
51 52							52.5'	1.9	N		
53 54 55		SW	***Well-Graded Sand with Gravel*** Wet, brown, very dense; mostly fine to coarse sand with trace to few silt and some gravel; cobbles to 2".				55'	0.2	N		
56 57							57.5	0.8	N		
58 59 60							60'	0.2	N		
61 62							62.5'	0.3	N		
63 64							65'	0.1	N		
65 66 67 68 69 70 71 72 73 74 75			End of Borehole								

Project No.: 16407.0

Boring/Well Designation: MW-20

Client: Steinberg & Associates/PFF, LLC
Logged By: Alex Jones
Date of Drilling: 6-30-04
Location: Tacoma, WA

Drilling Contractor: Cascade Drilling, Inc.
Method: 50k Sonic
Drill Rig: Sonic Rig
Borehole: 6 in.

Depth	SUBSURFACE PROFILE			SAMPLE				PID (ppm)	Sheen	Well Data	Comments
	Log	USCS Code	Description	Interval	Recovery	Blows per 6"	Sample				
0		ML	Ground Surface ***3" Asphalt Surfacing***								
1			***Silt*** Moist, brown, firm; mostly silt with trace fine sand; organic material; iron mottling; medium plasticity.				2.5'	0.2	N		
3			***Silt*** Moist, brown, firm; mostly silt with trace fine sand; medium plasticity.				5'	0.2	N		
5		ML									
6							7.5'	0.3	N		
9							10'	0.2	N		
10			***Silty Sand with Gravel*** Slightly moist, gray-brown, very dense; mostly sand with some silt and some gravel; cobbles to 2".				12.5'	0.1	N		
14							15'	0.1	N		
15		SM									
16							17.5'	0.1	N		
19							20'	0.1	N		
20			***Poorly-Graded Sand with Gravel*** Moist, brown, very dense; mostly medium to coarse sand with few silt and some gravel; cobbles to 3".				22.5'	0.1	N		
22		SP									
24							25'	0.1	N		
25											

Project No.: 16407.0

ENVIRONMENTAL PARTNERS INC

Boring/Well Designation: MW-20

Client: Steinberg & Associates/PFF, LLC	**Drilling Contractor:** Cascade Drilling, Inc.
Logged By: Alex Jones	**Method:** 50k Sonic
Date of Drilling: 6-30-04	**Drill Rig:** Sonic Rig
Location: Tacoma, WA	**Borehole:** 6 in.

Depth	USCS Code	SUBSURFACE PROFILE Description	Blows per 6"	Sample	PID (ppm)	Sheen	Comments
26–27	ML	***Silt with Gravel*** Moist, brown, hard; mostly silt with little sand and some gravel; medium plasticity; cobbles to 1".		27.5'	0.1	N	
27–37.5	SM	***Silty Sand with Gravel*** Moist, brown, very dense; mostly sand with some silt and some gravel.		30'	0.1	N	
				32.5'	0.1	N	
				35'	0.1	N	
				37.5	0.2	N	
37.5–40	SW	***Well-Graded Sand with Gravel*** Very moist, brown, very dense; mostly fine to coarse sand with little silt and some gravel; cobbles to 2".		40'	0.1	N	
40–42.5	SM	***Silty Sand with Gravel*** Moist, brown, very dense; mostly sand with some silt and some gravel; cobbles to 1.5".		42.5'	0.1	N	
42.5–50	SW	***Well-Graded Sand with Gravel*** Wet, gray-brown, very dense; mostly fine to coarse sand with few silt and some gravel, cobbles to 1".		45'	211	Y	Odor
				47.5'	52.0	Y	Odor ATD
				50'	66.9	Slight	Odor

Project No.: 16407.0

ENVIRONMENTAL PARTNERS INC

Boring/Well Designation: MW-20

Client: Steinberg & Associates/PFF, LLC
Logged By: Alex Jones
Date of Drilling: 6-30-04
Location: Tacoma, WA

Drilling Contractor: Cascade Drilling, Inc.
Method: 50k Sonic
Drill Rig: Sonic Rig
Borehole: 6 in.

Depth	SUBSURFACE PROFILE: Log	SUBSURFACE PROFILE: USCS Code	SUBSURFACE PROFILE: Description	SAMPLE: Interval	SAMPLE: Recovery	SAMPLE: Blows per 6"	SAMPLE: Sample	PID (ppm)	Sheen	Well Data	Comments
51 52		SW					52.5'	143	Y		Odor
53 54 55							55'	13.7	N		Slight Odor
56 57							57.5	0.1	N		
58 59 60		SM	***Silty Sand with Gravel*** Slightly moist, gray-brown, very dense; mostly sand with some silt and some gravel; cobbles to 1".				60'	0.1	N		
61 62		SW	***Well-Graded Sand with Gravel*** Wet, brown, very dense; mostly fine to coarse sand with trace silt and some gravel; cobbles to 2".				62.5'	0.4	N		
63 64 65		SM	***Silty Sand with Gravel*** Slightly moist, brown, very dense; mostly sand with some silt and some gravel; cobbles to 2".				65'	0.3	N		
66 67 68 69 70 71 72 73 74 75			End of Borehole								

Project No.: 16407.0

ENVIRONMENTAL PARTNERS INC

Boring/Well Designation: MW-22

Client: Steinberg & Associates/PFF, LLC

Logged By: Alex Jones

Date of Drilling: 7-1-04

Location: Tacoma, WA

Drilling Contractor: Cascade Drilling, Inc.

Method: 50k Sonic

Drill Rig: Sonic Rig

Borehole: 6 in.

Depth	SUBSURFACE PROFILE			SAMPLE				PID (ppm)	Sheen	Well Data	Comments
	Log	USCS Code	Description	Interval	Recovery	Blows per 6"	Sample				
-3											
-2											
-1											
0			Ground Surface Grass at surface; approx. 1' of organic topsoil.								
1			***Silt*** Moist, brown, firm; mostly silt with trace fine to coarse sand and few gravel.								
2							2.5'	0.5	N		
3											
4							5'	0.1	N		
5		ML									
6											
7							7.5'	0.1	N		
8											
9							10'	0.2	N		
10			***Silty Sand with Gravel*** Moist, brown, very dense; mostly sand with some silt and some gravel; cobbles to 2".								
11		SM					12.5'	0.3	N		
12											
13			***Well-Graded Sand with Gravel*** Moist, brown, very dense; mostly fine to coarse sand with little silt and some gravel; cobbles to 2".								
14		SW					15'	0.1	N		
15			***Silty Sand with Gravel*** Very moist, brown, very dense; mostly sand with some silt and some gravel; round cobbles to 1".								
16		SM					17.5'	0.4			
17											
18			***Poorly-Graded Sand with Gravel*** Very moist, brown, very dense; mostly fine to medium sand with trace silt and some gravel; cobbles to 3".								
19							20'	0.2	N		
20											
21		SP									
22							22.5'	0.1	N		
23											

Project No.: 16407.0

ENVIRONMENTAL PARTNERS INC

Boring/Well Designation: MW-22

Client: Steinberg & Associates/PFF, LLC
Logged By: Alex Jones
Date of Drilling: 7-1-04
Location: Tacoma, WA

Drilling Contractor: Cascade Drilling, Inc.
Method: 50k Sonic
Drill Rig: Sonic Rig
Borehole: 6 in.

Depth	SUBSURFACE PROFILE			SAMPLE				PID (ppm)	Sheen	Well Data	Comments
	Log	USCS Code	Description	Interval	Recovery	Blows per 6"	Sample				
24 25		SM	***Silty Sand with Gravel*** Moist, brown, very dense; mostly sand with some silt and some gravel; cobbles to 2".				25'	0.1	N		
26 27		SW	***Well-Graded Sand with Gravel*** Very moist, brown, very dense; mostly fine to coarse sand with little silt and some gravel; cobbles to 2".				27.5'	0.1	N		
28 29 30 31 32		SP	***Poorly-Graded Sand with Gravel*** Moist, brown, very dense; mostly medium sand with little silt and some gravel; cobbles to 3".				30' 32.5'	0.2 0.2	N N		
33 34		SM	***Silty Sand with Gravel*** Moist, brown, very dense; mostly sand with some silt and some gravel; cobbles to 3".				35'	0.3	N		
35 36 37 38 39 40 41 42		SP	***Poorly-Graded Sand with Gravel*** Wet, brown, very dense; mostly coarse sand with few silt and some gravel; at 38' grades to fine to medium sand.				37.5' 40' 42.5'	3.8 2.5 1.0	N N N		ATD
43 44		SM SP	***Silty Sand with Gravel*** Very moist, brown, very dense; mostly sand with some silt and some gravel; cobbles to 2".				45'	1.9	N		
45 46 47 48 49		SW	***Well-Graded Sand with Gravel*** Wet, brown, very dense; mostly fine to coarse sand with few silt and some gravel; cobbles to 2".				47.5' 50'	8.2 4.9	N N		

Project No.: 16407.0

Boring/Well Designation: MW-22

Client: Steinberg & Associates/PFF, LLC
Logged By: Alex Jones
Date of Drilling: 7-1-04
Location: Tacoma, WA

Drilling Contractor: Cascade Drilling, Inc.
Method: 50k Sonic
Drill Rig: Sonic Rig
Borehole: 6 in.

Depth	SUBSURFACE PROFILE			SAMPLE				PID (ppm)	Sheen	Well Data	Comments
	Log	USCS Code	Description	Interval	Recovery	Blows per 6"	Sample				
50											
51		SM	***Silty Sand with Gravel*** Moist, brown, very dense; mostly sand with some silt and some gravel; cobbles to 2".				52.5'	5.5	N		
52											
53											
54		SW	***Well-Graded Sand with Gravel*** Wet, brown, very dense; mostly fine to coarse sand with trace silt and some gravel.				55'	3.0	N		
55											
56		SM	***Silty Sand with Gravel*** Very moist, brown, very dense; mostly sand with some silt and some gravel; cobbles to 2".				57.5	1.2	N		
57											
58			End of Borehole								
59											
60											
61											
62											
63											
64											
65											
66											
67											
68											
69											
70											
71											
72											
73											
74											
75											

Project No.: 16407.0

MW-25d

LAI Project No: 136006.010

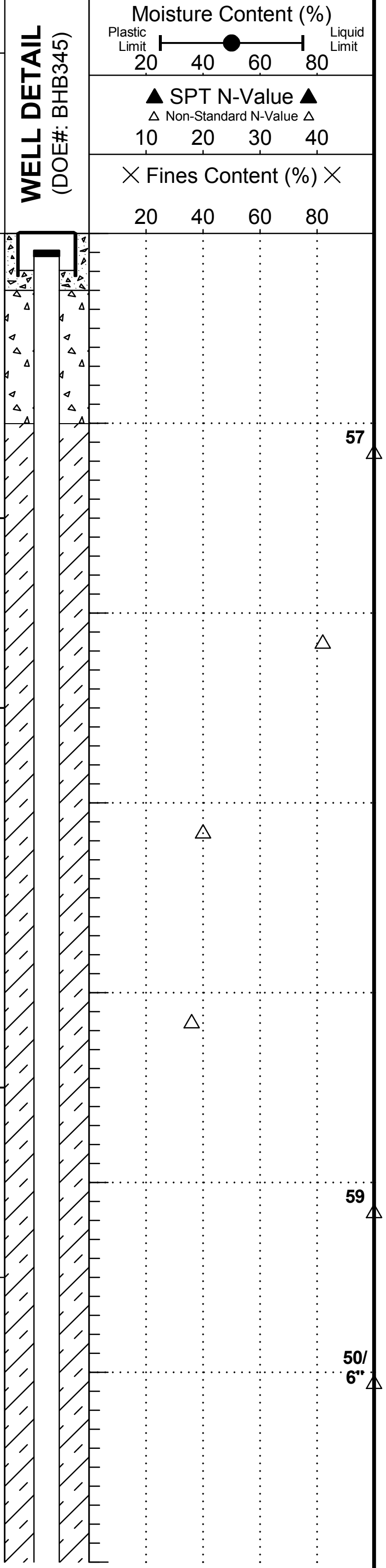
SAMPLE DATA

SOIL PROFILE

Drilling Method: Hollow-Stem Auger
Ground Elevation (ft): 405.53
Drilled By: Cascade Drilling Inc.
Logged By: TJS/PRR Date: 05/13/11

Depth (ft)	Elevation (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)
0	405				
5	400	S-1	a1	57	0
10	395	S-2	a1	41	0
15	390	S-3	a1	20	0
20	385	S-4	a1	18	0.1
25	380	S-5	a1	59	14.8
30	375	S-6	a1	50/ 6"	11.7
35					

USCS Symbol	Description
SP-SM	Brown, gravelly, fine to medium SAND with silt; no odor or sheen (medium dense, moist) **(FILL)**
SM	Gray with brown mottling, silty, gravelly, fine to medium SAND; strong odor, no sheen (medium dense, moist) **Soil sample: MW25d(10-10.5)20110513**
SM	Brownish-gray, silty, fine to medium SAND with gravel; hydrocarbon odor, no sheen (loose to medium dense, moist) **Soil sample: MW25d(15-15.5)20110513** - grades no odor or sheen and loose **Soil sample: MW25d(20-20.5)20110513**
SM	Gray, gravelly, silty, fine to medium SAND; strong hydrocarbon odor, sheen (medium dense, moist) **Soil sample: MW25d(25-25.5)20110513**
SM	Gray, silty, gravelly, fine to medium SAND; strong hydrocarbon odor, sheen (very dense, moist) **(UNIT 2)** **Soil sample: MW25d(30-30.5)20110513** - grades fine to coarse SAND



Notes: 1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.
4. DOE Unique Well Number: BHB345

136006.01 9/20/11 N:\PROJECTS\136006.010.GPJ SOIL BORING LOG WITH GRAPH

LANDAU ASSOCIATES

Perderson's Fryer Farms
Tacoma, Washington

Log of Boring MW-25d

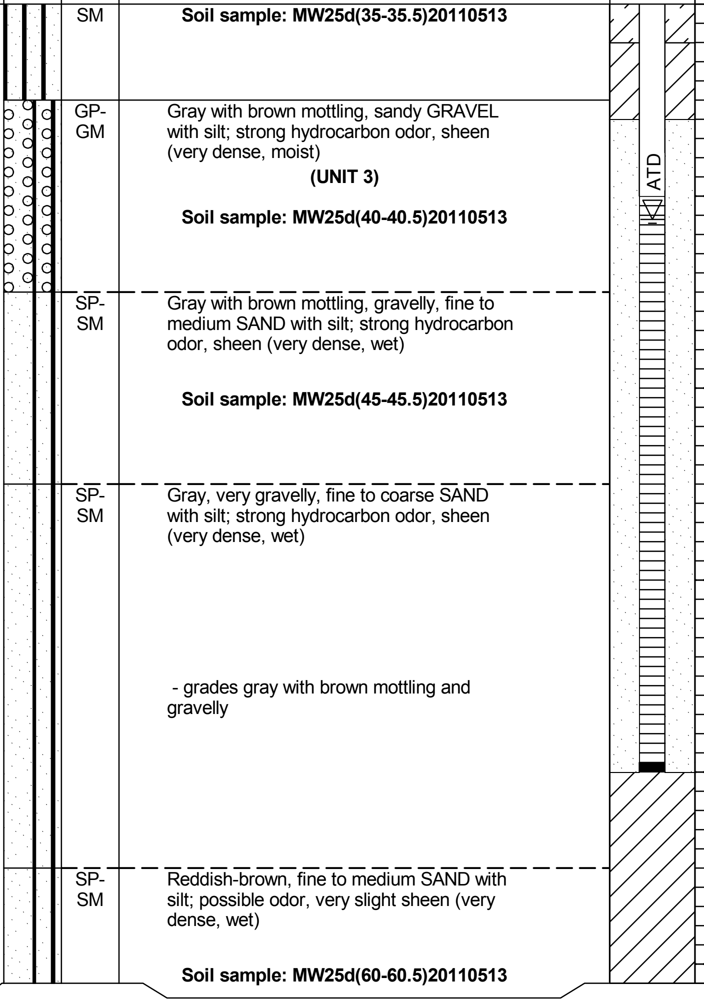
Figure
A-23
(1 of 2)

MW-25d

LAI Project No: 136006.010

SAMPLE DATA / SOIL PROFILE

Drilling Method: Hollow-Stem Auger
Ground Elevation (ft): 405.53
Drilled By: Cascade Drilling Inc.
Logged By: TJS/PRR Date: 05/13/11



Depth (ft)	Elevation (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	USCS Symbol	Description	SPT N-Value
35	370	S-7	a1	82	12.3	SM	**Soil sample: MW25d(35-35.5)20110513**	82
						GP-GM	Gray with brown mottling, sandy GRAVEL with silt; strong hydrocarbon odor, sheen (very dense, moist) **(UNIT 3)**	
40	365	S-8	a1	93	10.3		**Soil sample: MW25d(40-40.5)20110513**	93
						SP-SM	Gray with brown mottling, gravelly, fine to medium SAND with silt; strong hydrocarbon odor, sheen (very dense, wet)	
45	360	S-9	a1	50/ 6"	21.2		**Soil sample: MW25d(45-45.5)20110513**	50/ 6"
						SP-SM	Gray, very gravelly, fine to coarse SAND with silt; strong hydrocarbon odor, sheen (very dense, wet)	
50	355	S-10	a1	50/ 6"	12.7			50/ 6"
							- grades gray with brown mottling and gravelly	
55	350	S-11	a1	50/ 6"	0.6			50/ 6"
						SP-SM	Reddish-brown, fine to medium SAND with silt; possible odor, very slight sheen (very dense, wet)	
60		S-12	a1	50/ 6"	0		**Soil sample: MW25d(60-60.5)20110513**	50/ 6"
65								
70								

Moisture Content (%): Plastic Limit — Liquid Limit; 20 40 60 80
▲ SPT N-Value ▲ (△ Non-Standard N-Value △): 10 20 30 40
× Fines Content (%) ×: 20 40 60 80

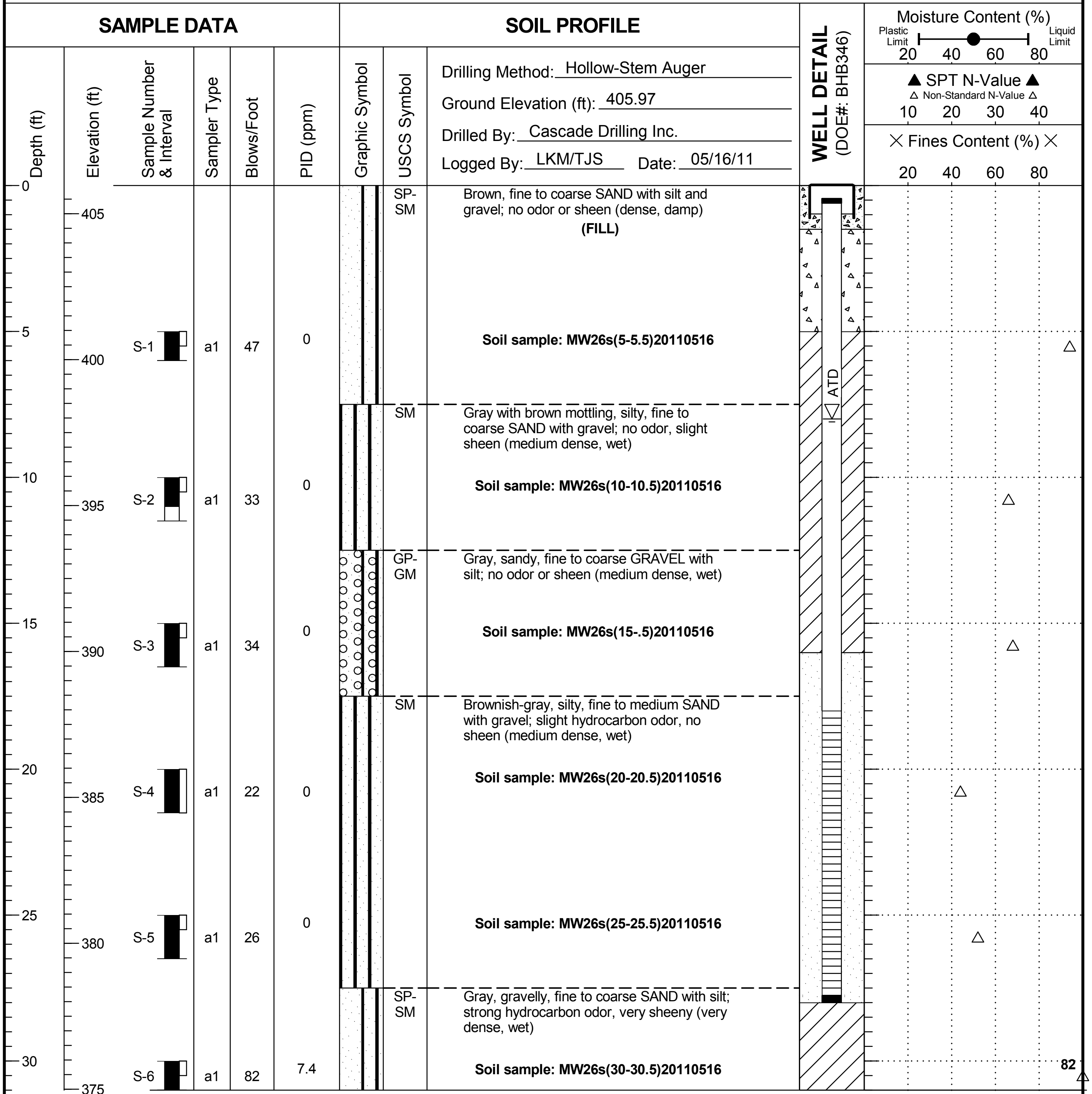
Boring Completed 05/13/11
Total Depth of Boring = 60.5 ft.

Monitoring Well Completed 05/13/11
Elevation at Top of Protective Casing = 404.90 ft.
Elevation at Top of Monitoring Well Casing = Not Measured
Total Depth of Monitoring Well = 55.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.
4. **DOE Unique Well Number: BHB345**

MW-26s

LAI Project No: 136006.010



Drilling Method: Hollow-Stem Auger

Ground Elevation (ft): 405.97

Drilled By: Cascade Drilling Inc.

Logged By: LKM/TJS Date: 05/16/11

Depth (ft)	Elevation (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)
5	400	S-1	a1	47	0
10	395	S-2	a1	33	0
15	390	S-3	a1	34	0
20	385	S-4	a1	22	0
25	380	S-5	a1	26	0
30	375	S-6	a1	82	7.4

USCS Symbol	Description
SP-SM	Brown, fine to coarse SAND with silt and gravel; no odor or sheen (dense, damp) **(FILL)** **Soil sample: MW26s(5-5.5)20110516**
SM	Gray with brown mottling, silty, fine to coarse SAND with gravel; no odor, slight sheen (medium dense, wet) **Soil sample: MW26s(10-10.5)20110516**
GP-GM	Gray, sandy, fine to coarse GRAVEL with silt; no odor or sheen (medium dense, wet) **Soil sample: MW26s(15-.5)20110516**
SM	Brownish-gray, silty, fine to medium SAND with gravel; slight hydrocarbon odor, no sheen (medium dense, wet) **Soil sample: MW26s(20-20.5)20110516** **Soil sample: MW26s(25-25.5)20110516**
SP-SM	Gray, gravelly, fine to coarse SAND with silt; strong hydrocarbon odor, very sheeny (very dense, wet) **Soil sample: MW26s(30-30.5)20110516**

Boring Completed 05/16/11
Total Depth of Boring = 31.0 ft.

Monitoring Well Completed 05/16/11
Elevation at Top of Protective Casing = 405.52 ft.
Elevation at Top of Monitoring Well Casing = Not Measured
Total Depth of Monitoring Well = 28.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.
4. **DOE Unique Well Number: BHB346**

LANDAU ASSOCIATES

Perderson's Fryer Farms
Tacoma, Washington

Log of Boring MW-26s

Figure
A-24

MW-27d

LAI Project No: 136006.010

SAMPLE DATA / SOIL PROFILE

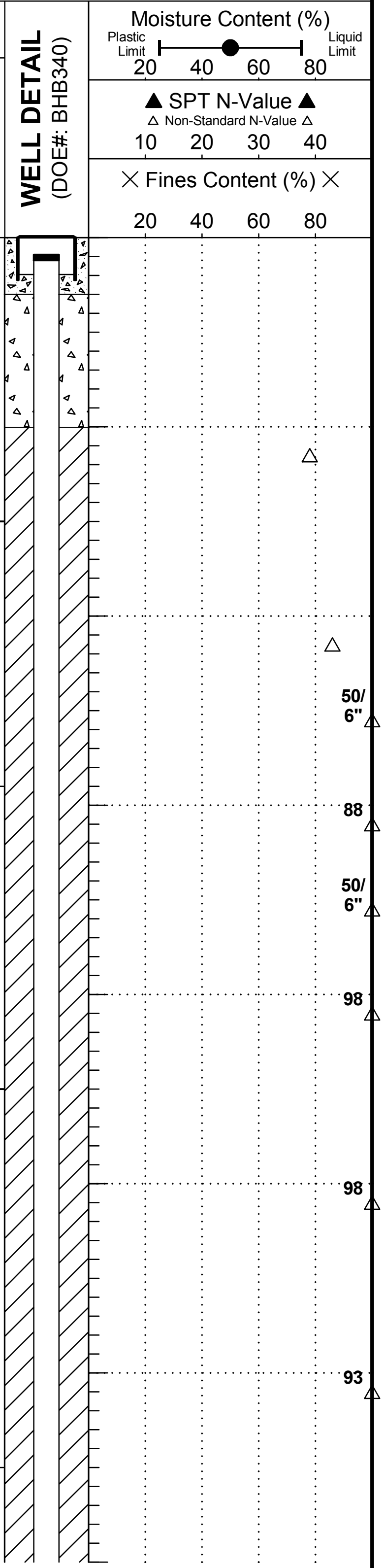
Drilling Method: Hollow-Stem Auger

Ground Elevation (ft): 406.38

Drilled By: Cascade Drilling Inc.

Logged By: TJS/PRR Date: 05/09/11

Depth (ft)	Elevation (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	USCS Symbol	Description
0						ML	Brown with red mottling, sandy SILT with organics; no odor or sheen (medium dense, damp)
	405						**(UNIT 1)**
5							
		S-1	b1	39	0		
	400						
						SM	Brown, gravelly, silty, fine to medium SAND; no odor or sheen (dense, moist)
10							
		S-2	b1	43			
	395						
		S-3	b1	50/ 6"			- grades very dense
15						SM	Brown, very gravelly, silty, fine to coarse SAND; no odor or sheen (very dense, moist) **(UNIT 2)**
		S-4	b1	88	0		
	390						
		S-5	b1	50/ 6"			- grades gravelly and fine to medium SAND (very dense, moist)
20							
		S-6	b1	98			**Soil sample: MW27d(20-20.5)20110509**
	385						
						GP-GM	Gray, sandy GRAVEL with silt; no odor or sheen (very dense, moist)
25							
		S-7	b1	98	0		
	380						
30							
		S-8	b1	93	0		**Soil sample: MW27d(30-30.5)20110509**
	375						
						SP-SM	
35							



Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.
4. **DOE Unique Well Number: BHB340**

LANDAU ASSOCIATES

Perderson's Fryer Farms
Tacoma, Washington

Log of Boring MW-27d

Figure
A-25
(1 of 2)

MW-27d

LAI Project No: 136006.010

SAMPLE DATA

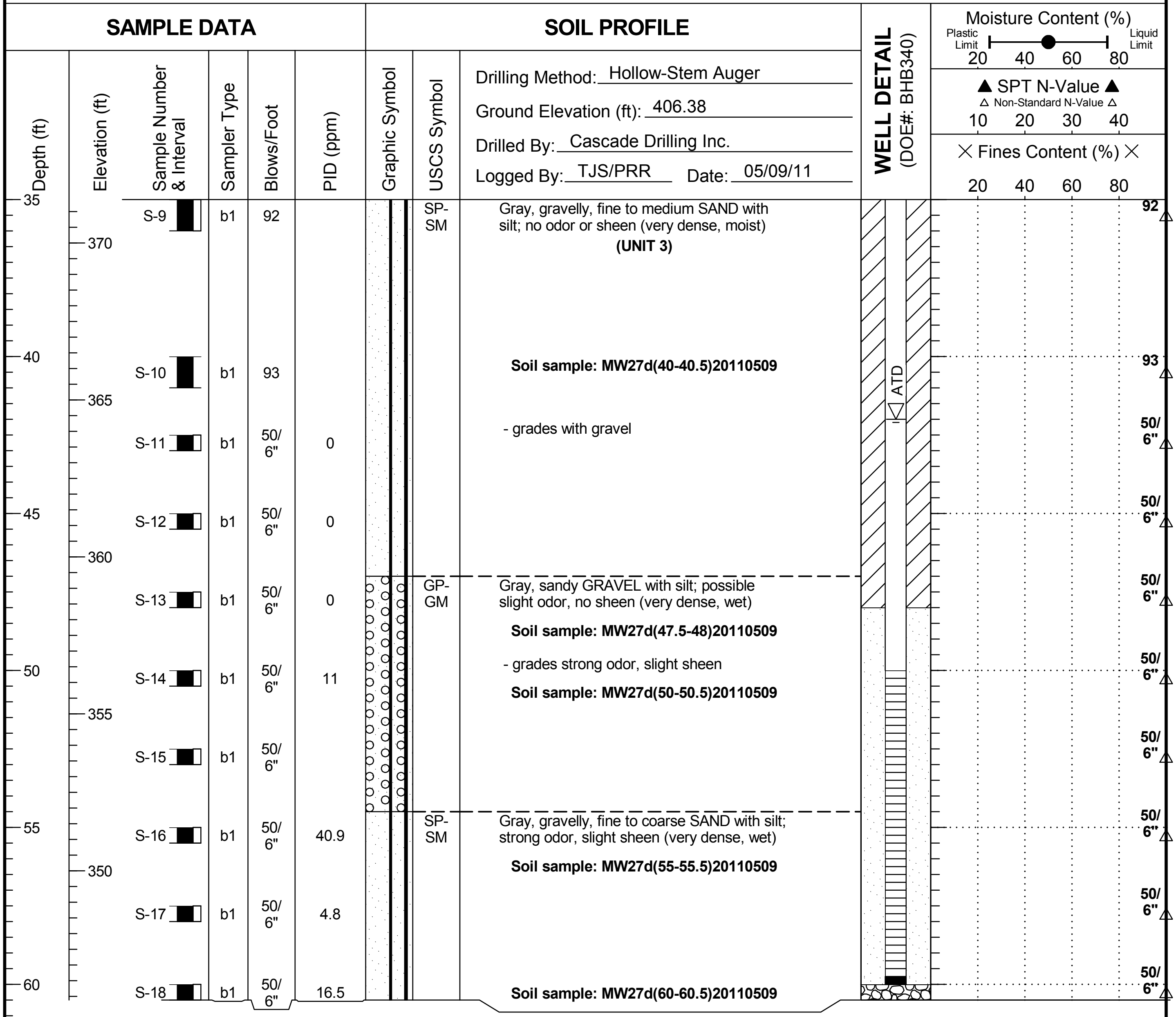
SOIL PROFILE

Drilling Method: Hollow-Stem Auger

Ground Elevation (ft): 406.38

Drilled By: Cascade Drilling Inc.

Logged By: TJS/PRR Date: 05/09/11



Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)
S-9	b1	92	
S-10	b1	93	
S-11	b1	50/ 6"	0
S-12	b1	50/ 6"	0
S-13	b1	50/ 6"	0
S-14	b1	50/ 6"	11
S-15	b1	50/ 6"	
S-16	b1	50/ 6"	40.9
S-17	b1	50/ 6"	4.8
S-18	b1	50/ 6"	16.5

USCS Symbol	Description
SP-SM	Gray, gravelly, fine to medium SAND with silt; no odor or sheen (very dense, moist) **(UNIT 3)** **Soil sample: MW27d(40-40.5)20110509** - grades with gravel
GP-GM	Gray, sandy GRAVEL with silt; possible slight odor, no sheen (very dense, wet) **Soil sample: MW27d(47.5-48)20110509** - grades strong odor, slight sheen **Soil sample: MW27d(50-50.5)20110509**
SP-SM	Gray, gravelly, fine to coarse SAND with silt; strong odor, slight sheen (very dense, wet) **Soil sample: MW27d(55-55.5)20110509** **Soil sample: MW27d(60-60.5)20110509**

Boring Completed 05/09/11
Total Depth of Boring = 60.5 ft.

Monitoring Well Completed 05/09/11
Elevation at Top of Protective Casing = 405.85 ft.
Elevation at Top of Monitoring Well Casing = Not Measured
Total Depth of Monitoring Well = 60.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.
4. **DOE Unique Well Number: BHB340**

LANDAU ASSOCIATES

Perderson's Fryer Farms
Tacoma, Washington

Log of Boring MW-27d

Figure
A-25
(2 of 2)

MW-28d

LAI Project No: 136006.010

Drilling Method: Hollow-Stem Auger
Ground Elevation (ft): 407.09
Drilled By: Cascade Drilling Inc.
Logged By: TJS Date: 05/11/11

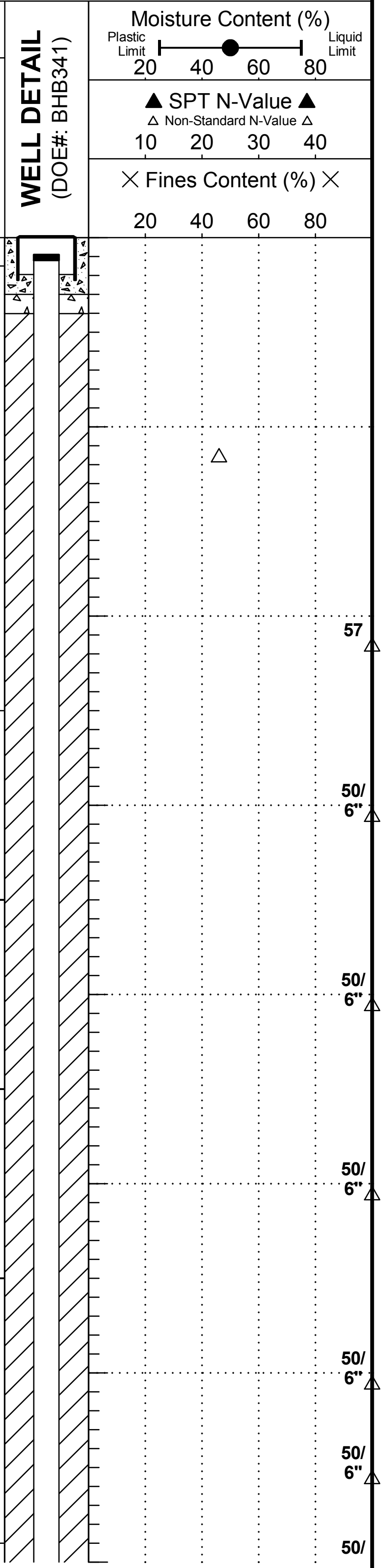
SAMPLE DATA

Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)
S-1	a1	23	0
S-2	a1	57	0
S-3	a1	50/ 6"	0
S-4	a1	50/ 6"	0
S-5	a1	50/ 6"	0
S-6	a1	50/ 6"	0
S-7	a1	50/ 6"	0

Depth (ft): 0, 5, 10, 15, 20, 25, 30, 35
Elevation (ft): 405, 400, 395, 390, 385, 380, 375

SOIL PROFILE

USCS Symbol	Description
AC	Asphalt concrete pavement
SM	Brown, silty, fine to medium SAND with trace gravel; no odor or sheen (medium dense, damp) **(UNIT 1)** - grades with gravel and dense
GP-GM	Brown, sandy GRAVEL with silt; no odor or sheen (very dense, damp) **(UNIT 2)**
SM	Brown, gravelly, silty, fine to coarse SAND; no odor or sheen (very dense, damp)
GP-GM	Grayish-brown, very sandy GRAVEL with silt; no odor or sheen (very dense, damp)
SP-SM	Brown, gravelly, fine to coarse SAND with silt; no odor or sheen (very dense, damp) - grades fine to medium SAND with gravel
SP	



Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.
4. **DOE Unique Well Number: BHB341**

LANDAU ASSOCIATES

Perderson's Fryer Farms
Tacoma, Washington

Log of Boring MW-28d

Figure
A-26
(1 of 2)

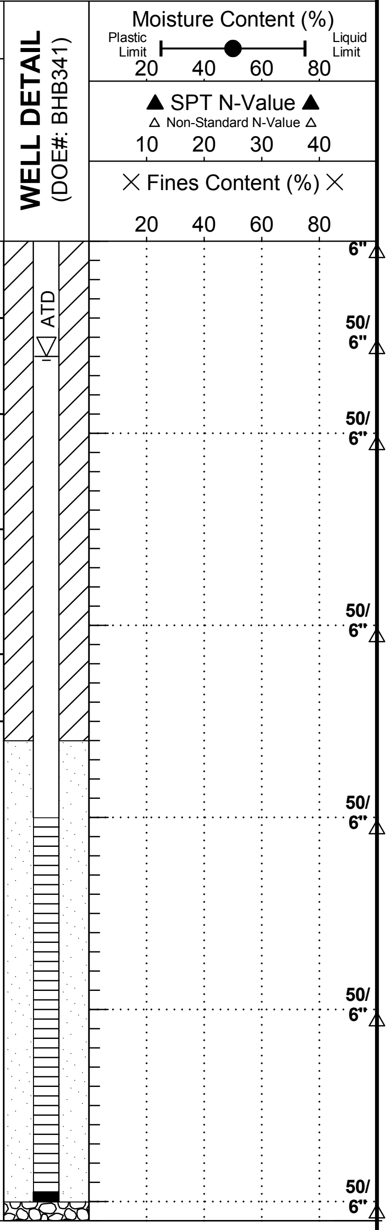
MW-28d

LAI Project No: 136006.010

SAMPLE DATA / SOIL PROFILE

Drilling Method: Hollow-Stem Auger
Ground Elevation (ft): 407.09
Drilled By: Cascade Drilling Inc.
Logged By: TJS Date: 05/11/11

Depth (ft)	Elevation (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	USCS Symbol	Description
35		S-8	a1	50/ 6"	0	SP	Grayish-brown, gravelly, fine to coarse SAND with trace silt; no odor or sheen (very dense, damp) **(UNIT 3)**
	370						
		S-9	a1	50/ 6"	0	SP-SM	Grayish-brown, gravelly, fine to coarse SAND with silt; no odor or sheen (very dense, wet)
40		S-10	a1	50/ 6"	0	GP-GM	Brown, sandy GRAVEL with silt; no odor or sheen (very dense, wet)
	365					SP-SM	Brown, gravelly, fine to coarse SAND with silt; no odor or sheen (very dense, wet)
45		S-11	a1	50/ 6"	0		
	360					SP	Gray, gravelly, fine to medium SAND with trace silt; no odor or sheen (very dense, wet)
						SP-SM	Gray, very gravelly, fine to coarse SAND with silt; strong hydrocarbon odor, slight sheen (very dense, wet)
50		S-12	a1	50/ 6"	0		**Soil sample: MW28d(50-50.5)20110511**
	355						- grades gravelly
55		S-13	a1	50/ 6"	2.6		**Soil sample: MW28d(55-55.5)20110511**
	350						
60		S-14	a1	50/ 6"	0		**Soil sample: MW28d(60-60.5)20110511**
65							
70							



Boring Completed 05/11/11
Total Depth of Boring = 60.5 ft.

Monitoring Well Completed 05/11/11
Elevation at Top of Protective Casing = 406.79 ft.
Elevation at Top of Monitoring Well Casing = Not Measured
Total Depth of Monitoring Well = 60.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.
4. **DOE Unique Well Number: BHB341**

LANDAU ASSOCIATES

Perderson's Fryer Farms
Tacoma, Washington

Log of Boring MW-28d

Figure
A-26
(2 of 2)

MW-29d

LAI Project No: 136006.010

SAMPLE DATA

Depth (ft)	Elevation (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)
0					
	405				
5		S-1	a1	11	0
	400				
10		S-2	a1	15	0
	395				
15		S-3	a1	82	0
	390				
20		S-4	a1	50/ 6"	0
	385				
25		S-5	a1	50/ 6"	0
	380				
30		S-6	a1	50/ 6"	0
	375				
35					

SOIL PROFILE

Drilling Method: Hollow-Stem Auger

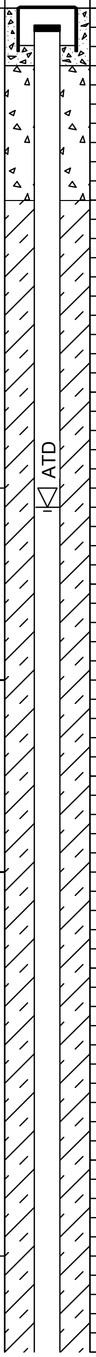
Ground Elevation (ft): 407.35

Drilled By: Cascade Drilling Inc.

Logged By: TJS/LKM Date: 05/16/11

USCS Symbol	Description
ML	Gray with brown mottling, sandy SILT; hydrocarbon odor, no sheen (stiff, damp) **(UNIT 1)** - grades with reddish-brown mottling, and trace gravel; very slight hydrocarbon odor, no sheen **Soil sample: MW29d(10-10.5)20110516**
GP	Brown, very sandy GRAVEL with trace silt; no odor or sheen (very dense, wet) **(UNIT 2)** **Soil sample: MW29d(15-15.5)20110516**
SP-SM	Brown, gravelly, fine to coarse SAND with silt; no odor or sheen (very dense, wet) **Soil sample: MW29d(20-20.5)20110516**
GP-GM	Brown, very sandy GRAVEL with silt; no odor or sheen (very dense, wet) **Soil sample: MW29d(25-25.5)20110516** - grades brownish-gray and wet
	No recovery

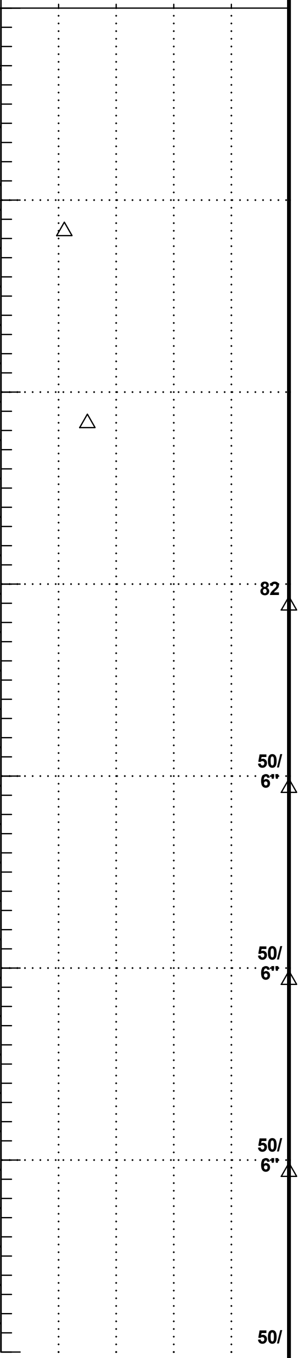
WELL DETAIL (DOE#: BHB347)



Moisture Content (%)
Plastic Limit — Liquid Limit
20 40 60 80

▲ SPT N-Value ▲
△ Non-Standard N-Value △
10 20 30 40

× Fines Content (%) ×
20 40 60 80



Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.
4. **DOE Unique Well Number: BHB347**

136006.01 9/20/11 N:\PROJECTS\136006.010.GPJ SOIL BORING LOG WITH GRAPH

LANDAU ASSOCIATES

Perderson's Fryer Farms
Tacoma, Washington

Log of Boring MW-29d

Figure
A-27
(1 of 2)

MW-29d

LAI Project No: 136006.010

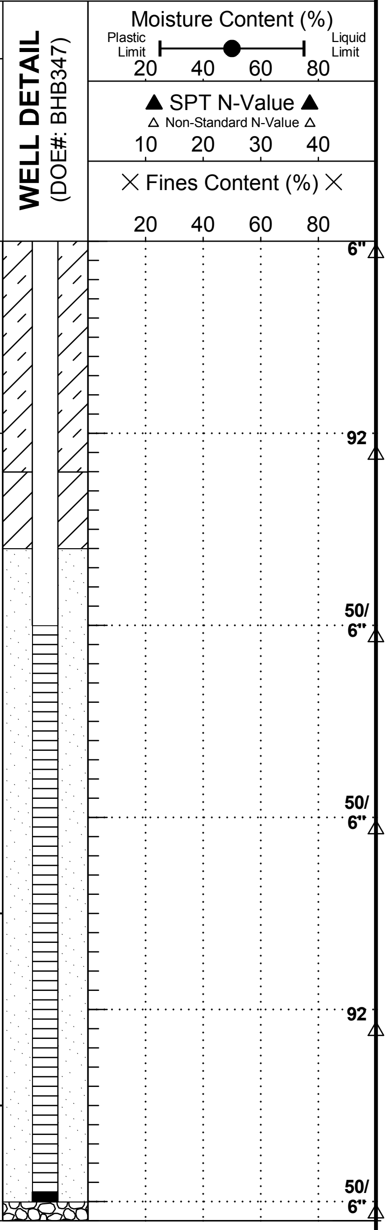
Drilling Method: Hollow-Stem Auger

Ground Elevation (ft): 407.35

Drilled By: Cascade Drilling Inc.

Logged By: TJS/LKM Date: 05/16/11

SAMPLE DATA						SOIL PROFILE	
Depth (ft)	Elevation (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	USCS Symbol	
35			a1	50/ 6"			No recovery
	370						
40		S-7	a1	92	0	SP- SM	Brown, fine to coarse SAND with gravel and silt; no odor or sheen (very dense, wet) **(UNIT 3)**
	365						- grades gravelly and very dense
45		S-7B	a1	50/ 6"	0		
	360						
50		S-8	a1	50/ 6"	0		
	355					SP	Brown, gravelly, coarse SAND with trace silt; no odor or sheen (very dense, wet)
55		S-9	a1	92	0		
	350					SP- SM	Brown, fine to coarse SAND with silt and trace gravel; no odor or sheen (very dense, wet)
60		S-10	a1	50/ 6"	0		
65							
70							



Boring Completed 05/16/11
Total Depth of Boring = 60.5 ft.

Monitoring Well Completed 05/16/11
Elevation at Top of Protective Casing = 406.88 ft.
Elevation at Top of Monitoring Well Casing = Not Measured
Total Depth of Monitoring Well = 60.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.
4. **DOE Unique Well Number: BHB347**

LANDAU ASSOCIATES

Perderson's Fryer Farms
Tacoma, Washington

Log of Boring MW-29d

Figure
A-27
(2 of 2)

MW-30d

LAI Project No: 136006.010

SAMPLE DATA / SOIL PROFILE

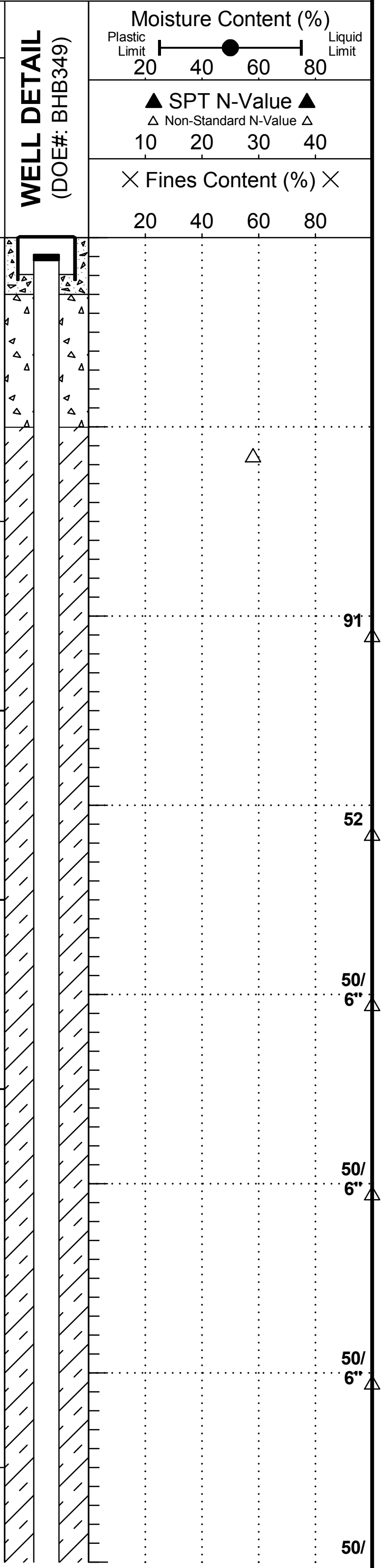
Drilling Method: Hollow-Stem Auger

Ground Elevation (ft): 409.38

Drilled By: Cascade Drilling Inc.

Logged By: PRR Date: 05/19/11

Depth (ft)	Elevation (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	USCS Symbol	
0						SM	Brown, silty, fine to medium SAND with gravel; no odor or sheen (medium dense, damp) **(UNIT 1)**
	405						
5		S-1	a1	29	0		
						SP-SM	Gray, gravelly, fine to medium SAND with silt; hydrocarbon odor (very dense, damp) **(UNIT 2)**
	400						
10		S-2	a1	91	2.1		**Soil sample: MW30d(10-10.5)20110519**
						SP	Gray, fine to medium SAND with trace silt and gravel; strong hydrocarbon odor, no sheen (dense, moist to wet)
	395						
15		S-3	a1	52	611		**Soil sample: MW30d(15-15.5)20110519**
						SP-SM	Gray, gravelly, fine to medium SAND with silt; no odor or sheen (very dense, wet)
	390						
20		S-4	a1	50/ 6"	23.4		**Soil sample: MW30d(20-20.5)20110519**
						GP-GM	Gray, sandy GRAVEL with silt; no odor or sheen (very dense, wet)
	385						
25		S-5	a1	50/ 6"	6.1		
	380						
30		S-6	a1	50/ 6"	1		**Soil sample: MW30d(30-30.5)20110519**
						SP	
	375						
35							



Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.
4. **DOE Unique Well Number: BHB349**

LANDAU ASSOCIATES

Perderson's Fryer Farms
Tacoma, Washington

Log of Boring MW-30d

Figure
A-28
(1 of 2)

MW-30d

LAI Project No: 136006.010

SAMPLE DATA

SOIL PROFILE

Drilling Method: Hollow-Stem Auger

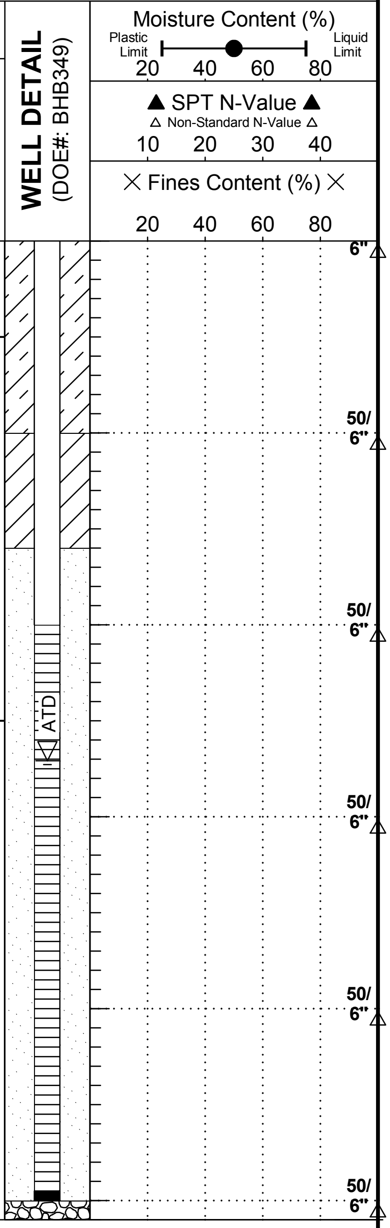
Ground Elevation (ft): 409.38

Drilled By: Cascade Drilling Inc.

Logged By: PRR Date: 05/19/11

Depth (ft)	Elevation (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)
35		S-7	a1	50/ 6"	0.9
	370				
40		S-8	a1	50/ 6"	1
	365				
45		S-9	a1	50/ 6"	0.8
	360				
50		S-10	a1	50/ 6"	1.4
	355				
55		S-11	a1	50/ 6"	1.1
	350				
60		S-12	a1	50/ 6"	0.2

USCS Symbol	Description
SP	Gray, fine to coarse SAND with gravel with trace silt; no odor or sheen (very dense, wet) **(UNIT 3)**
GP-GM	Gray, sandy GRAVEL with silt; no odor or sheen (very dense, wet) - grades moist
SP-SM	Gray, gravelly, fine to coarse SAND with silt; slight odor, no sheen (very dense, wet) **Soil sample: MW30d(50-50.5)20110519** - no odor or sheen



Boring Completed 05/19/11
Total Depth of Boring = 60.5 ft.

Monitoring Well Completed 05/19/11
Elevation at Top of Protective Casing = 409.05 ft.
Elevation at Top of Monitoring Well Casing = Not Measured
Total Depth of Monitoring Well = 60.0 ft.

Depth (ft)
65
70

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.
4. **DOE Unique Well Number: BHB349**

LANDAU ASSOCIATES

Perderson's Fryer Farms
Tacoma, Washington

Log of Boring MW-30d

Figure
A-28
(2 of 2)

MW-31d

LAI Project No: 136006.010

SAMPLE DATA

Depth (ft): 0, 5, 10, 15, 20, 25, 30, 35

Elevation (ft): 405, 400, 395, 390, 385, 380, 375

Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)
S-1	a1	31	5.6
S-2	a1	75	0.1
S-3	a1	50/ 6"	0.1
S-4	a1	50/ 6"	0
S-5	a1	50/ 6"	0
S-6	a1	50/ 6"	0
S-7	a1	50/ 6"	0

SOIL PROFILE

Drilling Method: Hollow-Stem Auger

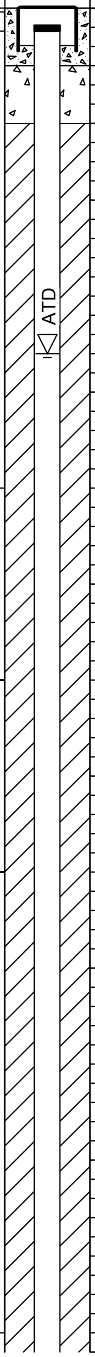
Ground Elevation (ft): 407.21

Drilled By: Cascade Drilling Inc.

Logged By: LKM/TJS Date: 05/12/11

USCS Symbol	Description
AC	Asphalt concrete pavement
PC	Portland concrete cement
SM	Gray with brown mottling, silty, fine to medium SAND with gravel; no odor or sheen (medium dense, damp) **(UNIT 1)** **Soil sample: MW31d(5-5.5)20110512** - grades brownish-gray, very dense and wet **Soil sample: MW31d(10-10.5)20110512**
SP-SM	Brownish0gray, gravelly, fine to medium SAND with silt; no odor or sheen (very dense, wet) **(UNIT 2)** **Soil sample: MW31d(15-15.5)20110512**
GM	Brownish-gray, silty, sandy GRAVEL; no odor or sheen (very dense, damp)
SP-SM	Brownish-gray, gravelly, fine to coarse SAND with silt; no odor or sheen (very dense, damp) - grades gray and very gravelly - grades gray with minor brown mottling and gravelly
SP	

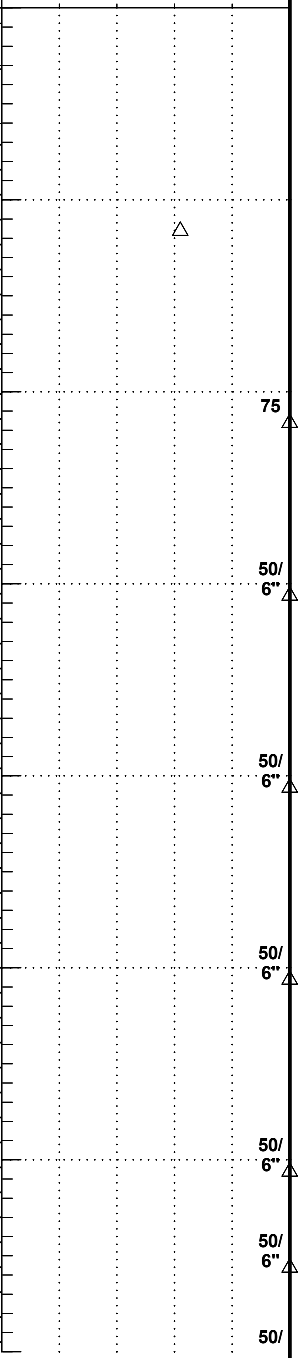
WELL DETAIL (DOE#: BHB344)



Moisture Content (%)
Plastic Limit — Liquid Limit
20 40 60 80

▲ SPT N-Value ▲
△ Non-Standard N-Value △
10 20 30 40

× Fines Content (%) ×
20 40 60 80



Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.
4. **DOE Unique Well Number: BHB344**

136006.01 9/20/11 N:\PROJECTS\136006.010.GPJ SOIL BORING LOG WITH GRAPH

LANDAU ASSOCIATES

Perderson's Fryer Farms
Tacoma, Washington

Log of Boring MW-31d

Figure
A-29
(1 of 2)

MW-31d

LAI Project No: 136006.010

SAMPLE DATA

Depth (ft)	Elevation (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)
35		S-8	a1	50/ 6"	0
	370				
		S-9	a1	50/ 6"	0
40		S-10	a1	50/ 6"	0
	365				
45		S-11	a1	50/ 6"	0
	360				
50		S-12	a1	50/ 6"	0
	355				
55		S-13	a1	50/ 6"	0
	350				
60		S-14	a1	50/ 6"	0
65					
70					

SOIL PROFILE

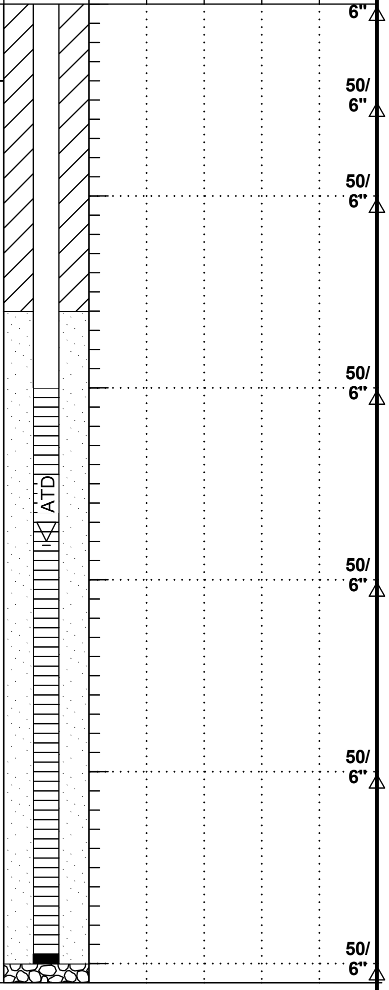
Drilling Method: Hollow-Stem Auger

Ground Elevation (ft): 407.21

Drilled By: Cascade Drilling Inc.

Logged By: LKM/TJS Date: 05/12/11

USCS Symbol	Description
SP	Brown, fine to medium SAND with trace gravel; no odor or sheen (very dense, damp) **(UNIT 3)**
SP-SM	Brown, gravelly, fine to coarse SAND with silt; no odor or sheen (very dense, damp) - grades wet



Boring Completed 05/12/11
Total Depth of Boring = 60.5 ft.

Monitoring Well Completed 05/12/11
Elevation at Top of Protective Casing = 406.80 ft.
Elevation at Top of Monitoring Well Casing = Not Measured
Total Depth of Monitoring Well = 60.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.
4. **DOE Unique Well Number: BHB344**

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Perderson's Fryer Farms
Tacoma, Washington

Log of Boring MW-31d

Figure
A-29
(2 of 2)

MW-32d

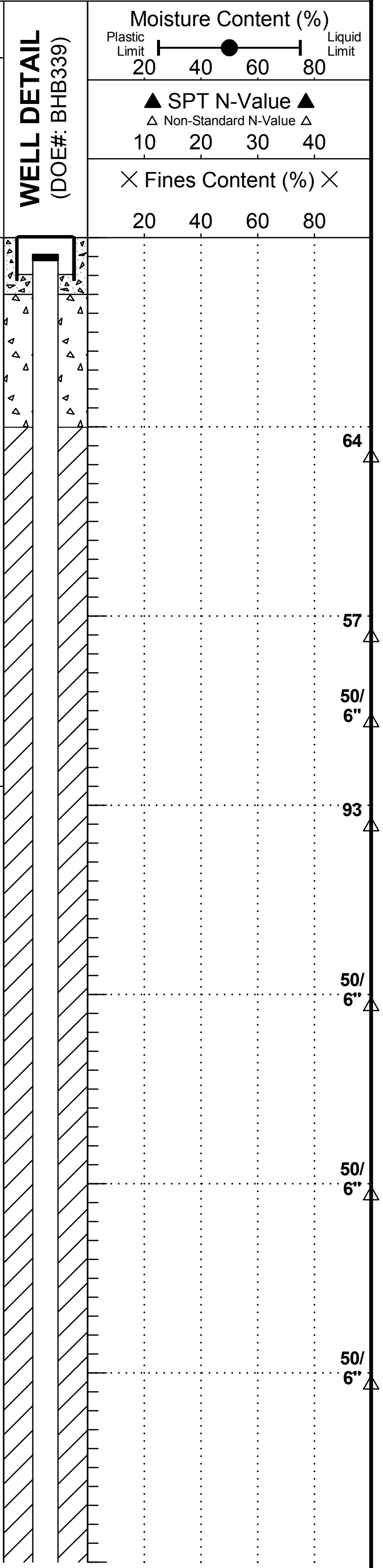
LAI Project No: 136006.010

SAMPLE DATA

SOIL PROFILE

Drilling Method: Hollow-Stem Auger
Ground Elevation (ft): 407.35
Drilled By: Cascade Drilling Inc.
Logged By: TJS/PRR Date: 05/09/11

Depth (ft)	Elevation (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	USCS Symbol	
0						SM	Brown, silty, fine to medium SAND with gravel; no odor or sheen (dense, damp) **(UNIT 1)**
	405						
5		S-1	b1	64			
	400						- grades with gravel
10		S-2	b1	57			
	395	S-3	b1	50/ 6"	0		- grades very dense
15		S-4	b1	93		SP-SM	Brown, gravelly, fine to coarse SAND with silt; no odor or sheen (very dense, moist) **(UNIT 2)**
	390						
20		S-5	b1	50/ 6"	0		
	385						
25		S-6	b1	50/ 6"			
	380						
30		S-7	b1	50/ 6"	0		
	375						
35							



Notes: 1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.
4. DOE Unique Well Number: BHB339

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Perderson's Fryer Farms
Tacoma, Washington

Log of Boring MW-32d

Figure
A-30
(1 of 2)

MW-32d

LAI Project No: 136006.010

SAMPLE DATA

SOIL PROFILE

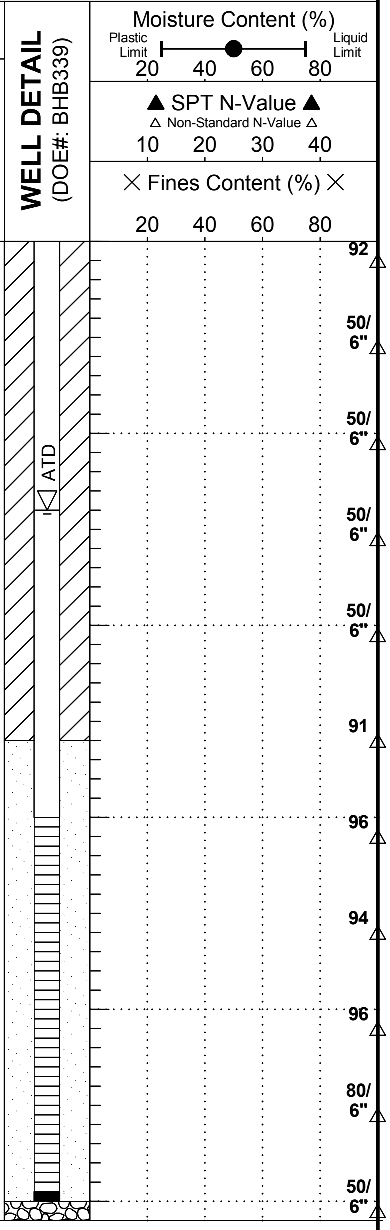
Drilling Method: Hollow-Stem Auger

Ground Elevation (ft): 407.35

Drilled By: Cascade Drilling Inc.

Logged By: TJS/PRR Date: 05/09/11

Depth (ft)	Elevation (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	USCS Symbol	Description
35		S-8	b1	92		SP-SM	Brown, gravelly, fine to coarse SAND with silt; no odor or sheen (very dense, moist) **(UNIT 2)**
	370	S-9	b1	50/ 6"			- grades moist to wet
40		S-10	b1	50/ 6"			
	365	S-11	b1	50/ 6"			- grades wet
45		S-12	b1	50/ 6"	0		
	360	S-13	b1	91			
50		S-14	b1	96			
	355	S-15	b1	94			
55		S-16	b1	96			- grades grayish-brown
	350	S-17	b1	80/ 6"			
60		S-18	b1	50/ 6"			



Boring Completed 05/09/11
Total Depth of Boring = 60.5 ft.

Monitoring Well Completed 05/09/11
Elevation at Top of Protective Casing = 406.88 ft.
Elevation at Top of Monitoring Well Casing = Not Measured
Total Depth of Monitoring Well = 60.0 ft.

65

70

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.
4. **DOE Unique Well Number: BHB339**

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Perderson's Fryer Farms
Tacoma, Washington

Log of Boring MW-32d

Figure
A-30
(2 of 2)

MW-33s

LAI Project No: 136006.010

SAMPLE DATA

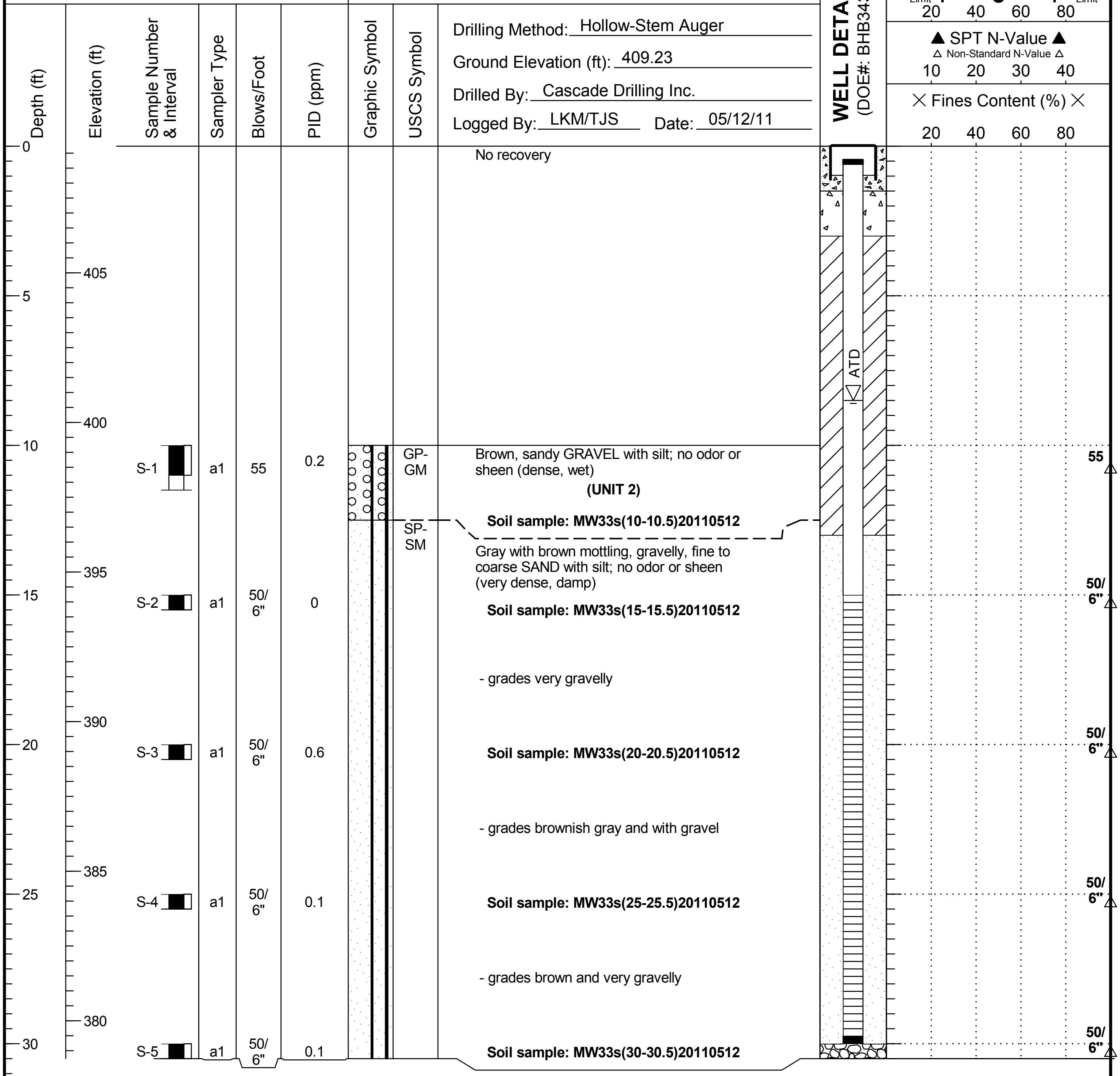
SOIL PROFILE

Drilling Method: Hollow-Stem Auger

Ground Elevation (ft): 409.23

Drilled By: Cascade Drilling Inc.

Logged By: LKM/TJS Date: 05/12/11



Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	USCS Symbol	Description
0						No recovery
10	S-1	a1	55	0.2	GP-GM	Brown, sandy GRAVEL with silt; no odor or sheen (dense, wet) **(UNIT 2)** **Soil sample: MW33s(10-10.5)20110512**
					SP-SM	Gray with brown mottling, gravelly, fine to coarse SAND with silt; no odor or sheen (very dense, damp)
15	S-2	a1	50/ 6"	0		**Soil sample: MW33s(15-15.5)20110512**
						- grades very gravelly
20	S-3	a1	50/ 6"	0.6		**Soil sample: MW33s(20-20.5)20110512**
						- grades brownish gray and with gravel
25	S-4	a1	50/ 6"	0.1		**Soil sample: MW33s(25-25.5)20110512**
						- grades brown and very gravelly
30	S-5	a1	50/ 6"	0.1		**Soil sample: MW33s(30-30.5)20110512**

Boring Completed 05/12/11
Total Depth of Boring = 30.5 ft.

Monitoring Well Completed 05/12/11
Elevation at Top of Protective Casing = 408.88 ft.
Elevation at Top of Monitoring Well Casing = Not Measured
Total Depth of Monitoring Well = 30.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.
4. **DOE Unique Well Number: BHB343**

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Perderson's Fryer Farms
Tacoma, Washington

Log of Boring MW-33s

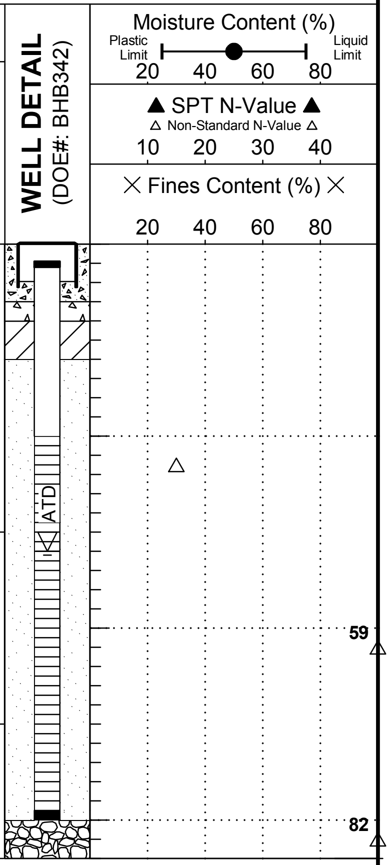
Figure
A-31

MW-34s

LAI Project No: 136006.010

Drilling Method: Hollow-Stem Auger
Ground Elevation (ft): 406.65
Drilled By: Cascade Drilling Inc.
Logged By: TJS/PRR Date: 05/11/11

Depth (ft)	Elevation (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	USCS Symbol	Soil Profile
0						SM	Brown and gray mottled, silty, fine to medium SAND with trace gravel; no odor or sheen (loose, damp) **(FILL)**
	405						
5							**Soil sample: MW34s(5-5.5)20110511**
		S-1	a1	15	0		
	400						
						SM	Gray, silty, fine to medium SAND; no odor or sheen (dense, moist) **(UNIT 1)**
10		S-2	a1	59	0		**Soil sample: MW34s(10-10.5)20110511**
	395						
						SP-SM	Brown, fine to medium SAND with gravel and silt; no odor or sheen (very dense, moist) **(UNIT 2)**
15		S-3	a1	82	0		**Soil sample: MW34s(15-15.5)20110511**
20							
25							
30							
35							



Boring Completed 05/11/11
Total Depth of Boring = 16.0 ft.

Monitoring Well Completed 05/11/11
Elevation at Top of Protective Casing = 406.26 ft.
Elevation at Top of Monitoring Well Casing = Not Measured
Total Depth of Monitoring Well = 15.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.
4. **DOE Unique Well Number: BHB342**

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Perderson's Fryer Farms
Tacoma, Washington

Log of Boring MW-34s

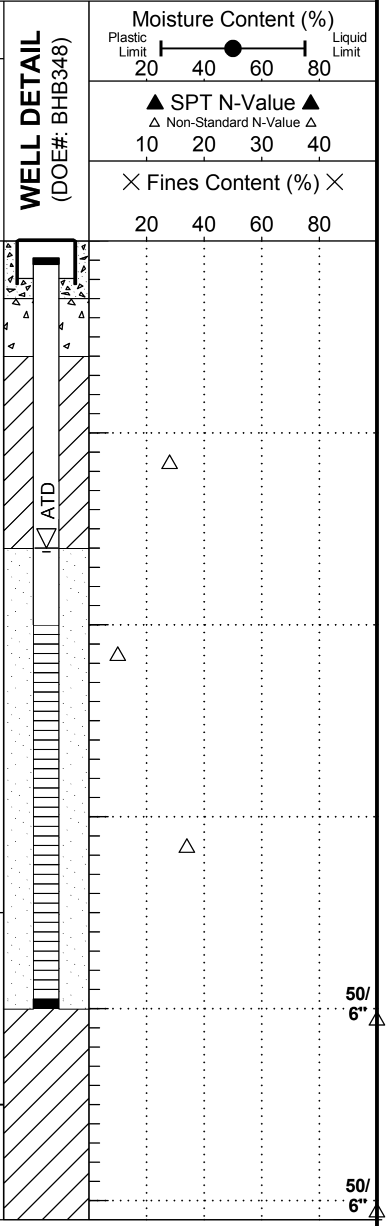
MW-35s

LAI Project No: 136006.010

SAMPLE DATA / SOIL PROFILE

Drilling Method: Hollow-Stem Auger
Ground Elevation (ft): 407.97
Drilled By: Cascade Drilling Inc.
Logged By: LKM/TJS Date: 05/17/11

Depth (ft)	Elevation (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	USCS Symbol	Description
0						SM	Brownish-gray, silty, fine to medium SAND with gravel; slight hydrocarbon odor, no sheen (loose, moist) **(FILL)**
	405						
5		S-1	a1	14	2.7		**Soil sample: MW35s(5-5.5)20110517**
	400						- grades with trace organics, very slight sheen, very loose and damp
10		S-2	a1	5	9.2		**Soil sample: MW35s(10-10.5)20110517**
	395						- grades without sheen and medium dense
15		S-3	a1	17	2.2		**Soil sample: MW35s(15-15.5)20110517**
	390					SM	Brownish-gray, silty, gravelly, fine to medium SAND with organics; slight odor, very slight sheen (very dense, wet) **(UNIT 2)**
20		S-4	a1	50/ 6"	0.5		**Soil sample: MW35s(20-20.5)20110517**
	385					SP-SM	Gray, gravelly, fine to coarse SAND with silt; slight odor, no sheen (very dense, wet)
25		S-5	a1	50/ 6"	1.2		**Soil sample: MW35s(25-25.5)20110517**
30							
35							



Boring Completed 05/17/11
Total Depth of Boring = 25.5 ft.

Monitoring Well Completed 05/17/11
Elevation at Top of Protective Casing = 407.59 ft.
Elevation at Top of Monitoring Well Casing = Not Measured
Total Depth of Monitoring Well = 20.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.
4. **DOE Unique Well Number: BHB348**

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Tacoma, Washington

Log of Boring MW-35s

Figure
A-33